

Jennifer Roberts

1. Contact Information

Name: Jennifer Roberts

Email: jkysharp@gmail.com

Home Address:

2243 N L ST

Washougal, WA 98671 US

Home Phone: 13606061352

Cell Phone : 13606061352

Institution Name: Camas High School

Institution Address:

26500 SE 15th Street

Camas, WA 98607 US

Institution Phone: 360-833-5750

Classroom/Office Extension: Room 508

Institution Fax: 1-360-335-3001

Institution Website: <http://chs.camas.wednet.edu/>

Other relevant websites: Magnet Website- program I helped develop and continue to teach and act as a research advisor within <https://chsmstmagnet.com/> My personal classroom Google Site <https://sites.google.com/camas.wednet.edu/apes2019/home>

Supervisor's Name: Dr. Liza Sejkora

Supervisor's Email Address: liza.sejkora@camas.wednet.edu

2. Demographic Information

a. Gender: Female

Race: White

c. Briefly describe your primary audience and surrounding community (e.g. K-12, public, rural/urban, technology access, economics): Camas High School is a suburban school that historically was supported by the paper mill. This mill has become largely inactive over the past five years. During the past twenty years that I have lived in the community I have seen it attract in more and more higher tech based industries such as HP, Underwriters Laboratories, Biocid., etc. In addition it has influences from its close proximity to Portland, Oregon that is a twenty minute drive across the Columbia river. There is a strong financial community support for their schools, demonstrated in their ability to pass bonds and support other improvement projects around the community. We are one of the top performing schools in the state in a variety of academic measurements.

d. Type of School (or students you work with): Public

Other Type of School

e. What is the population of your annual audience or school (estimates are fine) 2100

f. School Ethnicity:

0.4 % - American Indian or Alaska Native

8.8 % - Asian

1 % - Black or African American

8.2 % - Hispanic or Latino

0.2 % - Native Hawaiian or Other Pacific Islander

74.1 % - White

7.3 % - Multiracial

If your school uses other categories to describe race/ethnicity, please describe:

g. Percentage of students who receive free or reduced lunch: 2

h. Average class or audience size 30-33

i. Total number of students/audiences you teach in a year 150 not including

the kids I advise for research projects

j. If known, what are the approximate start and end dates of your school year or primary programs, etc. ? Include major professional vacation periods. i.e. Christmas break, summer break, etc.

Start first week of September and end around 3rd week of June depending on the winter weather make-up days. December 23rd-January 3rd winter break March 30th-April 3rd spring break.

3. Teaching Experience and Education

a. What type of university degree or other academic experience or qualifications do you have?

Bachelor's Degree (Major): Bachelor of Science in Microbiology Cum Laude March 1993

Bachelor's Degree (Minor):

Masters Degree (Discipline): Masters of Art Teaching June 1996

PhD Degree (Discipline):

Other Degree:

b. How many years of education experience do you have?: 22 years

c. How many years have you been working at your current institution?: 22 years

d. List up to 10 relevant professional licenses, certifications, registrations, awards or honors that you have received in your profession::

-Participant in the 2018 National Oceanic and Atmospheric Administration (NOAA) Teacher at Sea program working with Dr. Stacy Harter and Dr. John Reed aboard The Pisces researching Deep Sea Coral Ecosystems -National Board for Professional Teaching Standards Certificate for Science/Adolescence and Young Adulthood on December 16, 2017 Certificate #03012477 -Certificate of Recognition of participation from 2014-2019 in the College Board AP Reading scoring the AP Environmental Science exam in Cincinnati, OH -Partners in Science Program funded by M.J. Murdock Charitable Trust studying the Role of Planktonic Grazers on Cyanobacteria Toxin Production with Dr. Gretchen Rollwagen-Bollens at Washington State University Vancouver from 2011-2013, Additional Supplemental Grant award and Project implemented in 2014 as well -San Diego Zoo Institute for Conservation Research Certificate of Completion 2016 -Partners in Discovery GK-12 Project at Washington State University Vancouver from 2008-2011 a NSF funded project to bring college graduates into a year-long one-on-one collaborative partnerships in the classroom, focused on engaging students in inquiry investigations with a theme of "Global Change in a Local Context" -National Science Teacher Association member since 1998 -Washington Science Teacher Association member since 1998 -Toyota Tapestry Grants for Science Teachers Winner in 2006 for Excellence in Science

Education -Sammy Award presented by the Board of Clark County Commissioners in May 2002 for work done with students to monitor water quality in our local watersheds -Magic Apple Award from the Washington State Department of Ecology in recognition of outstanding achievement in the field of environmental education in June 2000 -Certificate of Training Completion Lab Safety Training For Researchers 2015 -Google Certified Educator Level 1 exam and training passed in August of 2019

4. Professional Assignment

a. What is your primary education assignment? Check all that apply

Secondary (Grades 9-12)

Other Primary Assignment

b. What subjects do you teach? Check all Secondary Biology, Secondary Earth Science

Other Subjects AP Environmental Science, Anatomy and Physiology, Forensic Science

5. Motivation for Participation

a. What motivates you to apply to PolarTREC and professionally, what do you hope to gain from the experience? (200 words maximum)

My passion for teaching science literacy skills and engaging students in authentic research highly correlates to the goals and objectives of PolarTREC. This opportunity will allow me to gain more content knowledge and expertise through personal involvement in the scientific research process. I believe I am a better science teacher due to participation in authentic research that improves my content knowledge, instructional delivery and ability to communicate my passion for science. More specifically, I look forward to gaining a deeper knowledge of global patterns and increased awareness of the current state of global conditions. I also look forward to PolarTREC's support in improving my collaboration and communication skills. I want all my students to learn critical thinking skills that will allow them to judge the scientific validity and legitimacy of claims they hear in the media. Too many students are leaving our secondary schools without fully understanding the true nature of science. With from the PolarTREC project, I will develop polar-based lesson plans that both heighten student scientific literacy and engage them in authentic research.

b. Aside from journaling/blogging, online photos, and webinars which all part of our program requirements, describe your ideas on how you will share this experience in your classroom or with the audiences you work with. (200 words maximum)

First, I will form a global digital pen pal community. Incorporating and fostering communication among peers across the globe can be incredibly impactful and appeal to educators around the world. The pen pal format will foster daily dialogue that encourages data exchange and observations. It also provides participants a platform on which to collaborate with those from other cultures and with different skill sets and experiences to brainstorm and engineer real solutions. Second, I will build a simulated Arctic or Antarctic expedition program (similar to the space program I have seen done at our middle school in the past). The simulated Arctic will be a more difficult task here at the 45th parallel, but I do have experience in developing simulations. When I was teaching Forensic Science classes, I created an animal body farm so students would have authentic “evidence” to examine. More recently, I facilitated the creation of a sustainable farm on school property. Students learn better when they feel the excitement of discovery while we provide them the opportunities to understand their world. So, why not a simulated research station that can do both!

c. Describe how you envision sharing your experience with other educators, your personal and professional communities, and the general public. (200 words maximum)

I will share my experience with other educators via face-to-face and digital communication. I will lead professional development sessions at the National and Washington State Teacher Association conferences, at our school district level technology and educator sessions, and at other northwest school district professional development events as asked. Additionally, I will make my lesson plans and unit outlines available on-line. I teach science summer camps for elementary students, and will expand that curriculum in order to more widely share the PolarTREC experience with the community. I will offer two-week long camps where elementary and middle school students enter the world of the Arctic research scientist. Campers will learn skills of global monitoring, lab techniques and sampling strategies that help us understand our world. They will divide into groups, adopting roles such as microbiologist, soil scientist or GPS engineer to collect and contribute real time data about the environment. Furthermore, I will share my experiences with the general public by submitting publications in the local and regional newspapers, giving lectures at local organizations such as OMSI and Water Resources Education Center,

and submitting news releases about the program to local publications.

d. Describe how you currently engage your audience and facilitate learning when educating on new and complex topics, concepts, or issues. (200 words maximum)

I use clarity of instruction and an authentic learning environment to motivate students and increase learning. First, I articulate the learning goal and clarify explicit learning targets in the environmental science curriculum. I base my pedagogy on brain-based research and growth mindset theory. I further facilitate learning by providing alternative ways to engage and process the skills and concepts through multiple learning styles. Students begin these complex projects by specializing and researching the existing literature. The classroom goal this year is to use sustainable practices that relate to food production in a suburban environment. Each student has her individual role and investigative question within this year-long project, yet works on a team to support a larger system (the farm). Students are building everything from composting and aquaculture to solar ovens. Students must trouble-shoot, search out expertise, recruit additional mentors and learn to write grants. I help them in all stages of this process. Students face a steep learning curve in an environment. I activities to be challenging, but where questions are encouraged, and confusion and failure are viewed as learning opportunities.

e. Describe the particular strengths you would bring to the PolarTREC program and to a field research team. (200 words maximum)

My strengths are curiosity, creativity, and caring. I believe life is a series of opportunities for learning. I have a natural habit of thinking, probing and questioning everything around me. I bring a whole new set of thoughts and questions to a field research team. I do not limit myself to one particular field of study, having delved into everything from immunology to geology, which can lead to thinking of unique connections. I love to immerse myself into subject matter and read until my understanding allows me to ask a good question. When student teams from other classrooms struggle on a project, their research advisors often refer them to me because of my reputation for having new ideas, a different perspective and a host of things to ponder. I like working on a team and value differing perspectives and skills. From Division I basketball teammates as a teenager to more recent professional collaborators, many have become lifelong friends and colleagues with whom I continue to keep in touch. I value listening to multiple perspectives and integrating disciplines to solve problems and design solutions.

f. Using examples from your own experience including your role and the contributions you made to a team effort, describe how you work as a

member of a team. (200 words maximum)

In 2006, I was one of four educators who initiated, designed, and implemented the Camas High School Magnet program for students who demonstrate an interest and aptitude for science, technology, English and math studies. Students go through an application process to access the program, and our success is reflected in increasing student interest, with enrollment expected to double by 2017. Currently in my tenth year on a teacher team that integrates these subjects, I teach freshman Advanced Placement environmental science. Not only does this teacher team effectively integrate the curriculum, we contribute to individual student and overall program success by organizing and implementing beyond-the-school-day events like trips to Shakespearian plays and science lecture series, study sessions and extended time research. As team leader, I am dedicated to both the support of my fellow teachers and to making our students experiences in high school exceptional. As a team member, I come prepared, listen openly, and follow through on tasks.

6. Communicating the Experience and Science

Write your journal entry for the general/lay audience. (200 words maximum)

October 4th, I attended a Coastal Hazards and Changing Climate Seminar yesterday, and I'm reminded of the critical need to voice our science to the public. I don't believe our society is ignorant, or apathetic, I think we are uninformed. The message about how our choices do affect the environment was clearly demonstrated with a variety of visualization tools and 800,000 years of data. The workshop was made more tangible by focusing on a local area that is being affected by climate change, one of my favorite campsites, Cape Disappointment state park. The main problem is the historical dredging practices in the Columbia River. What left me unsettled was that after years of trying to make reservations, myself, at this location I had not once understood the reason for the dwindling numbers of sites available. What a perfect mode, with over 100,000+ visitors a year, to share an important message of local issues and global conditions. Yet it took my attendance at workshop to understand the true nature of the problem. Collectively we are influencing global processes, individually and locally we can make a difference in the extent of this impact.

7. Scientific Interests and Research Area Preference

a. Where would you prefer to go on an expedition? Either

Please explain your preference

My preference is the Arctic field season because I don't like to miss time with my students. But I consider this a unique experience that I could commit to during either timespan and that would be supported by my administrators.

b. How long would you prefer to participate in an expedition? (Most expeditions are AT LEAST three weeks.) List any dates or periods of time when you are NOT able to participate in a field expedition

3-6 weeks.

c. Briefly describe your scientific interests. Which scientific topics interest you the most and why? Please note that climate change has become part of nearly all expeditions so you may choose to be more specific about this topic, if applicable. (200 words maximum)

My goal in applying for this program is not to remain comfortable in a field of study that I am particularly familiar with. I have two goals in applying for this program, increasing my ability to share science with a wider audience, and to “do science” that improves my ability to support students in authentic research. I am intensely curious about the world, and I have found that limiting my topic of study to only particular fields, also limits my perspective. If you asked me twenty years ago, I had a passion for molecular genetics and microbiology, ten years ago, forensic science and watershed monitoring, and today, global processes and scientific literacy. I thrive when I can dive into the research, make connections and then participate in the scientific process itself. I teach AP environmental science, and every single one of the research topics is of interest. If you ask me my strengths in research they would be; creativity and a strong background in molecular and cellular biology. But my interests are not limited to any particular topic. I love to learn new things and the more connections I can make across disciplines, the more engaging and deeper my understanding becomes.

Atmospheric Systems I am somewhat interested in this subject area

Cryospheric Systems I am somewhat interested in this subject area

Human and Social Systems I am somewhat interested in this subject area

Marine Systems I would really enjoy an expedition in this subject area

Terrestrial Systems I would really enjoy an expedition in this subject area

Ecology and Biotic Systems I would really enjoy an expedition in this subject area

Physics or Space Sciences I am somewhat interested in this subject area

Engineering and Technology I am somewhat interested in this subject area

Other (please specify)

Other Areas of Scientific Interest

e. Are you applying to work exclusively with a specific researcher? If yes, please list their full name, institution, and email address. (200 words maximum)

8. Background Information and Skills

a. Briefly describe your outdoor skills or experiences.

Wildland firefighter for 3 summers during my college years with training in first aid and fire suppression. As a teacher I have had clandestine gravesite training with a team of detectives on how to detect and process a murder scene. I am a master level PADI scuba diver. I love to camp, hike, boat, kayak and in general be outdoors. In Belize I had some very basic jungle survival training. As a coach I undergo first aid training every two years and AED/CPR training annually.

b. Provide a basic statement of your general health and physical condition.

I am a healthy 49 year old female who works out a minimum of three times a week at a fitness center. I have my own set of weights and work out routine I do at home in the morning before work as well. I have recently been prescribed a mild dose of a beta-blocker and aspirin for an intermittent but not persistent or regular heart arrhythmia that has existed but not been diagnosed/treated for at least 20 years. The NOAA Teacher at Sea program did a health assessment on me in 2018 and I passed all parameters of their exams.

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.

I am part of a STEM team- as such I am required to be up-to-date with most technology used at our school. This summer I took a course and passed my level 1 Google educators certification program. I am familiar with a PC at school and with the use of a Mac on my home system. I am most comfortable with PC based platforms.

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.

This year I am experimenting with my students using two new educational tools, BookCreator and Screencastify. In this past summer's course, offered through our district technology department, I used both applications to create a digital study book example and a video based explanation of my technological goals for my students for this year using the free screen recorder offered for Chrome on Screencastify. Weekly I use programs such as Quizlet Live, Kahoot, and Google Suite features with my students. Vernier technology, especially their environmental sensors for water and air quality monitoring, are used by my students for collecting data for both their short-term lab investigations and longer term research projects.

e. List any additional skills or information that you wish to be considered.

<https://noaateacheratsea.blog/category/2018/jennifer-dean/> For samples of my blogging and a more detailed look into my thoughts and experiences on my last research experience please visit the link above. Also note I got married in October of last year, which is why the last name no longer matches on many of my documents.

9. Previous Applications & Participation

a. Have you previously participated in a teacher research experience (e.g. NOAA Teacher at Sea, Earth Watch)? We do not accept applications from PolarTREC alumni. Yes

Program Information 2018 NOAA Teacher at Sea- Conducting ROV and multibeam sonar surveys inside and outside six marine protected areas (MPAs) and the Oculina Experimental Closed Area (OECA) to assess the efficacy of this management tool to protect species of the snapper grouper complex and Oculina coral. 2014-2017 Partners in Science Program - Murdock Foundation Algal Bloom Research 2011-2013 NSF GK12 Project at Washington State University of Vancouver

If yes, did you complete all program requirements? Yes

If yes, how do you see the PolarTREC professional development opportunity continuing to develop your professional skills, or how will it build on your previous research experiences?

I would like to be part of a scientific team, not only sharing and communicating the real science currently being undertaken on PolarTREC expeditions, but experiencing and applying the techniques used for data collection . I want to see firsthand our changing planet and the analysis of the observations that research teams implement to understand such complex global problems. There is a limited selection of lessons available that incorporate real data, graphs and tables and how to use them for our very diverse learners in the classroom. I want to use these tools myself and be better able to design curriculum that can convey to all audiences how to read about science and ask good questions. Then to teach how to dig into the science that gives a potential pattern that explains a possible answer to that question, and to decipher the scientific validity to the data from opinion. To understand the differences in correlations and causation, with real examples and authentic phenomena. I am hoping to develop that skill in my students by experiencing and sharing what makes science so exciting, discovery. One truly understands something when they do it and then can teach it. From PolarTREC's stated objectives it provides the opportunities to support both.

10. Orientation Availability

Are you available to attend the Orientation during this time period? Yes

If no, please explain

11. How did you hear about PolarTREC?

Email listserve. Please provide the name and/or URL

Friend or colleague. Provide a name if you wish

Former PolarTREC, TREC, or TEA teacher. Please provide their name

From a website. Please list the website name and URL

Conference or presentation. Please list the venue and/or presentation title

Other (please explain)

At Murdock's San Diego conferences for Partners in Science there are poster sessions where teachers and scientists can talk. During several of these sessions over the years I have had both scientists and teachers share with me the NOAA Teacher at Sea opportunities and the PolarTREC experiences. It was not a formal presentation that I heard about the program, but I highly recommend that this program get shared in a more formal manner at one of Partners in Science conferences.

b. Please suggest other places we might advertise this opportunity for teachers

Partners in Science Conference in January in San Diego - Murdock Charitable Trust

12. References

Reference 1

Name Kim Newman

Title and affiliation Partners in Science Program Director, my former teaching partner

Email Address kimn@murdocktrust.org

Phone Number 1-971-570-4140

Reference 2

Name Sam Greene

Title and affiliation English, STEM team teacher

Email Address sam.greene@camas.wednet.edu

Phone Number 1-360-433-5504

Reference 3

Name Brianna Abraham

Title and affiliation Science Teacher, new teaching partner in our STEM program

Email Address brianna.abraham@camas.wednet.edu

Phone Number 360-931-2613

2020-2021 PolarTREC Educator Application

Josue Rodriguez Colon

1. Contact Information

Name: Mr. Josue Rodriguez Colon

Email: jrodriguez0262@gmail.com

Home Address:

Cond San Juan View Apt 806B, #850 calle eider
San Juan, 00924 PR

Home Phone:

Cell Phone : 7872463328

Institution Name: Puerto Rico Astronomy Society

Institution Address:

PO Box 362846
San Juan, 00936 PR

Institution Phone: 7875317277

Classroom/Office Extension:

Institution Fax:

Institution Website: astronomiapr.org

Other relevant websites:

Supervisor's Name: Juan Villafane

Supervisor's Email Address: astronomiapr@gmail.com

2. Demographic Information

a. Gender: Male

Race: Hispanic or Latino

c. Briefly describe your primary audience and surrounding community (e.g. K-12, public, rural/urban, technology access, economics): As a member of both Nasa JPL Solar System Ambassador and of the Puerto Rico Astronomy Society, my audience target and community is very wide. I have participated in events all around the Island. But the main audience that I always try to reach are students 6-12.

d. Type of School (or students you work with): Public

Other Type of School

e. What is the population of your annual audience or school (estimates are fine) 4000 total, divided as 200 school students, 100 on summer camps and nature reserve entities. The rest on public family oriented events

f. School Ethnicity:

% - American Indian or Alaska Native

% - Asian

% - Black or African American

100 % - Hispanic or Latino

% - Native Hawaiian or Other Pacific Islander

% - White

% - Multiracial

If your school uses other categories to describe race/ethnicity, please describe:

g. Percentage of students who receive free or reduced lunch:

h. Average class or audience size 30 on private events 200+ on public events

i. Total number of students/audiences you teach in a year 4000

j. If known, what are the approximate start and end dates of your school year or primary programs, etc. ? Include major professional vacation periods. i.e. Christmas break, summer break, etc.

As informal educator, my events are all throughout the year , during school summer

breaks I mainly then focus on summer camps

3. Teaching Experience and Education

a. What type of university degree or other academic experience or qualifications do you have?

Bachelor's Degree (Major): Computer Science

Bachelor's Degree (Minor):

Masters Degree (Discipline):

PhD Degree (Discipline):

Other Degree:

b. How many years of education experience do you have?: 4

c. How many years have you been working at your current institution?: 4

d. List up to 10 relevant professional licenses, certifications, registrations, awards or honors that you have received in your profession::

4. Professional Assignment

a. What is your primary education assignment? Check all that apply Primary (Grades 1-5), Middle School (Grades 6-8), Secondary (Grades 9-12)

Other Primary Assignment

b. What subjects do you teach? Check all N/A

Other Subjects

5. Motivation for Participation

a. What motivates you to apply to PolarTREC and professionally, what do you hope to gain from the experience? (200 words maximum)

I joined the Puerto Rico Astronomy Society (an affiliate of the NASA Space Grant Consortium) in late 2015. On February 2017 I became its Vice President. On 2018 I became a member of NASA JPL's Solar System Ambassador Program. The PolarTREC program gives me a unique opportunity by giving me a stronger scientific background. Although I do not question the quality or amount of knowledge I possess, the program would give a huge boost and credibility to the informal education I provide. I hope with the program I can gain new experience and a solid scientific foundation to be able to impact and shape the youth of my country in a greater way. There is a lack of STEM education in my country and a big desire from the community to learn about the universe.

b. Aside from journaling/blogging, online photos, and webinars which all part of our program requirements, describe your ideas on how you will share this experience in your classroom or with the audiences you work with. (200 words maximum)

As the vice president of the Puerto Rico Astronomy Society (A NASA Space Grant Affiliate) and a member of NASA JPL's Solar System Ambassador Program I partake in many events throughout the year, around 10-15 private/public school visits, 4-5 General open public events that can go as low as 200 people to 500 (2000 during the last Solar Eclipse), private companies, and nature reserves like Para La Naturaleza, a few radio appearances and newspaper columns. Always trying to build a stronger professional network in order to provide the biggest impact possible. This is done with star parties, conferences, school visits and more. With this experience there's a possibility to add more diversity to the events and even include some students to partake on activities such as small tabletop projects.

c. Describe how you envision sharing your experience with other educators, your personal and professional communities, and the general public. (200 words maximum)

In Puerto Rico we have the best of both worlds in Astronomy, we see all of the northern sky as well as the best of the southern sky, and we have some pockets with lower light pollution while not being too far off the city. As such, the interest in astronomy is quite big. I use this opportunity that is facilitated by the programs I belong to and peak the public's curiosity, teach them a little bit of how what they are seeing works. How the universe is not this fairy tale of impossibility that movies and

media would have us believe, but in fact it is much more interesting and wonderful. People that come to my astronomy events are already interested in the topic and many of them being educators ask how they can bring such an event to their school. As such I have a professional network of astronomy clubs, nature reserves, educators and more entities which I can work with and am available for them to share the information I gain from this program.

d. Describe how you currently engage your audience and facilitate learning when educating on new and complex topics, concepts, or issues. (200 words maximum)

Schools and other venues I go to, while doing events for either the Puerto Rico Astronomy Society or NASA JPL's Solar System Ambassador program, mostly ask for presentations and star parties. I keep my presentations simple. No text whatsoever in them. I show pictures of the universe and proceed to compare those pictures with things they know or have seen on Earth. On star parties I show them directly with a laser pointer or my telescope. For example when they see Jupiter's great red spot through my telescope or a picture, I compare that hurricane to those that happen on Earth. The hardest thing to make people understand is just how big the Universe really is. But when I start them on the journey of the solar system and how it would take me in my car 8 months to get to the closest celestial neighbor, the Moon. When this comparison is made, it makes it much easier for them to remember information. It also shocks them when something that happens on earth happens in a much bigger scale in the universe. This makes it easier for students to retain information because it comes from comparing something that they already know.

e. Describe the particular strengths you would bring to the PolarTREC program and to a field research team. (200 words maximum)

As a software developer in the private industry, my job requires a lot of critical thinking, long work hours as needed per the task at hand. It also requires working as a team and communicating with them often. This is so the software that you are creating compliments and works with what the other team members are working on and you need to know how what they are doing works with your part of the project. So the nature of my job already provides me with many skills that would be useful to the PolarTREC program. Critical thinking, able to work with others, quick learning, computer knowledge, working long hours. As well as skills I have picked up as an amateur astronomer and informal educator.

f. Using examples from your own experience including your role and the contributions you made to a team effort, describe how you work as a member of a team. (200 words maximum)

I'm the vice-president of the Puerto Rico Astronomy society since Feb 2017 we organize small and big scale events. This needs a team effort, is impossible to do alone. Is important to understand people's strength in the team you work with. I normally facilitate communications between everyone involved to make the effort run smooth as well as trying to bring a perspective or unknown that can be caught and prevented. This also happens in my job as a software developer, these are big scale jobs that require team effort.

6. Communicating the Experience and Science

Write your journal entry for the general/lay audience. (200 words maximum)

We started noticing at work that our customers kept calling our Customer Service line mentioning that their orders had some missing information they had inputted. We figured out that the information at some point was being edited and the edit process was working incorrectly, deleting some information. Since the web application we have is very big and the source of this error was proving difficult to trace and time was of the essence, the team decided that we would put a custom code and message to each of the processes that called to edit the information as well as a message saying "please contact customer support with the code ####". We talked to the manager of customer support saying that we would on purpose generate this message to tell us where the error was happening so the Customer service representatives could properly log the information we needed. Soon enough we got some calls all stating a specific code that directly pointed to the process that was causing the misinformation and promptly fixed it. I have never fixed a programming error by having the customer be the one that tells us where the mistake was coming from.

7. Scientific Interests and Research Area Preference

a. Where would you prefer to go on an expedition? Either

Please explain your preference

b. How long would you prefer to participate in an expedition? (Most expeditions are AT LEAST three weeks.) List any dates or periods of time when you are NOT able to participate in a field expedition

4-5 weeks. As my main job is in the private industry, although the time off is completely possible, it's also something that I would need to coordinate with them, but there should not be any problem.

c. Briefly describe your scientific interests. Which scientific topics interest you the most and why? Please note that climate change has become part of nearly all expeditions so you may choose to be more specific about this topic, if applicable. (200 words maximum)

I'm looking to expand my knowledge in Astrophysics or astronomy related sciences. As my main method of STEM educating is through astronomy events. That's my biggest tool to catch the interest of the public. Having a direct method to show the universe and then expanding their knowledge of what they are seeing by helping them understand it and how even though it's far away, it still affects us and helps us understand how humanity came to be. For this, I need a stronger scientific foundation in order to be able to better explain what is happening around us, be it climate change or how the universe works

Atmospheric Systems I am somewhat interested in this subject area

Cryospheric Systems I am somewhat interested in this subject area

Human and Social Systems I do not want to be considered for an expedition in this subject area

Marine Systems I am somewhat interested in this subject area

Terrestrial Systems I am somewhat interested in this subject area

Ecology and Biotic Systems I am somewhat interested in this subject area

Physics or Space Sciences I would really enjoy an expedition in this subject area

Engineering and Technology I would really enjoy an expedition in this subject area

Other (please specify)

Other Areas of Scientific Interest

e. Are you applying to work exclusively with a specific researcher? If yes, please list their full name, institution, and email address. (200 words maximum)

8. Background Information and Skills

a. Briefly describe your outdoor skills or experiences.

b. Provide a basic statement of your general health and physical condition.

At the moment I have no medical condition nor gone through any emergency situation other than a kidney stone 2 years ago. Regarding my physical condition at 5'10 and 185lbs I am currently overweight, however is worth noting that through diet and exercise I have lost a total of 25lbs in the last 3 months and still working on this, so you could say my physical condition is getting better.

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.

Software developer with some tech repair skills mostly working on Windows PCs. Knowledge of Mac operating systems is limited.

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.

As a software developer I know a wide variety of programs including most of Microsoft Office, all major web browsers and the ability to learn and operate new software if needed. Very limited skills in graphic design programs.

e. List any additional skills or information that you wish to be considered.

Fully bilingual, Spanish as my primary language, English as second

9. Previous Applications & Participation

a. Have you previously participated in a teacher research experience (e.g. NOAA Teacher at Sea, Earth Watch)? We do not accept applications from PolarTREC alumni.

Program Information

If yes, did you complete all program requirements?

If yes, how do you see the PolarTREC professional development opportunity continuing to develop your professional skills, or how will it build on your previous research experiences?

10. Orientation Availability

Are you available to attend the Orientation during this time period? Yes

If no, please explain

11. How did you hear about PolarTREC?

Email listserve. Please provide the name and/or URL

Friend or colleague. Provide a name if you wish

Former PolarTREC, TREC, or TEA teacher. Please provide their name

Armando Caussade, Polar Trec Teacher for the 2014-2015 Antartic season

From a website. Please list the website name and URL

Conference or presentation. Please list the venue and/or presentation title

Other (please explain)

b. Please suggest other places we might advertise this opportunity for teachers

12. References

Reference 1

Name Kay Ferrari

Title and affiliation Jet Propulsion Laboratory

Email Address Kay.A.Ferrari@jpl.nasa.gov

Phone Number 818-354-7581

Reference 2

Name Leonor Alicea Rodriguez

Title and affiliation Para la Naturaleza

Email Address leonor@paralanaturaleza.org

Phone Number 787-722-5834

Reference 3

Name Armando Caussade

Title and affiliation President Emeritus and Avisor @ Puerto Rico Astronomy Society

Email Address ac@armandocaussade.org

Phone Number 787-531-6914

2020-2021 PolarTREC Educator Application

Laura Rogers

1. Contact Information

Name: Laura Rogers

Email: larogers77@gmail.com

Home Address:

360 Glendale Avenue
Decatur , GA 30030 US

Home Phone:

Cell Phone : 4046836903

Institution Name: Fayette County High School

Institution Address:

1 Tiger Trail
Fayetteville, GA 30214 US

Institution Phone: (770) 460-3540

Classroom/Office Extension:

Institution Fax:

Institution Website: <https://www.fcboe.org/fchs>

Other relevant websites:

Supervisor's Name: Bill Stikes

Supervisor's Email Address: stikes.bill@mail.fcboe.org

2. Demographic Information

a. Gender: Female

Race: White

c. Briefly describe your primary audience and surrounding community (e.g. K-12, public, rural/urban, technology access, economics): My primary audience is a suburban high school in Fayetteville, Georgia. It is located south of the Atlanta airport. It has around 1300 students and is grades 9-12. All students have access to a chromebook. 40% of the students receive free or reduced lunch.

d. Type of School (or students you work with): Public

Other Type of School

e. What is the population of your annual audience or school (estimates are fine) 1300

f. School Ethnicity:

1 % - American Indian or Alaska Native

5 % - Asian

58 % - Black or African American

11 % - Hispanic or Latino

0 % - Native Hawaiian or Other Pacific Islander

18 % - White

7 % - Multiracial

If your school uses other categories to describe race/ethnicity, please describe:

g. Percentage of students who receive free or reduced lunch: 40

h. Average class or audience size 26

i. Total number of students/audiences you teach in a year 130

j. If known, what are the approximate start and end dates of your school year or primary programs, etc. ? Include major professional vacation periods. i.e. Christmas break, summer break, etc.

School End Date: May 27th Holiday Vacation December 20th-January 6th

3. Teaching Experience and Education

a. What type of university degree or other academic experience or qualifications do you have?

Bachelor's Degree (Major): Environmental Science-Duke University

Bachelor's Degree (Minor): Global Health-Duke University

Masters Degree (Discipline): STEM Education-Mercer University

PhD Degree (Discipline):

Other Degree:

b. How many years of education experience do you have?: This is my third year teaching.

c. How many years have you been working at your current institution?: This is my third year at my current institution.

d. List up to 10 relevant professional licenses, certifications, registrations, awards or honors that you have received in your profession::

1. Broad field science certification 6-12 in Georgia I passed the GACE professional test and am certified to teach all sciences grades 6-12. 2. Woodrow Wilson Teaching Fellowship I received a fully-funded Masters of Arts in Teaching in secondary STEM education at Mercer University with year-long student teaching placement at Dodge County High School, GA and completed 500 hours of co-teaching experience in a physical science and forensics classroom 2. Member of GSTA and NSTA I presented at the Georgia Science Teacher Associations' Conference about how to have a successful first year teaching. 3. In Field Gifted Certification I am currently working on adding a gifted certification to my Georgia teaching certificate. 4. Advanced Placement in Environmental Science Certification I have participated in two CollegeBoard Advanced Placement summer institutes for environmental science. Summer 2018 and Summer 2019. 5. Goizueta Foundation Grant for Professional Development Funds In 2018, I received a grant of \$5,500 in order to attend the NSTA conference. I was able to bring my entire department of science teachers to the conference. We were all able to attend sessions that pertained to our subject area. In 2019, I received another grant worth \$5,500 to attend both GSTA and NSTA. Two other teachers from two different schools around the state were also able to attend these conferences. 6. Teaching Assistant for Environmental I was a teaching

assistant for students at Duke University in the course Introduction to Environmental Field Methods under professor Mike Bergin. We traveled to Bolivia to collect air and water samples.

7. Peer-Reviewed Publications: *Wyatt, L. H., Diring, S. E., Rogers, L. A., Hsu-Kim, H., Pan, W. K., & Meyer, J. N. (2016). Antagonistic Growth Effects of Mercury and Selenium in *Caenorhabditis elegans* Are Chemical-Species-Dependent and Do Not Depend on Internal Hg/Se Ratios. *Environmental Science & Technology Environ. Sci. Technol.*, 50(6), 3256-3264. doi:10.1021/acs.est.5b06

*Weinhouse, C., Ortiz, E. J., Berky, A. J., Bullins, P., Hare-Grogg, J., Rogers, L., Morales, A. M., Hsu-Kim, H., ... Pan, W. K. (2017). Hair Mercury Level is Associated with Anemia and Micronutrient Status in Children Living Near Artisanal and Small-Scale Gold Mining in the Peruvian Amazon. *The American journal of tropical medicine and hygiene*, 97(6), 1886-1897

4. Professional Assignment

a. What is your primary education assignment? Check all that apply

Secondary (Grades 9-12), Gifted

Other Primary Assignment

b. What subjects do you teach? Check all Secondary Biology

Other Subjects Advanced Placement Environmental Science

5. Motivation for Participation

a. What motivates you to apply to PolarTREC and professionally, what do you hope to gain from the experience? (200 words maximum)

Being an educator allows for amazing professional development opportunities, which not only benefits me as an educator, but also my students. PolarTREC would give me the field research experience of a lifetime that I could bring back to my classroom. As a researcher at Duke University, I was able to experience the world in new and fascinating ways, but since I have become an educator, I have missed the opportunity to get out in the field and collect data. I teach biology and Advanced Placement Environmental Science, both of which could benefit from my participation in this expedition. I strive to give my students real life experiences and to show them the application to what we are learning in the classroom. I want them to see that scientists solve problems that can help people around the globe. This experience would give me the opportunity to bring back data that would not be the same as reading from a book. I teach about the Arctic in depth in AP Environmental Science. Being able to experience the research and the ecosystem first hand could change the way I teach forever.

b. Aside from journaling/blogging, online photos, and webinars which all part of our program requirements, describe your ideas on how you will share this experience in your classroom or with the audiences you work with. (200 words maximum)

The goal of any professional development is to bring new and innovative ways of teaching back to the students. I would hopefully be able to use this experience in both my biology and AP Environmental Science courses. One of the many activities I do often in AP Environmental Science is to discuss scientific studies to connect the students to the broader science community. I would hope to use this experience as a theme throughout my course, whether that be teaching about biogeochemical cycles or climate change. A field research experience in the Arctic would change the way I approach the environmental science curriculum. I could bring back concrete examples of research and what scientists do in the field. Not only would this experience give my students more connections to this ever-changing climate we live in, but it would also give them the chance to see scientists in action. In my biology classes, I teach about ecosystems and organisms in a variety of different manners. I would hope to use what I learn from this field work to give my students perspective on the Arctic and how organisms are adapting to a world that is changing.

c. Describe how you envision sharing your experience with other educators, your personal and professional communities, and the general

public. (200 words maximum)

In the high school in which I currently, we are encouraged to share our experiences with other colleagues. We plan and meet together at least once a week. I plan to share this with my colleagues in the science department, but also to a broader audience. My administration values teachers who want to improve their practice by attending professional development. I would be encouraged to share this experience with not only the entire faculty, but also with other science teachers from across the county. We meet with science teachers from four other high schools at least once a semester and I would like to be able to present what I have learned from PolarTREC with them as well. I would also plan to present at the Georgia Science Teachers' Association Conference where I could meet and share this experience from teachers across the state.

d. Describe how you currently engage your audience and facilitate learning when educating on new and complex topics, concepts, or issues. (200 words maximum)

The first thing I want my students to do when engaging with a difficult question or topic is to ask questions. Not only does this questioning get the students thinking about the topic, but it also gives me the opportunity to recognize their misconceptions. I start with a phenomenon or a case study that gets the students thinking. To the students at the onset it may not seem like these questions have anything to do with the topic, but I get them to think about how it could relate to what we are learning. Once the students have seen and discussed the phenomenon, I often do not give them the answer, but rather I tell them that this is what we are going to be discussing and learning about. I want them to keep that phenomenon in their mind as we go through the topic more in depth. I do a combination of student-centered activities and teacher led activities through a variety of differentiated modes of delivery. Once the students have gone through a number of different activities that build on their knowledge, I ask them to go back to the phenomenon or case study and wrap up their understanding of the topic.

e. Describe the particular strengths you would bring to the PolarTREC program and to a field research team. (200 words maximum)

As a high school teacher, I think I have a unique set of skills that I would bring to the PolarTREC team. One strength that I think sets me apart is my patience. As a high school teacher, patience is key. You have to work with a variety of people including students, parents, other teachers, and administrators. My ability to listen and be patient with others will be useful to the research team because I would be able to work well with the team. The next thing I would bring to the team is flexibility. I know

that science does not always go as planned, especially when doing field work in difficult and sometimes remote locations. I would be able to roll with the punches and even think of new ideas in the field. The last thing I would bring to the field is a willingness to learn and perform any task. Performing research in the Arctic is a lifelong dream and I plan to be an enthusiastic participant of anything that is asked of me.

f. Using examples from your own experience including your role and the contributions you made to a team effort, describe how you work as a member of a team. (200 words maximum)

All of my life I have been a part of a team, whether that be as a soccer player, as a researcher in college, or as part of the biology team at my high school. I have learned to work to cooperate with others, while also speaking my mind. The biology team at my school consists of three other teachers and we work together to plan curriculum and activities for our students. We all have to communicate what we need or want for our classrooms to be effective. I work to make sure that everyone's voice is being heard in the group and by being an active participant in the group. I work to make sure that I bring valuable ideas to the group. I work hard so that I am always a prepared team member and often help others with tasks when needed.

6. Communicating the Experience and Science

Write your journal entry for the general/lay audience. (200 words maximum)

At 6:00 AM I hear loud music and realize it is my alarm. Time to get up for school! My mind is already racing. But, as per usual, I press the snooze, but my cat makes sure I am up and ready to go. After hastily getting ready for school, I head off in my car. We are doing a photosynthesis and cellular respiration lab in my freshman biology class, which always requires great preparation and patience. I have some slight anxiety as I arrive at school realizing how much work I have to do before the students arrive. I furiously set up the lab and students arrive. Miraculously, things go as planned! There were very few hiccups, but my students were able to understand how carbon dioxide concentration is affected by light and the process of photosynthesis. As their plants began to take up more photosynthesis, they learned about how plants use carbon dioxide to produce glucose for cellular respiration. While labs can be complicated, any day that my students can articulately describe what we are learning is a success!

7. Scientific Interests and Research Area Preference

a. Where would you prefer to go on an expedition? Arctic

Please explain your preference

I have always been interested in the Arctic and the changing ecosystem that occurs there. I am interesting in connecting humans to science. My major interests at Duke included how the environment affected human health. I would like to experience first hand what is going on in the Arctic and how that is affecting the people that are living there.

b. How long would you prefer to participate in an expedition? (Most expeditions are AT LEAST three weeks.) List any dates or periods of time when you are NOT able to participate in a field expedition

I have no preference on the length of time. It would be best if the field expedition started after my last day of school on May 27th.

c. Briefly describe your scientific interests. Which scientific topics interest you the most and why? Please note that climate change has become part of nearly all expeditions so you may choose to be more specific about this topic, if applicable. (200 words maximum)

As an environmental science teacher, I am very interested in the changing world and the effects that this has on the environment and on humans. I would be most interested in participating in a field expedition that I could link back to both my biology classes and my environmental science classes. I would be interesting to see how the Arctic is responding due to climate change, whether that be plants, animals, or changes in permafrost. In both classes, I teach about the biogeochemical cycling of matter, so studying the amount of carbon in the Arctic and how that plays a role in climate change is also of interest to me. I have never been a member of a research team that studies climate change, so I would be interested in bringing back data that I could use with my students.

Atmospheric Systems I am somewhat interested in this subject area

Cryospheric Systems I am somewhat interested in this subject area

Human and Social Systems I would really enjoy an expedition in this subject area

Marine Systems I am somewhat interested in this subject area

Terrestrial Systems I would really enjoy an expedition in this subject area

Ecology and Biotic Systems I would really enjoy an expedition in this subject area

Physics or Space Sciences I do not want to be considered for an expedition in this subject area

Engineering and Technology I am somewhat interested in this subject area

Other (please specify)

Other Areas of Scientific Interest

e. Are you applying to work exclusively with a specific researcher? If yes, please list their full name, institution, and email address. (200 words maximum)

8. Background Information and Skills

a. Briefly describe your outdoor skills or experiences.

I have spent a large amount of time outdoors. I have spent time camping, backpacking, and hiking. I have also spent time kayaking in a variety of different types of environments.

b. Provide a basic statement of your general health and physical condition.

I am in very good general health with no problems. I am in great physical condition. I exercise at least 3-5 times per week including weight training. I play soccer twice a week. I am able to participate in many different physical activities.

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.

I am familiar with both Mac and PC. I have used both operating systems and am skilled in both. I can use excel, word, and powerpoint well.

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.

I often use internet browsers professional and personally to research material. I use powerpoint, microsoft word, and excel professionally in order to make engaging lessons for my students. On a personal level, I have a digital camera that I utilize while traveling.

e. List any additional skills or information that you wish to be considered.

I have previously written a blog post for a field expedition. This can be found at this link: <https://globalhealth.duke.edu/media/blogs/voices-of-dghi/perceptions-and-realities-field-research-my-story> I have moderate proficiency in Spanish.

9. Previous Applications & Participation

a. Have you previously participated in a teacher research experience (e.g. NOAA Teacher at Sea, Earth Watch)? We do not accept applications from PolarTREC alumni. Yes

Program Information Georgia Tech Intern Fellowship for Teachers Summer 2019

If yes, did you complete all program requirements? Yes

If yes, how do you see the PolarTREC professional development opportunity continuing to develop your professional skills, or how will it build on your previous research experiences?

The PolarTREC professional development opportunity would allow for professional growth in a new way. My experience at Georgia Tech consisted of writing curriculum and spending time in the lab. PolarTREC would give me a new opportunity to go out into the field to collect data. I could bring this experience and combine my knowledge of working in a lab with my knowledge of being out in the field.

10. Orientation Availability

Are you available to attend the Orientation during this time period? Yes

If no, please explain

11. How did you hear about PolarTREC?

Email listserve. Please provide the name and/or URL

Friend or colleague. Provide a name if you wish

Former PolarTREC, TREC, or TEA teacher. Please provide their name

From a website. Please list the website name and URL

Conference or presentation. Please list the venue and/or presentation title

Other (please explain)

I was searching for teacher professional development on Google

b. Please suggest other places we might advertise this opportunity for teachers

12. References

Reference 1

Name Malia Bergstrom

Title and affiliation Biology Team Leader

Email Address bergstrom.malia@mail.fcboe.org

Phone Number 770-365-0686

Reference 2

Name Bill Stikes

Title and affiliation Assistant Principal

Email Address stikes.bill@mail.fcboe.org

Phone Number 770-460-3540

Reference 3

Name Judy Godfrey

Title and affiliation Mentor Mercer University

Email Address godfrey_jb@mercer.edu

Phone Number

2020-2021 PolarTREC Educator Application

Caitlin Roufa

1. Contact Information

Name: Ms. Caitlin Roufa

Email: caitpenn@gmail.com

Home Address:

2515 Landstrom Rd.
Rockford, IL 61107 US

Home Phone: 815-505-1860

Cell Phone : 815-505-1860

Institution Name: Harlem High School

Institution Address:

1 Huskie Cir
Machesney Park, IL 61115 US

Institution Phone: 815-654-4511

Classroom/Office Extension:

Institution Fax:

Institution Website: <https://www.harlem122.org/>

Other relevant websites:

Supervisor's Name: Terrell Yarbrough

Supervisor's Email Address: terrell.yarbrough@harlem122.org

2. Demographic Information

a. Gender: Female

Race: White

c. Briefly describe your primary audience and surrounding community (e.g. K-12, public, rural/urban, technology access, economics): My primary audience is grades 9-12 in a public high school in courses ranging from introductory up through AP physical and Earth sciences. On the community and district level, we have a diverse student population, totaling over 6000 students, mostly living in the greater Rockford urban area. Homes students come from range from several trailer parks, small homes formerly built for factory workers in tight knit neighborhoods, and a few suburban development communities. 50% of our students are classified as low-income and 3% as homeless. We have around 1700 students as of 2019-2020 (no official number yet as we just merged our freshman and senior campuses due to budget). Of these students, over 12.3% are latinex, 5% are black, 5.3% are mixed race, 74.6% are white, and the remaining fit into other ethnicities. (Data taken from the Illinois Report Card) Our students struggle with apathy as we have a 43% chronic absenteeism rate, well above the state average of 17%. We've seen a lot of industry dry up and factories close up until the last couple years. Many in the community do not have appropriate career training (despite good local college and university resources) which limits their access to the many new job openings from the burgeoning aerospace industry in our area.

d. Type of School (or students you work with): Public

Other Type of School

e. What is the population of your annual audience or school (estimates are fine) I personally teach 210 students per year in my courses, lead Key Club with an additional 30 students, and our school serves around 1700.

f. School Ethnicity:

1 % - American Indian or Alaska Native

2 % - Asian

5 % - Black or African American

12 % - Hispanic or Latino

1 % - Native Hawaiian or Other Pacific Islander

74 % - White

5 % - Multiracial

If your school uses other categories to describe race/ethnicity, please describe:

g. Percentage of students who receive free or reduced lunch: 50

h. Average class or audience size 21

i. Total number of students/audiences you teach in a year 210

j. If known, what are the approximate start and end dates of your school year or primary programs, etc. ? Include major professional vacation periods. i.e. Christmas break, summer break, etc.

3rd Week of August through the week before Memorial Day every year. 2 weeks for winter break starting around the 20th of December and ending 2 days after New Years. 3 Days for Thanksgiving and the 3rd week of March for Spring Break.

3. Teaching Experience and Education

a. What type of university degree or other academic experience or qualifications do you have?

Bachelor's Degree (Major): BA Physics

Bachelor's Degree (Minor): Astrophysics and Mathematics

Masters Degree (Discipline): currently pursuing MS Secondary Physics Ed and MS Physics

PhD Degree (Discipline):

Other Degree:

b. How many years of education experience do you have?: 3 in the public classroom, 3 in the college classroom and planetarium as a TA, 2 in STEAM outreach for a total of 8 years

c. How many years have you been working at your current institution?: 3 years

d. List up to 10 relevant professional licenses, certifications, registrations, awards or honors that you have received in your profession::

Illinois Professional Educators Lisc - Secondary Science (9-12), Middle School Science (6-8), Physical Science, Physics

4. Professional Assignment

a. What is your primary education assignment? Check all that apply

Secondary (Grades 9-12)

Other Primary Assignment

b. What subjects do you teach? Check all Secondary Earth Science, Secondary Physical Science, Secondary Physics

Other Subjects Specific subjects: Astronomy, Oceanography, Meteorology, STEAM Physics, AP Physics 1 Past subjects: Physical Science

5. Motivation for Participation

a. What motivates you to apply to PolarTREC and professionally, what do you hope to gain from the experience? (200 words maximum)

As a teacher of meteorology, climate, oceanography, astronomy, and physics, I am thrilled to have an experience doing real research in one of these fields. Nearly every day as I do activities with my students, show videos, and teach about these topics, I think about how exciting it would be to be "on the ground" with these researchers. I am one of those lifelong learners, so personally, it sounds like a fascinating experience to conduct research with other scientists on current issues. Not many people from our area (at least those who I know) get to visit the arctic or antarctic. The prospect of doing that alone makes me say, "Yes! Let's go!" Professionally, not only will it provide me with more tools in my educators resourcebox, but it will also benefit my school, district, and community to have this as a resource from which to draw.

b. Aside from journaling/blogging, online photos, and webinars which all part of our program requirements, describe your ideas on how you will share this experience in your classroom or with the audiences you work with. (200 words maximum)

I teach Earth Science topics in meteorology, climate, oceanography, and astronomy (as well as AP Physics). Depending on the topic of research, I would want to share (if possible) data and conclusions from my trip with the class, and incorporate that into inquiry based activities and discussions. Prior to my trip, I would ask my students to come up with questions for me to ask the researchers and things for me to find out or photograph for them. This could go a long way toward making the experience more interactive with my current students and for my students after the experience, knowing that the questions are student driven and relevant. In addition, I would want to reach out to our district's students. We host events such as a career conference for our students, so I would submit to be one of the presenters to at these existing events. I would also like to address the elementary and middle school students in activities or presentations of the experience in the auditorium during the school day.

c. Describe how you envision sharing your experience with other educators, your personal and professional communities, and the general public. (200 words maximum)

Our district provides its own professional development sourced from educators in district who share what they have learned elsewhere during our district-wide SIP and Institute days. I would make a proposal to our district to provide a PD workshop for K-

12 educators in our district about the experience and data driven lessons which could be incorporated into their classrooms. I would also approach the academic community to which I belong, NIU, and offer to provide workshop(s) and/or talks for the STEM cafe and other community events they host.

d. Describe how you currently engage your audience and facilitate learning when educating on new and complex topics, concepts, or issues. (200 words maximum)

I often use news articles to drive discussion in my classroom. For example, if I see a new climate article, I will post it to my google classroom page, ask students to read it, then we will discuss it at the beginning of class for 5-10 minutes. There was a recent article on the fires in the Amazon that connected the burning of fossil fuels to the burning of ancient forests. The perspective in the article was striking and it sparked a lot of discussion in my classroom. When I posted the article, we had just finished talking about various cycles such as the carbon cycle and the water cycle. Students were able to connect these topics to the article and draw conclusions about changing climate. I also like to approach my lessons with inquiry labs and engineering challenges. In a recent lab I asked students, how does the tilt of the Earth affect a region's climate? So students came up with a lab where they used direct and angled lights to measure the insolation on surfaces.

e. Describe the particular strengths you would bring to the PolarTREC program and to a field research team. (200 words maximum)

I have a very broad background. I am one of those jack of all trades, master of none types. I really just enjoy learning and trying new things. Not only do I have a strong education background, but also experience as a GA, Fellow, and TA. So I have interpersonal skills as well as a knowledge of care in measurement and experimental accuracy and precision. I have conducted research on the Kuiper Telescope and Yerkes Observatory (planetary nebula and spectrometry), NASA's Vomit Comet (lunar regolith filtration and angle of repose), and using high altitude weather balloons too look at aerosols. I have written several scientific publications, science blogs, and educational outreach materials. I love being outdoors, and am not the squeamish type. My colleagues and friends would say that I'm upbeat and positive and have a lot of energy. For a research project, I will go where I need to go, and help where I am able to get the job done! I am really eager to learn something new and to be involved in current research.

f. Using examples from your own experience including your role and the contributions you made to a team effort, describe how you work as a member of a team. (200 words maximum)

Currently, I am a collaborator with other teachers for our Earth Science courses. We are responsible for creating curriculum and assessments for our courses. Over the last several years, our district has made a big push to do more data driven instruction and to align ourselves with NGSS. To that end, my team was tasked with creating common pre and post assessments for use in our courses, so that we could see how our instruction impacted student learning. As a member of the team, I co-wrote the assessments. Since I have more familiarity with the standards, I took charge of ensuring that all of our questions and curriculum were standards aligned. I have also continued to adapt our old curriculum to incorporate more inquiry based activities and labs as well as engineering challenges in order to focus on skill building and questioning techniques among students. I have done leadership training through Character Quest, and through that I learned to set goals, organize tasks, own it and be humble when you make a mistake, and that being a good leader means being a good team member first and foremost.

6. Communicating the Experience and Science

Write your journal entry for the general/lay audience. (200 words maximum)

Tuesday 10/1/2019: After preparing for my day with a quick shower, I grabbed my lunch, and dashed through heavy school traffic to get to work. Today was the day of my formal evaluation with a new administrator, determining if I get asked to come back next year to teach again or not. As I walked through the throngs of students in the school, I felt more confident and excited than worried. I had a good lab already prepared, and my students would be engaged. I got settled in my room just as the bell rang. Students filed in along with the administrator. I asked my physics students to think about the lab they had previously done and into the new question for the day, what affects the horizontal displacement or distance away from the lab table, of a projectile, our hotwheels cars? Students discussed, then developed a procedure and set up their labs. The admin's poker face gave nothing away as I circulated the room, asking students why they chose to do one thing rather than another, and what data they are trying to collect, and how will they measure it? Suddenly, a hotwheels car flew just in front of my feet. Some students snickered, other looked panicked. "It's ok! Just watch your surroundings before launch next time," I smiled, and returned their car to them. After class, I got my evaluation feedback... all positive! Later that day, we started making mousetrap cars in STEAM Physics class in order to race them and learn about velocity. After giving a safety lesson on mousetraps, a girl snapped her finger and screamed. Not five minutes later, she screamed again, having set off the trap on the edge of the table, bouncing to hit her in the teeth. I quickly redirected my students away from this purposeful misuse of materials. Later that day, I took my 7 month dog to advanced obedience class. There, we learned how to recall off leash, and to ignore other dogs on walks. The dogs learn by positive praise for good behavior.

7. Scientific Interests and Research Area Preference

a. Where would you prefer to go on an expedition? Either

Please explain your preference

I would greatly enjoy the experience of working with researchers regardless of the location. While a general preference is for the Antarctic due to timing (I would like to share with students while I am gone... might be more engaging for them!), I am available and open to both locations!

b. How long would you prefer to participate in an expedition? (Most expeditions are AT LEAST three weeks.) List any dates or periods of time when you are NOT able to participate in a field expedition

I would prefer a three to four week expedition, as I do have a family and a 6 year old daughter at home. I can be flexible, however. I am available all year for an expedition.

c. Briefly describe your scientific interests. Which scientific topics interest you the most and why? Please note that climate change has become part of nearly all expeditions so you may choose to be more specific about this topic, if applicable. (200 words maximum)

My background is in astrophysics, and I've taught astronomy at the HS and college (TA) level, so my biggest area of interest would be in physics and space sciences (for example, neutrino and other cosmic ray projects). I also have a great deal of experience teaching meteorology, climate, and oceanography. Projects involving atmospheric (ionosphere interactions, distribution of aerosols and more), ocean currents and how they are changing as a result of climate change, and glacial melting all sound exciting to me. As a physics person, I think about energy and how things move and change, so I'm more interested in those topics than in the life sciences (though those are also interesting to me, and I appreciate the connections between these systems).

Atmospheric Systems I would really enjoy an expedition in this subject area

Cryospheric Systems I would really enjoy an expedition in this subject area

Human and Social Systems I do not want to be considered for an expedition in this subject area

Marine Systems I would really enjoy an expedition in this subject area

Terrestrial Systems I am somewhat interested in this subject area

Ecology and Biotic Systems I am somewhat interested in this subject area

Physics or Space Sciences I would really enjoy an expedition in this subject area

Engineering and Technology I would really enjoy an expedition in this subject area

Other (please specify)

Other Areas of Scientific Interest

e. Are you applying to work exclusively with a specific researcher? If yes, please list their full name, institution, and email address. (200 words maximum)

8. Background Information and Skills

a. Briefly describe your outdoor skills or experiences.

I am an avid camper, going every other weekend Spring through Fall with my family. I used to live in a cabin in the mountains in Idaho and gained many skills from that: chopping firewood, starting a fire, first aid, animal and wilderness safety. I am currently training a dog in advanced obedience, therapy, and other skills and have worked with other animals (goats, horses). I go hiking and road biking at a local park. I have shot a few firearms and done archery, but have not done those for a long time. I have done orienteering and army ranger style leadership training through Character Quest. I grew up in a farm family and used to work for the IDNR at Rock Cut State Park as a conservation worker, and learned how to use a chainsaw, maintenance tools, tractors. I generally prefer to be outside as opposed to inside. I can drive stick.

b. Provide a basic statement of your general health and physical condition.

I am very healthy, eating a balanced diet and maintaining a healthy weight. I stay active by being outside, walking my dogs, jogging on a treadmill, biking, and hiking. I have had a good physical every year, with low blood pressure, average cholesterol, and no issues. I do have a condition called migraine with brainstem aura which is well controlled by treatments with botox every 3 months, so I will not need any specific medication or accommodations for my condition.

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.

I use a Macbook pro at home and a PC running windows 10 at work. I used to use Linux operating systems including Ubuntu and Fedora. I feel comfortable operating any computer. I took some programming classes, but would not say that I know how to code.

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.

I regularly use excell and google sheets for data analysis in my classroom (grades, pre and post tests for data driven instruction) and for my thesis. I use powerpoint and google slides regularly for my classroom. I have used apps such as google hangouts and skype to video chat with professors and family. I use chromebooks in conjunction with Pasco probeware in the classroom. I have and use a Pentax DSLR for personal use (family photos and bad astrophotography) from time to time.

e. List any additional skills or information that you wish to be considered.

9. Previous Applications & Participation

a. Have you previously participated in a teacher research experience (e.g. NOAA Teacher at Sea, Earth Watch)? We do not accept applications from PolarTREC alumni. Yes

Program Information Idaho Spaceward Bound 2011 via Idaho Space Grant Consortium and NASA: traveled around Southern Idaho with Dr. Chris McKay and local researchers to look at Earth analogues for Martian environment and habitats and extremophiles. We developed a data driven curriculum for local students.

If yes, did you complete all program requirements? Yes

If yes, how do you see the PolarTREC professional development opportunity continuing to develop your professional skills, or how will it build on your previous research experiences?

I still use my experience from Spaceward Bound to engage students in learning about the planets in our solar system as well as exoplanets. Using data, lesson plans, stories, and photos from the experience, I am able to inspire students to connect the science to the news stories and what they can observe on our planet. PolarTREC will allow me to engage in more topics which are relevant to what I teach. I am hoping to have an experience that engages me in research, so that I can share these techniques with my students as well as gain a stronger understanding of the underlying phenomena. I am passionate about sharing STEM career opportunities with my students as well, so by participating, I hope to show students another taste of what amazing things they could do with their careers post high school and college.

10. Orientation Availability

Are you available to attend the Orientation during this time period? Yes

If no, please explain

11. How did you hear about PolarTREC?

Email listserve. Please provide the name and/or URL

Friend or colleague. Provide a name if you wish

Former PolarTREC, TREC, or TEA teacher. Please provide their name

From a website. Please list the website name and URL

Conference or presentation. Please list the venue and/or presentation title

Other (please explain)

b. Please suggest other places we might advertise this opportunity for teachers

12. References

Reference 1

Name Patricia Lenz

Title and affiliation

Email Address

Phone Number

Reference 2

Name Sule Bertram

Title and affiliation

Email Address

Phone Number

Reference 3

Name Jack Harrison

Title and affiliation

Email Address

Phone Number

2020-2021 PolarTREC Educator Application

Kathryn Roznai

1. Contact Information

Name: Ms. Kathryn Roznai

Email: kroznai@gmail.com

Home Address:

2838 N Francisco Ave, Apt #1A
Chicago, IL 60618 US

Home Phone:

Cell Phone : 8472075283

Institution Name: World Language High School

Institution Address:

3120 S Kostner Ave
Chicago, IL 60623 US

Institution Phone: 7735354334

Classroom/Office Extension:

Institution Fax: 7732548470

Institution Website: <https://wl.lvlhs.org/>

Other relevant websites: www.biggreen.org www.lvejo.org
www.girlswhocode.com www.cs4all.io

Supervisor's Name: Brian Rogers

Supervisor's Email Address: bjrogers@cps.edu

2. Demographic Information

a. Gender: Female

Race: White

c. Briefly describe your primary audience and surrounding community (e.g. K-12, public, rural/urban, technology access, economics): I teach high school students in the Little Village neighborhood on the southwest side of Chicago. My students are primarily Latinx/Hispanic, with a few African American students. About 95% of the students are low-income and receive free or reduced lunch and breakfast. World Language High School is on the Little Village Lawndale High School Campus, a building that hosts four different Chicago Public Schools. Many students do not have technology access at home, but we have computer labs and Chromebook carts in many classrooms. I teach Chemistry to sophomores and Exploring Computer Science to juniors. Twice a week, I co-facilitate Girls Who Code, an after-school club that encourages and empowers girls to learn computer science and create meaningful projects. I am also one of the members of our Learning Garden Team; I and three other teachers wrote a grant last year to get a Learning Garden installed at our school. Through this garden, students learn about healthy choices and where their food comes from – they plant the seeds, water and weed, and harvest the vegetables. The garden team is also working with a neighborhood organization, Little Village Environmental Justice Organization (LVEJO) and Loyola University Chicago to monitor the air quality around the school and the pollution from nearby factories. The community is very social-justice oriented, and in 2000, fourteen residents went on a nineteen-day hunger strike to get this campus built. They chose the small-schools-within-a-big-school model so that students can get more individualized instruction while still being able to enjoy the benefits and facilities of a large school (for example, the four schools compete together in sports as the LVLHS Phoenix).

d. Type of School (or students you work with): Public

Other Type of School

e. What is the population of your annual audience or school (estimates are fine) World Language High School has about 350-400 students enrolled. I work with all the sophomores (about 100) and some of the juniors (about 30).

f. School Ethnicity:

0 % - American Indian or Alaska Native

0 % - Asian

4 % - Black or African American

94 % - Hispanic or Latino

0 % - Native Hawaiian or Other Pacific Islander

1 % - White

0 % - Multiracial

If your school uses other categories to describe race/ethnicity, please describe: Other = 1%

g. Percentage of students who receive free or reduced lunch: 95

h. Average class or audience size 20-35

i. Total number of students/audiences you teach in a year 130

j. If known, what are the approximate start and end dates of your school year or primary programs, etc. ? Include major professional vacation periods. i.e. Christmas break, summer break, etc.

First Day for Teachers: August 26, 2019 (1 week before students) First Day for Students: September 3, 2019 (day after Labor Day) Thanksgiving Break: November 27-29, 2019 (3 days surrounding Thanksgiving) Winter Break: December 23, 2019 - January 3, 2020 (2 weeks surrounding Christmas/New Year) Spring Break: April 6-10, 2020 (1 week, ending in Easter) Last Day for Students: June 16, 2020 Last Day for Teachers: June 18, 2020 Summer Break: June 19, 2020 - August 31, 2020 (Labor Day 2020 is Sep 7)

3. Teaching Experience and Education

a. What type of university degree or other academic experience or qualifications do you have?

Bachelor's Degree (Major): B.S. Chemistry - Concentration in Physical/Analytical Chemistry

Bachelor's Degree (Minor): Mathematics & German

Masters Degree (Discipline): M.Ed. Secondary Education - Chemistry

PhD Degree (Discipline):

Other Degree:

b. How many years of education experience do you have?: 6

c. How many years have you been working at your current institution?: 2

d. List up to 10 relevant professional licenses, certifications, registrations, awards or honors that you have received in your profession::

Professional Educator License (Illinois): Endorsements in Secondary Education 6-12, Science-Chemistry 9-12, Mathematics 9-12 Expected Endorsement (2021): Computer Science 9-12 Professional Learning Community (PLC) Facilitator/Lead for Exploring Computer Science (ECS), Southwest region of Chicago National Science Teaching Association (NSTA) American Association of Chemistry Teachers (AACT) Computer Science Teachers Association (CSTA)

4. Professional Assignment

a. What is your primary education assignment? Check all that apply
Secondary (Grades 9-12)

Other Primary Assignment

b. What subjects do you teach? Check all Secondary Chemistry

Other Subjects Secondary Computer Science

5. Motivation for Participation

a. What motivates you to apply to PolarTREC and professionally, what do you hope to gain from the experience? (200 words maximum)

In my chemistry classroom, I tie everything back to what scientists actually “do” through the NGSS Science & Engineering Practices (i.e. Questioning, Models, Investigations, Analyzing Data, etc). So far, I have just been tying this back to my experiences in undergraduate chemistry and various summer internships, but I am looking forward to learning more about a scientist’s day-to-day through the research I will do on this expedition. Furthermore, I am always looking for new and exciting ways to engage my students in chemistry, computer science, and science in general. I hope to find ways to integrate my polar research experience throughout my chemistry units (thermal energy, matter, reactions, atoms, bonds, intermolecular forces, and the chemistry of climate change) and my computer science units (human-computer interaction, problem solving, web design, programming, data science, and robotics). Students are always far more engaged in personal experiences, and if I can bring such a unique perspective to the table as polar research, I hope I can open their eyes to different types of science that exist outside the city limits. Many of my students have never even left the city, so I hope I can inspire them to learn more about their world.

b. Aside from journaling/blogging, online photos, and webinars which all part of our program requirements, describe your ideas on how you will share this experience in your classroom or with the audiences you work with. (200 words maximum)

I aim to integrate what I learn from this experience throughout the lessons I teach. Everything relies on the properties of matter and energy, so I know that no matter the type of project I am assigned to, I can find a way to connect it to chemistry. Most research involves some type of problem solving and data analysis, so I can connect it to computer science as well. In chemistry, I focus each unit around an anchoring phenomenon (e.g. the thermodynamics unit focuses on why ice melts faster on aluminum than plastic). I can adapt my anchoring phenomena to include things I witnessed during my expedition. In computer science, I can use the research data in our data science unit, which will lend more importance to the data since it’s “real”. I can also teach them about any programming that I had to do throughout the analysis process. The community that I teach in is very social-justice focused, so we can also discuss what we can do here in Chicago to lessen or reverse aspects of climate change that affect the polar regions (during my climate change unit in chemistry,

and during my problem solving unit in computer science).

c. Describe how you envision sharing your experience with other educators, your personal and professional communities, and the general public. (200 words maximum)

I plan to present what I learned from the expedition to the other three members of my science department (physics, biology, and special education teachers) during one of our monthly department meetings. I will share the ideas I have for my curricula and suggest ideas I have for theirs and offer to give a talk to their classes. I can also present during the sophomore team meeting, and we can discuss cross-curricular connections with social studies, English, math, or the arts. Also, as a member of NSTA and CSTA, I can submit an application to lead a session at the national conference, so I can share my experience and how I applied it in my chemistry classroom at NSTA and how I applied it in my computer science classroom at CSTA. I have attended both of these conferences before and loved learning from my fellow educators across the country and getting new ideas for lessons. More locally, I can speak with the social justice group LVEJO to work on climate change activism in our community and how the research at the poles is relevant right here in Chicago and what we can do about it.

d. Describe how you currently engage your audience and facilitate learning when educating on new and complex topics, concepts, or issues. (200 words maximum)

As a high school teacher of chemistry and computer science, I am used to my audience coming in with preconceptions about the difficulty of the class. I ensure to stress growth mindset and explain that your brain grows more when you struggle and make mistakes. This lays the groundwork for exploring complex concepts. I am a big proponent of inquiry-based learning, so I am rarely lecturing. My classes are primarily discussions and explorations, and in chemistry they focus around anchoring phenomena and driving questions. Together, we examine a scenario that at first glance seems odd and makes us wonder “how/why is it doing that?” We work towards designing and performing successive investigations to work it out piece-by-piece and give the concepts names after we have seen them in effect. This drive for knowledge pushes and engages them in the concept in a way that lectures cannot. In computer science, the discussions aim to connect the student to the material. For instance, we study how Navajo blankets and African American braids both use iterations and other computational thinking techniques.

e. Describe the particular strengths you would bring to the PolarTREC program and to a field research team. (200 words maximum)

Whenever I start something new, I go into it at full force. Last year, when I was hired as a chemistry teacher, I was “voluntold” that I would also be teaching Exploring Computer Science (ECS). I had never taught it or studied it before, but I was sent to a week-long professional development (PD). After that initial PD, I was hooked. I am now part of several online communities (and started a Facebook group called “ECS Teachers of Chicago”) where CS teachers share lessons and strategies. I received a scholarship to attend the CSTA conference in Phoenix this past summer. I am taking classes to receive my endorsement in CS. Even more, I have emerged as a leader in the Chicago CS community and was chosen to be one of four PLC leaders. I strive to learn everything I can and want to share all that with everyone. In PolarTREC, most likely I will not have prior knowledge about my assigned project. My curiosity will drive me to soak up all the information I can find about it, and I share that information as readily as I gain it. I get so excited about everything that I do and learn that I want the world to know.

f. Using examples from your own experience including your role and the contributions you made to a team effort, describe how you work as a member of a team. (200 words maximum)

I have always gravitated towards people and working in teams, and often rise into leadership positions. At my previous school, Colegio Panamericano in Floridablanca, Colombia, I was the math department head. Since it is an international school, there is a lot of teacher turnover and my entire department was hired in the same year. We were not given any curricula or guidance other than “Read the Common Core standards for Integrated Math”. I led the team in creating a Scope and Sequence with defined unit topics based on the standards and the integrated method of teaching. This provided fluidity as each class spiraled upwards from the previous year’s topics, with none of the “non-negotiable” topics left out. At my current school, I joined three teachers from the other schools in my building in writing a grant for a Learning Garden. Although we have four schools sharing a building, there is not much cross-campus collaboration. The four of us brought a Learning Garden to LVLHS and continue to work together on planning the planting, upkeep, and harvesting. We are also working with LVEJO and Loyola University on studying the impact of air pollution from nearby factories on the garden and gardeners.

6. Communicating the Experience and Science

Write your journal entry for the general/lay audience. (200 words maximum)

Last week, I attended a professional development to train me to lead a professional learning community (PLC) about Exploring Computer Science. During this training, I learned about my current leadership style enneagram, and discovered that I am primarily a "challenger", "giver", and "perfectionist" type. This means that I stand up for what I believe in and want to be right, but can occasionally be stubborn. I find it very interesting to study how I and others think, as it can help when working in a team. In my PLC, my "challenger" type will enable me to lead, and my "giver" type will make me want to help others. As a PLC leader, I will need to help my teammates to learn new strategies to teach the computer science content in an engaging way that promotes inquiry and equity. This means everyone must feel involved in the lesson and the students should learn through discovery and discussion, not lectures. It can be tough for veteran teachers to adjust their teaching style, so I need to work with them to promote a growth mindset in themselves as well as their students. Basically, struggle helps us learn and helps our brains to grow.

7. Scientific Interests and Research Area Preference

a. Where would you prefer to go on an expedition? Either

Please explain your preference

I am excited to travel to, learn about, and do research in both polar regions. I have never been to either location and I know approximately the same amount about both.

b. How long would you prefer to participate in an expedition? (Most expeditions are AT LEAST three weeks.) List any dates or periods of time when you are NOT able to participate in a field expedition

If during the school year (September-mid June), I would prefer to miss up to only 3 weeks of school (if the expedition falls over Thanksgiving, Christmas break, or Spring break, that is preferred). If in the summer (mid June-August), as many as 6 weeks would be awesome! There are no dates when I am unable to participate in a field expedition; the above are solely preferences, not rigid restrictions.

c. Briefly describe your scientific interests. Which scientific topics interest you the most and why? Please note that climate change has become part of nearly all expeditions so you may choose to be more specific about this topic, if applicable. (200 words maximum)

I am generally interested in chemistry, computer science, and physics. I am also interested in how these topics relate to or are used in other fields, so I can help my students to think about connections and bring in current research that is interesting and relevant. I teach my chemistry class according to the Next Generation Science Standards, and in the Chicago Public School district, this means Earth and Space science are integrated throughout the three years of Biology, Chemistry, and Physics. I have two units where I teach about the chemistry of climate change and how climate change could impact the Chicago region, including carbon cycling, atmospheric temperature, the equilibrium of ocean chemistry, and how that could all affect Chicagoans and what we can do. If there is are projects that discuss how climate change in the polar regions (where I understand it is felt more strongly) affects the rest of the world, or projects about the chemistry of climate change, I would be very interested in that. Furthermore, if there is any research that heavily uses computer science in the research process (programming, data science, etc) that would tie in extremely well with my Exploring Computer Science course.

Atmospheric Systems I would really enjoy an expedition in this subject area

Cryospheric Systems I am somewhat interested in this subject area

Human and Social Systems I am somewhat interested in this subject area

Marine Systems I am somewhat interested in this subject area

Terrestrial Systems I am somewhat interested in this subject area

Ecology and Biotic Systems I am somewhat interested in this subject area

Physics or Space Sciences I would really enjoy an expedition in this subject area

Engineering and Technology I would really enjoy an expedition in this subject area

Other (please specify)

Other Areas of Scientific Interest

e. Are you applying to work exclusively with a specific researcher? If yes, please list their full name, institution, and email address. (200 words maximum)

8. Background Information and Skills

a. Briefly describe your outdoor skills or experiences.

I have gone on camping trips with family and friends, and participated in Girl Scouts when I was younger. I have also participated in several day hikes of various difficulties in Colombia.

b. Provide a basic statement of your general health and physical condition.

I am in generally good health. I am 5'11" and 250 lbs, though I am actively working on losing weight through diet and exercise (I lost 50 lbs last year and hope to keep that up). I take medication daily for hypothyroidism/Hashimoto's and mild anxiety. These do not affect my physical condition. In college I was on the rugby team and in high school I was on the water polo and swim teams. I swam from age 8 through age 18 and coach swimming and water polo at my current school. I am fairly strong and have good endurance to walk for long distances.

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.

I am most familiar with PCs & Windows. My current laptop is a Dell Inspiron running Windows 10. I consider myself very skilled with basic computer programs and the Google Suite (I am a Certified Google Educator, Levels 1 and 2). My coworkers often come to me with questions on computer help. I am currently taking classes to get my computer science endorsement on my teaching license; through this program I have been learning Java and web design. I also have experience in Photoshop and basic video editing (i.e. Windows Movie Maker & iMovie). I feel comfortable tinkering around with a new program until I learn how to use it and believe myself to be an "expert" Googler.

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.

I primarily use a laptop computer, but also have experience with iPads and other tablets, as well as Chromebooks. I have experience with digital cameras, both simple point-and-shoot and D-SLR. I have experience with Photoshop and basic video editing (i.e. Windows Movie Maker & iMovie). I absolutely love spreadsheets and am always experiencing with new formulas to gain new insights from my data. I primarily use the Google Suite (Sheets, Docs, Slides, Forms, Drawings, etc) but am also experienced in Microsoft Office (Word, Excel, Powerpoint, OneNote, etc) and Adobe Acrobat. I do all my internet browsing on Google Chrome.

e. List any additional skills or information that you wish to be considered.

I have basic conversational skills in Spanish and German.

9. Previous Applications & Participation

a. Have you previously participated in a teacher research experience (e.g. NOAA Teacher at Sea, Earth Watch)? We do not accept applications from PolarTREC alumni. No

Program Information

If yes, did you complete all program requirements?

If yes, how do you see the PolarTREC professional development opportunity continuing to develop your professional skills, or how will it build on your previous research experiences?

10. Orientation Availability

Are you available to attend the Orientation during this time period? Yes

If no, please explain

11. How did you hear about PolarTREC?

Email listserve. Please provide the name and/or URL

Friend or colleague. Provide a name if you wish

Former PolarTREC, TREC, or TEA teacher. Please provide their name

From a website. Please list the website name and URL

Conference or presentation. Please list the venue and/or presentation title

Other (please explain)

b. Please suggest other places we might advertise this opportunity for teachers

Facebook, professional organizations (i.e. National Science Teachers Association (NSTA) and other similar organizations)

12. References

Reference 1

Name Brian Rogers

Title and affiliation Principal of World Language High School

Email Address bjrogers@cps.edu

Phone Number +1 (773) 535-4200

Reference 2

Name Lisa Berens

Title and affiliation Science Department Head of World Language High School

Email Address llberens@cps.edu

Phone Number +1 (708) 567-2206

Reference 3

Name Mary West

Title and affiliation Principal at Colegio Panamericano (where I worked from 2016-2018)

Email Address mary.west@panamericano.edu.co

Phone Number +57 (301) 719-1441

2020-2021 PolarTREC Educator Application

Meredith Salmon

1. Contact Information

Name: Ms. Meredith Salmon

Email: msalmon@peddie.org

Home Address:

201 South Main Street
Hightstown , NJ 08520 US

Home Phone: 5705750485

Cell Phone : 5705750485

Institution Name: Peddie School

Institution Address:

201 South Main Street
Hightstown , NJ 08520 US

Institution Phone: (609) 944-7500

Classroom/Office Extension: 609-944-7624

Institution Fax: 609-944-7901

Institution Website: <https://www.peddie.org/>

Other relevant websites: <https://noaateacheratsea.blog/category/2018/meredith-salmon/> <https://blog.earthwatch.org/2019/07/29/project-kindle-diversity-in-nature-and-education/>

Supervisor's Name: Peter Quinn

Supervisor's Email Address: pquinn@peddie.org

2. Demographic Information

a. Gender: Female

Race: White

c. Briefly describe your primary audience and surrounding community (e.g. K-12, public, rural/urban, technology access, economics): Peddie is an independent, coeducational boarding and day school that serves 551 students in grades 9-12. We welcome a diverse student body from all across the United States and the world. Our students represent a total of 23 states as well as 34 countries and 64% of students are boarding while the remaining 36% commute. Therefore, I am committed to creating a global classroom where students are engaged in a problem-based curriculum that emphasizes scientific investigation and critical thinking. In addition to teaching, I serve as the Assistant Girls' Varsity Soccer Coach and will be the Assistant JV Girls' Basketball Coach this winter. I have also coached winter track the past two years. I live and work as a Dorm Supervisor in a sophomore level female dormitory as well. Working as a teacher, coach, and dorm parent in the Peddie Community has granted me the unique opportunity to shape the lives of many students in and outside the classroom environment.

d. Type of School (or students you work with): Private

Other Type of School

e. What is the population of your annual audience or school (estimates are fine) 550

f. School Ethnicity:

0 % - American Indian or Alaska Native

31 % - Asian

11 % - Black or African American

5 % - Hispanic or Latino

0 % - Native Hawaiian or Other Pacific Islander

40 % - White

6 % - Multiracial

If your school uses other categories to describe race/ethnicity, please describe: Prefer not to respond - 6% Other - 1%

g. Percentage of students who receive free or reduced lunch: 10

h. Average class or audience size 16

i. Total number of students/audiences you teach in a year 64

j. If known, what are the approximate start and end dates of your school year or primary programs, etc. ? Include major professional vacation periods. i.e. Christmas break, summer break, etc.

Spring Break - March 1 - March 15, 2020 Summer Vacation June 8 - August 28, 2020

November Break - November 16-December 1, 2020 Winter Break - December 15-

January 5, 2021

3. Teaching Experience and Education

a. What type of university degree or other academic experience or qualifications do you have?

Bachelor's Degree (Major): B.S. Ed. Secondary Education in Biology

Bachelor's Degree (Minor):

Masters Degree (Discipline): Master of Science in Biology

PhD Degree (Discipline):

Other Degree:

b. How many years of education experience do you have?: 5

c. How many years have you been working at your current institution?: 5

d. List up to 10 relevant professional licenses, certifications, registrations, awards or honors that you have received in your profession::

National Geographic Certified Educator Earthwatch Project Kindle Fellowship TOP

Goethe Institut STEM Fellowship NOAA Teacher at Sea Ecology Project International

Baja Island Ecology Fellow

4. Professional Assignment

a. What is your primary education assignment? Check all that apply
Secondary (Grades 9-12)

Other Primary Assignment

b. What subjects do you teach? Check all Secondary Biology

Other Subjects Marine Science

5. Motivation for Participation

a. What motivates you to apply to PolarTREC and professionally, what do you hope to gain from the experience? (200 words maximum)

In mid-September, a student rushed into my classroom shouting, “Ms. Salmon! A research vessel is going to be drifting in an ice floe for a year!” This student was fascinated that scientists were willing to go to the ends of the earth to advance our knowledge of Arctic climate change. I shared the article with the class and students were surprised by this expedition. “How is that possible?! That’s amazing!” they exclaimed. My students were intrigued by this research, so I can only imagine how curious and inspired they would be if I was granted the unique opportunity to be a member of a PolarTREC team. Students should be aware that polar landscapes are dynamic laboratories that need to be explored through multidisciplinary research. PolarTREC would allow me to create a sustainable partnership with researchers and participants involved. My Biology and Marine Science courses would be enriched with real-world data and interviews from the field. First-hand experiences would teach students that changes in these remote regions of the world directly impact their lives well. PolarTREC will provide me with the experience and confidence to empower students to increase their understanding, appreciation, and conservation of the polar regions of our world.

b. Aside from journaling/blogging, online photos, and webinars which all part of our program requirements, describe your ideas on how you will share this experience in your classroom or with the audiences you work with. (200 words maximum)

In today’s society, students can create global connections from their own classrooms. As a teacher, it is my goal to foster holistic perspectives by directly linking students to PolarTREC researchers, participants, and other expedition members. Students will have the opportunity to skype scientists involved with particular PolarTREC projects and will utilize PolarConnect to bring their learning to life. I will partner with our Tech Department to download Google 360 Virtual Reality (VR) expeditions so students can explore polar landscapes using Peddie’s VR headsets. This will allow students to venture on virtual field trips so they can immerse themselves in these unique ecosystems. I currently use the PolarTREC lesson Exploring the Ocean: CTDs in my Marine Science course and curriculum that incorporates field methodology in addition to new data collected will be created and utilized. In order for students to understand that scientists close to home are involved in active polar research programs, I will partner with Rutgers Polar Research

and Princeton University's Atmospheric and Oceanic Sciences faculty members to host them as guest speakers. I am very enthusiastic about sharing my field experiences with the Peddie community and public audiences in order to increase polar literacy.

c. Describe how you envision sharing your experience with other educators, your personal and professional communities, and the general public. (200 words maximum)

Aside from sharing this experience with my science colleagues, I would present my research conclusions to the entire Peddie community at one of our all-school meetings. I also intend to collaborate with our Communications Department and write an article in Peddie's alumni publication. My undergraduate university asked me to coordinate an "Instagram takeover" this summer while I was conducting fieldwork with Earthwatch, so I would be able to share PolarTREC's mission on this platform as well. Since PolarTREC develops long-term professional relationships between the education and scientific communities, my ultimate goal would be to create a Peddie field research trip. Students would participate directly in fieldwork, assist scientists with their project goals, and advance our knowledge of the natural world. Students engaged in this citizen science project would have the potential to help produce peer-reviewed publications and inform management policies that conserve our Earth's ecosystems. Beyond the classroom, I would write an article about the positive impact of PolarTREC and the importance of understanding the polar regions for *Current: The Journal of Marine Education*. I would also submit a proposal to present polar marine topics and climate change at the annual New Jersey Science Convention.

d. Describe how you currently engage your audience and facilitate learning when educating on new and complex topics, concepts, or issues. (200 words maximum)

In my Biology and Marine Science classes, students are involved in a discovery-based program that highlights the importance of real-world applications. I strive to create intentional activities and labs designed for a variety of learners. For instance, after completing NOAA's Teacher at Sea Program, I designed a unit for my marine science class that focused on the kinds of maps used for ocean exploration. I collaborated with our Robotics and Engineering teacher to 3-D printed maps of important seafloor features. These models were placed in sealed plastic containers and groups of students used scaled sounding rods (wooden dowels) to simulate SONAR systems. Students were able to collect depth measurements, graph a prediction of their hidden seafloor, and generate a map of the significant features

hidden in their box. After this activity, our class hosted a telepresence conference with the Okeanos Explorer while they were conducting a mapping and ROV expedition. Students learned about the sonar systems onboard and how scientists use robots to discover what is beneath the surface of the ocean. Finally, students used Peddie's VR headsets to complete a 360 Google Expedition and explored the ocean depths in a scientific human-operated vehicle (HOV).

e. Describe the particular strengths you would bring to the PolarTREC program and to a field research team. (200 words maximum)

This July, I was selected as an Earthwatch Project Kindle Fellow and had the opportunity to assist scientists in the mountains of southern Costa Rica where we studied the biodiversity of tropical birds. A few days before our departure, we received notice that the airport in Golfito, Costa Rica was out of commission for the remainder of the summer. Therefore, our travel plans changed drastically. Many members of our team were worried about the alteration of transportation, but my level-headedness and calm demeanor allowed me to lead by example. I motivated others to modify and adjust plans. I remained incredibly flexible and patient throughout the process and was able to help our lead scientists plan an alternate route home. Aside from being very flexible, I would be an asset to a PolarTREC field team since I live by the motto "who dares to teach, must never cease to learn." As a believer in the joy of lifelong learning, I think that it is incredibly important for teachers to continue to learn and act as intellectual role models for their students and colleagues. I truly enjoy studying different scientific disciplines, conducting field research, and sharing my knowledge with others.

f. Using examples from your own experience including your role and the contributions you made to a team effort, describe how you work as a member of a team. (200 words maximum)

I proposed to my colleagues that we restructure our Biology curriculum to focus on Evolution as a unifying theme throughout the year. As the team leader, I delegated tasks, organized meetings, welcomed others' ideas, and communicated effectively. I inspired my colleagues to take risks in the classroom and develop new innovative experiences that highlighted the fact that Biology relies on a foundation of evolutionary knowledge. In order to bring Darwin's Theory of Natural Selection to life, I suggested that we contact Dr. Peter and Rosemary Grant at Princeton University. I took a chance and invited them to be featured as guest speakers since our students studied their Galapagos finch research. They accepted our offer, so I was in charge of organizing their lecture for the entire student body and the local community. I also hosted a question and answer session after the event with a large group of students.

Many students came up to my colleagues and I for months after the event and said that this was an “amazing, eye-opening, fantastic, awe-inspiring” night. Since we had studied and modeled Dr. Grants’ research, students were incredibly excited to meet them and learn about how they devoted their entire lives to science.

6. Communicating the Experience and Science

Write your journal entry for the general/lay audience. (200 words maximum)

“Every second counts.” I am constantly reminding my team that I coach that soccer is unpredictable. This sport requires relentless focus, nonstop intensity, and unmatched teamwork. It is crucial that when every player steps on the field, they make their minutes matter. Fortunately, that held true for every player on Peddie Girls Soccer last Friday against our Prep League rival, the Hill School. Hill gained control of the score board when a defensive player worked her way up the field and scored in the 48th minute of the game. Peddie Girls soccer continued to battle and finally scored with 6:45 left in the game. At this point, everyone was bracing for overtime, but the clock was still ticking. A Peddie senior set up one final play with 10 seconds left. She crossed the ball just in time for a freshman to settle the pass. The freshman drilled the ball into the upper right-hand corner of the net with one second left on the clock. The team and fans rushed the field to celebrate an epic win! After celebrating the triumphant victory, the freshman hustled off the field to give me final high five and said, “Coach – you’re right. Every second counts.”

7. Scientific Interests and Research Area Preference

a. Where would you prefer to go on an expedition? Either

Please explain your preference

I have no particular preference as I would love to conduct research in either region. An Arctic visit would be preferable and probably easier since it seems to fit better timewise with summer vacation, but if an Antarctic research trip overlapped with one of our breaks, I would make it work!

b. How long would you prefer to participate in an expedition? (Most expeditions are AT LEAST three weeks.) List any dates or periods of time when you are NOT able to participate in a field expedition

I would be interested in participating in an expedition for as long as possible. I already spoke with my Department Chair and she informed me that my classes would be able to be covered if I was selected for the Antarctic field season. I have no specific dates that would prevent me from contributing to a field expedition.

c. Briefly describe your scientific interests. Which scientific topics interest you the most and why? Please note that climate change has become part of nearly all expeditions so you may choose to be more specific about this topic, if applicable. (200 words maximum)

Since New Jersey is a coastal state, I often use the Atlantic ocean as a focus and reference point in Marine Science. It would be much more interesting for students to compare different oceans since I am constantly reminding my students that the ocean is a single unit that links so many different ecosystems together. I find it fascinating that a majority of the ocean has yet to be explored, so I am particularly interested in ocean biodiversity, marine wildlife, and terrestrial and marine organism adaptations. The adaptations found in polar animals that allow them to withstand such an inhospitable environment are so fascinating and I would really enjoy learning more about the ways in which they have evolved to survive. I am also very interested in both terrestrial and marine ecosystem dynamics in the polar regions.

Atmospheric Systems I am somewhat interested in this subject area

Cryospheric Systems I am somewhat interested in this subject area

Human and Social Systems I am somewhat interested in this subject area

Marine Systems I would really enjoy an expedition in this subject area

Terrestrial Systems I would really enjoy an expedition in this subject area

Ecology and Biotic Systems I would really enjoy an expedition in this subject area

Physics or Space Sciences I am somewhat interested in this subject area

Engineering and Technology I am somewhat interested in this subject area

Other (please specify) I am somewhat interested in this subject area

Other Areas of Scientific Interest

ROV technology and marine engineering

e. Are you applying to work exclusively with a specific researcher? If yes, please list their full name, institution, and email address. (200 words maximum)

8. Background Information and Skills

a. Briefly describe your outdoor skills or experiences.

From a very young age, my parents taught my four brothers and I the value of questioning, exploring, and appreciating the natural world. Many of my fondest childhood memories took place outside whether it was camping in the mountains, biking, fishing, or kayaking with my family. Thanks to my parents, I am still passionate about the outdoors and aim to inspire my very own students to develop a sense of fascination with nature. During the summer months of college, I was employed as the Lead Environmental Science Educator at Earth Camp. This valuable summer program designed for middle school students taught them the importance of environmental education and conservation. Once I started teaching at Peddie upon graduation, I volunteered multiple times to be a chaperone on the weeklong Peddie School Sophomore Bike Trip. A group of about thirty sophomore students and seven faculty chaperones bike and camp from Hightstown, New Jersey to Washington D.C. Along the journey, students experience cultural, historical, and geographic opportunities in Gettysburg, Lancaster County, the Appalachian Trail, and our nation's capital. This trip emphasizes the importance of teamwork since everyone rides, camps, eats, cleans, and grows together. In addition to the bike trip, I also worked as an Oceanic Teaching Staff at the Acadia Institute of Oceanography in 2016. For nine weeks in the summer, students of all ages studied tidepool diversity, collected and maintained tank specimens, snorkeled in the ocean, conducted a variety of lab activities, and hiked many of Acadia's mountains.

b. Provide a basic statement of your general health and physical condition.

During high school and college, I was an avid soccer player and still continue to compete in a co-ed soccer league in New Jersey. At Peddie, I serve as the assistant Girls Varsity Soccer coach during the fall and the assistant JV Girls' Basketball coach in the winter. I design strength and conditioning workouts for both teams and teach players about the importance of proper exercise and nutrition. In addition to soccer, I enjoy running, strength training, and pilates and incorporate workouts into my daily schedule. I am always willing to try new sports, activities, or exercise classes.

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.

Our faculty and student computers at Peddie are PC, so I am very familiar with this operating system. I rely on my laptop daily to prepare lessons, labs, and activities for my classes. During my undergraduate research project, I relied heavily on Macs to log, process, and analyze data sets. I learned how to utilize Macs to compile, sort,

and analyze data and generate detailed graphs that displayed our conclusions. In addition, I enrolled in a Tech and Teachers class that emphasized the importance of incorporating Mac computers during curriculum development and the classroom. During the summer of 2018, I learned how to utilize different seafloor mapping programs such as Qimera and Fledermaus while aboard the Okeanos Explorer.

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.

To prepare for daily lessons, I utilize my school provided laptop to create Powerpoint and Prezi presentations. All of our classrooms at Peddie are equipped with Smartboards and every faculty member and student uses a learning management system known as Canvas to post assignments, lead discussions, and upload course materials. Aside from the textbook, students use teacher suggested videos, podcasts, and animations in order to expand their knowledge in a variety of ways. When conducting lab experiments, I teach students how to utilize Excel spreadsheets, Google sheets, and LoggerPro equipment to collect, graph, and analyze data. In addition, students often utilize websites such as Cells Alive, Learn. Genetics, HHMI Biointeractive, and BBC Human Body and Mind as resources to supplement their course content. I just started using the Virtual Reality headsets in my classroom as well.

e. List any additional skills or information that you wish to be considered.

I am CPR/AED certified and also have my CDL Class B license so I am able to drive both the soccer and basketball teams to away games.

9. Previous Applications & Participation

a. Have you previously participated in a teacher research experience (e.g. NOAA Teacher at Sea, Earth Watch)? We do not accept applications from PolarTREC alumni. Yes

Program Information Earthwatch Project Kindle Fellowship - Summer 2019 NOAA Teacher at Sea - Summer 2018 Ecology Project International - March 2016

If yes, did you complete all program requirements? Yes

If yes, how do you see the PolarTREC professional development opportunity continuing to develop your professional skills, or how will it build on your previous research experiences?

Thanks to the NOAA Teacher at Sea Program, I created a Marine Science elective at Peddie. I have been able to use much of what I learned aboard the Okeanos Explorer to reinvigorate my classroom with a sense of discovery and wonder. Students are learning about how the ocean directly impacts their everyday lives and I believe that the PolarTREC development opportunity will allow me to further enhance my own field research skills. I will be able to bring these techniques back to my very own classroom and I will also be able to utilize them when I design a field research trip for Peddie students. I also plan on using the research content to design activities and labs that directly relate to the research conducted. The scientists in the field and other PolarTREC researchers will be featured in my course and students will be given the opportunity to directly connect with these people to further their understanding of the polar regions. This opportunity will benefit generations of students and hopefully, steer them in the direction of STEM-related career paths. My goal is to inspire students to practice a sense of environmental stewardship and appreciation for our amazing planet.

10. Orientation Availability

Are you available to attend the Orientation during this time period? Yes

If no, please explain

11. How did you hear about PolarTREC?

Email listserve. Please provide the name and/or URL

Friend or colleague. Provide a name if you wish

Dr. Shani Peretz Joanna Chierici

Former PolarTREC, TREC, or TEA teacher. Please provide their name

Joanna Chierici

From a website. Please list the website name and URL

Conference or presentation. Please list the venue and/or presentation title

Other (please explain)

b. Please suggest other places we might advertise this opportunity for teachers

12. References

Reference 1

Name Peter Quinn

Title and affiliation Headmaster

Email Address pquinn@peddie.org

Phone Number 6099371871

Reference 2

Name Dr. Shani Peretz

Title and affiliation Science Department Chair

Email Address speretz@peddie.org

Phone Number 6096498356

Reference 3

Name Mr. Joshua Sham

Title and affiliation Science teacher and Sophomore Class Dean

Email Address jsham@peddie.org

Phone Number 5857331954

2020-2021 PolarTREC Educator Application

Karen Sample-Mangan

1. Contact Information

Name: Ms. Karen Sample-Mangan

Email: Karen.Sample@hotmail.com

Home Address:

516 Bradmar Dr

Freeport, IL 61032-4404 US

Home Phone: 815-233-1925

Cell Phone : 815-291-8546

Institution Name: Freeport High School

Institution Address:

701 West Moseley Street

Freeport, IL 61032 US

Institution Phone: 815-232-0400

Classroom/Office Extension:

Institution Fax:

Institution Website: <https://www.fsd145.org/FHS>

Other relevant websites:

Supervisor's Name: Dr. Beth Summers

Supervisor's Email Address: Beth.Summers@fsd145.org

2. Demographic Information

a. Gender: Female

Race: White

c. Briefly describe your primary audience and surrounding community (e.g. K-12, public, rural/urban, technology access, economics): Freeport is a town of a little over 24,000 people, and is the largest city in Stephenson County in Northwest Illinois. The city has high unemployment and underemployment. I teach at Freeport High School. The school is the only public high school in Freeport and has about 1,200 students. We are a one-to-one high school, so all students have Chromebooks.

d. Type of School (or students you work with): Public

Other Type of School

e. What is the population of your annual audience or school (estimates are fine) Freeport High School 1,200 students. My classes 120 students.

f. School Ethnicity:

0.3% % - American Indian or Alaska Native

0.9% % - Asian

22.3% % - Black or African American

9.7% % - Hispanic or Latino

0.3% % - Native Hawaiian or Other Pacific Islander

54.7% % - White

11.8% % - Multiracial

If your school uses other categories to describe race/ethnicity, please describe:

g. Percentage of students who receive free or reduced lunch: 60.3%

h. Average class or audience size 22 Students

i. Total number of students/audiences you teach in a year 120 Students

j. If known, what are the approximate start and end dates of your school year or primary programs, etc. ? Include major professional vacation periods. i.e. Christmas break, summer break, etc.

School year: August 20th - June 1st Thanksgiving: Wednesday, Thursday, and Friday of Thanksgiving Winter Break: Two weeks that included Christmas and New Years Spring Break: Last full week in March

3. Teaching Experience and Education

a. What type of university degree or other academic experience or qualifications do you have?

Bachelor's Degree (Major): General Mathematics

Bachelor's Degree (Minor):

Masters Degree (Discipline): Math Education with Secondary and Middle School Teaching Endorsement

PhD Degree (Discipline):

Other Degree:

b. How many years of education experience do you have?: 10 years of teaching completed

c. How many years have you been working at your current institution?: 10 years in Freeport School District, 5 years at Freeport High School

d. List up to 10 relevant professional licenses, certifications, registrations, awards or honors that you have received in your profession::

Professional Licenses Secondary Education - Mathematics Grades 6-12 Awards and Honors 2018 Participant in NASA's Wallops Rocket Academy for Teachers

4. Professional Assignment

a. What is your primary education assignment? Check all that apply
Secondary (Grades 9-12)

Other Primary Assignment

b. What subjects do you teach? Check all Secondary Math

Other Subjects

5. Motivation for Participation

a. What motivates you to apply to PolarTREC and professionally, what do you hope to gain from the experience? (200 words maximum)

I want to participate in the PolarTREC program so I can create lessons that show students how math is used in the real world and I want to expose my students to careers and experiences they have never heard of before. This past summer I participated in the Illinois Petroleum Resource Board's teacher work shop. The workshop gave me a lesson plan centered on well drilling, and well profitability, which used linear equations. I started my year off with this lesson and the response I got from my students was amazing. The students were engaged in the lesson. They worked together discussing ideas on how to solve the problems presented. The students were learning how math is used in businesses. I could see them start to understand how the abstract concepts of linear equations will be used in their future careers. Finally, students were exposed and asked questions about careers in an industry they didn't even know existed in Illinois. I want create lesson plans centered on the Arctic and Antarctic. I want students to discover how scientists are using math and what a job as a scientist is really like.

b. Aside from journaling/blogging, online photos, and webinars which all part of our program requirements, describe your ideas on how you will share this experience in your classroom or with the audiences you work with. (200 words maximum)

I will share the experience of PolarTREC with my students by creating math lessons that incorporate what I learned. I teach statistics, and I want to create a lesson around the statistical analysis of the research I will help with through the PolarTREC program. I can use the raw data and have my students find trends with glacier melt. I can have students take historical weather data and use a five number summary to create a box and whisker plot. After they established historically what "normal" temps were in the Arctic or Antarctic, they can plot the last 5 years temperatures and see if they are outliers or more normal. I want my students compute real world data. I want them to see pictures of the data being collected as well as hear about my experiences collecting the data. The multi-faceted lessons will engage them and expose them to math in a way a book never could.

c. Describe how you envision sharing your experience with other educators, your personal and professional communities, and the general public. (200 words maximum)

The high school I work for is moving to an academy model next school year. This

means our school will be divided into 4 academies, each specializing in a different area, a bit like college majors. I am on a team that will specialize in science and the environment. I will meet weekly with members the English, Science, and History departments and in our weekly meetings, we can plan cross curriculum lessons. I envision my team planning a unit around the research I will do in the Arctic or Antarctic. Another way I envision sharing my experience is with the other math teachers. I will also be meeting with all math teachers once a week, and in those meetings I can give the math teachers the lesson plans I create. Being from a small town, I envision creating a power point so I can share my experience in the PolarTREC program with the general public by speaking at Kiwanis meetings, Lions Club meetings, and at the local library.

d. Describe how you currently engage your audience and facilitate learning when educating on new and complex topics, concepts, or issues. (200 words maximum)

I teach math, so I am used to engaging audiences and facilitate learning while presenting complex topics. I start the process by talking about something the students or audience does know and can understand. As I present, I slowly bring in more advance topics and relate them to the prior knowledge. Another thing I like to do when presenting complex topics or concepts, is ask the students or audience questions. I want to know what they are thinking; I want to know what they did not understand and what I can explain differently. I have found that having a two way conversations allows for students or an audience to engage in the complex topics and understand them better.

e. Describe the particular strengths you would bring to the PolarTREC program and to a field research team. (200 words maximum)

The strengths I would bring to the PolarTREC program and the field research team is my eagerness to learn something new, my willingness to help out where ever I am needed, and my experience in being part of a team. I want to learn and participate in research. That is why I am applying for this opportunity. I want to learn what it is like to be a scientist out in the field and I want to understand the research so I can explain it to my students. I am willing to help out where I am needed. I understand that not all tasks in a job are fun or glamorous, but they are necessary. I am willing to do what is needed of me so the research can be successful. I have been part of team many times before. I know that successful teams require communication and understanding. Spending 6 weeks together in a remote location can be tough at times. I understand that team members need to treat each other with respect and understanding everyone deserves in order to be successful and complete the

research.

f. Using examples from your own experience including your role and the contributions you made to a team effort, describe how you work as a member of a team. (200 words maximum)

I worked on 7th grade teams that meet each day for one class period to discuss concerns and plan events. The team worked because if there was a job to do, one person took the lead and the rest supported the teacher in any way they needed. Every year our team took all the 7th graders to a state park for the day. The science teacher was in the lead, but and the rest of us supported her. Over the years I was asked to set up busing, lead nature hikes, teach students how to fish, and organizing lunch. I did whatever the lead teacher needed me to do. I supported her so the day would run smoothly. I have also been on teams where I was the lead. I was asked to run MAP testing for all students 5th through 8th grade. When I was in the lead, I planned out training for all teachers, and offered individual training as needed. As test day approached I emailed teachers and asked what they needed from me. I set up "go to" people in each grade so other teachers had easy access to help when issues came up on test day.

6. Communicating the Experience and Science

Write your journal entry for the general/lay audience. (200 words maximum)

The day started off with rain, lots and lots of rain. It came down really hard, almost like we were in a monsoon. I could see sheets of rain blowing across the lawn. Some of the streets had flooded and we had a small river flowing through our back yard. The impromptu river went through my raised garden and the wooden frame floated away. The sewers were overflowing with so much water; the pressure blew a manhole cover off and created a geyser in the street. It was amazing to see it all; thank goodness no one was hurt. With the sewer overflowing, all I could think about was the raccoons that live in there. Where do they go when it rains like this? They can't stay down there. The water is flowing so fast, and there is so much of it, I can't imagine there would be any safe and dry place to be. Yet, I never see them crawl out of the sewers before or during a rain storm. Obviously they have figured out some way to survive a flash flood in the sewers, because I do see them crawl out every night, I just wonder how.

7. Scientific Interests and Research Area Preference

a. Where would you prefer to go on an expedition? Either

Please explain your preference

If I had to choose between the Arctic or Antarctic, I would the Arctic, but I would NOT turn down any opportunity to work with a research team at either end of the earth.

b. How long would you prefer to participate in an expedition? (Most expeditions are AT LEAST three weeks.) List any dates or periods of time when you are NOT able to participate in a field expedition

I am available any time. If summer travel works out, that would be great, but I would make school year travel work also.

c. Briefly describe your scientific interests. Which scientific topics interest you the most and why? Please note that climate change has become part of nearly all expeditions so you may choose to be more specific about this topic, if applicable. (200 words maximum)

I have always been in awe of glaciers and icebergs. I find it so fascinating that something that looks solid and stable can calve and produce icebergs. I find it so interesting that glaciers are responsible for both carving the Rocky Mountains and flattening out the Great Plains. The size of glaciers makes me feel so small, and insignificant. It is hard to wrap my head around ice that is miles thick. Now most glaciers are melting, and change is happening to the glaciers and the surrounding areas. I am interested in learning about the change. I want to know what is happening now and what change will happen in 20 or 30 years. Glaciers are calving more, so that means more icebergs. How does that change the ocean? Are the marine animals better off now, but will suffer in the long run? Glaciers are producing more summer melt. How does that change rivers and streams? When the glaciers are gone what will happen to those areas, how will they change then? Glaciers are melting and their mass is decreasing. How does the decreasing weight effect the land mass under the glacier? Glaciers have always changed the environment that surrounds them. I want to learn how that is happening now.

Atmospheric Systems I would really enjoy an expedition in this subject area

Cryospheric Systems I would really enjoy an expedition in this subject area

Human and Social Systems I do not want to be considered for an expedition in this subject area

Marine Systems I would really enjoy an expedition in this subject area

Terrestrial Systems I would really enjoy an expedition in this subject area

Ecology and Biotic Systems I would really enjoy an expedition in this subject area

Physics or Space Sciences I would really enjoy an expedition in this subject area

Engineering and Technology I am somewhat interested in this subject area

Other (please specify)

Other Areas of Scientific Interest

e. Are you applying to work exclusively with a specific researcher? If yes, please list their full name, institution, and email address. (200 words maximum)

8. Background Information and Skills

a. Briefly describe your outdoor skills or experiences.

I do have outdoor experience. My experience includes back country, and day excursions. I kayak a little over 4 miles every week. I have been on two different week long back country back packing trips. One week I hiked parts of the Appalachian Trail, by the Great Smoky Mountains and another week I hiked the Porcupine Mountains in Michigan. I have gone back country canoeing in Quetico National Park in Canada three times and to Boundary Waters in Minnesota once. This past summer I did day hikes of 5+ miles in the Adirondack Mountains, Glacier National Park, and in New Mexico. In the winter I snow shoe and I do have experience cross country skiing.

b. Provide a basic statement of your general health and physical condition.

My general health is very good. I take no prescription medications. The only pill I take daily is a vitamin. I am physically active. Every week I walk 3 miles 2-3 times a week, I kayak 4 miles a week and do yoga 1-2 times a week.

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.

I have a PC and I am proficient with it. I am able to learn and use all programs the school district provides for me. I am proficient with EXCEL, Word and Power Point.

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.

At school I use a laptop computer. I use Google as my main internet browser. In my classroom I use and teach students how to use Excel, Word and PowerPoint. I also use the Google version of those and switch documents between the two formats. Before I was a teacher, I was a data analyst and used Excel extensively. I have done v-lookups, pivot tables, and multi-step if/then equations.

e. List any additional skills or information that you wish to be considered.

Other skills I have are wood working, knitting, crocheting and sewing. For woodworking I can use a lathe, sander, table saw, and miter saw. I can knit and crochet sweaters, hats, blankets. I can sew quilts and clothes.

9. Previous Applications & Participation

a. Have you previously participated in a teacher research experience (e.g. NOAA Teacher at Sea, Earth Watch)? We do not accept applications from PolarTREC alumni. No

Program Information

If yes, did you complete all program requirements?

If yes, how do you see the PolarTREC professional development opportunity continuing to develop your professional skills, or how will it build on your previous research experiences?

10. Orientation Availability

Are you available to attend the Orientation during this time period? Yes

If no, please explain

11. How did you hear about PolarTREC?

Email listserve. Please provide the name and/or URL

Friend or colleague. Provide a name if you wish

Former PolarTREC, TREC, or TEA teacher. Please provide their name

From a website. Please list the website name and URL

Conference or presentation. Please list the venue and/or presentation title

Other (please explain)

I searched the internet for "Teacher Research Opportunities" and found your website.

b. Please suggest other places we might advertise this opportunity for teachers

12. References

Reference 1

Name Beth Summers

Title and affiliation Principal at Freeport High School

Email Address Beth.Summers@fsd145.org

Phone Number 815-232-0400

Reference 2

Name Sarah Hasken

Title and affiliation Associate Principal at Freeport High School

Email Address Sarah.Hasken@fsd145.org

Phone Number 815-232-0400

Reference 3

Name Derek Avery

Title and affiliation Associate Principal at Freeport High School

Email Address Derek.Avery@fsd145.org

Phone Number 815-232-0400

2020-2021 PolarTREC Educator Application

Mele Sato

1. Contact Information

Name: Mele Sato

Email: msato@hightechhigh.org

Home Address:

4581 Oregon St.

San Diego, CA 92116 US

Home Phone: 8083921764

Cell Phone : 8083921764

Institution Name: High Tech High Media Arts

Institution Address:

2230 Truxtun Rd., 3rd Floor

San Diego, CA 92106

Institution Phone: (619) 398-8620

Classroom/Office Extension: n/a

Institution Fax: (619) 224-1198

Institution Website: <https://www.hightechhigh.org/>

Other relevant websites: Current graduate work -
<https://melesato.wixsite.com/hthgse> Classroom site -
<https://sites.google.com/hightechhigh.org/hthmamath12>

Supervisor's Name: Isaac Jones

Supervisor's Email Address: ijones@hightechhigh.org

2. Demographic Information

a. Gender: Female

Race: Multiracial

c. Briefly describe your primary audience and surrounding community (e.g. K-12, public, rural/urban, technology access, economics): My primary audience is a public charter school that uses a lottery based system for enrollment. Students are chosen based on their zip code and the number of school age children living in that zip code. This creates a diverse population of students that reflect the population of San Diego with respect to race, ethnicity, socioeconomic status, and geography. Through various in-class and internship programs at our school we have built many connections within our community. As for technology, our school is 1-1 with Chromebooks. Students do have access, if necessary, to some Mac computers for software needs.

d. Type of School (or students you work with): Public

Other Type of School

e. What is the population of your annual audience or school (estimates are fine) I see 100 students every year and the population of our student body for 9-12 is around 400.

f. School Ethnicity:

2 % - American Indian or Alaska Native

9 % - Asian

9 % - Black or African American

52 % - Hispanic or Latino

2 % - Native Hawaiian or Other Pacific Islander

26 % - White

% - Multiracial

If your school uses other categories to describe race/ethnicity, please describe:

g. Percentage of students who receive free or reduced lunch: 44

h. Average class or audience size 26 students per class

i. Total number of students/audiences you teach in a year 100 students

during the year

j. If known, what are the approximate start and end dates of your school year or primary programs, etc. ? Include major professional vacation periods. i.e. Christmas break, summer break, etc.

School in session: August 26th, 2019 – November 22nd, 2019 Thanksgiving Break: November 25th, 2019 – November 29th, 2019 School in session: December 2nd, 2019 – December 20th, 2019 Winter Break: December 23rd, 2019 – January 3rd, 2020 School in session: January 6th, 2020 – March 20th, 2020 Spring Break: March 23rd, 2020 – April 3rd, 2020 School in session: April 6th, 2020 – June 18th, 2020

3. Teaching Experience and Education

a. What type of university degree or other academic experience or qualifications do you have?

Bachelor's Degree (Major): Harvey Mudd College: B.S. Mathematics

Bachelor's Degree (Minor): Music

Masters Degree (Discipline): UC Santa Barbara, M.Ed. Teaching and Learning (2008); High Tech High Graduate School of Education, M.Ed. Educational Leadership (expected graduation date June 2020)

PhD Degree (Discipline):

Other Degree:

b. How many years of education experience do you have?: 13

c. How many years have you been working at your current institution?: 12

d. List up to 10 relevant professional licenses, certifications, registrations, awards or honors that you have received in your profession::

SST in Mathematics and Physics, District Intern and BTSA Mentor, Cooperating Teacher for USD and HTH Teaching Credential Programs, CMC South Annual Conference Presenter (2012, 2019), Knowles Science Teaching Fellowship

4. Professional Assignment

a. What is your primary education assignment? Check all that apply
Secondary (Grades 9-12)

Other Primary Assignment

b. What subjects do you teach? Check all Secondary Math

Other Subjects

5. Motivation for Participation

a. What motivates you to apply to PolarTREC and professionally, what do you hope to gain from the experience? (200 words maximum)

What is important for teenagers to know about themselves and the world they live in when they graduate? The role of education, who we learn from, what lessons we keep with us, AND what we remember can help us figure out what is important. At the end of the day, our objective as educators is kids being happy and loving themselves. I want kids to experience and learn about empathy and compassion through mathematics. In the hopes of creating opportunities where students are building compassion for our world, I think it is necessary for educators to be models for their students by remaining curious and humble about their subject matter and others. I want to collaborate, create, and innovate with my students. Mathematics is how I make sense of the world and connect with others. The purpose of mathematics is not only about applications in the real world but rather how we can use mathematics to understand and make connections with our surroundings and each other. PolarTREC will connect our school to a network of educators that are still learning about the connections between disciplines that are typically separated in traditional high schools.

b. Aside from journaling/blogging, online photos, and webinars which all part of our program requirements, describe your ideas on how you will share this experience in your classroom or with the audiences you work with. (200 words maximum)

We are a school that is highly collaborative and integrated. We not only are encouraged to collaborate and design projects with teachers that share the same group of students as us but also across grade levels. I can easily see planning a project with some if not all the other STEM teachers before leaving to do research. The overall project might incorporate student projects or questions to bring on the expedition or things to test while there. I also hope to work with other teachers to include data and research collected on the expedition in future activities and projects.

c. Describe how you envision sharing your experience with other educators, your personal and professional communities, and the general public. (200 words maximum)

Upon returning from the expedition I would be able to share with my colleagues in a professional development setting. Our students would also have the opportunity to connect with our community in an exhibition. We have exhibitions of student work at the end of every semester. I also wonder what connections will be created through

local research institutes like Scripps Institute of Oceanography where my students and I could potentially share our experience. Two larger networks that I participate in through our organization are the Math Agency Improvement Network (MAIC) and the Equity and Innovation Group. While the first focuses on student understanding in mathematics, the latter group I am in is about creating projects that are meaningful and relevant to students' lives. Both of these communities, in addition to the school wide opportunities above, are ways I envision sharing my experience with others.

d. Describe how you currently engage your audience and facilitate learning when educating on new and complex topics, concepts, or issues. (200 words maximum)

If you were to walk into my classroom you would see students working in groups, often struggling through a group task or activity. That activity might bring them outside to run 100m or see how high they could jump in order to bring a tangible concept to the very abstract concepts of found in calculus. There are resources in the classroom such as class notes that the class has come to an agreed understanding through the earlier struggles. The goal is for students to share their different ideas in approaching a problem and connecting those ideas with others. I also incorporate a ton of reading and writing when introducing topics. This not only provides context and relevancy to the content but also incorporates literacy and communication into mathematics. All of these articles, reflections, and projects, allow for student to explore and inquire about the topic. My hope is that students even for a brief moment see the math that is in all their lives and how they too are mathematicians.

e. Describe the particular strengths you would bring to the PolarTREC program and to a field research team. (200 words maximum)

While it has been over ten years, my extensive lab and classroom experiences in Mathematics, Engineering, and the Physical Sciences has well prepared me for working within a research team. I not only worked on multiple projects during undergrad on a team doing research but also co-wrote our findings together. My strength in those projects were attention to details, finding connections between processes and results, and in organizing and structuring how we were going to present all of our research and findings. Those same strengths continue in my current position. I find myself in tune with what others are doing in their classrooms so I can connect with them personally and professionally through their content. There will always be overlap in STEM fields. Thus, I am also curious about the connections that mathematics has to topics in the humanities and also believe that mathematics is a means of finding solutions to some of the local and global issues

we face today. Having this perspective will make me a stronger team member because I don't view tasks, measurements, etc., as isolated from one another. I will ask questions that amplify those connections.

f. Using examples from your own experience including your role and the contributions you made to a team effort, describe how you work as a member of a team. (200 words maximum)

In meetings and in professional learning communities I find myself willing to be vulnerable and use inquiry as a way to engage in the task or dilemma. Having a conversation about the task is one way to bring to light all the details. I am one member of a four-person team that is putting together a Community Resource Fair for our school that will connect families to many of the organizations that are in our local community that they may not be aware of. Since I enjoy bringing to light all the details of a project I began our first planning session by asking the question, "what do we want the fair to look like?" This helped ground everyone in their hopes and goals for the fair before getting into the details. We were able to connect each other's ideas and strengths in order to decide who was taking the lead on different parts of the planning. I am often the organizer and recorder of all the details just in case it's applicable later. As a result I tend to do a lot of listening and recording because every idea has the potential to be significant.

6. Communicating the Experience and Science

Write your journal entry for the general/lay audience. (200 words maximum)

It was Sunday, around 2:00pm, Ben went to go see It 2 with his friends, and I was prepped and planned for the entire week. I was alone and the tomato plants desperately needed some pruning. The plants were crowded and needed some love. The okra was still going strong when we planted a couple of months ago and we did not want to deny ourselves from fresh okra through the fall. Pruning becomes a meditation where I search for individual leaves and then full branches, clipping off just what is necessary to maintain the structure, but rid the plant of any diseased portions. Then I saw the poop. Lots of small, pebble like, black poop, covered the walkway where the branches crept over the side of the box. There was a lot of it, which meant there was either one very large caterpillar or two smaller ones. My vermiphobia, the fear of wormy things, paralyzed me. I knew if I didn't do something this one caterpillar would make his way through each individual leaf on a branch and then to our sweet Sungold Tomatoes. Although disguised by the bright green color of its skin, I found it.

7. Scientific Interests and Research Area Preference

a. Where would you prefer to go on an expedition? Either

Please explain your preference

Both have their pros for different reasons. While going to the Arctic would most likely mean not missing school in the Fall which would be easier than trying to find a long term substitute, it would mean I could bring back my experience to my future students. However, being gone during the school year has the benefit of possible video chatting with my students live and depending on if school started before the expedition I might be able to bring questions the students have about the research.

b. How long would you prefer to participate in an expedition? (Most expeditions are AT LEAST three weeks.) List any dates or periods of time when you are NOT able to participate in a field expedition

I am expecting some time away from the classroom and would enjoy the opportunity to actively be in the field while my students are in class. I have no preference as to the length of the expedition. However, I'm not sure if the timing for this application conflicts with April - June of 2020, but I would be unavailable during this time. However, I will be available during those months in 2021. Other than that, there are no conflicts.

c. Briefly describe your scientific interests. Which scientific topics interest you the most and why? Please note that climate change has become part of nearly all expeditions so you may choose to be more specific about this topic, if applicable. (200 words maximum)

From an early age my dream was to discover a planet or star. I learned in school how the Native Hawaiians were able to use the stars to navigate out in the open ocean to find new lands. Mathematics became the language and lens through which I could not only continue learning about the stars but also about how our changing climate is affecting our health. Also, ever since learning that there are people called glaciologists, I have wondered how the change in sea ice affects all the other variables that keep our planet in balance. I wonder about structure of ice, if it can be modeled mathematically, and if it's not only the amount of ice that has changed but the structure of it as well. I am also interested in what neutrinos found in ice can tell us about what is going on in space. Migration is another topic that interests me, both human and animal migration. Living near the U.S./Mexico border allows me to bring migration into question for my students as they grapple with the concept of a wall that birds and butterflies can fly over, and whales can swim around, but people get

stopped at.

Atmospheric Systems I am somewhat interested in this subject area

Cryospheric Systems I would really enjoy an expedition in this subject area

Human and Social Systems I am somewhat interested in this subject area

Marine Systems I am somewhat interested in this subject area

Terrestrial Systems I would really enjoy an expedition in this subject area

Ecology and Biotic Systems I am somewhat interested in this subject area

Physics or Space Sciences I would really enjoy an expedition in this subject area

Engineering and Technology I do not want to be considered for an expedition in this subject area

Other (please specify)

Other Areas of Scientific Interest

e. Are you applying to work exclusively with a specific researcher? If yes, please list their full name, institution, and email address. (200 words maximum)

No, I am not.

8. Background Information and Skills

a. Briefly describe your outdoor skills or experiences.

I am an avid hiker and enjoy long distance backpacking (7-10 days) throughout California in various regions at least once or twice a year. I spend a lot of time rock climbing in Joshua Tree and Yosemite National Parks so am very comfortable camping, layering in varied temperatures, cooking my own food, as well as having an awareness and understanding my impact on local flora and fauna. I am a certified Wilderness First Responder through Wilderness Medical Associates International (WMA). I have also led groups of 20-25 students on multi-day backpacking trips into Joshua Tree National Park on three different occasions. While I tend to be more of a mountain person with my activities, I love relaxing in the ocean and being in the water. I grew up in Hawai'i so am very comfortable being in and on the ocean. I would not consider myself a sailor at all, but I have gone on two long distance sailing trips. One was to Catalina Island from San Diego with no autopilot, and the other was to Los Angeles from San Diego. My friend who has his Captain's license needed a second person for crew. He told me what to do and I got a very basic introduction to sailing. The first trip to Catalina with no autopilot was a lot more challenging. Getting used to being on open ocean like that and trying to keep the compass headed in the right direction without the beam swinging was tough, but with practice (many hours at the helm) I got better.

b. Provide a basic statement of your general health and physical condition.

I stay active by practicing yoga, climbing, dancing hula, and playing soccer. I have no chronic illnesses or severe allergies that are relevant (cats give me hives). I had knee surgery in February 2018 after tearing my ACL, MCL, and both menisci when I fell climbing. My knee is probably at 90% of where it was before the injury. However, I have gone on two week long backpacking trips in the past year, I practice yoga at least twice a week, and I have long since returned to climbing with no issues. Other than that, I feel like I'm in good health.

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.

Currently I use a Mac computer (school issued) so am most familiar with its OS. However, I have only had this Mac for four years and prior to that I used a PC. If I were to use a PC again, I would probably just need a little time to reorient myself and then I would be fine. On both operating systems I feel like I have an above average skill level. I'm quick to learn and like to keep things organized. My best tool is that I am a good troubleshooter if something isn't working I can usually access my

resources and figure it out.

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.

Laptop computer: I use this on a daily basis at school to take attendance, check emails, create curriculum, do research for projects, etc. I then take my school computer home to write papers for graduate school, create activities on Google docs, and slides, etc. Microsoft Office: I tend to use Google applications most frequently because our student computers are Chromebooks so I want to make sure anything I create, as a model or activity, students are able to access. However, when I had a PC I would use Excel, PowerPoint, and Word all the time to keep track of my finances at home, for data analysis in statistics projects with my students, to write papers, and prepare presentations. I also used to use Word to format handouts for students. Internet browsers: I most frequently use Google Chrome and Safari. However, there are some websites that because of the Flash or Java script on them will only open in Firefox, so I will occasionally use it. Digital Camera: I have a small Canon digital camera that I take on trips. It's sturdy and takes great pictures with a strong zoom. I'll sometimes attach it to my climbing harness with a carabiner so I can take photos while I'm on the wall. Google Drive: I frequently use it to organize all my files, and I use most of its apps such as: Docs, Sheets, Slides, Forms, Photos, Hangouts Adobe Suite: I can use Photoshop at a very beginner level. I have not explored the other programs as much as Photoshop.

e. List any additional skills or information that you wish to be considered.

Conversational Japanese Proficient in the operation of most woodshop machines and tools such as drills, jigsaw, planer, table saw, disc sander, circular saw, etc.

9. Previous Applications & Participation

a. Have you previously participated in a teacher research experience (e.g. NOAA Teacher at Sea, Earth Watch)? We do not accept applications from PolarTREC alumni. No

Program Information

If yes, did you complete all program requirements?

If yes, how do you see the PolarTREC professional development opportunity continuing to develop your professional skills, or how will it build on your previous research experiences?

10. Orientation Availability

Are you available to attend the Orientation during this time period? Yes

If no, please explain

11. How did you hear about PolarTREC?

Email listserve. Please provide the name and/or URL

Friend or colleague. Provide a name if you wish

Former PolarTREC, TREC, or TEA teacher. Please provide their name

I recalled a couple years back that two peers of mine, Casey O'Hara and Katey Shirey, from the Knowles Science Teaching Fellowship, had participated in a program where they got to do research in Antarctica. I did some digging on the Internet and found that it was with PolarTREC. They didn't tell me about it directly, but it was because of them I found the program.

From a website. Please list the website name and URL

Conference or presentation. Please list the venue and/or presentation title

Other (please explain)

b. Please suggest other places we might advertise this opportunity for teachers

12. References

Reference 1

Name Isaac Jones

Title and affiliation Director, High Tech High Media Arts

Email Address ijones@hightechhigh.org

Phone Number 9175188737

Reference 2

Name Katie Weisberg

Title and affiliation Director, M.Ed. in Educational Leadership Program, High Tech High Graduate School of Education

Email Address kweisberg@hightechhigh.org

Phone Number 8584053853

Reference 3

Name Anna Chiles

Title and affiliation 6th grade Humanities Teacher, High Tech Middle Mesa

Email Address achiles@hightechhigh.org

Phone Number 2059104254

2020-2021 PolarTREC Educator Application

Thomas Savage

1. Contact Information

Name: Mr. Thomas Savage

Email: tjsavage@hcpsnc.org

Home Address:

104 Finley Brook Way
Hendersonville, NC 28739 US

Home Phone: 828 698-8367

Cell Phone : 828-458-7293

Institution Name: Henderson County Early College

Institution Address:

tel:828-697-4561
Flat Rock, NC 28731 US

Institution Phone: 828-697-4561

Classroom/Office Extension:

Institution Fax: 828-697-4564

Institution Website: <http://www.hendersoncountypublicschoolsnc.org/hcec/>

Other relevant websites:

Supervisor's Name: Beth Caudle

Supervisor's Email Address: bcaudle@hcpsnc.org

2. Demographic Information

a. Gender: Male

Race: White

c. Briefly describe your primary audience and surrounding community (e.g. K-12, public, rural/urban, technology access, economics): The early college is a five year high school and college program in which students receive their associate's degree and high school diploma. This program is a collaborative effort between Henderson County Public Schools, Blue Ridge Community College and North Carolina New Schools. Our students are first-generation college attendees who may have financial hardship attending college, who are capable of completing honors and college classes, and who are underrepresented in four year college and universities. Last year we had a 100% graduation rate with 99 % of our students continuing on to attend universities and state colleges. In addition, for the past few years over sixty five percent of our graduates went on to study STEM related careers. Our community is rural where apple and other agriculture spread across the landscape. We currently serve 200 full time students and all courses are taught at the honors level.

d. Type of School (or students you work with): Public

Other Type of School

e. What is the population of your annual audience or school (estimates are fine) 200 +

f. School Ethnicity:

0.5 % % - American Indian or Alaska Native

0.5 % % - Asian

6 % % - Black or African American

65 % % - Hispanic or Latino

% - Native Hawaiian or Other Pacific Islander

28 % % - White

% - Multiracial

If your school uses other categories to describe race/ethnicity, please describe:

g. Percentage of students who receive free or reduced lunch: 65 %

h. Average class or audience size 24 %

i. Total number of students/audiences you teach in a year 200 +

j. If known, what are the approximate start and end dates of your school year or primary programs, etc. ? Include major professional vacation periods. i.e. Christmas break, summer break, etc.

Aug 2nd Start May 28th End December 18 - Jan 2

3. Teaching Experience and Education

a. What type of university degree or other academic experience or qualifications do you have?

Bachelor's Degree (Major): Geography/Natural Science

Bachelor's Degree (Minor): Secondary Education

Masters Degree (Discipline): Geoscience

PhD Degree (Discipline):

Other Degree:

b. How many years of education experience do you have?: 16

c. How many years have you been working at your current institution?: 11

d. List up to 10 relevant professional licenses, certifications, registrations, awards or honors that you have received in your profession::

Licenses NC Certified in 9-12 Science (300) National Board Certified (Science)

Registrations North Carolina Science Teacher Leadership Fellow NCSLA (2017 - 2019)

North Carolina Science Teachers Association National Science Teaching Association

North Carolina Science Teacher Leadership Fellow NCSLA (2017 - 2019) Awards

Henderson County Early College Teacher of the Year (2010 & 2017) NSTA / Shell

Science Lab Challenge Award (southeast region winner) 2017, Air Force Association

(Western North Carolina) Teacher of the Year 2017. North Carolina Science Teachers

Association Outstanding High School Science Teacher District 8 2019

4. Professional Assignment

a. What is your primary education assignment? Check all that apply

Secondary (Grades 9-12)

Other Primary Assignment

b. What subjects do you teach? Check all Secondary Chemistry, Secondary Earth Science, Secondary Physical Science

Other Subjects Forensics

5. Motivation for Participation

a. What motivates you to apply to PolarTREC and professionally, what do you hope to gain from the experience? (200 words maximum)

Polar science holds the best key to Earth's past climates and to solving some of our greatest environmental challenges. I would like to share current scientific information from the polar regions with my students. As a Scientist, Teacher, and National Park Ranger, I have experienced a variety of climates from desert to marine to high alpine. A PolarTREC experience would benefit my instruction as I challenge my students to be future scientists who will help solve scientific challenges including climate change. Experiencing this region and bringing back additional scientific knowledge and tools, would enhance my overall ability to translate scientific research and data into exciting and relevant lessons. It is a professional goal to develop additional lasting partnerships with polar scientists who could provide up to date information and allow continual lesson plan development. Connecting my students with real data and polar scientists will provide them with a solid connection between education, field science and research data, and knowledge gained and applied to decisions made by current and future leaders of the world. In the end, this experience will inspire my students and motivate them to become future scientists and solve our climate challenges.

b. Aside from journaling/blogging, online photos, and webinars which all part of our program requirements, describe your ideas on how you will share this experience in your classroom or with the audiences you work with. (200 words maximum)

PolarTREC experience would be shared with students at my school and beyond. First, I would develop a polar curriculum and incorporate it into my existing chemistry, earth science, and physical science high school courses. Lessons would include inquiry based labs with stations for students to examine polar region data and information. Students would verbally report their findings and conclusions. I would also incorporate polar science into my Cetacean acoustic lab and lesson that is a product of many months of collaboration with the NOAA scientists who I worked with during my 2015 Teacher at Sea research cruise. After my Teacher at Sea experience, I began a new outreach program called "Young Scientists". This outreach targets elementary students in third through fifth grades and includes the lesson Sounds of the Sea which focuses on whale and other marine mammal acoustic calls. The PolarTREC experience would benefit this program as well as my outreach with Boy Scouts of America. I provide an ecology themed program for cub scouts at Camp

Daniel Boone twice a year. Bringing polar science to the mountains of Western North Carolina would have a profound impact on these future scientists and provide them with a global perspective.

c. Describe how you envision sharing your experience with other educators, your personal and professional communities, and the general public. (200 words maximum)

My vision includes sharing lessons with other educators by making presentations at local, state and national science conferences. For the last five years, I have presented at the NC Science Teachers Association conference and shared my experiences, lessons, and collaborative efforts. I would love to return to this conference and make a presentation about the polar region and share my lesson plans with conference participants. Within our school district, we have a professional learning community of science teachers. We meet throughout the year to share lesson ideas. This would be a fantastic way of sharing my experiences, photos, data, and lessons designed from the PolarTREC program with other science educators. Our community has many civic groups and well educated retirees. I have made presentations to local civic groups, retirement communities, and churches about my NOAA Teacher at Sea experiences. I serve on the board of our local gem and mineral museum. After PolarTREC, I would network with these groups to provide presentations that would target misinformation regarding global warming and develop a positive platform to educate the public on current scientific challenges.

d. Describe how you currently engage your audience and facilitate learning when educating on new and complex topics, concepts, or issues. (200 words maximum)

I have been trained in model based science inquiry and use it extensively in my classroom. This style focuses on student discourse with emphasis placed on building student skills through inquiry with minimum teacher centered instruction. This places heavy emphasis on students examining real data, photos, and written interpretation and drawing conclusions based on collected information. Questions are prompted by me throughout this process to promote understanding. This style of learning encourages students to make connections to their lives and real world problems. One lesson example utilized real case studies involving local well water contamination from pesticides that were used in our county's apple industry. Students easily make connections that helped them transition into complex topics such as underground hydrology. This method requires students to generate their own experiments and decide as a group on variables, equipment, hypothesis and method of execution. Through their conclusions new topics are scaffolded from

previous lessons. Protocols are used extensively to promote enhanced thinking; this includes collaborative group work, literacy groups, scaffolding, and writing to learn. Ultimately, using these teaching techniques has promoted enhanced scientific thinking and self reliance. Many of my former students are pursuing degrees and careers in scientific fields.

e. Describe the particular strengths you would bring to the PolarTREC program and to a field research team. (200 words maximum)

I would bring a strong teaching background and scientific knowledge base as well as enthusiasm for science and learning to the PolarTREC program. Translating difficult scientific topics and field studies into fun and engaging lessons is a passion of mine. I have a genuine interest in the arts, specifically photography and would contribute my photographic skills and observant eye to documenting the beauty of the polar region. Past professional experiences include scientific field research in extreme climates including a graduate field study in San Salvador, Bahamas in 2010; a coral reef study and scuba field experience in the Gulf of Mexico in 2013, and a Teacher at Sea whale inventory in Georges Bank aboard a NOAA research ship in 2015. Continual collaboration with scientists after field studies have allowed me to enhance my labs and instruction. I am physically active and can work in adverse environments and perform physically demanding tasks. My goal as a teacher is to creatively explore different methods and learning experiences to make science fun, meaningful, and relevant to my students and to expose them to the larger natural world.

f. Using examples from your own experience including your role and the contributions you made to a team effort, describe how you work as a member of a team. (200 words maximum)

Our Early College High School opened in the fall of 2009. Since the school's inception, I have been the primary science teacher responsible for teaching the majority of the high school science classes including Earth Science, Chemistry, and Physical Science. Team-work is critical at our small school and I have taken a leadership role in my school and school district. Currently, I serve on our School Improvement Team and coach the Science Olympiad team of thirty six students who compete in science events at regional and state competitions. As a team member, I have secured grants and private and corporate donations to support school programs. I coordinate activities for students outside the classroom including Discover SCUBA which introduces students to diving and Discover flying which introduces students to aviation. As a NOAA Teacher at Sea, I was part of a science team from the Northeast Fisheries conducting a two week Cetacean inventory off the

coast of Cape Cod. My responsibilities included the installation of science equipment prior to departure and communicating whale identification data and entering computer data while at sea. Today, I continue to collaborate with NOAA on lesson planning and outreach. I also serve on community boards and currently serve on North Carolina Science Leadership Association Fellowship.

6. Communicating the Experience and Science

Write your journal entry for the general/lay audience. (200 words maximum)

Good news comes in many forms and it can be unpredictable and arrive at times most needed. This week, I received a followup email from a member of our local Rotary Club pledging \$5,000 for our Science Olympiad team and an additional \$20,000 in scholarships for our team members entering STEM and medical careers. This came after I presented a program at their organization to thank them for financially supporting our Science Olympiad team over the years. The presentation included our many success stories including winning 1st and 3rd place at our regional competition. The donor was most interested in the STEM careers our recent graduates are now pursuing including pre-med, aerospace engineering, pharmacy, and BioChemical research. News such as this could not have come at a more important time as we were struggling to identify funding to purchase necessary equipment for the Science Olympiad Team and competition.

7. Scientific Interests and Research Area Preference

a. Where would you prefer to go on an expedition? Antarctic

Please explain your preference

After being interviewed for a possible PolarTREC project in Antarctica with a researcher from NASA IceBridge mission in December 2016; I researched more of their mission and became more intrigued in the rapid rate of melting occurring in the Antarctica. I have shown my students video clips and other photos that I have incorporated into my lessons, specifically ocean currents. Since then, I became very interested in this ecosystem specifically impacts on the marine life. Making correlations in our small rural region has become a hallmark of mine. My students are surrounded by rivers and know their actions impact this ecosystem. Bringing back first hand photos, videos and experiences from Antarctica would exponentially enhance their curiosity with a target result of many wanting to go into STEM fields that will hopefully find solutions. I would relish the opportunity participate in polar research and learn more about this fragile ecosystem, polar animals, and how I can make a difference as a teacher and global citizen to protect and preserve it.

b. How long would you prefer to participate in an expedition? (Most expeditions are AT LEAST three weeks.) List any dates or periods of time when you are NOT able to participate in a field expedition

4 weeks

c. Briefly describe your scientific interests. Which scientific topics interest you the most and why? Please note that climate change has become part of nearly all expeditions so you may choose to be more specific about this topic, if applicable. (200 words maximum)

I have an innate curiosity for the natural world and passion for science. I am intrigued with marine mammals and their migration patterns and adaptations to the physical geography and climate of the polar region specifically Antarctica. After being interviewed for a possible PolarTREC project in Antarctica with a researcher from NASA IceBridge mission in December 2016, I researched more of their mission and became more intrigued in the rapid rate of melting. I have shown my students video clips and other photos I have incorporated into my lessons, specifically ocean currents. Since then, I became very interested in this ecosystem specifically impacts on the marine life. Making correlations in our small rural region. My students are surrounded by rivers and know their actions impact this ecosystem. Bringing back first hand photos, videos and experiences from Antarctica would exponentially

enhance their curiosity with a target result of many wanting to go into STEM fields that will hopefully find solutions. I would relish the opportunity participate in polar research and learn more about this fragile ecosystem, polar animals, and how I can make a difference as a teacher and global citizen to protect and preserve it.

Atmospheric Systems I am somewhat interested in this subject area

Cryospheric Systems I would really enjoy an expedition in this subject area

Human and Social Systems I do not want to be considered for an expedition in this subject area

Marine Systems I would really enjoy an expedition in this subject area

Terrestrial Systems I do not want to be considered for an expedition in this subject area

Ecology and Biotic Systems I do not want to be considered for an expedition in this subject area

Physics or Space Sciences I would really enjoy an expedition in this subject area

Engineering and Technology I do not want to be considered for an expedition in this subject area

Other (please specify)

Other Areas of Scientific Interest

e. Are you applying to work exclusively with a specific researcher? If yes, please list their full name, institution, and email address. (200 words maximum)

8. Background Information and Skills

a. Briefly describe your outdoor skills or experiences.

I enjoy the outdoors and hike in all weather and seasons. I most enjoy kayaking rivers and lakes. As an active Boy Scout leader for eight years, I camp in all-weather, and have completed the boy scout lifeguard training which includes first aid and CPR. I have an advanced SCUBA certification and enjoy diving in mountain lakes and ocean reefs. After college, I was a National Park Ranger and was trained in search and rescue. Prior to becoming a teacher, I was a conservation planner and supervised AmeriCorp crews in the construction of the Palmetto Trail in the mountains of South Carolina including the construction of new trails, foot bridges, and drainage systems . My hobbies include sailing, biking, travel, and photography.

b. Provide a basic statement of your general health and physical condition.

I am in good general health and physical condition. I am physically active and jog or work-out daily. I enjoy hiking and walking my dog on trails in the woods behind my house or in Dupont State Forest. I have experience working at remote field sites and have the stamina to work well in extreme climates and the endurance to work long hour

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.

Microsoft, PC, Google Chrome, and Apple products are some of many technological devices and software applications I utilize daily in my teaching. Smartboards, vernier probeware, and a cart of laptop computers compliment my science curriculum. I incorporate various online applications to enhance my instruction. I frequently use online labs to enhance my students engagement with Chemistry. For eight years, I worked as Geographic Information Systems (GIS) Analyst and utilized GPS to create a myriad of maps and other technology systems for local governments and utilities. As a 2015 NOAA Teacher at Sea, I used computers and technology to record whale data.

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.

In the classroom, I use technology daily on various devices including Vernier probeware, Chromebooks, Ipads, and laptop computers. I am skilled at using microsoft software products including Excel and PowerPoint as well as Apple and Google software and applications and photo and movie software. I am a skilled photographer and use digital cameras in my teaching to document labs and the progression of various investigations.

e. List any additional skills or information that you wish to be considered.

9. Previous Applications & Participation

a. Have you previously participated in a teacher research experience (e.g. NOAA Teacher at Sea, Earth Watch)? We do not accept applications from PolarTREC alumni. Yes

Program Information 2015 Georges Bank / Cape Cod NOAA Teacher at Sea 2018 Point Hope, Alaska. NOAA Teacher at Sea

If yes, did you complete all program requirements? Yes

If yes, how do you see the PolarTREC professional development opportunity continuing to develop your professional skills, or how will it build on your previous research experiences?

The PolarTREC professional development opportunity would greatly benefit my high school instruction and enhance my existing cetacean sound acoustics lab and lesson developed from my NOAA Teacher at Sea research experience. As a PolarTREC participant, I would generate creative ways to incorporate polar research data and make connections my students would understand. I am passionate about science and about inspiring our future generations to pursue careers in science and tackle global scientific problems including climate change. The Polar TREC professional development opportunity would greatly benefit my “Young Scientists” outreach program with elementary students and scouts. I developed this outreach program to inspire children’s interest in and curiosity about science at an early age. PolarTREC would allow me to incorporate polar sciences and field research into this elementary outreach and allow me to expand children’s understanding of these special places. PolarTREC would help me be a better scientist, researcher, teacher, and polar literate citizen. I would share this experience and the resulting lesson plans with colleagues at local, state, and national meetings and conferences and incorporate the experience and research data into all facets of my teaching. One of my strengths as a teacher is deliver creative lessons that make science relevant to my students and their lives. I would like bring polar science to my classroom and community to resonate the changes occurring in world climates and the urgency to develop new technologies. Ultimately, quicker solutions to world climate problems will come with more polar literate citizens.

10. Orientation Availability

Are you available to attend the Orientation during this time period? Yes

If no, please explain

11. How did you hear about PolarTREC?

Email listserve. Please provide the name and/or URL

Friend or colleague. Provide a name if you wish

Former PolarTREC, TREC, or TEA teacher. Please provide their name

T

From a website. Please list the website name and URL

Conference or presentation. Please list the venue and/or presentation title

Other (please explain)

b. Please suggest other places we might advertise this opportunity for teachers

12. References

Reference 1

Name Tyler Honeycutt

Title and affiliation Math/Science teacher. Henderson County Early College

Email Address thoneycutt@hcpsnc.org

Phone Number 704-796-0012

Reference 2

Name Ben Morris

Title and affiliation Science/Math teacher. Henderson County Early College

Email Address bmorris@hcpsnc.org

Phone Number 225-266-9761

Reference 3

Name Genevieve Davis

Title and affiliation Marine Acoustics Technician. NOAA Northeast Marine Mammal Center

Email Address genevieve.davis@noaa.gov

Phone Number 508-495-2325

2020-2021 PolarTREC Educator Application

Jennifer Schriber

1. Contact Information

Name: Ms. Jennifer Schriber

Email: msjennifer@alsionschool.org

Home Address:

PO Box 752

Los Gatos, CA 95031 US

Home Phone: 954-699-7788

Cell Phone : 954-699-7788

Institution Name: Alsion Montessori Middle/High School

Institution Address:

750 Witherly Lane

Fremont, CA 94539 US

Institution Phone: 510-445-1127

Classroom/Office Extension: NA

Institution Fax: NA

Institution Website: www.alsionschool.org

Other relevant websites: www.witherlyheights.com and www.sjcc.edu

Supervisor's Name: Mr. Joey Morrison

Supervisor's Email Address: mrjoey@alsionschool.org

2. Demographic Information

a. Gender: Female

Race: White

c. Briefly describe your primary audience and surrounding community (e.g. K-12, public, rural/urban, technology access, economics): Alsion Montessori Middle/High School is a nonprofit private school in the suburbs of Fremont, California. It is primarily a middle-class population from 7th to 12th grade with access to technology. San Jose City College is an urban public community college of San Jose, California with diverse cultural and economic status.

d. Type of School (or students you work with): Other (describe below)

Other Type of School Alsion Montessori Middle/High School is a nonprofit private school. San Jose City College is a public community college.

e. What is the population of your annual audience or school (estimates are fine) At Alsion Montessori middle/high school the annual population is approximately 70 students. San Jose City College the annual population is about 9,000 students.

f. School Ethnicity:

0 % - American Indian or Alaska Native

45 % - Asian

2 % - Black or African American

40 % - Hispanic or Latino

1 % - Native Hawaiian or Other Pacific Islander

5 % - White

7 % - Multiracial

If your school uses other categories to describe race/ethnicity, please describe: NA

g. Percentage of students who receive free or reduced lunch: 0

h. Average class or audience size At Alsion Montessori Middle/High School the average class size varies from 10 to 20 students per class. San Jose City College the typical class size is between 30 to 60 students per semester.

i. Total number of students/audiences you teach in a year About 50 students

per year at Alston Montessori middle/high school and 90 students per year at San Jose City College.

j. If known, what are the approximate start and end dates of your school year or primary programs, etc. ? Include major professional vacation periods. i.e. Christmas break, summer break, etc.

Alston Montessori Middle/High School is a year-round program. School is in session from July 6th to August 7th, September 7th to December 18th, and January 25th to May 27th. Thus, vacation periods are from August 8th to September 6th, November 21st to November 29th, December 19th to January 24th, April 2nd to April 11th, and May 28th to July 5th. San Jose City College follows the same academic calendar.

3. Teaching Experience and Education

a. What type of university degree or other academic experience or qualifications do you have?

Bachelor's Degree (Major): Bachelor of Science (Major: Environmental Horticulture)

Bachelor's Degree (Minor): NA

Masters Degree (Discipline): Master of Science (Major: Tropical Plant and Soil Science) and Master of Education (Major: Integrated Education)

PhD Degree (Discipline): NA

Other Degree: NA

b. How many years of education experience do you have?: Approximately fifteen years.

c. How many years have you been working at your current institution?: For 10 years at Alston Montessori Middle/High School and 12 years at San Jose City College.

d. List up to 10 relevant professional licenses, certifications, registrations, awards or honors that you have received in your profession::

California Secondary Teacher Credential Montessori Secondary Education Credential CPR, AED, and Basic First Aid Certified Recipient of the Whole Kids Foundation and the Bee Cause Project-Honey Bee Grant American Montessori Society Member and Presenter Siemens Teachers Researcher (STARs) at the Pacific Northwest National Laboratory in Washington Coach award for Siemens - We can Change the World Winrock Biologist Consultant in Guatemala Chinese Culture Exchange Research Partner with National Chung Hsing University in Taiwan AmeriCorps Education Award Participant.

4. Professional Assignment

a. What is your primary education assignment? Check all that apply Middle School (Grades 6-8), Secondary (Grades 9-12), Community, Vocational, or Technical College

Other Primary Assignment NA

b. What subjects do you teach? Check all Middle School Science, Secondary Biology, Secondary Chemistry, Secondary Earth Science, Secondary General Science, Secondary Physical Science, Secondary Physics

Other Subjects Advanced Placement Environmental Science, Advanced Placement Biology, Genetics, Human Heredity, Ethics, Physical Education, and Sustainable Gardening

5. Motivation for Participation

a. What motivates you to apply to PolarTREC and professionally, what do you hope to gain from the experience? (200 words maximum)

Teaching Environmental Science at Alston Montessori Middle/High School and San Jose City College, I have covered many issues regarding the Arctic, Antarctic, Tundra, Glaciers, and Alpine Glaciers. In class, we often review videos, photos, and scientific data of the natural ecological processes of these areas as well as the human influences. After numerous years of educating students about these unique environments and human impacts, it has inspired me to become a part of the research on understanding these irreplaceable environments. I want to be able to witness and communicate the experience of the ongoing scientific process and data collection to my students, peers, friends, and family. Thus, my biggest hope is to gain a better understanding of the various research projects through actual experience and then being able to communicate the experience to others.

b. Aside from journaling/blogging, online photos, and webinars which all part of our program requirements, describe your ideas on how you will share this experience in your classroom or with the audiences you work with. (200 words maximum)

Create an experimental or a simulation lab that will mimic the experience of the program in which would be shared with students and colleagues. In addition, create a video and share it with our online journal www.witherlyheights.com.

c. Describe how you envision sharing your experience with other educators, your personal and professional communities, and the general public. (200 words maximum)

Either by creating a children's book or a comic book that would be shared with the general public. Also, creating a podcast with other PolarTREC team members in which we can share our experiences with our communities and the general public. In addition, present my experience to Alston Montessori Middle/High School in an open lecture hour and during professional development day at San Jose City College.

d. Describe how you currently engage your audience and facilitate learning when educating on new and complex topics, concepts, or issues. (200 words maximum)

I follow the three-period lesson strategy. First, introduce the concept either through a demonstration, PowerPoint presentation, video, art piece, or a literature piece which stimulates visual and aural learning processes. Secondly, administer a group activity

or lab in which they explore information through experimentation or communication which stimulates movement and kinesthetic learning processes. Third, ask students to do further research investigating a specific concept within the complex topic or issue. Lastly, they present their discoveries whether through creating their own experiment, art piece, video, or presentation.

e. Describe the particular strengths you would bring to the PolarTREC program and to a field research team. (200 words maximum)

I have always been passionate about Environmental Studies and for the past twenty years, have worked in a position that involves Environmental Science, whether as a teacher, supervisor, ecologist, biologist, and researcher. Presently, as an educator, I recognize the importance of and value my role of empowering students to achieve their educational goals and be active members of their community. Caring deeply about student success, I am dedicated to bringing enthusiasm to the classroom with organized detailed material. I create a reliable safe environment while also having a friendly rapport with students and colleagues. In addition, I am a respectful communicator and motivate creative critical thinking skills in classroom engagements or during professional conferences. I also am a very patient individual who works well with colleagues from various disciplines on collaborations and have been fortunate to receive encouraging feedback.

f. Using examples from your own experience including your role and the contributions you made to a team effort, describe how you work as a member of a team. (200 words maximum)

At Alston Montessori Middle/High School we try to integrate cross-curriculum within our subjects. Working with the art teacher we often design activities that encompass art and science such as a Rube Goldberg design. Working with the history instructor we have developed Mock Trials regarding environmental issues such as deforestation or Cetacean standing (whale beaching). In addition, I have collaborated on several lab designs with various professors at San Jose City College. Overall, communication, patience, and flexibility are essential for team projects. I bring new ideas in which myself and colleagues evaluate their effectiveness with revisions. I enjoy collaboration and communication with others whether it is being a team leader or a supporter. Open communication amongst a community brings better understanding and more insight than just a single individual working in isolation.

6. Communicating the Experience and Science

Write your journal entry for the general/lay audience. (200 words maximum)

Yesterday was an inspirational day. Students presented their school sustainability proposal. They were required to create a proposal in which they would manage a school sustainability project. Their proposal was to be written as a scientific research project with a hypothesis and an investigation that they would collect data and interpret if their proposal encouraged sustainability. Majority of the students proposed impressive ideas such as educating the students about proper recycling, compost, and waste disposal procedures, installing rain barrel collection systems, collecting disposable plastic pens, markers, highlighters, and incandescent light bulbs, and encouraging vermiculture (composting with worms) into our sustainable garden. My heart and mind were elated with their ideas and enthusiasm. I could not ask for a better day. Also, one of the students at San Jose City College requested me to be his mentor for his honor's project. He proposed to research various methods of sustainable water purification systems for his native area in Kenya. His motivation and devotion flourished as we talked about practicalities and procedures. I am looking forward to witnessing all these various students proposals and encountering their obstacles and triumphs.

7. Scientific Interests and Research Area Preference

a. Where would you prefer to go on an expedition? Either

Please explain your preference

Open to either location because I have always wanted to explore the Arctic and Antarctic. However, one of my friends, Adam Melhourn, is a ranger at the Gates of the Arctic National Park and Preserve, who I would want to share and collaborate some of my experiences with PolarTREC.

b. How long would you prefer to participate in an expedition? (Most expeditions are AT LEAST three weeks.) List any dates or periods of time when you are NOT able to participate in a field expedition

Both schools, Alston Montessori Middle/High School and San Jose City College are in support of me participating in the expedition and are flexible to any duration or dates.

c. Briefly describe your scientific interests. Which scientific topics interest you the most and why? Please note that climate change has become part of nearly all expeditions so you may choose to be more specific about this topic, if applicable. (200 words maximum)

One research interest is studying phytoremediation or bioremediation in the treatment of contaminated soil, freshwater, or saltwater. Both the Arctic and Antarctic have accumulated contaminants such as mercury, polychlorinated biphenyls, metals, and hydrocarbons through the transportation of oil, fuel spills, coal burning, and various marine debris. Phytoremediation and bioremediation propose sustainable environmental solutions to help reduce contamination levels within these pristine cold environments. Removal is necessary since these frigid environments have a slower natural process to remove toxins due to their low temperatures. Data has shown, that poisons have bioaccumulated to various marine and terrestrial species in that both the Arctic and Antarctic and has the potential of biomagnification to other species, including humans. Another scientific interest would be conducting ice core sampling to reveal evidence of carbon dioxide, methane, and nitrous oxide levels within various years. It would be interesting to correlate it with ice shelves melting, glacial retreat, and sea levels. Also to link the various greenhouse gases with temperature change which influences the advancement of invasive species and the displacement of ice-dependent species.

Atmospheric Systems I am somewhat interested in this subject area

Cryospheric Systems I would really enjoy an expedition in this subject area

Human and Social Systems I am somewhat interested in this subject area

Marine Systems I would really enjoy an expedition in this subject area

Terrestrial Systems I would really enjoy an expedition in this subject area

Ecology and Biotic Systems I am somewhat interested in this subject area

Physics or Space Sciences I am somewhat interested in this subject area

Engineering and Technology I am somewhat interested in this subject area

Other (please specify)

Other Areas of Scientific Interest

NA

e. Are you applying to work exclusively with a specific researcher? If yes, please list their full name, institution, and email address. (200 words maximum)

No

8. Background Information and Skills

a. Briefly describe your outdoor skills or experiences.

Being an avid outdoor person, I enjoy hiking, camping, snowboarding, snowshoeing, skiing, swimming, snorkeling, kayaking, stand up paddleboarding, boating, and surfing. I am CPR, AED, and Basic First Aid Certified and hope to obtain a Backcountry Accreditation and Wilderness First Aid Certification this year.

b. Provide a basic statement of your general health and physical condition.

I am a healthy individual who is in charge of the outdoor education program at Alston Montessori Middle/High School and work out regularly during the week. I do not have any allergies or other health issues and eat a healthy well-balanced diet.

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.

I am familiar and confident with both Mac and PC.

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.

I have experience with several programs such as MS Office 365 (Excel, Word, PowerPoint), GIS, GPS, ARC View, Adobe Photoshop, BG-BASE database, Google Classroom, Blackboard, Moodle, Canvas iPhoto, iMovie, and Windows Movie Maker. I have used several desktop computers, laptop computers, iPads, digital cameras and also familiar with various Internet browsers such as Firefox, Chrome, Safari.

e. List any additional skills or information that you wish to be considered.

Intermediate level regarding spoken, written, or reading of Spanish. Possess a Commercial Driver's License and have been an assistant mechanic working on various vehicles as well as maintaining landscaping tools.

9. Previous Applications & Participation

a. Have you previously participated in a teacher research experience (e.g. NOAA Teacher at Sea, Earth Watch)? We do not accept applications from PolarTREC alumni. Yes

Program Information Siemens Teachers Researcher (STARs) at the Pacific Northwest National Laboratory in Richland, Washington (Summer 2012)

If yes, did you complete all program requirements? Yes

If yes, how do you see the PolarTREC professional development opportunity continuing to develop your professional skills, or how will it build on your previous research experiences?

PolarTREC will allow me the opportunity to bring the research to the classroom showing students real applicable scientific research and studies. Thus, engaging students with the current project and inspiring future ideas within the classroom.

10. Orientation Availability

Are you available to attend the Orientation during this time period? Yes

If no, please explain NA

11. How did you hear about PolarTREC?

Email listserve. Please provide the name and/or URL

Friend or colleague. Provide a name if you wish

NA

Former PolarTREC, TREC, or TEA teacher. Please provide their name

NA

From a website. Please list the website name and URL

NA

Conference or presentation. Please list the venue and/or presentation title

NA

Other (please explain)

During the summer of 2012 as a Siemens Teachers Researcher at the Pacific Northwest National Laboratory in Washington, we were requested to search various scholarship and professional development opportunities. I stumbled upon PolarTREC. Since then I have been subscribed to the email listserve thru polartrec.com and have been wanting to apply to the program but had to wait because of other engagements such as Secondary Montessori Training and completing the Master of Education program.

b. Please suggest other places we might advertise this opportunity for teachers

Possibly reaching out to various Universities, the College Board, and Instagram posting.

12. References

Reference 1

Name Michelle Doyle

Title and affiliation Director of Study and Work at Alston Montessori Middle/High School. Michelle Doyle is a colleague at Alston Montessori Middle/High School.

Email Address msmichelle@alstonschool.org

Phone Number (408)-627-5492

Reference 2

Name Sanhita Datta

Title and affiliation Professor of Biology at San Jose City College. Presently, Sanhita Datta and I teach Environmental Science at San Jose City College.

Email Address Sanhita.Datta@sjcc.edu

Phone Number (408) 314-3662

Reference 3

Name Carter McCoy

Title and affiliation History Teacher at Heatherwood Middle School. Carter McCoy is an old colleague from Alston Montessori Middle High School.

Email Address cartermccoy@gmail.com

Phone Number (831)-419-4880

2020-2021 PolarTREC Educator Application

Stacey Sebert

1. Contact Information

Name: Ms. Stacey Sebert

Email: seberts@scolonie.org

Home Address:

804 Fairfield Court

East Greenbush, NY 12061 US

Home Phone: 5183768390

Cell Phone : 5183768390

Institution Name: South Colonie Schools

Institution Address:

329 Sand Creek Road

Albany, NY 12205 US

Institution Phone: 5184591333

Classroom/Office Extension: 4301

Institution Fax: 5184591404

Institution Website: www.southcolonieschools.org

Other relevant websites: www.scienceclassrocks.com

www.staceyseberttravels.com @seaeduca8or - Twitter

Supervisor's Name: Gregory Bearup

Supervisor's Email Address: bearupg@scolonie.org

2. Demographic Information

a. Gender: Female

Race: White

c. Briefly describe your primary audience and surrounding community (e.g. K-12, public, rural/urban, technology access, economics): I work in a K-12 urban school district. I completed a grant where they provided a couple of webcams for classroom use. Our high school is 1:1 chrome books and we are slowly working our way down but my current students do not have their own. I can sign out a cart for them to use when needed. My school has 37% free or reduced breakfast and lunch so we are considered economically disadvantaged area and are a Title 1 school.

d. Type of School (or students you work with): Public

Other Type of School

e. What is the population of your annual audience or school (estimates are fine) 834

f. School Ethnicity:

1 % - American Indian or Alaska Native

11 % - Asian

8 % - Black or African American

7 % - Hispanic or Latino

0 % - Native Hawaiian or Other Pacific Islander

65 % - White

8 % - Multiracial

If your school uses other categories to describe race/ethnicity, please describe: We also have 3% of our students who are English Language Learners.

g. Percentage of students who receive free or reduced lunch: 37%

h. Average class or audience size 25

i. Total number of students/audiences you teach in a year 142

j. If known, what are the approximate start and end dates of your school year or primary programs, etc. ? Include major professional vacation periods. i.e. Christmas break, summer break, etc.

We start the Tuesday after Labor Day in September. We have November 27th - 29th off for Thanksgiving. Our Christmas break runs from December 23rd to January 3rd. Winter break is February 15th-21st. April/Easter break is from April 10th - April 17th. We end school on June 26th.

3. Teaching Experience and Education

a. What type of university degree or other academic experience or qualifications do you have?

Bachelor's Degree (Major): Bachelors of Science - Biology

Bachelor's Degree (Minor): Oceanography and Marine Science

Masters Degree (Discipline): Masters in Science Education

PhD Degree (Discipline):

Other Degree:

b. How many years of education experience do you have?: 17

c. How many years have you been working at your current institution?: 17

d. List up to 10 relevant professional licenses, certifications, registrations, awards or honors that you have received in your profession::

1- Excellence in Science Teaching Middle School STANYS (Science Teachers Across New York State) Award Recipient 2019 2 - New York State Master Teacher 2017 - present 3 - American Meteorological Society Maury Project on Oceanography and Project Atmosphere fellow - 2018 and 2019 4 - SWARM project educator - 2019 (present)* 5 - Ecology Project International fellow - 2018 6 - Educating and Research Testing Hypotheses (EARTH) fellow attendee 2017 and 2018 7 - San Diego Zoo Conservation fellow - 2018 8 - Women@Work focused Women in STEM educator - 2018 9 - Maitland Simmons award winner - 2015 10 - DEC educator for Project WET, Project WILD, and Project Learning Tree - since 2014

4. Professional Assignment

a. What is your primary education assignment? Check all that apply Middle School (Grades 6-8)

Other Primary Assignment

b. What subjects do you teach? Check all Middle School Science, Secondary Chemistry, Secondary Earth Science, Secondary Physics

Other Subjects Next fall I will also teach a Marine Science elective to upperclassmen.

5. Motivation for Participation

a. What motivates you to apply to PolarTREC and professionally, what do you hope to gain from the experience? (200 words maximum)

PolarTREC is an opportunity to connect myself, students, and the surrounding community to the Polar Regions. When my classroom video conferences each year with Palmer station, students are amazed at how vastly different and remote the area is. Their excitement about the Polar Region bubbles over in the classroom. The administration (my supervisor and superintendent) has even gotten involved, coming to our talks. The talks have gotten so popular that I need to move to a larger forum this year to fit all those who are interested in attending beyond just my students! My class has followed Lisa Seff's and Joanna Chierici's journey with PolarTREC. They read their blogs and have asked questions or made comments. I have also used PolarTREC developed lessons and will continue to do so through my work with Project SWARM. Real time data is one of the most valuable components to bring to the classroom. Students love working with scientists and getting to be a part of the data analysis. Even more amazing would be if that data was collected by their teacher. Talking with Jillian, Elizabeth, and Joanna - former PolarTREC teachers, and hearing their excitement about the program, only reinforced my desire to apply myself.

b. Aside from journaling/blogging, online photos, and webinars which all part of our program requirements, describe your ideas on how you will share this experience in your classroom or with the audiences you work with. (200 words maximum)

I would love to collaborate with former and current PolarTREC teachers, educators, scientists, and/or crew members. I have discussed this with Jillian Worssam, Elizabeth Eubanks, Joanna Chierici and other PolarTREC alum, and plan to bring our classes and Polar scientists together via zoom conferencing to enrich each others' Polar education programs. Students from different schools would pair up on an idea and work together via google slides. One possible idea would be to compare the area where they live to each other and the Polar Regions. Jillian lives in Arizona, Elizabeth is in Florida, and I am in New York so working together would be an opportunity for students to teach each other about their local climate and then collaborate, using the Polar literacy principles and create a polar climate piece. Creating a lesson or project based on my experience would also enhance the Polar literacy and climate change standards in my classroom. I currently have an entire unit on climate change, a lesson on albedo and I'm working with SWARM to add more.

c. Describe how you envision sharing your experience with other educators, your personal and professional communities, and the general

public. (200 words maximum)

As a Master Teacher, I can present my PolarTREC experience at the state wide cohort meeting. The meeting has over 1,000 attendees that are the top STEM educators in New York. Second, I can Tweet and blog about my experiences with PolarTREC. I am constantly growing my professional network through Twitter and have travel based blogs, from hiking in Utah to tagging sea turtles in Mexico, I discuss the ins and outs of each trip. Third, I'm in a number of Facebook educator groups where I can share information on PolarTREC. Next, I can present PolarTREC at both the state (STANYS) and national (NSTA) conferences. Additionally, I'd love to set up a community night at my school where to video chat with the local community, showing the work that I'm doing with PolarTREC. Lastly, I'd like to write an article for our local papers or talk to a local news station about the PolarTREC program, possibly having them videotape the community while I'm holding the zoom conference.

d. Describe how you currently engage your audience and facilitate learning when educating on new and complex topics, concepts, or issues. (200 words maximum)

I get students into scientific concepts by using phenomenon. I have a hook to pique their interest, sometimes a cool video or demonstration. Other times students start with inquiry based lab activities that often sparks more questions than answers. I relate the concept to their own lives. If we're talking about friction, velocity, acceleration or Newton's Laws, we discuss riding bikes. We build roller coasters or launch straw rockets. Project based learning is a great way to get concepts across in a clear, hands on way. The rocket project has all students build a base model. They launch, then the class comes up with ways to modify the design to launch the rocket further. Each group picks a modification, launch again and disseminate results to the class. Groups then make any modifications they want with justifications, writing a CER, and launch their ultimate rocket. The excitement during the project is contagious where many passerby's stop to see the excitement. In 8th grade students complete a year-long project about National Parks using information they learned about Earth Science and researching how it affects the park (ex. What type of landforms or rock formations are in the park?)

e. Describe the particular strengths you would bring to the PolarTREC program and to a field research team. (200 words maximum)

First, I'm a team player. I started my teaching career on a team where I was the youngest and most inexperienced and I played my part and contributed to the team. Now I'm one of the veteran teachers and have become more of a team leader, guiding newer teachers and still helping them play a part on the team. Second, I

blog, tweet, and have published articles so I have experience conveying information to the masses. Along with this, I use and am well versed in many forms of technology. Third, I have presented multiple times, on many different topics, to a variety of audience types. As a Master Teacher, I have presented to approximately 1,000 educators that are in the top of their field - more than once - about different professional development opportunities. Many of these attendees have gone on to apply for and attend the programs I presented on. Fourth, I have a background in Marine Science and have taught all of the sciences (biology, physics, chemistry, and Earth science) at various levels so I have a broad scientific knowledge base.

f. Using examples from your own experience including your role and the contributions you made to a team effort, describe how you work as a member of a team. (200 words maximum)

Having special education and English language learners in my class, I work as a team with the special education teacher, her assistant and the English language teacher along with her assistant. While the teachers aren't directly in class with me, the assistants are. We work as a team, making sure all students are understanding material and on task. When necessary, we work with individual students. For example, recently there were a number of students who needed to make up or complete a lab. One of the assistants worked with those students while I completed a review activity with other students. This way, every student was engaged in something and those students who needed more time to complete or make up work could, and not fall behind. I've also been working on Project SWARM with research scientists, collegiate educators, and teachers from other districts. Over the course of the week, we reached our goal of creating lessons to disseminate to other teachers to use in their classroom. Despite our varied backgrounds and levels of education, the group worked seamlessly together. I really enjoyed this collaboration and felt like a valued member of the group.

6. Communicating the Experience and Science

Write your journal entry for the general/lay audience. (200 words maximum)

I just returned from the most amazing trip! I flew to Milwaukee and met up with my friend Joanna to tour baseball parks in the region. Using Uber to get to The Plaza, we dropped our stuff and started exploring Milwaukee. What a cool city! We tried local cuisine, went to the art museum (incredible!), took in the sites, even had our picture taken with the Bronze Fonz! On our list was attending a night game of the Brewers vs. Cardinals at Miller Park. The coolest part was when it started pouring and we got to see the roof close. Of course, we also had infamous fried cheese curds - they tasted just like mozzarella sticks! Next, we rode the train to Chicago and explored that city. Since everyone says you have to try it, I had a deep dish pizza (I like NY style better). We visited many places here; Shedd's aquarium (fantastic!), Comiskey park (not calling it Guaranteed Rate Field), the Museum of Science and Industry (a must see!), the Navy Pier, an impromptu Bears football game (\$20 9th row end zone seats at the last minute... score!) and finally Wrigley Field (the oldest National League ballpark still in existence, loved the ivy!). Incredible trip - memories will last a lifetime!

7. Scientific Interests and Research Area Preference

a. Where would you prefer to go on an expedition? Either

Please explain your preference

I do not have a preference in location. Collaborating with research scientists in either location will be incredible. To be able to take back near real time data for my students to analyze in the classroom is one of my reasons for applying as well as playing a role in scientific research.

b. How long would you prefer to participate in an expedition? (Most expeditions are AT LEAST three weeks.) List any dates or periods of time when you are NOT able to participate in a field expedition

My school district sees the value in having one of their educators participate in a field experience such as this. The district values their staff members and affords them the ability to attend meaningful opportunities such as this so they can bring back their experience and the data to the classroom. This would be a great opportunity to share with the school and surrounding community.

c. Briefly describe your scientific interests. Which scientific topics interest you the most and why? Please note that climate change has become part of nearly all expeditions so you may choose to be more specific about this topic, if applicable. (200 words maximum)

I've always been interested in marine science. So much so that I presented to the school board an elective course for upperclassmen on marine science and they loved the idea. I spent most of my summer creating curriculum for the course and it was the most worthwhile summer I've had in a long time. My ideas flowed freely and time just flew by - the passion I have for the course came out through my lessons the board told me when I presented my ideas. Within the elective, a unit on climate - specifically discussing polar regions and climate change - will be covered. I have even included a human impact project where groups will research and create infographics on sea level rise, melting glaciers, micro-plastics, ocean acidification, sustainability of fisheries, oil spills and other such topics. I am hoping that my students will work to make changes both within themselves and others to aid in the survival of our Earth. They will certainly know who Greta Thunberg is if they don't already. I am also planning on having students collaborate with elementary students, creating marine science based children's books (like Iceberg of Antarctica by Marlo Garnsworthy) that are informative yet simple for the younger kids to understand.

Atmospheric Systems I would really enjoy an expedition in this subject area

Cryospheric Systems I would really enjoy an expedition in this subject area

Human and Social Systems I would really enjoy an expedition in this subject area

Marine Systems I would really enjoy an expedition in this subject area

Terrestrial Systems I would really enjoy an expedition in this subject area

Ecology and Biotic Systems I would really enjoy an expedition in this subject area

Physics or Space Sciences I would really enjoy an expedition in this subject area

Engineering and Technology I would really enjoy an expedition in this subject area

Other (please specify)

Other Areas of Scientific Interest

e. Are you applying to work exclusively with a specific researcher? If yes, please list their full name, institution, and email address. (200 words maximum)

8. Background Information and Skills

a. Briefly describe your outdoor skills or experiences.

I am Red Cross CPR and first aid certified. I am an avid hiker (recently spent a week hiking all 5 National Parks in Utah in 8 days) and kayak regularly. I've camped at many campgrounds around the Eastern United States and have tented in a remote area of Magdalena Bay Mexico, using only a squat toilet and a buried water container to wash up with for a week. Coyotes were always near and even stole a teacher's sandals during the trip!

b. Provide a basic statement of your general health and physical condition.

I exercise multiple times a week. In the summer, I hike, walk, or jog outside. In the winter, I'm a member of my local gym and I use the elliptical, treadmills, bike and lift weights on occasion.

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.

My school uses PC's for the teachers desktop and chrome books for the students. I also have a Mac as my personal laptop so I am familiar with all of those operating systems and computer types. I also have an Apple cell phone.

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.

I am very familiar with all things Google as we are a Google school. I use Classroom, forms, doc's, slides and many other Google applications. The main internet browser used in school is Chrome although I have used Explorer and Firefox in the past. I am familiar with Microsoft Office (especially Excel and PowerPoint) but haven't used it as much since our school became a Google school. I am very familiar with using equipment like webcam's to video conference. I've used multiple platforms to hold the video conferences and most frequently use zoom. I've used multiple websites, applications, and programs in my classroom. I just purchased a Merge cube to add a VR/AR piece to some of my lessons. Other websites I use frequently with students to build virtual roller coasters, or analyze earthquakes from around the world - to name a few. I was the photography and yearbook club adviser for many years so I'm familiar with digital cameras and the yearbook platform. I also have done a lot of digital photography for my own personal use - I have many nature photos hung on my walls at home and school. My students have used movie software to create stop motion videos as well.

e. List any additional skills or information that you wish to be considered.

I can sew.

9. Previous Applications & Participation

a. Have you previously participated in a teacher research experience (e.g. NOAA Teacher at Sea, Earth Watch)? We do not accept applications from PolarTREC alumni. No

Program Information

If yes, did you complete all program requirements?

If yes, how do you see the PolarTREC professional development opportunity continuing to develop your professional skills, or how will it build on your previous research experiences?

10. Orientation Availability

Are you available to attend the Orientation during this time period? Yes

If no, please explain

11. How did you hear about PolarTREC?

Email listserve. Please provide the name and/or URL

Friend or colleague. Provide a name if you wish

George Matsumoto from the EARTH workshop

Former PolarTREC, TREC, or TEA teacher. Please provide their name

Jillian Worssam, Joanna Chierici, Elizabeth Eubanks, Kevin Dickerson, Jenny Hartigan, Ashley Cosme, and Spencer Cody

From a website. Please list the website name and URL

www.polartrec.com

Conference or presentation. Please list the venue and/or presentation title

Other (please explain)

b. Please suggest other places we might advertise this opportunity for teachers

Present to the Master Teacher program in NY. <https://www.suny.edu/masterteacher/>

12. References

Reference 1

Name Mr. Timothy Backus

Title and affiliation Assistant Superintendent for Instruction

Email Address backust@scolonie.org

Phone Number 518 869-3576

Reference 2

Name Mr. James Brown

Title and affiliation STEM educator, NBCT, Past PAEMST winner, Exxon Mobil STEM teacher award

Email Address brownj@scolonie.org

Phone Number 518 664-2864

Reference 3

Name Jillian Worssam

Title and affiliation Professional Educator and PolarTREC Alumni

Email Address jworssam@fusd1.org

Phone Number 928 606-6653

2020-2021 PolarTREC Educator Application

Jennifer Sherman

1. Contact Information

Name: Ms. Jennifer Sherman

Email: jsherman01@hamline.edu

Home Address:

31 Belvidere St W, Saint Paul, MN, USA
Saint Paul, MN 55107 US

Home Phone: 651-488-5139

Cell Phone : 612-839-6702

Institution Name: Dugsi Academy Charter School

Institution Address:

1091 Snelling Ave N.
St. Paul, MN 55108 US

Institution Phone: 651-642-0667

Classroom/Office Extension: none

Institution Fax: 651-642-0668

Institution Website: <http://www.dugsiacademy.org/>

Other relevant websites: <https://www.summitlearning.org/>

Supervisor's Name: Mary Stafford

Supervisor's Email Address: mary@truenorthed.com

2. Demographic Information

a. Gender: Female

Race: White

c. Briefly describe your primary audience and surrounding community (e.g. K-12, public, rural/urban, technology access, economics): Dugsi is a K-8 urban charter school. The student population is entirely Somali American. 99% of the students qualify for free and reduced lunch. Over 80% of the students are English Learners (ELs). There are several newly arrived immigrant families of Students with Limited or Interrupted Formal Education (SLIFE). There is very good technology access in the building, but it is limited for some of our students at home. There is a 1 to 1 Chromebook program for grades 5-8.

d. Type of School (or students you work with): Public

Other Type of School

e. What is the population of your annual audience or school (estimates are fine) 300 students

f. School Ethnicity:

% - American Indian or Alaska Native

% - Asian

100 % - Black or African American

% - Hispanic or Latino

% - Native Hawaiian or Other Pacific Islander

% - White

% - Multiracial

If your school uses other categories to describe race/ethnicity, please describe: Somali American

g. Percentage of students who receive free or reduced lunch: 99

h. Average class or audience size 25

i. Total number of students/audiences you teach in a year 89

j. If known, what are the approximate start and end dates of your school year or primary programs, etc. ? Include major professional vacation periods. i.e. Christmas break, summer break, etc.

No calendar for 2020-2021 has been set. However, we always start the day after Labor Day and go until mid June. Approximate dates Sept 8th 2020 to June 11th 2021. Winter Break Dec 23rd to Jan 1st. Spring Break could be anytime in late March or early April. It will be one week long.

3. Teaching Experience and Education

a. What type of university degree or other academic experience or qualifications do you have?

Bachelor's Degree (Major): Religion

Bachelor's Degree (Minor): History

Masters Degree (Discipline): 1st MA is Teaching, 2nd MA is Science of Education in Montessori Adolescent Development

PhD Degree (Discipline):

Other Degree:

b. How many years of education experience do you have?: Eight years as a licensed teacher, and six years as a special education paraprofessional

c. How many years have you been working at your current institution?: This is my 5th year.

d. List up to 10 relevant professional licenses, certifications, registrations, awards or honors that you have received in your profession::

K-12 English as Second Language MN teaching license Montessori Adolescent Certification program completion

4. Professional Assignment

a. What is your primary education assignment? Check all that apply Middle School (Grades 6-8)

Other Primary Assignment

b. What subjects do you teach? Check all Middle School English/Language Arts

Other Subjects English as a Second Language

5. Motivation for Participation

a. What motivates you to apply to PolarTREC and professionally, what do you hope to gain from the experience? (200 words maximum)

I have a long-standing interest in the polar regions, dating back to a visit to the Roald Amundson museum in Norway when I was 18. This interest in all things polar-related caused me to become interested in PolarTREC. I learned about PolarTREC from the father of one of my former students. After he returned from the Antarctic field season, we were discussing the kind of research that his team does. I expressed a wish for a program that would take teachers to polar regions, so he told me about PolarTREC. Professionally, I want to enhance my STEM experience in order to find ways to incorporate STEM material into the English Language Arts (ELA) curriculum. I want to become more familiar with the reality of scientific research. Experiencing the nitty gritty of daily life on a research expedition will allow me to more fluently relate the experience to my students, who, being from an African immigrant community, have little to no knowledge of the polar regions. I want to be a working member of a team, and make a small contribution to the wider scientific community.

b. Aside from journaling/blogging, online photos, and webinars which all part of our program requirements, describe your ideas on how you will share this experience in your classroom or with the audiences you work with. (200 words maximum)

If it's possible, I would like to use an app to have live web conversations with my classroom students. I would film short videos of days in the field, and do short interviews with my team mates. These videos would be emailed back to the students, who would also take video mini quizzes with content stemming from daily activities on the expedition, or related topics. I plan to develop a curriculum unit that involves researching previous polar explorers and reading selections from accounts of their expeditions. The students would write accounts of their own fictitious polar expeditions. They would be required to incorporate information that they learned as a result of my participation in PolarTREC.

c. Describe how you envision sharing your experience with other educators, your personal and professional communities, and the general public. (200 words maximum)

MinneTESOL, the state professional organization for ESL teachers, has a large statewide professional conference that solicits classroom teachers as presenters. I would apply to present at the Fall 2022 conference. Also, the school's director has previously worked with several reporters with our local PBS affiliate. They could be

contacted to cover the story. In addition, I could apply to present at a conference offered by the charter school network that authorizes the school.

d. Describe how you currently engage your audience and facilitate learning when educating on new and complex topics, concepts, or issues. (200 words maximum)

Teaching vocabulary first is critically important with ELs. Using videos and images as much as possible is also crucial. I combine videos, images, and student-friendly definitions to create introductory vocabulary lessons. Quizlet, Socratic, and Kahoot are online quiz applications the students enjoy using that can be used to introduce new information. Whenever possible, I start with an authentic learning experience. When teaching about different ecosystems or climate change, a polar professional has come to share his experiences with my class. Paul Morin, a polar researcher, has shared his story with past students. Also, there have been demonstrations and field observations of phenomena such as erosion, weathering, and deposition. The students have gone on walks around the neighborhood during the spring thaw making observations, and recording their data.

e. Describe the particular strengths you would bring to the PolarTREC program and to a field research team. (200 words maximum)

I'm a good amateur photographer. I don't complain about hard work, and pick up new skills quickly. I am widely read, so I have a lot of background knowledge on a whole range of topics. I live in Minnesota, so harsh winter conditions are normal

f. Using examples from your own experience including your role and the contributions you made to a team effort, describe how you work as a member of a team. (200 words maximum)

As a co-teacher, working effectively as part of a team is my everyday teaching experience. I am very skilled at being a productive, tactful teammate. I listen well, and work above and beyond my responsibilities. Maintaining professionalism at all times is also a skill that I bring to a team. I have a good sense of humor, and don't become angry or irritated very easily. Patience is a skill all teachers have. This year, I am leading our middle school curriculum implementation. This involves overseeing members of the team, but without any administrative authority. Using a lot of tact, I have been able to successfully address areas of improvement that my co-workers had previously resisted while maintaining a strong team dynamic.

6. Communicating the Experience and Science

Write your journal entry for the general/lay audience. (200 words maximum)

Friends, the day was almost a disaster. It was almost hypothermia, broken bones. Worst of all, it was almost an opportunity for my sister to say "I TOLD you so!". I was Up North on the annual cabin closing weekend with my aunt Barb, my sister Kat, and my cousin Deb. Kat had been doing her older sister routine about how I needed to take one of her hiking poles when I went scrambling out on the rocks along the Lake Superior shore. I would not be convinced. I should have listened. As I climbed up the rocks onto the breakwater leading out to Artist's Point in Grand Marais, I slipped so badly that I almost crashed over the side into the lake and came close to destroying my new camera. After lying on the rocks for a few minutes to catch my breath, I crawled along the breakwater to solid earth. I must have looked utterly ridiculous, a grown woman crawling along a cement wall wearing a backpack and dragging a purse. Eventually, I recovered and spent two hours taking fall colors pictures of the beautiful shores of Lake Superior. I never did tell my sister what happened.

7. Scientific Interests and Research Area Preference

a. Where would you prefer to go on an expedition? Either

Please explain your preference

I am very interested in both locations. I would prefer the Antarctic to the Arctic, but I would be thrilled with the opportunity to go to either location. Both places have fascinating flora and fauna, and living in Minnesota is decent practice for either environment.

b. How long would you prefer to participate in an expedition? (Most expeditions are AT LEAST three weeks.) List any dates or periods of time when you are NOT able to participate in a field expedition

If the expedition takes place June to August, I could be gone as long as six weeks. If the expedition is during the school year, I would prefer an expedition that is 3-5 weeks. I am unavailable June 18, 2020 until July 5th, 2020.

c. Briefly describe your scientific interests. Which scientific topics interest you the most and why? Please note that climate change has become part of nearly all expeditions so you may choose to be more specific about this topic, if applicable. (200 words maximum)

Almost everything is interesting. Even astronomy and atmospheric studies are interesting in the short term. However, I'm most interested in how climate change is affecting flora and fauna in the polar regions. I am curious about how the plants and animals are being affected by, and are adapting to, their new climate conditions. Particular interests include how climatic conditions are affecting the hunting and breeding patterns of different animals. Also, I am interested in how the human populations that live in the Arctic Circle are being affected by their changing circumstances—specifically, how traditional hunting, fishing, and herding practices are being impacted by climate change. There are also geopolitical implications from the melting sea ice in the Arctic Circle, and the fight over control of the Northwest Passage. I am also curious about the changing geology of the polar regions, and the kinds of effects that's having on all the different biological systems. The volcanoes in the Antarctic are a topic that I developed some interest in when I was teaching science to newly arrived immigrants.

Atmospheric Systems I am somewhat interested in this subject area

Cryospheric Systems I am somewhat interested in this subject area

Human and Social Systems I would really enjoy an expedition in this subject area

Marine Systems I would really enjoy an expedition in this subject area

Terrestrial Systems I would really enjoy an expedition in this subject area

Ecology and Biotic Systems I would really enjoy an expedition in this subject area

Physics or Space Sciences I am somewhat interested in this subject area

Engineering and Technology I would really enjoy an expedition in this subject area

Other (please specify)

Other Areas of Scientific Interest

e. Are you applying to work exclusively with a specific researcher? If yes, please list their full name, institution, and email address. (200 words maximum)

8. Background Information and Skills

a. Briefly describe your outdoor skills or experiences.

I swim regularly. I have some camping experience. I have canoeing and hiking experience, primarily in northern Minnesota. I have been to many state and national parks with all kinds of terrain and different biomes.

b. Provide a basic statement of your general health and physical condition.

I am in fairly good health, but I am morbidly obese. This has not affected my general health, and I exercise regularly. However, my endurance for jogging or running is miserable. I can hike long distances, and carry a heavy backpack. I can't climb up rocks very well without hiking poles, because I have balance problems. I do have several medical conditions, which are controlled by medication. I am diagnosed with Meiere's disease, an inner ear disorder. It causes vertigo, hearing loss, and tinnitus. I haven't had any vertigo attacks in a year, and my vertigo is well controlled by steroid shots. My hearing loss is minimal at this time. I also have vestibular migraines, which are well controlled by medication and should not impact me during the expedition. I do have issues with balance.

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.

I have used Macs and iPads, but I'm not comfortable with them. I use PCs at work and at home, and I am very comfortable with them. I have used a document camera and laptop projector.

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.

I am very comfortable with word processing software and Power Point. Word is loaded on both my personal and work computers. At work, we use the Google suite. I use Google Docs, Google Classroom, Google Slides, Google Forms, and Google Earth. I am not comfortable with designing spreadsheets, but perfectly fine doing data entry. I use a digital camera at home. I have a laptop and projector at work. The students all use Chromebooks. I have an HP Spectre laptop/tablet at home. I also have a Kindle Fire 9. I use my projector every day at work, because our middle school curriculum is web-based.

e. List any additional skills or information that you wish to be considered.

9. Previous Applications & Participation

a. Have you previously participated in a teacher research experience (e.g. NOAA Teacher at Sea, Earth Watch)? We do not accept applications from PolarTREC alumni. No

Program Information

If yes, did you complete all program requirements?

If yes, how do you see the PolarTREC professional development opportunity continuing to develop your professional skills, or how will it build on your previous research experiences?

10. Orientation Availability

Are you available to attend the Orientation during this time period? No

If no, please explain We have parent conferences on March 18 and 19. However, my principal is very supportive of this application, and if I had advanced notice, she would probably approve my absence to go to the Orientation week. I have a co-teacher who could fill in easily. Alternatively, they might move the conferences to different dates—conference dates have been changed in past years.

11. How did you hear about PolarTREC?

Email listserve. Please provide the name and/or URL

Friend or colleague. Provide a name if you wish

Paul Morin

Former PolarTREC, TREC, or TEA teacher. Please provide their name

From a website. Please list the website name and URL

Conference or presentation. Please list the venue and/or presentation title

Other (please explain)

b. Please suggest other places we might advertise this opportunity for teachers

12. References

Reference 1

Name Paul Morin

Title and affiliation Director, Polar Geospatial Center

Email Address lpaul@umn.edu

Phone Number 612-625-6090

Reference 2

Name Sam Pfeifer

Title and affiliation Lead Teacher, Dugsi Academy

Email Address spfeifer@dugsiacademy.org

Phone Number 608-444-0170

Reference 3

Name Mary Stafford

Title and affiliation Director, Dugsi Academy; Owner, TrueNorth Education

Email Address mary@truenorthed.com

Phone Number 218-565-1456

2020-2021 PolarTREC Educator Application

Lacee Sherman

1. Contact Information

Name: Ms. Lacee Sherman

Email: lsherman3@cherrycreekschools.org

Home Address:

2364 S Truckee Way
Aurora, CO 80013 US

Home Phone: 8054166368

Cell Phone : 8054166368

Institution Name: Infinity Middle School

Institution Address:

25100 E Belleview Ave
Aurora, CO 80016 US

Institution Phone: (720)886-6000

Classroom/Office Extension: 66033

Institution Fax: 720-886-6088

Institution Website: <https://www.cherrycreekschools.org/infinity>

Other relevant websites: School Blog:

<https://sites.google.com/cherrycreekschools.org/missshermansimsscienceblog/home>

NOAA TAS Blog: https://teacheratsea.noaa.gov/#/2018/Lacee*Sherman/blogs

Supervisor's Name: Shelby Schneebeck

Supervisor's Email Address: sschneebeck@cherrycreekschools.org

2. Demographic Information

a. Gender: Female

Race: White

c. Briefly describe your primary audience and surrounding community (e.g. K-12, public, rural/urban, technology access, economics): Aurora Colorado is a suburb of Denver and has a colorful history in regards to education, as this is where Columbine High School is located. There have also been multiple other violent threats towards schools in Aurora in the past few years. There is a sense of fear felt by many about teaching or attending schools in this area, because it is seen as dangerous. This can deter some people from working here, or sending their children to school here, but to my students this is home and they deserve the best education that can be provided to them. Aurora is a working class city and the families of my students work very hard. My kids often go home to empty houses since both of their parents must work in order to be able to live in the area. My students have supportive parents and they are doing the best that they can to provide for their children. Many of my students at my school have parents that serve in the Military at Buckley Air Force base, and some of their parents are regularly deployed. The school and community are incredibly diverse and our district, Cherry Creek Schools, has families that speak over 140 different languages. In every single one of my classes I have at least 4 different cultural and ethnic backgrounds represented. The school is very new and with that we have some great technology resources available to the students, such as chromecarts in every classroom with enough computers for our students to be 1 to 1 with technology as needed.

d. Type of School (or students you work with): Public

Other Type of School

e. What is the population of your annual audience or school (estimates are fine) I teach 120 students on a daily basis but assist in the teaching of others weekly, and there are a total number of 771 students at my school.

f. School Ethnicity:

0 % - American Indian or Alaska Native

9 % - Asian

8 % - Black or African American

16 % - Hispanic or Latino

0 % - Native Hawaiian or Other Pacific Islander

59 % - White

8 % - Multiracial

If your school uses other categories to describe race/ethnicity, please describe:

g. Percentage of students who receive free or reduced lunch: <10%

h. Average class or audience size Approximately 30 students per class

i. Total number of students/audiences you teach in a year I teach 120 students daily, and assist with the teaching of about 40 others on a weekly basis for enrichment and intervention opportunities.

j. If known, what are the approximate start and end dates of your school year or primary programs, etc. ? Include major professional vacation periods. i.e. Christmas break, summer break, etc.

School begins at the beginning of August We have a week of fall break in October Two weeks for the winter holidays usually falling right before Christmas until right after the beginning of the New Year One week in March for spring break School gets out the last week in May

3. Teaching Experience and Education

a. What type of university degree or other academic experience or qualifications do you have?

Bachelor's Degree (Major): Natural Sciences - Biology Emphasis

Bachelor's Degree (Minor):

Masters Degree (Discipline):

PhD Degree (Discipline):

Other Degree:

b. How many years of education experience do you have?: I am in my 6th year as a middle school science educator.

c. How many years have you been working at your current institution?: This is my first year at Infinity Middle School, and the third year that my school has been in existence.

d. List up to 10 relevant professional licenses, certifications, registrations, awards or honors that you have received in your profession::

Presenter at California STEAM Symposium 2018 NOAA Teacher at Sea Participant 2018 Firebaugh Middle School Teacher of the Year 2016 100 K in 10 Teacher Forum Member 2016-Current Howard Hughes Medical Institute Research Fellow for the STAR Program 2013-2015 Participant in USAC Study Abroad program at Griffith University in Australia for the Fall of 2012 President of the Bulldog Marching Band at California State University, Fresno for the 2011 year (Shows leadership experience)

4. Professional Assignment

a. What is your primary education assignment? Check all that apply Middle School (Grades 6-8)

Other Primary Assignment

b. What subjects do you teach? Check all Middle School Science

Other Subjects

5. Motivation for Participation

a. What motivates you to apply to PolarTREC and professionally, what do you hope to gain from the experience? (200 words maximum)

PolarTREC would be an incredible next step in furthering my Teacher Researcher identity. While I was finishing up my Bachelor's degree I was approached by my academic advisor and told that I should apply to the STAR teacher researcher program. This conversation may have seemed minor at the time, but it ultimately impacted my life and my teaching practice for the better. I have been able to assist with research projects at Fresno State, the NOAA Earth Systems Research Laboratory in Boulder, Colorado, and the NOAA Teacher at Sea Program. My passions for education and scientific research are equally matched and being able to work on research while using that to inspire my students to love science and see the value of the scientific community is the perfect combination. My previous research experiences have proved to be invaluable assets to my teaching career thus far, and I would be honored to be selected as a PolarTREC educator to show my new school and community the value of scientific research in a time when there is so much skepticism surrounding science and whether or not to "believe" in science. I want to use my platform as an educator to change their minds.

b. Aside from journaling/blogging, online photos, and webinars which all part of our program requirements, describe your ideas on how you will share this experience in your classroom or with the audiences you work with. (200 words maximum)

In addition to the program requirements, I will be proud to display my research efforts in any way possible. I have all 3 of my previous research posters hanging in my classroom as well as photos taken from my time on NOAA Ship Oscar Dyson. I share my blog link from my Teacher at Sea experience on my school blog and I use the lessons that I've created based off of my research with my students to give them an authentic look at the process of doing science. I would love to make (or have my students make) a poster to hang in our classroom with photos from my PolarTREC experience as well as share my blog link with my students, their families and the school community by having my PolarTREC blog accessible on the school website. I will incorporate my experiences into lessons that my students will get to try out. I would also love to hold a "welcome home" presentation celebrating my arrival back at Infinity on the indoor presentation stairs at my school and invite my students and their families to learn about all of the exciting research that is happening in the Arctic/ Antarctic regions.

c. Describe how you envision sharing your experience with other educators, your personal and professional communities, and the general public. (200 words maximum)

I envision sharing my PolarTREC experience with other educators by applying to speak at professional teaching conferences such as NSTA, CAST (Colorado Association of Science Teachers), and locally within my district's STEM Cohort about the value of research experience for educators. In 2018 I presented at the California STEAM Symposium about the positive impact of doing research as an educator and look forward to being able to present at other conferences on issues that I feel are important for the good of other educators and their students. I think that it is crucial to see, and be able to speak with people who are educators and active in the scientific community simultaneously. It's very powerful to be able to tell my students that I don't just teach them about science as their teacher, and that I am actually a scientist as well. I also post my blog links and pictures on my personal social media pages to give access to those who may not be involved with science, or education and to try and spark some interest through my experiences.

d. Describe how you currently engage your audience and facilitate learning when educating on new and complex topics, concepts, or issues. (200 words maximum)

When I am teaching my students new and complex topics I try to really engage my students with ways that they can be hands on and "discover" science for themselves. I use many inquiry based activities and begin each unit with a problem, or phenomenon that we are going to learn about so that we can attempt to explain or solve that problem. For my current 6th grade classes we are learning about metabolism. Our essential question that they were presented with was "What if your identical twin, were no longer identical to you?". They were then introduced to the unique situation of Astronauts Mark and Scott Kelly, who are identical twins, and after Scott went to space the twins no longer genetically identical. The students learned all about metabolism and their project was to come up with a complete health plan to regulate an astronaut's metabolism during long term space travel. During the entire unit, they were so excited about their "Astronaut Project" that they were willing to learn about complicated topics like cellular respiration so that they could keep their astronaut alive in space. We were also able to clear up a large number of misconceptions around the word metabolism in the process.

e. Describe the particular strengths you would bring to the PolarTREC program and to a field research team. (200 words maximum)

I would be a great addition to the PolarTREC program, and a field research team because I am well rounded, have previous research experience, a positive attitude, learn quickly, and love to be an active participant in what is going on. I understand the challenges that can come from being put with a new group of people and I can adapt to this quickly and become a part of the team almost right away. I am friendly towards others and like to get to know people. I know how to lean on others for their strengths when I need to, and support those who need help. I am a natural leader, but am also very capable and willing to follow the instructions and examples of others. I believe that I have a gift to see creative solutions and turn monotonous tasks into fun challenges and activities. I can entertain a room full of teenagers, simply with Popsicle sticks for almost an hour. My soccer team I coached insisted on having soccer practices after the season was over because they loved having practices together so much. I think that this kind of ability can prove very useful in remote locations to promote a team culture outside of work/research hours.

f. Using examples from your own experience including your role and the contributions you made to a team effort, describe how you work as a member of a team. (200 words maximum)

I have always been told that I am a strong member of a team and that I take direction well, but I will also step up as a leader when necessary. I am not the kind of person to sit and watch someone struggle with a task without offering to step up and

help. Whenever there is a new member of our staff, I would sit with them and discuss some of my successes and failures in order to help them be prepared for some of the hurdles that they may encounter. When my school schedule allows it, I will cover classes for my colleagues, provide advice or support when requested and step in to help with ideas for lessons or planning. I use my voice as a member of a team to advocate for those around me and to make sure that others can be successful. In a team settings, I am willing and able to recognize my own weaknesses and lean on those around me for support. I try to always pull my weight within a group, but I also know when to ask for help or support so that a task or job can be completed successfully.

6. Communicating the Experience and Science

Write your journal entry for the general/lay audience. (200 words maximum)

It was a Saturday morning at 5:30am and there I was getting into my car, bundled up, camelbak backpack filled with water, snacks, and first aid kit headed off for an adventure. As I was driving towards Manitou Springs, Colorado, I looked up and I saw it. A skinny line with no trees leading from the bottom of the mountain all the way to the top. I had spotted the trail, and although it was intimidating, there was no turning back now. Standing at the bottom of "The Incline" I laced up my hiking boots, looked to the top of the trail, and gave myself a mini pep talk. The first 500 steps were easy, the next 500 were tough, the following 500 difficult, and so it went until I reached stair number 2,700. Only 68 to go until I reached the summit and every step was a struggle, every breath was labored, but eventually I and many new hiking buddies, made it to the top. The hike down the mountain was a winding easy path covered with trees and polite conversation with strangers who had become my support system in many moments of need on the Incline.

7. Scientific Interests and Research Area Preference

a. Where would you prefer to go on an expedition? Either

Please explain your preference

Although the Arctic and Antarctic regions are very different, I believe that I would be able to learn from, and love, either experience. I hesitate to choose one over the other because I would honestly be very fortunate to visit either location and get to learn about all of the exciting research projects that are happening there.

b. How long would you prefer to participate in an expedition? (Most expeditions are AT LEAST three weeks.) List any dates or periods of time when you are NOT able to participate in a field expedition

I know that the normal range for PolarTREC expeditions are between 3-6 weeks and anything within that time frame is very doable for me. I would prefer not to be gone for more than 6 weeks, since I would miss my students though! My NOAA Teacher at Sea experience involved me living on the research ship for 23 days and I was very comfortable spending that amount of time (or more) away, living in a new place, adjusting to new people, and taking on new tasks and experiences. I would have actually have preferred to stay longer since I had become very comfortable with my responsibilities and companions and had a very time leaving to head home. I love to learn new things and have the opportunities to make new connections that I can use to help me be a better science educator. It would be great if the expedition that I were selected for was at least partially during the winter holiday break or summer so that I can lessen the number of days missed from my class, but I know that my students and administration will be very understanding and excited for me to have this opportunity and to be able to communicate with them while i'm gone. They will be so much more invested in the research knowing that I am there and a part of it! I do not have any children of my own that I would be leaving behind, so there is no strain in that regard. I also do not have any specific time when I would be unavailable to participate.

c. Briefly describe your scientific interests. Which scientific topics interest you the most and why? Please note that climate change has become part of nearly all expeditions so you may choose to be more specific about this topic, if applicable. (200 words maximum)

I have always been fascinated by the ocean. It's been an unexplainable feeling and I love to go snorkeling, scuba diving, spend time on boats, or even at the aquarium just staring at this whole other world that is still being discovered. In general, I lean

more towards interests in biological and environmental sciences, but I am always willing to learn more about something new. As I've grown older my fascination with nature and wildlife has gone beyond that of just a casual interest and moved into this internal desire to see all of the beautiful places on this Earth and learn as much as I can about it. I feel an innate need to protect this beautiful planet that we live on, whether that means promoting recycling and composting at school, opening windows instead of turning on the air conditioning, or actually spending time in a lab trying to quantify the levels of ozone depleting substances and investigating the long term effects of CFCs. I am a genuinely curious person and I enjoy things that need investigation or discovery to uncover.

Atmospheric Systems I would really enjoy an expedition in this subject area

Cryospheric Systems I would really enjoy an expedition in this subject area

Human and Social Systems I am somewhat interested in this subject area

Marine Systems I would really enjoy an expedition in this subject area

Terrestrial Systems I would really enjoy an expedition in this subject area

Ecology and Biotic Systems I would really enjoy an expedition in this subject area

Physics or Space Sciences I am somewhat interested in this subject area

Engineering and Technology I would really enjoy an expedition in this subject area

Other (please specify)

Other Areas of Scientific Interest

N/A

e. Are you applying to work exclusively with a specific researcher? If yes, please list their full name, institution, and email address. (200 words maximum)

I am not applying to work with a specific researcher.

8. Background Information and Skills

a. Briefly describe your outdoor skills or experiences.

I love to go hiking, spend time on boats, and camp. I lived on the NOAA Ship Oscar Dyson for 23 days and felt very comfortable. I feel comfortable sleeping in a sleeping bag/ tent and don't expect gourmet meals. I spent over 20 days sleeping in tents while traveling in Africa at different campsites. I have not done any backwoods camping, but I would feel comfortable doing so. I can go for days without internet if needed and will not complain. I completed my basic first aid/CPR certification last year and will keep that certification up to date. I would love to learn wilderness first aid and additional survival skills and would be happy to take courses this upcoming summer if I were selected as a PolarTREC educator.

b. Provide a basic statement of your general health and physical condition.

I am in good general health and am in good overall physical condition. I have no major physical health concerns, take no daily medication, and exercise 3-5 days per week for at least an hour. I am able to go on long hikes, lift moderate amounts and remain on my feet for most of the day with no issues.

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.

I am familiar with both the Mac and PC operating systems and can use both very comfortably. My personal computers for the last 10 years have always been Mac, and my computers provided by my schools have always been run on the PC operating system.

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.

I feel confident in my ability to use the Microsoft Office products such as Excel, Powerpoint, and Word, as well as the entire Google Suite of products including: Google Drive, Mail, Docs, Slides, Sheets, Forms, Classroom, and Sites. I am also now using Microsoft Outlook and feel comfortable using that as well. I have owned digital cameras and am able to upload photos, do basic editing through phone apps, and keep a blog. I am learning to use the video editing software WeVideo that my school has access to as well. I am also familiar with Skype and other video chatting platforms such as zoom.

e. List any additional skills or information that you wish to be considered.

I love to travel and am accustomed to living in new places and adapting to my

surroundings. I believe that my versatility and ability to learn quickly make me an excellent candidate for PolarTREC. I will use the experiences that I learn from participating in PolarTREC to make me a better educator to my students and to inspire the other educators that I work with. I have traveled a bit on my own and that requires you to be self sufficient, which in turn makes me a great asset as a team member since I am used to pulling my own weight. I work well with others and my creative thinking, and positive attitude can help to turn a situation around. I am great at communicating and presenting my ideas with others. I enjoy a challenge and am willing to push myself to be a valuable asset under all circumstances.

9. Previous Applications & Participation

a. Have you previously participated in a teacher research experience (e.g. NOAA Teacher at Sea, Earth Watch)? We do not accept applications from PolarTREC alumni. Yes

Program Information STAR Program- 2013, 2014, 2015 <https://star-web.csm.calpoly.edu/> NOAA Teacher at Sea - 2018 https://teacheratsea.noaa.gov/#/2018/Lacee*Sherman/blogs

If yes, did you complete all program requirements? Yes

If yes, how do you see the PolarTREC professional development opportunity continuing to develop your professional skills, or how will it build on your previous research experiences?

Even though I have participated in research experiences in the past, I believe that participating in the PolarTREC program will make me a better educator to my students, and a more impactful voice in the local STEM community. I am teaching in a new city, district, and state now, and although there are a few science labs within the Denver Metropolitan area, I feel like the majority of my students have probably never met a scientist before meeting me. They don't have a connection to active research projects or an emotional investment in the scientific process yet. I want to show my students what doing science looks like in real time and allow them to interact with me while I work on research, and also to be a voice to inspire other educators in my community. My district offers an optional STEM Cohort that I am participating in, and while this is great, many of the individuals involved have never actually had any authentic experience in their fields. Since I am active in this district-wide STEM cohort, I have not only the opportunity to impact my students, I have the opportunity to impact a large number of STEM educators on a regular basis. I am passionate about getting other educators involved in research experiences so that they can better educate and inspire their own students. I find myself constantly encouraging others to push themselves out of their comfort zone to do something that will better their teaching practice. What better way to teach and inspire future scientists, engineers and mathematicians, than to be one yourself?

10. Orientation Availability

Are you available to attend the Orientation during this time period? Yes

If no, please explain

11. How did you hear about PolarTREC?

Email listserve. Please provide the name and/or URL

Friend or colleague. Provide a name if you wish

Jean Pennycook

Former PolarTREC, TREC, or TEA teacher. Please provide their name

Leslie Anderson

From a website. Please list the website name and URL

Conference or presentation. Please list the venue and/or presentation title

Other (please explain)

b. Please suggest other places we might advertise this opportunity for teachers

Educational conferences such as NSTA, CSTA, CAST and the California STEAM Symposium

12. References

Reference 1

Name Jean Pennycook

Title and affiliation STAR Research Program Educator Mentor

Email Address jean.pennycook@gmail.com

Phone Number (559) 696-8998

Reference 2

Name Sarah Stienessen

Title and affiliation NOAA Scientist that I sailed with during the NOAA Teacher at Sea program on ship Oscar Dyson

Email Address sarah.stienessen@noaa.gov

Phone Number (206)526-4524

Reference 3

Name Randy Daniels

Title and affiliation Science Educator - We have planned many lessons and units together.

Email Address randy.daniels@simivalleyusd.org

Phone Number (818) 812-9362

2020-2021 PolarTREC Educator Application

Kathryn Sickinger

1. Contact Information

Name: Kathryn Sickinger

Email: kroedig0812@gmail.com

Home Address:

1230 Thurnridge Drive
Cincinnati, OH 45215 US

Home Phone: (513) 602-0876

Cell Phone : (513) 602-0876

Institution Name: The Summit Country Day School

Institution Address:

2161 Grandin Road
Cincinnati, OH 45208 US

Institution Phone: (513) 871-4700

Classroom/Office Extension: 320

Institution Fax:

Institution Website: summitcds.org

Other relevant websites: <https://sites.google.com/site/katmroedig2017/home>

Supervisor's Name: Kelly Cronin

Supervisor's Email Address: cronin_k@summitcds.org

2. Demographic Information

a. Gender: Female

Race: White

c. Briefly describe your primary audience and surrounding community (e.g. K-12, public, rural/urban, technology access, economics): Urban, culturally diverse

d. Type of School (or students you work with): Private

Other Type of School Private, Catholic, Independent School

e. What is the population of your annual audience or school (estimates are fine) 1019

f. School Ethnicity:

% - American Indian or Alaska Native

5 % - Asian

9 % - Black or African American

5 % - Hispanic or Latino

% - Native Hawaiian or Other Pacific Islander

70 % - White

8 % - Multiracial

If your school uses other categories to describe race/ethnicity, please describe: Middle Eastern, Mayan Indian, Other, Not indicated 3%

g. Percentage of students who receive free or reduced lunch: 0

h. Average class or audience size 20

i. Total number of students/audiences you teach in a year 50

j. If known, what are the approximate start and end dates of your school year or primary programs, etc. ? Include major professional vacation periods. i.e. Christmas break, summer break, etc.

2019-2020 School Year Thanksgiving break: November 27- December 2, 2019

Christmas break: December 23, 2019-January 6, 2020 Winter break: February 14- 17,

2020 Spring break: April 10-19th, 2020 Last day of school: May 22, 2020

3. Teaching Experience and Education

a. What type of university degree or other academic experience or qualifications do you have?

Bachelor's Degree (Major): Bachelors of Science in Biology

Bachelor's Degree (Minor):

Masters Degree (Discipline): Masters of Arts in Biology

PhD Degree (Discipline):

Other Degree:

b. How many years of education experience do you have?: 6.5

c. How many years have you been working at your current institution?: 6.5

d. List up to 10 relevant professional licenses, certifications, registrations, awards or honors that you have received in your profession::

University of Cincinnati's Research Experience for Teachers Participant 2017-2018

Ohio 5 year professional teaching license—Adolescence to Young Adult (7-12) in Life Sciences

4. Professional Assignment

a. What is your primary education assignment? Check all that apply
Secondary (Grades 9-12)

Other Primary Assignment

b. What subjects do you teach? Check all Secondary Biology, Secondary General Science

Other Subjects Advanced Placement Environmental Science Honors Anatomy and Physiology

5. Motivation for Participation

a. What motivates you to apply to PolarTREC and professionally, what do you hope to gain from the experience? (200 words maximum)

I have always been interested in conducting scientific research, especially in the Arctic/Antarctic regions. These regions are of great value to various scientific topics that I teach. Both my master's degree and the Research Experience for Teacher's program I participated in required me to complete pre-and post-research activities to use within my classroom and this has dramatically changed the way I teach. I would like to continue to develop my critical thinking and problem solving skills which I share with my students every day in the classroom/laboratory. I would also like the opportunity to collaborate with other scientists and educators to learn more about the Arctic/Antarctic region. This experience would help me lead by example for my students and peers in that I am helping to not only gain knowledge about but also take initiative to be actively involved in our world. This experience would give me the opportunity to reflect on, learn from and think of ways to develop research skills in my classroom/laboratory with my students. The professional development aspect of this experience interests me greatly because it will help me interact more with my students on important topics in environmental science.

b. Aside from journaling/blogging, online photos, and webinars which all part of our program requirements, describe your ideas on how you will share this experience in your classroom or with the audiences you work with. (200 words maximum)

Our school has a Science Research Institute Program that teaches high school students how to conduct scientific research. Each year this program has a colloquium to highlight the research students have completed. Hopefully, I could be the keynote speaker at the upcoming year's colloquium to showcase the research I conducted through this experience. Our school also hosts "A Global Evening" to showcase our culturally diverse community through students' and teachers' work and presentations. Presenting my Arctic/Antarctic experience at the upcoming year's Global Evening would be another excellent opportunity to share with our school's community these areas of our world. Last fall I attended a Case Study Teaching in Science Conference sponsored by the National Center for Case Study Teaching in Science. Using what I learned from this conference, I hope to take data collected from the research experience and create case studies to put on their website that teachers from around the country could use in their classrooms to reach a more broad audience. I plan on sharing this experience with my Advanced Placement

Environmental Science classes by taking what I have learned and applying it directly to lessons in the laboratory, class discussions, case studies or other activities.

c. Describe how you envision sharing your experience with other educators, your personal and professional communities, and the general public. (200 words maximum)

The school where I received my master's degree from hosts a World Community Conference each December. This conference brings people from all over the world and showcases the research formal and informal educators have conducted and how it has impacted their communities. I would love to be able to take the research I conducted through PolarTREC from the Arctic/Antarctic and apply to be a keynote speaker at this conference. This way, I would be able to reach a broader audience than just those within my school community.

d. Describe how you currently engage your audience and facilitate learning when educating on new and complex topics, concepts, or issues. (200 words maximum)

My summer research through the University of Cincinnati's Research Experience for Teachers program taught me about challenge-based learning (CBL) and the engineering design process (EDP). As a part of this program, we had to create a unit based on our summer research topic that used CBL and EDP. I have taken this a step further and have altered various units to use these teaching techniques to help engage students more in certain topics. Using these techniques, students are given a problem/challenge. Then, they identify and define the problem in the challenge and gather information on what is needed to help find a solution to the problem. From there, they identify various alternatives on how to solve the problem and select solutions to test to solve the problem. Lastly, they implement solutions to test their effectiveness of solving the problem, evaluate and refine those solutions and then ultimately communicate their solutions. These techniques encourage many skills that students should have, including critical thinking and innovative problem solving. It is impossible to use these techniques in every unit throughout the entire school year, so other ways I engage students are through the use of hands-on activities, laboratories, class discussions and case studies.

e. Describe the particular strengths you would bring to the PolarTREC program and to a field research team. (200 words maximum)

My experience with the University of Cincinnati's (UC) Research Experience for Teachers program taught me a great deal about conducting research, collaborating on research, and disseminating and presenting research findings. It taught me how

to incorporate what I learned through the research I conducted over a seven week period into my classroom. Throughout the summer of 2017, I worked with a research team comprised of another teacher, two UC graduate students, one UC faculty mentor and one UC intern to study the spatiotemporal variability of air pollution in microenvironments. Each team member had a role in the research conducted and we worked very well together. Being a part of this program strengthened my teamwork and leadership skills and showed me that I can contribute significantly to a research team. Throughout seven weeks in the summer, we conducted research, wrote daily logs, read articles related to our research, had professional development workshops, met with our faculty mentors and graduate assistants, and gave bi-weekly presentations. These activities taught me to be organized and thorough when conducting research and made me confident in following research instructions and disseminating research results which would be valuable to being a part of a research team.

f. Using examples from your own experience including your role and the contributions you made to a team effort, describe how you work as a member of a team. (200 words maximum)

At the end of the summer experience of the University of Cincinnati's Research Experience for Teachers program, each teacher team had to submit a report, PowerPoint presentation, and research video to our coordinator documenting the research project completed and the classroom units developed, and a summary report for submission to the National Science Foundation. Knowing we had seven weeks, I sat down with my fellow teacher on the first day and together we outlined our responsibilities for all of the deliverables due at summer's end. It was important to us to equally distribute the work and this meeting helped us accomplish our goal. Throughout my master's program I helped facilitate team discussions. Each course where we traveled outside of the country had a pre-trip assignment where we were assigned groups with topics to research and complete a synthesis paper. While in the country, our group had to lead a discussion on our groups' topic. During the planning and discussions I would voice my ideas and build upon others ideas to assist successful group discussions. These experiences have taught me that I work well in a team whether that be in a leadership role or taking directions from a team leader.

6. Communicating the Experience and Science

Write your journal entry for the general/lay audience. (200 words maximum)

It's finally my husband's birthday! We decided to go canoeing with our friends so we packed up our sunscreen, bug spray, drinks and snacks and hit the road to meet our friends. We spent 7 hours paddling through the winding river, making stops along the way to talk, drink and eat with our friends. Exhausted, we finally made it home. Upon entering our house, we noticed there were about 100 large, green/black flies in our kitchen and living room. What had happened while we were gone?! We immediately grabbed the fly swatter and started killing flies! We would swat what we thought were all of them, just to notice about 50 more had appeared since we started. We finally gave up with the fly swatter and started using the vacuum to be more effective. Running around the house with a vacuum trying to catch flies that would fly just out of our reach was the most hilarious and exhausting event of the day; even after paddling for 7 hours on the river. It looks like we will be calling an inspector to see where these flies are coming from before our entire home becomes infested! Happy birthday honey!

7. Scientific Interests and Research Area Preference

a. Where would you prefer to go on an expedition? Either

Please explain your preference

I am more interested in an Antarctic experience but this opportunity is amazing and would be honored to get the opportunity to conduct research in either area.

b. How long would you prefer to participate in an expedition? (Most expeditions are AT LEAST three weeks.) List any dates or periods of time when you are NOT able to participate in a field expedition

If the expedition is during the school year (beginning/mid August-end of May) then I am only allowed to take 4 weeks unless some of the weeks add on to holiday breaks. During the summer months (end of May- beginning of August) I would be able to take the entire time if necessary. As of right now I am unaware of specific dates where I would not be able to participate in an expedition.

c. Briefly describe your scientific interests. Which scientific topics interest you the most and why? Please note that climate change has become part of nearly all expeditions so you may choose to be more specific about this topic, if applicable. (200 words maximum)

Towards the end of my undergraduate career that focused more on general biology, I became very interested in cultural diversity, environmental science, ecology and conservation. Taking ecology the second to last semester of my senior year made me realize that I'm very passionate about teaching ways we can conserve and preserve our resources this earth has given us. These interests guided me to choose my master's program at Miami University because many of the courses throughout the program had an emphasis on conservation while some had experiences with various cultures through expeditions outside of the country. Being immersed in various cultures, conducting all the research and creating three inquiry action projects made me realize that getting others involved is vital to aiding in conservation efforts. I loved working with fellow educators, students and community members throughout my inquiry action projects. This helped lead me to the University of Cincinnati's Research Experience for Teacher's program which increased my interest in learning about pollution and climate change. Being a part of that program has expanded my interest in conducting research and bringing that research back into my classroom to help teach various topics differently than I usually have.

Atmospheric Systems I am somewhat interested in this subject area

Cryospheric Systems I am somewhat interested in this subject area

Human and Social Systems I am somewhat interested in this subject area

Marine Systems I would really enjoy an expedition in this subject area

Terrestrial Systems I am somewhat interested in this subject area

Ecology and Biotic Systems I would really enjoy an expedition in this subject area

Physics or Space Sciences I do not want to be considered for an expedition in this subject area

Engineering and Technology I do not want to be considered for an expedition in this subject area

Other (please specify) I would really enjoy an expedition in this subject area

Other Areas of Scientific Interest

Understanding Environmental Change in the Polar Regions
The Effect of Microplastics on Antarctica

e. Are you applying to work exclusively with a specific researcher? If yes, please list their full name, institution, and email address. (200 words maximum)

No

8. Background Information and Skills

a. Briefly describe your outdoor skills or experiences.

During my master's program we were required to participate in three Earth Expeditions. These courses had a component where we would travel outside of the country for ten days. My first course in my master's program was in Baja, and this course taught me about field methods and conducting research to get us ready for the rest of the master's program. We stayed on a ranch in the desert as well as at a sea station by the Vermillion Sea where we vigorously hiked, snorkeled and slept outside under the stars. My father has owned a boat since before I was born so I have basically grown up on the lake. In addition, my last undergraduate course took me on a trip to the Galapagos Islands where we stayed on a boat and traveled the islands for ten days. Our daily activities on this trip included hiking and snorkeling. I have taken backpacking classes through REI and am in the process of planning my first big backpacking trip. I am very comfortable with being outdoors and willing to learn as much as I can about it. I am currently certified in CPR and First Aid. In June of 2019 I was an American Wilderness Leadership School participant where I spent 7 days in Jackson Hole, Wyoming learning about outdoor safety and survival, shooting sports, and conservation.

b. Provide a basic statement of your general health and physical condition.

I am 29 years old and in outstanding health and physical condition. I have been involved in sports my entire life and do high-intensity interval training with a personal trainer at least six days a week to stay in shape. I was an NCAA division III collegiate student-athlete in the sport of volleyball and continue to play sand volleyball often. I enjoy hiking, kayaking and stand-up paddle boarding whenever I can. I take pride in maintaining a healthy lifestyle and take care of myself physically, mentally, spiritually, and emotionally. In addition, I eat a nutritious, well-balanced diet.

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.

I have been trained on Microsoft programs such as Word, Excel, and Power Point and have used them often throughout my life. I also know how to use Windows Movie Maker to create videos. My summer experience in the University of Cincinnati's Research Experience for Teachers Program required me to use Excel daily for collecting research data, use Power Point to create a poster, presentation, and video, and also use Windows Movie Maker to create a video. I am very confident in my skills with these programs. In addition, we use Vernier probes and Logger Pro with our

students in multiple labs throughout the school year. These probes range from oxygen and carbon dioxide sensors to hand-grip heart rate monitors and blood pressure cuffs. We use many of the probes to monitor water quality (pH and conductivity probes). The software collects data and puts it onto graphs for students to use in data analysis. I have intermediate training with iPads and iPhones.

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.

Electronic devices I use on a regular basis include laptops, Samsung phone, Amazon Kindle and digital cameras. The software I use on a regular basis includes Microsoft Excel, Power Point, and Word. I use Excel with my students to conduct statistical data analysis. I use Power Point to create notes, posters and videos I use with my students in class and also teach them how to use Power Point for the same things. I use Word to type documents but also to journal. My students use Word when I have them type research and lab reports. As previously stated Vernier probes are used often in lab to gather and analyze environmental data.

e. List any additional skills or information that you wish to be considered.

When it comes to technology I learn fairly quickly so if there is something I need to be trained on it should not take much time for me to master. For the summer component of the Research Experience for Teachers Program I participated in, I had to be trained on how to work two monitors—the DustTrak for monitoring particulate matter size 2.5 microns concentration and the AE51 for monitoring black carbon concentration. We had one hour long training session and used these monitors every day for the seven weeks of summer research. I would say that it only took me a day or two to be fully confident and comfortable using these monitors and downloading and assessing the data. After my 7 day experience with the American Wilderness Leadership School I became certified in archery with NASP and was trained by professionals on the use of various firearms used for recreational hunting purposes.

9. Previous Applications & Participation

a. Have you previously participated in a teacher research experience (e.g. NOAA Teacher at Sea, Earth Watch)? We do not accept applications from PolarTREC alumni. No

Program Information

If yes, did you complete all program requirements?

If yes, how do you see the PolarTREC professional development opportunity continuing to develop your professional skills, or how will it build on your previous research experiences?

10. Orientation Availability

Are you available to attend the Orientation during this time period? Yes

If no, please explain

11. How did you hear about PolarTREC?

Email listserve. Please provide the name and/or URL

Friend or colleague. Provide a name if you wish

Former PolarTREC, TREC, or TEA teacher. Please provide their name

From a website. Please list the website name and URL

Conference or presentation. Please list the venue and/or presentation title

Other (please explain)

I was researching 'teacher research trips to the Antarctic' and the following PolarTREC website came up as one of the top links: <https://www.polartrec.com/>

b. Please suggest other places we might advertise this opportunity for teachers

At conferences that teachers attend, such as NSTA, ACS or NABT or maybe at various colleges across the country that enroll students in education programs.

12. References

Reference 1

Name Debbie Liberi

Title and affiliation District Coordinator, CEEMS and RET, University of Cincinnati College of Engineering and Applied Science. Debbie was my coordinator at the RET program I was a participant in during 2017-2018.

Email Address debbieliberi@gmail.com

Phone Number (513) 608-4741

Reference 2

Name Karen Suder

Title and affiliation Upper School Science Teacher. Karen is one of my most valued colleagues and department head along with being my mentor teacher for completing the Ohio Resident Educator program.

Email Address suder_k@summitcds.org

Phone Number (513) 871-4700 ext 310

Reference 3

Name Tracy Law

Title and affiliation Upper School Teacher. Tracy is another one of my most valued colleagues and we led a group of 18 students on a trip to Iceland in the spring of 2018.

Email Address law_t@summitcds.org

Phone Number (513) 871-4700 ext 304

2020-2021 PolarTREC Educator Application

Rebecca Siegel

1. Contact Information

Name: Rebecca Siegel

Email: rebeccassiegel@gmail.com

Home Address:

General Delivery

Brevig Mission, AK 99785 US

Home Phone: 8579196837

Cell Phone :

Institution Name: Brevig Mission School

Institution Address:

Main St

Brevig Mission, AK 99785 US

Institution Phone: 9076424021

Classroom/Office Extension:

Institution Fax: (907) 642-4031

Institution Website: <https://sites.google.com/bssd.org/brevigmission>

Other relevant websites:

Supervisor's Name: Diane Crockett

Supervisor's Email Address: dcrockett@kts.bssd.org

2. Demographic Information

a. Gender:

Race: White

c. Briefly describe your primary audience and surrounding community (e.g. K-12, public, rural/urban, technology access, economics): Brevig Mission is Inupiaq community of 400 people on the shore of the Bering Sea. Located on the Seward Peninsula, at 65 degrees latitude, the village is very remote and is not connected to any roads. There are limited employment opportunities in the village, and people live a subsistence lifestyle, relying on fishing, hunting, and picking berries and greens. Brevig Mission is experiencing many effects of climate change, including a shorter sea ice season and impacts on salmon and game species. Brevig Mission School is a public school serving students from pre-K to 12th grade. After graduating, some students go on to job training programs elsewhere in the state. Very few go on to college, but in recent years no students have completed college. The school has internet access.

d. Type of School (or students you work with): Public

Other Type of School

e. What is the population of your annual audience or school (estimates are fine) Brevig Mission School has 154 students from pre-K to 12th grade.

f. School Ethnicity:

100 % - American Indian or Alaska Native

0 % - Asian

0 % - Black or African American

0 % - Hispanic or Latino

0 % - Native Hawaiian or Other Pacific Islander

0 % - White

0 % - Multiracial

If your school uses other categories to describe race/ethnicity, please describe:

g. Percentage of students who receive free or reduced lunch: 100

h. Average class or audience size 8

i. Total number of students/audiences you teach in a year 49

j. If known, what are the approximate start and end dates of your school year or primary programs, etc. ? Include major professional vacation periods. i.e. Christmas break, summer break, etc.

The last day of school this year is May 22, 2020. For the 2020-2021 school year, the school year will most likely begin around August 19. For the 2020-2021 school year, the Christmas break will most likely be about December 16-January 1.

3. Teaching Experience and Education

a. What type of university degree or other academic experience or qualifications do you have?

Bachelor's Degree (Major): Geology

Bachelor's Degree (Minor): Geography

Masters Degree (Discipline): Master of Arts in Teaching

PhD Degree (Discipline):

Other Degree:

b. How many years of education experience do you have?: This is my second year as a classroom teacher. Prior to becoming a teacher, I worked as an informal educator for several years. During that time, I taught environmental education at the Center for Alaskan Coastal Studies (Homer, AK) for six seasons, and o

c. How many years have you been working at your current institution?: This is my second year working at Brevig Mission School.

d. List up to 10 relevant professional licenses, certifications, registrations, awards or honors that you have received in your profession::

Alaska Initial Teacher Certificate Massachusetts Initial Teacher License (with Sheltered English Immersion Endorsements)

4. Professional Assignment

a. What is your primary education assignment? Check all that apply Middle School (Grades 6-8), Secondary (Grades 9-12)

Other Primary Assignment

b. What subjects do you teach? Check all Middle School Science, Secondary Earth Science, Secondary General Science

Other Subjects Secondary Environmental Science Secondary STEM Secondary Health and Physical Education Secondary Outdoor Survival Credit Recovery

5. Motivation for Participation

a. What motivates you to apply to PolarTREC and professionally, what do you hope to gain from the experience? (200 words maximum)

My motivation to apply to PolarTREC stems from the desire to bring more educational opportunities to my students and to create content that is relevant to their lives. I teach in an under-resourced Arctic school district. My students have limited educational opportunities, and none of their parents have graduated from college. Global warming is rapidly changing their world. Most curriculum and teaching materials available do not directly relate to my students' lives. When my students study scientific subjects they have experienced first-hand, such as Arctic shrub expansion, they connect to the science more deeply and learn the concepts more easily. PolarTREC would give me the opportunity to develop experiential, place-based learning about science that matters to my students' lives. I want to connect them to research about changes at the Poles so they can better understand what is happening to their environment and help their community to adapt. Additionally, I am working to build their understanding of science as a process rather than as a list of facts. By participating in a PolarTREC expedition, I hope to make the process of doing science real to them and help them view themselves as people capable of doing science.

b. Aside from journaling/blogging, online photos, and webinars which all part of our program requirements, describe your ideas on how you will share this experience in your classroom or with the audiences you work with. (200 words maximum)

During the PolarTREC expedition, I would talk on the phone or email with my students regularly to answer their questions about the research. If the expedition was during the summer, I would work with our summer school coordinator to teach summer students about the expedition and related science. After the expedition, I would develop hands-on, place-based lessons for my students. I observed a project that Mark Goldner developed for his students following his 2011 PolarTREC experience with a team that collected and analyzed sediment cores from a glacial fjord. Mark had his students collect and analyze sediment cores from a local pond, and he taught them to use paleoclimate research methods to recreate the history of their area. I would create a similar project for my students, teaching them about the research I had done and helping them apply similar techniques to their own backyard. I have done citizen science projects with my students and would also like to conduct citizen science with them that connects to the PolarTREC research.

Finally, I hope to forge ongoing relationships with PolarTREC researchers. After the expedition, they could skype into my classroom to lead lessons and provide mentorship and advice for students who want to go to college.

c. Describe how you envision sharing your experience with other educators, your personal and professional communities, and the general public. (200 words maximum)

My experience would be useful to other science teachers in my region. We all face the same challenge of making science meaningful and relatable to our students' lives. I envision that I would develop lessons or curricula based on the expedition and share them with other teachers in my district (13 schools). I could also reach out to nearby districts such as Northwest Arctic School District, Lower Yukon School District, and Nome Public Schools. I would also share my experience with other teachers in my school, making lesson plans and presentations appropriate for the elementary school classes. Furthermore, I would reach out to the Brevig Mission community. I would hold a community outreach event in the Multipurpose Building in which I presented about the expedition. Many people in Brevig Mission are very active on social media. If there was access to platforms like Facebook during the expedition, I could engage the community in real-time by posting about my experiences. I am involved with the Alaska Climate Action Network, an organization that works to share information about climate change through multiple platforms. I would be eager to give a presentation about the science I learned to AK CAN members.

d. Describe how you currently engage your audience and facilitate learning when educating on new and complex topics, concepts, or issues. (200 words maximum)

My students' reading, writing, and math skills are below grade-level, and many references in textbooks are unfamiliar to them (e.g humid summer days). To reach my students, I make my lessons hands-on and have them engage with complex topics in multiple formats. For example, when studying the seasons, we did a lab, graphed data, read an article, made models, and wrote explanations. To introduce students to unfamiliar topics, I start by engaging them around a phenomenon that they can relate to, then use the questions this generates to dive deeper into the subject. For example, when studying air pressure, we started by experimenting with water, cups, and air, which led to the insight that air exerts a force. I then taught the students the underlying science, equipping them to investigate questions about the relationship between air pressure and temperature. When teaching complex topics such as global warming, I build my students' critical thinking skills so they can better understand the science and articulate their viewpoints. I explicitly teach them skills

like supporting their ideas with evidence and making inferences. This has enabled them to participate in weekly discussions about complicated and relevant issues like climate change impacts on subsistence foods.

e. Describe the particular strengths you would bring to the PolarTREC program and to a field research team. (200 words maximum)

I have significant experience living and working in remote areas and have learned to be flexible. My village is not accessible by car and in bad weather, planes cannot reach us. I adapt to schedule changes and adjust plans to make up for missing resources. For example, we cannot get Bunsen burner fuel; to teach chemistry labs, I built alcohol stoves out of soda cans and heat tape. In college, I participated in an REU program in Svalbard, Norway. This kindled my excitement about polar science, taught me basic field research skills, and gave me experience working with a small, remote team. I am curious about the natural world and passionate about science. While living in Homer, Alaska, I learned to identify more than 150 intertidal invertebrates. I am a hard worker who embraces challenges. After years of working on farms and teaching outdoor education, I enjoy working outdoors in all weather conditions. I also have a positive attitude and am not easily discouraged. For example, last winter my pipes froze and I had no indoor plumbing for two months. Knowing that the situation was out of my control, I stayed cheerful, adapted my routines, and joked about the situation.

f. Using examples from your own experience including your role and the contributions you made to a team effort, describe how you work as a member of a team. (200 words maximum)

I am experienced working with small, remote teams, including the small team of teachers at my school, fellow students and researchers in Svalbard, and naturalists at the Center for Alaskan Coastal Studies. On a team, I work hard, listen, bring a positive attitude, and welcome feedback. Last year, teachers and staff at our school created a Senior Support Team to help struggling seniors graduate. On the team, I suggested my own ideas and listened carefully to others' input, asking questions that were clarifying but not critical. I learned from my teammates eagerly. Coming from a different culture, I had preconceptions about students' behaviors, such as responding slowly to instructions or questions. I listened carefully to the perspectives of Inupiaq co-workers to gain new perspective on my students' behavior. As well as fulfilling my responsibilities, I supported other team members. For example, when someone hadn't done one of their jobs, I asked, "how can we support you to do it in the coming week?" instead of criticizing the delay. I am open to receiving feedback and adjust my actions accordingly: when a co-worker said I was speaking too fast in

class, I made an effort to slow down my speech.

6. Communicating the Experience and Science

Write your journal entry for the general/lay audience. (200 words maximum)

Brevig Mission is one of the windiest places I've ever been (tonight it's gusting to 48 mph). Last Saturday was calm, so I seized the opportunity to kayak in our lagoon, which stretches fifteen miles west of the village. Someday I'll paddle to the far end, but Saturday I set my sights on exploring some closer islands. I keep my kayak at a friend's fish rack. The fish rack always smells interesting, due to the strips of salmon hanging to dry. Though I hope for a calm day to kayak, they are bad for drying fish. You need breezy days to keep the bugs away and let the fish dry quickly. I paddled between low, grassy islands, exploring small channels and looking for birds. In fall, migrating birds stop to rest in our lagoon. Three weeks ago, thousands of sandhill cranes were flying overhead while hundreds of ducks and swans were honking and swimming in the lagoon. There aren't many left now, but I still came across lots of gulls, and some ducks and swans. Soon, ravens will be the only birds left. They spend the winter scavenging trash at the dump and seal carcasses on the sea ice.

7. Scientific Interests and Research Area Preference

a. Where would you prefer to go on an expedition? Either

Please explain your preference

I am interested in either the Arctic or the Antarctic. My students live in the Arctic, so an Arctic expedition would provide numerous opportunities to connect the research directly to their lives. I would be doing science about processes and changes that they directly experience. An expedition in the Antarctic would help my students connect their own experiences to processes and conditions in the larger world. They can feel isolated from other regions of Alaska and the US, and descriptions of human experiences (such as playing soccer on a grassy field) and the natural world (such as thunderstorms) in other places can feel unreal to them. Discovering connections between their region and the Antarctic would show them that they are connected to the world as a whole. For example, it would help them understand biogeographic similarities between the regions and the relationship between latitude and climate. This could help them make connections between the changes they are experiencing and changes around the world.

b. How long would you prefer to participate in an expedition? (Most expeditions are AT LEAST three weeks.) List any dates or periods of time when you are NOT able to participate in a field expedition

Any amount of time between 3 and 6 weeks works for me. There are no dates when I would be unable to participate.

c. Briefly describe your scientific interests. Which scientific topics interest you the most and why? Please note that climate change has become part of nearly all expeditions so you may choose to be more specific about this topic, if applicable. (200 words maximum)

My scientific interests are shaped by processes relevant to my students' experiences: marine systems and ecology, sea ice, permafrost, glaciers, and terrestrial ecology. I am interested in marine systems and ecology because they are vital to my students' lives. Fish and marine mammals are crucial to their culture and subsistence lifestyle. They rely on knowledge of ocean currents to travel and hunt by boat. Ocean conditions here are changing, and my students must be able to understand what is going on. Plankton and marine invertebrates fascinate me. Sea ice is vitally important to my community. People rely on it for travel and subsistence, but the sea ice season has shortened in our area. I would love to connect my students to sea ice science. I am interested in permafrost because Brevig Mission is built on it and

because people rely on permafrost for preparing traditional foods like fermented walrus. I did research in college about factors influencing calving events on tidewater glaciers in the Arctic. I would love to further study glaciers and ice sheets and to participate in more glacier research. I am interested in terrestrial ecology because community members often talk about changes they have observed in plant communities.

Atmospheric Systems I am somewhat interested in this subject area

Cryospheric Systems I would really enjoy an expedition in this subject area

Human and Social Systems I am somewhat interested in this subject area

Marine Systems I would really enjoy an expedition in this subject area

Terrestrial Systems I am somewhat interested in this subject area

Ecology and Biotic Systems I would really enjoy an expedition in this subject area

Physics or Space Sciences I am somewhat interested in this subject area

Engineering and Technology I am somewhat interested in this subject area

Other (please specify)

Other Areas of Scientific Interest

e. Are you applying to work exclusively with a specific researcher? If yes, please list their full name, institution, and email address. (200 words maximum)

8. Background Information and Skills

a. Briefly describe your outdoor skills or experiences.

I have significant outdoors experience, both professional and personal. Professionally, I have taught outdoor education, leading multiday backpacking, ski touring, and canoeing trips in Australia, Maine, and Quebec. I am currently teaching an outdoor safety course at school, covering hypothermia prevention, backcountry navigation, and other topics. I have worked as a sea kayak guide in Homer, Alaska. Personally, I spend as much time as I can in the outdoors. For example, last summer I spent two weeks sea kayaking alone in the Prince William Sound, and completed three shorter kayaking trips, and several backpacking trips. I am comfortable and experienced in extreme cold, wind, and blizzards. I enjoy winter camping, cross-country skiing, and other snow sports. In the winter I enjoy skiing across the sea ice to the next village, which is seven miles away. I am certified as a Wilderness First Responder. I am experienced driving small boats in rough, icy seas. and sea kayaking in frigid and icy conditions. I am experienced working and travelling in bear country. I had firearms training in 2011 while doing field research in Svalbard, Norway. Mosquitos and bugs don't bother me!

b. Provide a basic statement of your general health and physical condition.

I am healthy and fit. I exercise every day (running, hiking, biking, kayaking, cross-country skiing). I have no long-term medical issues.

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.

I am most familiar with the Mac and Chromebook operating systems, because I use them at school. I am also familiar with PCs because I had a PC for a personal computer (Lenovo ThinkPad) for several years.

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.

I use MacBooks and Chromebooks on a daily basis at school. I use them for planning lessons, grading, collaborating with other teachers, and for computer-based classwork such as "interactivities" on pearsonrealize.com, which are part of our middle school science curriculum. I use G Suite for many purposes, including sharing resources and collaborating with other teachers, making slide shows, making spread sheets, and editing documents. I give my students assignments in Google Classroom. I have used Google Hangout and Zoom to arrange and attend meetings. I am comfortable using the internet browsers Chrome, Safari, Firefox. I use them for work,

for my personal life, and as the secretary of the Alaska Climate Action Network. I use a Nikon Coolpix digital camera to take photos. I edit the photos with iPhoto, and sometimes share them with my family on a small blog. I have used iMovie to edit personal videos. I use Microsoft Excel for making graphs and keeping track of my finances. I use Microsoft PowerPoint for making presentations. In 2018, I posted my students' homework assignments on a blog (<http://mssiegelscience.blogspot.com>). I use several different platforms for communicating with family and friends, including Skype and What's App.

e. List any additional skills or information that you wish to be considered.

I am proficient in Spanish. Wilderness First Responder certification

9. Previous Applications & Participation

a. Have you previously participated in a teacher research experience (e.g. NOAA Teacher at Sea, Earth Watch)? We do not accept applications from PolarTREC alumni. No

Program Information

If yes, did you complete all program requirements? Yes

If yes, how do you see the PolarTREC professional development opportunity continuing to develop your professional skills, or how will it build on your previous research experiences?

10. Orientation Availability

Are you available to attend the Orientation during this time period? Yes

If no, please explain

11. How did you hear about PolarTREC?

Email listserve. Please provide the name and/or URL

Friend or colleague. Provide a name if you wish

Former PolarTREC, TREC, or TEA teacher. Please provide their name

Mark Goldner, Katie Gavenus

From a website. Please list the website name and URL

Conference or presentation. Please list the venue and/or presentation title

Other (please explain)

I was a student in the Svalbard REU program in July 2011. There was a PolarTrec teacher as part of our team, Mark Goldner. I got back in touch with Mark while getting my teaching degree in 2017. Mark shared many ideas with me and encouraged me to apply to PolarTREC.

b. Please suggest other places we might advertise this opportunity for teachers

12. References

Reference 1

Name Diane Crockett

Title and affiliation Principal, Brevig Mission School

Email Address dcrockett@kts.bssd.org

Phone Number (907) 642-4021

Reference 2

Name Katie Gavenus

Title and affiliation Program Director, Center for Alaskan Coastal Studies

Email Address katieg@akcoastalstudies.org

Phone Number (907) 299-0983

Reference 3

Name Kevin Labar

Title and affiliation Middle School Teacher, Brevig Mission School

Email Address kevin.labar@kts.bssd.org

Phone Number (907) 642-4021

2020-2021 PolarTREC Educator Application

Yajaira Sierra-Sastre

1. Contact Information

Name: Dr. Yajaira Sierra-Sastre

Email: yarisierra@gmail.com

Home Address:

154 Gibbs St #345

Rockville, MD 20850 US

Home Phone: 607-379-0531

Cell Phone : 607-379-0531

Institution Name: Project PoSSUM (Polar Suborbital Science in the Upper Mesosphere)

Institution Address:

1830 22nd Street, Apt 6

Boulder, CO 80302 US

Institution Phone: 720-352-3227

Classroom/Office Extension:

Institution Fax:

Institution Website: <https://projectpossum.org>

Other relevant websites: <https://projectpossum.org/the-possum-13/> Hashtag: @yarinaut on Facebook, Twitter, and Instagram LinkedIn:

<https://www.linkedin.com/in/yajaira-sierra-sastre-phd-2728396/> <https://teachers-in-space.com/2016-2018-flight-experience-program/perlan-cubesat-participant-thomas-armstrong-toro-high-school/>

Supervisor's Name: Dr. Jason Reimuller

Supervisor's Email Address: Jason.reimuller@projectpossum.org

2. Demographic Information

a. Gender: Female

Race: Hispanic or Latino, Multiracial

c. Briefly describe your primary audience and surrounding community (e.g. K-12, public, rural/urban, technology access, economics): - Middle and high school students from public schools in Puerto Rico and Latin American countries - Hispanic community in US mainland - Community-led programs such as MakerSpace and robotic clubs - Smithsonian museums

d. Type of School (or students you work with): Public

Other Type of School

e. What is the population of your annual audience or school (estimates are fine) 300

f. School Ethnicity:

% - American Indian or Alaska Native

5 % - Asian

15 % - Black or African American

70 % - Hispanic or Latino

% - Native Hawaiian or Other Pacific Islander

10 % - White

% - Multiracial

If your school uses other categories to describe race/ethnicity, please describe:

g. Percentage of students who receive free or reduced lunch: 100

h. Average class or audience size 50

i. Total number of students/audiences you teach in a year 300

j. If known, what are the approximate start and end dates of your school year or primary programs, etc. ? Include major professional vacation periods. i.e. Christmas break, summer break, etc.

3. Teaching Experience and Education

a. What type of university degree or other academic experience or qualifications do you have?

Bachelor's Degree (Major): Chemistry

Bachelor's Degree (Minor): Science Education, Teacher's Certification

Masters Degree (Discipline): Bioanalytical Chemistry

PhD Degree (Discipline): Materials Science and Nanotechnology

Other Degree: Post-graduate courses in Environmental Health, Planetary Geology, Aeronomy (Mesosphere)

b. How many years of education experience do you have?: 5 years of teaching experience at K-12 and college levels, 7 years of informal science education and public outreach

c. How many years have you been working at your current institution?: 2

d. List up to 10 relevant professional licenses, certifications, registrations, awards or honors that you have received in your profession::

1. Highest score in the 2000 Specialty Science Test for Teacher's Certification in Puerto Rico
2. University of Puerto Rico Alumni Association (UPRAA) - recognized for her career contributions and mentoring initiatives (Washington, DC), 12/2018
3. Senate of Puerto Rico - recognized for her scientific contributions, mentoring initiatives, and community service. (Arroyo, PR), 05/2017
4. National Hispanics Corporate Achievers Award (New York, NY), 10/2012 - the organization highlights Hispanic leaders and role models in America (New York, NY), 10/2012
5. Highly Qualified Astronaut Candidate Applicant, 2013 and 2016
6. Cornell Research Provost's Diversity Fellowship, 2008
7. 2016 Aspen Ideas Festival Scholar - Selected from a very competitive list of nominations to participate in the Leadership Festival. Three hundred (300) leaders from United States and 30 different countries were selected for their accomplishments and ability to transform ideas into action (Aspen, CO), 06/2016
8. NASA University Center Research Fellowship, 2003-2004
9. Latinos Making a Difference - Featured online by MSN Latino along with Justice Sonia Sotomayor and Eva Longoria, 09/2013

4. Professional Assignment

a. What is your primary education assignment? Check all that apply Middle School (Grades 6-8), Secondary (Grades 9-12), Informal Education (Science or Nature Center, Museum, etc.), Community, Vocational, or Technical College, Four-Year College or Institution

Other Primary Assignment

b. What subjects do you teach? Check all Middle School Math, Middle School Science, Secondary Chemistry, Secondary Physical Science

Other Subjects

5. Motivation for Participation

a. What motivates you to apply to PolarTREC and professionally, what do you hope to gain from the experience? (200 words maximum)

I am a teacher-turned scientist and for the past seven years I have been dedicated to building coalitions between K-12 students, researchers, makers, and educators for the advancement of citizen science initiatives in Puerto Rico and Latin America. I am also an aspiring astronaut, who dreams of becoming the first Puerto Rican woman to fly to space. I see my quest to reach the stars as a way to inspire the next generation of STEM professionals: to choose to be bold, to be the first, and to go where no one (like you) has gone before. I was extremely inspired to apply to PolarTREC by Prof. Armando Caussade, a former alumni from this program and first Puerto Rican to visit the South Pole research station. As a scientist, I am motivated to contribute to polar science. As an explorer, I am driven to the adventure of reaching these far-away and extreme environments. As an informal science educator, I have witnessed how both science and exploration can ignite the curiosity within students to explore the unknowns. I hope to utilize this experience to inspire Latinx students to consider working in STEM careers.

b. Aside from journaling/blogging, online photos, and webinars which all part of our program requirements, describe your ideas on how you will share this experience in your classroom or with the audiences you work with. (200 words maximum)

As part of my science education activities, I frequently Skype or visit classrooms in public schools and Hispanic serving institutions. I have led and coordinated science workshops, oral presentations and hands-on demonstrations for K-12 students and plan to leverage my network with numerous organizations to further my reach. But I have a more ambitious project and would love PolarTREC to be a part of it. Many Latina scientists remain hidden figures and their documented contributions and scientific biographies remain scarce. I plan to publish a self-biography and scientific journey 'from the bench to planet Mars'. I once was part of a simulated Mars mission on Mauna Loa volcano in Hawaii. I have also tested space technologies in moon-analog locations and Antarctica is the ultimate analog environment. I plan to use storytelling in my book and intertwine scientific concepts with personal life experiences about resilience and grit in these extreme environments. I would like to inspire Latinx students to boldly go and pursue their wildest dreams.

c. Describe how you envision sharing your experience with other educators, your personal and professional communities, and the general public. (200 words maximum)

I currently volunteer with various non-profit organizations for the public understanding of science. One of those organizations is Ciencia Puerto Rico, a web-based platform focused on informal science education through partnerships with media outlets and local schools districts. The organization has increased culturally-relevant scientific content and information about Puerto Rican scientists, locally and globally, through the publication of news articles, podcasts, and K-12 science curriculum. Contextualizing the impact of climate change from the Caribbean to the poles will make this conversation more relevant to communities still underrepresented in this field. I am also part of Project PoSSUM (Polar Suborbital Science in the Upper Mesosphere), an astronautics research and education program studying the upper atmosphere and its role in climate change. I recently helped launched PoSSUM 13, a new initiative dedicated to increasing representation of female K-12 students through STEM outreach and a mentoring program. Additionally, I volunteer at outreach events at various Smithsonian museums and manage several social media platforms with a total of ~8,000 followers. I plan to leverage these professional communities as well as social media to share my PolarTREC experience.

d. Describe how you currently engage your audience and facilitate learning when educating on new and complex topics, concepts, or issues. (200 words maximum)

My science education initiatives employ project-based learning when engaging with students. Since my work is largely focused on science education outside the classroom, independence and initiative are nurtured from project launch to culmination. I match students with research mentors, mainly local researchers who employ instructional strategies to help them navigate new concepts. As part of the PoSSUM 13 initiative, for instance, students have to formulate a research question, practice STEM skills in relevant scenarios (e.g., writing scientific protocols, designing experiments, etc.) and build a payload to investigate physical phenomena in microgravity. Since the organization is focused on diversity and inclusion, it is essential for our mission to enhance the learning experience by making the science relevant to the individual's language, context, and culture. Another example is a CubeSat project I led in collaboration with a makerspace. The project involved experiential learning in areas of computer programming, digital fabrication, and equipment assembly. I facilitated mentoring sessions for a team of scientists, students, educators, and community volunteers located in different geographic locations. The air sampling apparatus flew on board a high-altitude glider.

e. Describe the particular strengths you would bring to the PolarTREC program and to a field research team. (200 words maximum)

I have a multidisciplinary background in materials chemistry, microbiology, bioastronautics, and human factors. I have also participated in field geology, worked as a project manager, and led research teams in isolated and remote environments. I will be able to actively contribute to research teams by collecting samples, analyzing data, and operating equipment. I am also a bilingual science communicator and envision bringing this strength to share my experience in the program in both languages.

f. Using examples from your own experience including your role and the contributions you made to a team effort, describe how you work as a member of a team. (200 words maximum)

Throughout my teaching and science career I have contributed to teams in different roles. I have been a team leader, a follower, a collaborator, and facilitator. During my participation in a simulated Mars mission, I led and managed research operations for the program. I was responsible with keeping my crewmates committed to the mission objectives, as well as assigning tasks and prioritizing activities to stay on schedule. But I also played a supporting role running experiments and gathering data for other investigators. As an informal science educator, I have played supporting roles assisting organizations in developing curriculum and media content. I have applied my science communication skills in the creation of educational videos about astronomy and the contributions of Puerto Ricans to the field of space exploration. I was also the coordinator of a cross-functional team of scientists, students, teachers and technology hobbyists who successfully designed and ran an experiment on a high altitude flight, in collaborations with the Perlan Project. Being both a teacher and a scientist has allowed me to apply the scientific method to consider all perspectives that are brought to the table. In all cases, I truly enjoy serving others, building relationships, and working in multidisciplinary teams.

6. Communicating the Experience and Science

Write your journal entry for the general/lay audience. (200 words maximum)

Last week we celebrated Astronaut Jessica Meir's departure on a six-month mission to the International Space Station. By cosmic coincidence, the PoSSUM 13 initiative was also counting down the days for an 'out-of-this-world' adventure. PoSSUM 13 is a group of thirteen global ambassadors dedicated to increasing female representation, particularly young students, in space research. A 16-year-old Colombian student won this year's campaign and was awarded with the opportunity to experience weightlessness in an airplane that makes up-down-up maneuvers called parabolas. These parabolas allow scientists to conduct research during periods of increased gravity or weightlessness. The excitement was immense, but so were the challenges, as time was running out for the student's VISA to be processed prior to her trip to Canada. Finally, we received the great news last Friday that her VISA was issued, ensuring the student's participation in the program. The dreams and hopes of hundreds of young women were hitching a ride with astronaut Meir on her first trip to space. Meanwhile, back here on Earth, initiatives like PoSSUM 13 continue to promote scientific cooperation, by overcoming geographic, generational, and cultural divides as we engage underrepresented communities in space science.

7. Scientific Interests and Research Area Preference

a. Where would you prefer to go on an expedition? Antarctic

Please explain your preference

Due to other commitments, I will only be able to join an expedition between September and February.

b. How long would you prefer to participate in an expedition? (Most expeditions are AT LEAST three weeks.) List any dates or periods of time when you are NOT able to participate in a field expedition

I will be available to join the longest expedition (six weeks) if necessary.

c. Briefly describe your scientific interests. Which scientific topics interest you the most and why? Please note that climate change has become part of nearly all expeditions so you may choose to be more specific about this topic, if applicable. (200 words maximum)

The scientific areas that interest me the most are astrophysics, geospace, and astrobiology. I am interested in learning more about cosmic background radiation, cosmic-rays, and subatomic particle physics such as neutrinos. While these topics have always sparked public curiosity about the evolution of the cosmos, astrophysics can be used as a vehicle to teach chemistry concepts. Getting exposed to this research will allow me to build upon the work conducted by Prof. Armando Caussade during his participation in the IceCube program. Research in astrobiology, microbial ecosystems, genomics, or the search for life in extreme environments also aligns with my current research interests and skills. In addition, research about the role of the Antarctic upper atmosphere in global environmental processes will help me contribute to Project PoSSUM's education initiatives.

Atmospheric Systems I would really enjoy an expedition in this subject area

Cryospheric Systems I would really enjoy an expedition in this subject area

Human and Social Systems I am somewhat interested in this subject area

Marine Systems I am somewhat interested in this subject area

Terrestrial Systems I do not want to be considered for an expedition in this subject area

Ecology and Biotic Systems I do not want to be considered for an expedition in

this subject area

Physics or Space Sciences I would really enjoy an expedition in this subject area

Engineering and Technology I am somewhat interested in this subject area

Other (please specify)

Other Areas of Scientific Interest

Adaptations to Life in Extreme Cold and Prolonged Darkness

e. Are you applying to work exclusively with a specific researcher? If yes, please list their full name, institution, and email address. (200 words maximum)

No

8. Background Information and Skills

a. Briefly describe your outdoor skills or experiences.

Open water SCUBA certification (including dry suit certification) ~25 dives, hypoxia training, camping, hiking, and running. Have done ice climbing in Iceland, snorkeling in Silfra, and have traversed lava fields while wearing simulated spacesuits.

Experience with high-G aerobatic flights. Experience with long duration space analog missions in confinement and isolation on Mauna Loa, Utah desert, and the San Francisco Volcanic Field.

b. Provide a basic statement of your general health and physical condition.

I am physically active and do strength training 4 times per week. I also run and do high intensity cardio training 3 times per week. I have passed extensive medical evaluations for NASA's Human Research Programs.

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.

I am technically proficient with both operating systems and use them on a daily basis.

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.

Laptop and desktop computers (e.g., Word, Excel, Power Point, Internet) for presentations, tabulating data, etc. iMovie - to create/edit videos GoPro Cameras, digital cameras

e. List any additional skills or information that you wish to be considered.

Fully bilingual: English and Spanish Proficient with multiple lab techniques: spectroscopy, chemistry, microscopy, microbiology, etc.

9. Previous Applications & Participation

a. Have you previously participated in a teacher research experience (e.g. NOAA Teacher at Sea, Earth Watch)? We do not accept applications from PolarTREC alumni. Yes

Program Information 2002 Summer Research Experience for Teachers at Stanford University

If yes, did you complete all program requirements? Yes

If yes, how do you see the PolarTREC professional development opportunity continuing to develop your professional skills, or how will it build on your previous research experiences?

My summer research experience at Stanford University was a pivotal point in my career as a scientist and formal educator. I was a high school chemistry teacher back then and this summer experience empowered me and sparked my interest for research. I have since become a scientist but I will always be a teacher at heart. The two careers are equal parts of my identity. From exploring the properties of nanomaterials to evaluating life support systems for future missions to Mars, I am always excited about pushing the boundaries of exploration. When reaching out to students in all my informal education activities I have found it extremely valuable to be able to call on the different experiences to help them rediscover the pleasure of finding things out. It helps students understand that science is not as compartmentalized as they may think. PolarTREC will add to this diversity of stories that I can share with students and the general public.

10. Orientation Availability

Are you available to attend the Orientation during this time period? Yes

If no, please explain

11. How did you hear about PolarTREC?

Email listserve. Please provide the name and/or URL

Friend or colleague. Provide a name if you wish

Former PolarTREC, TREC, or TEA teacher. Please provide their name

Dr. Sian Proctor Prof. Armando Caussade

From a website. Please list the website name and URL

Conference or presentation. Please list the venue and/or presentation title

Other (please explain)

b. Please suggest other places we might advertise this opportunity for teachers

12. References

Reference 1

Name Giovanna Guerrero-Medina

Title and affiliation Executive Director, Ciencia Puerto Rico/Yale Center for Scientific Teaching

Email Address giovanna.guerrero-medina@yale.edu

Phone Number 616-643-7666

Reference 2

Name Dr. Jason Reimuller

Title and affiliation CEO, Integrated Spaceflight Services

Email Address Jason.Reimuller@integratedspaceflight.com

Phone Number 720-352-3227

Reference 3

Name Dr. Sian Proctor

Title and affiliation Geology Faculty Professor, South Mountain Community College

Email Address sian.proctor@southmountaincc.edu

Phone Number 480-216-7347

2020-2021 PolarTREC Educator Application

Lindsey Smaka

1. Contact Information

Name: Lindsey Smaka

Email: lindsey.smaka@gmail.com

Home Address:

1477 Hoyt Ave W

Falcon Heights, MN 55108 US

Home Phone: 952-457-7669

Cell Phone : 952-457-7669

Institution Name: Edina High School

Institution Address:

6754 Valley View Rd

Edina, MN 55439 US

Institution Phone: 952-848-3800

Classroom/Office Extension: 952-848-3115

Institution Fax:

Institution Website: www.edinaschools.org

Other relevant websites: <https://lindseysmaka.wixsite.com/globaled>

Supervisor's Name: Andrew Beaton

Supervisor's Email Address: andrew.beaton@edinaschools.org

2. Demographic Information

a. Gender: Female

Race: White

c. Briefly describe your primary audience and surrounding community (e.g. K-12, public, rural/urban, technology access, economics): Edina High School is a comprehensive four-year high school in Edina, Minnesota (a suburb of Minneapolis) with a graduation rate at approximately 82%. Edina Public Schools is a single high school district, located in a community that is supportive. Our community of families partner with us to share their expertise, time and resources to our school. Edina Public Schools serves a large portion of the City of Edina, a first-tier Minneapolis suburb of approximately 47,900 residents. It is a nationally recognized suburban public school that serves approximately 8,500 students. There are two elementary schools that qualify for Title I, but the high school itself does not. Edina High School is a 1:1 school where students bring their own device (laptop or chromebook). Students on Free/Reduced Lunch are provided a device. The Edina High School student culture is one that fosters excellence in academics, athletics and the arts with an active presence in the community. Edina High School wants to foster students to see themselves as future leaders with the capacity to tackle problems and answer questions around the globe. Edina High School embraces the district's All for All mission working in partnership with families and the community, to educate all individuals to be responsible, lifelong learner who possess the skills, knowledge, creativity, sense of self-worth, and ethical values necessary to thrive in a rapidly changing, culturally diverse, global society.

d. Type of School (or students you work with): Public

Other Type of School

e. What is the population of your annual audience or school (estimates are fine) Approximately 2,740

f. School Ethnicity:

% - American Indian or Alaska Native

% - Asian

% - Black or African American

% - Hispanic or Latino

% - Native Hawaiian or Other Pacific Islander

% - White

% - Multiracial

If your school uses other categories to describe race/ethnicity, please

describe: Edina High School reports 76% white and 24% students identify minority status.

g. Percentage of students who receive free or reduced lunch: 9

h. Average class or audience size 31

i. Total number of students/audiences you teach in a year 155

j. If known, what are the approximate start and end dates of your school year or primary programs, etc. ? Include major professional vacation periods. i.e. Christmas break, summer break, etc.

The end date of the 2019-2020 school year is June 2, 2020. The calendar for the 2020-2021 school year is not finalized.

3. Teaching Experience and Education

a. What type of university degree or other academic experience or qualifications do you have?

Bachelor's Degree (Major): Bachelor of Science, Chemistry

Bachelor's Degree (Minor): Bachelor of Arts, German Studies

Masters Degree (Discipline): Master of Education, Science

PhD Degree (Discipline):

Other Degree:

b. How many years of education experience do you have?: 9

c. How many years have you been working at your current institution?: 6

d. List up to 10 relevant professional licenses, certifications, registrations, awards or honors that you have received in your profession::

Fulbright Teachers for Global Classrooms Fellow National Geographic Certified Educator National Geographic Educator Certification Guide ESL for Mainstream Teachers Certification

4. Professional Assignment

a. What is your primary education assignment? Check all that apply

Secondary (Grades 9-12)

Other Primary Assignment

b. What subjects do you teach? Check all Secondary Chemistry, Secondary

General Science

Other Subjects

5. Motivation for Participation

a. What motivates you to apply to PolarTREC and professionally, what do you hope to gain from the experience? (200 words maximum)

I love both teaching and the outdoors and this would be a chance to combine my two passions. I dream of going to these regions of the globe. Growing up in the midwest, I have a strong connection with snow, in fact I would call it one of my passions. Personally, I am a life-long learner of all things outdoors and I hope to learn more about these environments. I performed a lot of research in college and I think it would be amazing to step back into the role of researcher, especially if I can help these portions of the world. I will bring all of these lessons back to my classroom and inspire students. I am passionate about environmental and try to bring these into my curriculum as much as possible. I seek out current real world environmental and global issues that I can tie to my content. I wish to show students how science is an internationally collaborative field. I hope to learn scientific content from this experience that I can bring into my classroom, which will bring relevance to the standards taught. I also hope to form long-term connections. It would be amazing to form life-long partnerships to utilize in my classroom well beyond this experience.

b. Aside from journaling/blogging, online photos, and webinars which all part of our program requirements, describe your ideas on how you will share this experience in your classroom or with the audiences you work with. (200 words maximum)

In addition to just sharing the day-to-day experiences of the expedition with my classes, I hope to use concepts I learn within the curriculum, by integrating scientific content and research. One idea I have is to teach with a model. I would show data or a photo from the expedition and have students ask questions or theorize what is happening scientifically in this model. From here, content will be taught. Seeing this model first will give the content so much more meaning. From what I learn in the poles, I also wish to make connections to similar research happening locally here in Minnesota. Students can compare and contrast the research. By including the local perspective, the research happening on the poles has more meaning for the students. I wish to form a long-term partnership with the researcher I work with to continue including students in the future in the work being done in the poles. Having students involved in the real-time research would be an amazing way to share what is happening at the poles. I hope to actively include the people I meet on the expedition in lessons (Skype, FlipGrid or having students help analyze data).

c. Describe how you envision sharing your experience with other educators, your personal and professional communities, and the general

public. (200 words maximum)

This experience would help spread the word about threats to our poles and work currently being done there. Outside of the science community, threats, geography and science of these regions are not well know. Personally, I hope to learn facts to become an ambassador for how we can work together as a globe to help the poles. Even though I am one person, I do have a voice that can spread to multiple people and beyond. I plan on blogging my whole experience to share with the larger community and staying active on social media to share my experience. I currently try to stay active on twitter and Instagram to make connections and share my teaching experiences with the greater Minnesota community and educator's community. I would also share my experience with my fellow educators with staff development trainings. I have led numerous workshops for my colleagues, both at the high school and other schools in the district. I would love to share the knowledge that I learn from this expedition. In our school, we have Professional Learning Communities, so I plan to share my experience with my Chemistry and Science team.

d. Describe how you currently engage your audience and facilitate learning when educating on new and complex topics, concepts, or issues. (200 words maximum)

I currently engage my students in many ways including incorporating the UN Sustainable Development Goals (SDGs) and Green Chemistry into the curriculum. Students are introduced to the SDGs, and then each unit of the chemistry course is tied to a SDG. Students come up with their own ideas has to how chemistry can help achieve the global goals and which SDG the concept is tied to. In addition to this, I bring in current events and youth culture that are relevant to the content. For example, when teaching about bioplastics, students read about the positives and negatives of this material. From here, students synthesize their own biodegradable plastic to replace a single-use plastic item. Another example is the gas laws unit. I bring in my love of SCUBA diving into the curriculum. Students learn the gas laws through the lens of scuba diving and fish. I teach Boyle's law by showing students how swim bladders work in a fish. After learning the gas laws, students research the deep-water fishing and the effects it has both environmentally and economically. I really believe that the more passionate I am about the content, the more students get excited about chemistry and therefore learn.

e. Describe the particular strengths you would bring to the PolarTREC program and to a field research team. (200 words maximum)

I have a strong passion for environmental science and conservation. I bring a unique

lens with the discipline of chemistry. Chemistry is very intertwined and imperative for many aspects of environmental research. The more we understand what is happening at the molecular level, the better we can extrapolate to the biological level. I work extremely hard in all aspects of my life and thrive in the outdoors. I have strong communication skills and am very dedicated. I love my career of teaching and work to open opportunities for my students to thrive. I will bring an upbeat personality and positive attitude to the expedition. I am an optimist at heart, which means I do not give up very easily. I will keep trying until we succeed or find a new way to complete the task. I work very well in a team and with people from all parts of the globe. I am a strong believer in taking things as they come and adapting to the situation at hand. I am extremely flexible on the fly and can think on my feet. When new things come my way, I am easily able to analyze and integrate into my life.

f. Using examples from your own experience including your role and the contributions you made to a team effort, describe how you work as a member of a team. (200 words maximum)

I have been in the role of both team leader and team member. I believe both are equally important. I am flexible, while still voicing my ideas. Big successes usually come from very good communication and collaboration of multiple ideas coming together into one. Everyone comes with different backgrounds and experiences even if they are from the same country, so it is important to hear varying and valuable perspectives. We meet as a chemistry team once a week. I ensure that everyone stays on task; everyone's voice is heard and communicating effectively.

Communication is one of the most important things for a team to be effective. I have very good written and verbal communication skills. I was part of a team with a Moroccan and American teacher while I was teaching abroad in Morocco. During this process, teamwork was imperative. We designed and implemented lessons with extremely limited resources. Working with people from across the globe required cross-cultural communication skills. I was able to think fast on my feet in stressful situations and hold the team together. I have been working hard at these skills. I have experience communicating effectively with people from all over the globe.

6. Communicating the Experience and Science

Write your journal entry for the general/lay audience. (200 words maximum)

L'étoile du nord Growing up in the Midwest seasoned me to endure many things - including the weather. 80 degrees one day and the next, shoveling snow. However, I love the changing seasons. I am obnoxiously proud to be from the "North Star State"! I spent last weekend "up north" in Duluth, Minnesota. Minnesotans refer to any type of travel north, whether it be one mile or two hundred miles - as going "up north" - and we LOVE weekends up there! Duluth is nestled on the southern edge of Lake Superior and in its prime time now - autumn. The landscape is speckled in shades of gold, orange and crimson. All against the magnificent blue backdrop of the giant lake. We spent the day hiking through forests lining the lake. We navigated the birch and oak trees while leaves fell through the sunshine overhead, breathing in the crisp, cool air. We climbed boulders at Agate Beach, jumping from between rocks while trying to not fall into the 41-degree water. We would not have cared even if we did! The sky soon changed from brilliant blue to cotton candy pink and purple while we watched the sun drop into the glistening lake.

7. Scientific Interests and Research Area Preference

a. Where would you prefer to go on an expedition? Either

Please explain your preference

I prefer Antarctica, as it has always been my dream. However I am open to both locations.

b. How long would you prefer to participate in an expedition? (Most expeditions are AT LEAST three weeks.) List any dates or periods of time when you are NOT able to participate in a field expedition

3 weeks - 4 weeks 19 June, 2020 - 6 July, 2020

c. Briefly describe your scientific interests. Which scientific topics interest you the most and why? Please note that climate change has become part of nearly all expeditions so you may choose to be more specific about this topic, if applicable. (200 words maximum)

I teach chemistry and have always had a passion for plastics. I focused and had a strong passion for polymers in my studies. I researched biorenewable plastics, in particular PLA (polylactic acid) for my undergraduate research. I focused on degradation rates of PLA in the environment. I also worked on synthesizing PLA to create properties to mimic every day materials as a replacement to oil-based polymers. My passion evolved towards environmental effects of plastics around the globe. A topic that interests me is plastics effect on wildlife, in particular consumption by birds and sea life. I also have an interest on microplastics, in particular how far it has reached. After travelling with students on conservation research expeditions, I am extremely interested in native biotic systems and how invasive species affect this system. Since becoming SCUBA certified, I now have a strong passion for the oceans. I am interested in ocean acidification the analysis of CO₂ and carbonate presence in sea waters and how this is affecting marine life. After witnessing this first hand and meeting indigenous communities, I now have a strong interest in conservation's relationship to indigenous communities. I am interested in how indigenous communities are involved in the conservation process and if it is harming their culture.

Atmospheric Systems I am somewhat interested in this subject area

Cryospheric Systems I am somewhat interested in this subject area

Human and Social Systems I would really enjoy an expedition in this subject area

Marine Systems I would really enjoy an expedition in this subject area

Terrestrial Systems I am somewhat interested in this subject area

Ecology and Biotic Systems I would really enjoy an expedition in this subject area

Physics or Space Sciences I am somewhat interested in this subject area

Engineering and Technology I am somewhat interested in this subject area

Other (please specify) I am somewhat interested in this subject area

Other Areas of Scientific Interest

Plastics and human effect on these regions

e. Are you applying to work exclusively with a specific researcher? If yes, please list their full name, institution, and email address. (200 words maximum)

No

8. Background Information and Skills

a. Briefly describe your outdoor skills or experiences.

I grew up in a small town in Wisconsin and spent the majority of my time outdoors. I have done extensive camping and informal explorations. Growing up in land-locked Midwest I did not see the ocean much, but we boated very frequently on all of the lakes. I spent a lot of time in the water. I enjoy hiking and backpacking and frequent our State Parks. I travel with students on two-week expeditions where we were very remote with no cell service. I am very comfortable being completely off the grid and living off the land. The expeditions consisted of extensive hiking with our packs and conservation surveys.

b. Provide a basic statement of your general health and physical condition.

I am in very good health and physical condition. I have had no major illnesses or history of illness.

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.

I am most familiar with a PC. I am very skilled in all aspects of the PC. I am also familiar with the MAC operation system and can navigate it fairly well.

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.

On a daily basis, I use a laptop PC. I am very familiar with Google and Google Drive including docs, sheets, slides, maps etc. I am very well versed in Excel and PowerPoint. I regularly use my DSLR camera.

e. List any additional skills or information that you wish to be considered.

Proficient in German

9. Previous Applications & Participation

a. Have you previously participated in a teacher research experience (e.g. NOAA Teacher at Sea, Earth Watch)? We do not accept applications from PolarTREC alumni. No

Program Information

If yes, did you complete all program requirements?

If yes, how do you see the PolarTREC professional development opportunity continuing to develop your professional skills, or how will it build on your previous research experiences?

10. Orientation Availability

Are you available to attend the Orientation during this time period? Yes

If no, please explain

11. How did you hear about PolarTREC?

Email listserve. Please provide the name and/or URL

Friend or colleague. Provide a name if you wish

Former PolarTREC, TREC, or TEA teacher. Please provide their name

From a website. Please list the website name and URL

Conference or presentation. Please list the venue and/or presentation title

Other (please explain)

National Geographic Community

b. Please suggest other places we might advertise this opportunity for teachers

NSTA

12. References

Reference 1

Name Andrew Beaton

Title and affiliation Principal, Edina High School

Email Address andrew.beaton@edinaschools.org

Phone Number 952-848-3899

Reference 2

Name Deanne Moore

Title and affiliation Course Instructor, Fulbright Teachers for Global Classrooms

Email Address deannemariemoore@gmail.com

Phone Number 617-968-5666

Reference 3

Name Sabina Sully

Title and affiliation Teacher, Baltimore City Schools (Travelling co-teacher to Morocco)

Email Address sabinasully@gmail.com

Phone Number 412-996-3912

2020-2021 PolarTREC Educator Application

Adam Smith

1. Contact Information

Name: Mr. Adam Smith

Email: adamoftoday@gmail.com

Home Address:

1622 Stella Ln

Hood River, OR 97031 US

Home Phone: (503) 758-6925

Cell Phone : (503) 758-6925

Institution Name: Hood River Middle School

Institution Address:

1602 May Street

Hood River, OR 97031 US

Institution Phone: (541) 386-2114

Classroom/Office Extension: 3956

Institution Fax: (541) 387-5070

Institution Website: <https://www.hoodriver.k12.or.us/Domain/269>

Other relevant websites: My teacher website: bit.ly/smithHRMS Eagle Creek Fire film: <https://vimeo.com/264888957> My personal website: <https://sites.google.com/view/adam-of-today/home> A blog of my expedition to Svalbard: <https://arcticadam.wordpress.com/>

Supervisor's Name: Brent Emmons

Supervisor's Email Address: brent.emmons@hoodriver.k12.or.us

2. Demographic Information

a. Gender: Male

Race: White

c. Briefly describe your primary audience and surrounding community (e.g. K-12, public, rural/urban, technology access, economics): Hood River is a small semi-rural town in the Columbia River Gorge, right in the middle of the Cascade Mountain Range. While it is a small community, the economics are fairly diverse. The dominant economic driver is agriculture, with a particular emphasis on orchards (namely pear and apple). Technology and tourism are also significant aspects of our community's economy. Regarding technology access, our school is fairly up-to-date with classrooms having a 1-to-1 ratio of iPads to students. In the broader community, however, diverse socioeconomic backgrounds make universal access to technology hit or miss in the home context.

d. Type of School (or students you work with): Public

Other Type of School

e. What is the population of your annual audience or school (estimates are fine) 600

f. School Ethnicity:

1 % - American Indian or Alaska Native

1 % - Asian

1 % - Black or African American

32 % - Hispanic or Latino

0.5 % - Native Hawaiian or Other Pacific Islander

59.5 % - White

5 % - Multiracial

If your school uses other categories to describe race/ethnicity, please describe:

g. Percentage of students who receive free or reduced lunch: 50

h. Average class or audience size 28

i. Total number of students/audiences you teach in a year 240

j. If known, what are the approximate start and end dates of your school year or primary programs, etc. ? Include major professional vacation

periods. i.e. Christmas break, summer break, etc.

Aug 27, 2019, Teachers Start Sept 3, 2019, Students Start Dec 21, 2019 - Jan 5, 2020, Winter Break Mar 21-29, 2020, Spring Break June 12, 2020, Last Day

3. Teaching Experience and Education

a. What type of university degree or other academic experience or qualifications do you have?

Bachelor's Degree (Major): Nature and Culture

Bachelor's Degree (Minor): Cultural Anthropology

Masters Degree (Discipline): Science Teaching

PhD Degree (Discipline):

Other Degree:

b. How many years of education experience do you have?: 9

c. How many years have you been working at your current institution?: 9

d. List up to 10 relevant professional licenses, certifications, registrations, awards or honors that you have received in your profession::

Professional Teaching License, PreK-12, in Integrated Science, Foundational Mathematics, Foundational English Language Arts, and Foundational Social Studies
Albert Einstein Distinguished Educator Fellow placed at the National Science Foundation, Sept 2016-July 2017 National Geographic Grosvenor Teacher Fellow to Svalbard, Norway, Summer 2014 Participant in the Fulbright Japan-U.S. Teacher Exchange Program for Education for Sustainable Development, summer 2012 NSTA member 2009-present Selected to participate in Oregon State University's Professional Development Working Group to promote Outdoor School for all 5th or 6th graders in the state of Oregon

4. Professional Assignment

a. What is your primary education assignment? Check all that apply Middle School (Grades 6-8)

Other Primary Assignment

b. What subjects do you teach? Check all Middle School Science

Other Subjects Photography, Ukulele

5. Motivation for Participation

a. What motivates you to apply to PolarTREC and professionally, what do you hope to gain from the experience? (200 words maximum)

I often tell my students “science is a verb”, and to be sure, participating in a PolarTREC project would be a remarkable way of showing my students the veracity of this statement. As a middle school science teacher I love finding ways of bringing a sense of exploration and curiosity to my students while also developing concrete skills. Increasing my capacity to teach science and geography in an engaging and informed way is also a driving force in my professional development. I’m particularly drawn to doing this work in our planet’s polar regions. Not only are they stunning landscapes, but their sensitivity to change also makes them extraordinary laboratories for learning about systems that impact our whole planet. Indeed, for several years my 6th-grade students investigated the polar regions and developed an immersive museum experience for community visitors to help explain the causes of climate change, its impact at the poles, and how that, in turn, affects us. My previous time spent in Svalbard helped take this to the next level. Now, teaching 7th and 8th grade I’m eager to have an immersive science-based experience in these regions to help ignite curiosity for my students and our community.

b. Aside from journaling/blogging, online photos, and webinars which all part of our program requirements, describe your ideas on how you will share this experience in your classroom or with the audiences you work with. (200 words maximum)

Middle School is a fantastic time for students to expand their love and understanding of their corner of the planet to the broader world. Explorations of the high latitudes provide a compelling counterpoint for students to see the commonalities and unique differences between these places and their community. During seventh grade, students investigate how people are connected to the planet via the lithosphere, atmosphere, and hydrosphere, each holding strong possibilities for connecting to the poles. It would be fascinating, for instance, to compare the water quality of the polar regions with the water quality analysis my students do in our watershed. A PolarTREC project could help also help bolster students' understanding of the atmosphere and the impacts of its warming, a common theme connected to our local glaciers. The polar regions are also a wonderland geologically and could be used to underscore investigations into plate tectonics, volcanology, glaciology, and so forth. Throughout their investigations, there is a heavy emphasis on citizen science and how STEM professionals share their discoveries with the broader community, and I

would continue my work in helping students to tell the stories of their community and the wider world.

c. Describe how you envision sharing your experience with other educators, your personal and professional communities, and the general public. (200 words maximum)

I would like to share via social media images and lessons I create from the project with my network of colleagues from around the world who have participated through programs such as Fulbright, National Geographic's Grosvenor Teacher Fellowship, the Albert Einstein Fellowship, and the University of Washington's DIG Field School. To date, the sharing of ideas and resources in this way has been very fruitful not only in the US but Canada and Japan as well! Beyond this I would write a photo essay for the local newspaper and deliver a presentation to my local school board, showcasing the PolarTREC program and how it is impacting our students. I would also plan to present a session at an NSTA or more local OSTA conference. Further, my school district allows for flexible in-service opportunities where teachers lead workshops. I would enjoy teaching a workshop on project-based learning as linked to my experiences in the field. Finally, I would love to use my experience to connect with local scientists investigating local impacts of climate change (i.e. wildfires, and glaciers in the Cascade Mountains).

d. Describe how you currently engage your audience and facilitate learning when educating on new and complex topics, concepts, or issues. (200 words maximum)

Humans crave knowledge. We love to learn. Unfortunately, many students have been fooled into believing that school is just a place to jump through hoops often resulting in frustration. While learning ought to be challenging, it is crucial to present opportunities for intellectual growth that meet students where they're at. By carefully assessing students' prior knowledge and getting a sense of their interests we can co-create projects that compel students to find answers to questions that they want to explore. I endeavor to stimulate multiple learning types. I make time for kinesthetic learning activities, art projects, appropriate reading selections, and relevant games. As a favorite teacher of mine once said, "If your butt is asleep, so is your brain." We also make time for quiet, structured reflection. Approaching complex topics from multiple angles and with repetition allows students to be steeped not only in the content but in the act of doing science. Learning extends outside of school with a quarterly "science menu" where students venture further outside of our core curriculum to pursue their science interests. These include everything from artistic science communication projects to science-related movie reviews and the

increasingly popular community river restorations.

e. Describe the particular strengths you would bring to the PolarTREC program and to a field research team. (200 words maximum)

I have many skills that lend themselves well to a PolarTREC project. To begin, I am a leader of many STEM activities in my school and district, often taking the initial steps to start a new project. One example of this is a high altitude weather balloon my students and I began that resulted in two successful launches. I am also a natural collaborator. Working with others is often where the best ideas come from. In the case of the weather balloon project, I partnered with my school's engineering teacher to create a parallel lesson that her students were working on and thus increased the total number of students who got to participate in the project. Finding success in these endeavors requires a variety of skills including the ability to listen, communicate your ideas, and stay organized. Finally, I have a great sense of humor and can work with a positive attitude even when things are tough, a mindset I know can be valuable in the field. I also have experience as a leader at the national level, having served as an Albert Einstein Distinguished Educator Fellow at NSF and continuing to help out on panels.

f. Using examples from your own experience including your role and the contributions you made to a team effort, describe how you work as a member of a team. (200 words maximum)

One of the most empowering events of 6th grade is Outdoor School. Before state funding, most schools in Oregon did not participate in tough budgets, testing demands, and dwindling resources. Despite these challenges, my team fought hard to keep the program going. We were able to accomplish this through a focused team effort, including not only educators and administrators, but also leveraging parental volunteer support and incorporating high school leaders. For my part, I developed and led a geomorphology unit which included a 2.5-hour field study in the shadow of Mt. Hood as our students got dirty learning about volcanism and erosion. Having taught the other field studies as well I was able to help new educators get their bearings before they added their unique spin to the lessons. I also assisted in all on-site logistics (who goes where and when), in addition to providing ample camp songs courtesy of the guitar and ukulele. Such an endeavor takes a lot of teamwork and communication. We were all proud to co-create such a robust program and take us into a new era in which there is vastly increased support from the state.

6. Communicating the Experience and Science

Write your journal entry for the general/lay audience. (200 words maximum)

Ice Bears: The day began as we rumbled through last year's pack ice on a quest for the famous ice bear. As we strained eagerly through early morning snow and fog we spotted a sow and cub meandering across the ice. The ship crept forward, cracking and crunching through the ice. The pair was curious but unconcerned about the approach of our vessel. Despite the driving snow and icy wind, we looked on in quiet awe as we absorbed this rare and beautiful sight. After several minutes, the sow led the cub across breaks in the ice into the distance ... The polar bear is well suited to a life on ice. Massive snowshoe-like paws can propel the bear through water or deal with a deadly blow. Thick fur insulates, while coarse, hollow outer hairs trap sunlight like a greenhouse against their black skin. I look down at myself, wrapped from in wool, down, and all the latest synthetics. I'm still freezing. These polar bears, on the other hand, are as comfy as can be. I think there must be truth to the old Inuit saying, "The polar bear has the strength of ten men and the wisdom of twelve."

7. Scientific Interests and Research Area Preference

a. Where would you prefer to go on an expedition? Either

Please explain your preference

I fell in love with the Arctic when I joined a National Geographic expedition to Svalbard as a Grosvenor Teacher Fellow in 2014. I would relish the opportunity to return with a more hands-on science role. That being said, my students and I would benefit tremendously if I were able to explore the other end of the planet in Antarctica and be able to speak to the similarities and differences of these important regions. Having never been to Antarctica, this does hold particular allure.

b. How long would you prefer to participate in an expedition? (Most expeditions are AT LEAST three weeks.) List any dates or periods of time when you are NOT able to participate in a field expedition

It is challenging for me to be gone for too long during instructional days. Projects that overlap with spring break or winter break during the school year are more likely (thus limiting time out of the classroom) and the easiest is during summer break.

c. Briefly describe your scientific interests. Which scientific topics interest you the most and why? Please note that climate change has become part of nearly all expeditions so you may choose to be more specific about this topic, if applicable. (200 words maximum)

I get the most excited about sciences that reach across disciplines and time. Some topics that continuously excite me are as follows. Astrobiology: I took a course in grad school where we looked at the fossilization of archaea and bacteria in geyser pools around Yellowstone National Park as a way to create a model of what fossilized microscopic life elsewhere in the universe might look like. It was exciting because it combined aspects of biology, geology, and microscopy, all while being able to spend time in a gorgeous environment! Paleontology: This past summer I was a participant in the Burke Museum's DIG Field School. During our time in Hell Creek State Park, we learned about and practiced field methods while investigating the K-Pg boundary and how mammalian life diversified after the extinction event. Glaciology: I'll never forget seeing the Austfonna ice cap of Svalbard, or the look of an alpine glacier at sunset. They are beautiful and also serve a major role in climate. I'd love to investigate these more. Lastly, ecology: Specifically I'm thinking of the story of how the reintroduction of wolves to Yellowstone impacted the broader ecosystem, eventually down to the flow of rivers themselves.

Atmospheric Systems I would really enjoy an expedition in this subject area

Cryospheric Systems I would really enjoy an expedition in this subject area

Human and Social Systems I am somewhat interested in this subject area

Marine Systems I am somewhat interested in this subject area

Terrestrial Systems I am somewhat interested in this subject area

Ecology and Biotic Systems I am somewhat interested in this subject area

Physics or Space Sciences I would really enjoy an expedition in this subject area

Engineering and Technology I am somewhat interested in this subject area

Other (please specify) I am somewhat interested in this subject area

Other Areas of Scientific Interest

paleontology

e. Are you applying to work exclusively with a specific researcher? If yes, please list their full name, institution, and email address. (200 words maximum)

8. Background Information and Skills

a. Briefly describe your outdoor skills or experiences.

My dad took me on my first backpacking trip when I was seven years old and I haven't stopped exploring the outdoors since then. I have taken wilderness first aid, and I'm currently up-to-date in First Aid/CPR/AED through the American Red Cross. During college I worked as a wilderness guide, predominantly taking students on overnight backpacking trips and occasionally guiding single-day whitewater rafting trips. I love recreational kayaking on the various lakes of the Cascade Mountains and on the Columbia River itself. I am most familiar with sit-on-top kayaks though I have spent time in traditional sea kayaks. Three summers ago I did a 100-mile solo backpacking trip on a portion of the John Muir Trail. While it was admittedly grueling it was empowering to know I had the logistical skills, outdoors skills, and endurance to make it. I am also a cross country skier and learning to downhill ski.

b. Provide a basic statement of your general health and physical condition.

I am in good physical condition, capable of handling cold temperatures, and hiking in moderate to difficult conditions with a heavy pack.

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.

I am a Mac user (currently running macOS High Sierra) and would rank myself as being above average in my skill. I also use iPads frequently with my students and have used Chromebooks frequently. Lastly, I'm familiar with PCs having used them extensively during my fellowship at NSF and prior to that in school.

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.

I love photography and use my digital SLR both personally and professionally. I find that a compelling photograph can be a convenient way to jump start questions among my students, and I'm particularly proud when one of those conversation starters is a picture that I crafted. I'm also well versed in using my smartphone and iPad's suite of apps to assist me in the classroom. I am currently experimenting with GoPros and other photographic devices including spherical imaging. I have experience using water quality testing equipment both in the classroom (Vernier) and more professional equipment through citizen science projects. Lastly, I am a huge advocate of using Google's suite of apps for educating including Google Drive, Google Earth, and Google Expeditions.

e. List any additional skills or information that you wish to be considered.

I have some background in Spanish though I am not fluent. I teach photography. I also teach and play the ukulele (in addition to guitar, banjo, and mandolin).

9. Previous Applications & Participation

a. Have you previously participated in a teacher research experience (e.g. NOAA Teacher at Sea, Earth Watch)? We do not accept applications from PolarTREC alumni. No

Program Information

If yes, did you complete all program requirements?

If yes, how do you see the PolarTREC professional development opportunity continuing to develop your professional skills, or how will it build on your previous research experiences?

10. Orientation Availability

Are you available to attend the Orientation during this time period? Yes

If no, please explain

11. How did you hear about PolarTREC?

Email listserve. Please provide the name and/or URL

Friend or colleague. Provide a name if you wish

Former PolarTREC, TREC, or TEA teacher. Please provide their name

Betsy Wilkening

From a website. Please list the website name and URL

Conference or presentation. Please list the venue and/or presentation title

Other (please explain)

b. Please suggest other places we might advertise this opportunity for teachers

Edutopia, NSTA

12. References

Reference 1

Name Brent Emmons

Title and affiliation Principal

Email Address brent.emmons@hoodriver.k12.or.us

Phone Number (541) 386-2114

Reference 2

Name Lorri Epstein

Title and affiliation Water Quality Director, Columbia Riverkeeper

Email Address lorri@columbiariverkeeper.org

Phone Number (541) 399-0769

Reference 3

Name Michael Becker

Title and affiliation Food and Conservation Science Teacher, Hood River Middle School, Colleague

Email Address michael.becker@hoodriver.k12.or.us

Phone Number (541) 490-5911

2020-2021 PolarTREC Educator Application

Erica Street

1. Contact Information

Name: Ms. Erica Street

Email: orvahutcherson@gmail.com

Home Address:

1220 Winsor Ave

North Bend, OR 97459 US

Home Phone: 5412175957

Cell Phone : 5412175957

Institution Name: North Bend High School

Institution Address:

2323 Pacific Ave

North Bend, OR 97459-2605 US

Institution Phone: 541-756-8328

Classroom/Office Extension: 541-751-7143

Institution Fax: 541-756-6945

Institution Website: <http://www.nbhs.nbend.k12.or.us/>

Other relevant websites:

Supervisor's Name: Jake Smith

Supervisor's Email Address: jsmith@nbend.k12.or.us

2. Demographic Information

a. Gender: Female

Race: White

c. Briefly describe your primary audience and surrounding community (e.g. K-12, public, rural/urban, technology access, economics): North Bend High School is a public 9-12 school located in a small town with a large rural area surrounding it. The town of North Bend is surrounded on three sides by Coos Bay, the largest estuary between San Francisco and Seattle. Surrounded by the ancestral lands of the Coos, Umpqua, Siuslaw, and Coquille Peoples, Coos Bay and its associated natural resources continue to sustain our area both economically and culturally. Primary industries include forestry, commercial fishing, and tourism. Like many areas that rely on natural resources, our region is now relatively economically depressed. However, our science department has benefited from good community partners and a solid school foundation, and we have brought in over \$40,000 in grants for science equipment in the last 4 years. We have also received impressive support from our district to build and refine a rigorous and engaging core curriculum with emphases in the areas of science inquiry, problem-solving, mathematical and computational literacy, engineering design, collaboration, and science discourse. We have good technology infrastructure within our district. Students have access to one-to-one Chromebooks in my classroom, and we use Google Classroom, Google Drive, and other Google Apps regularly. We use Vernier's Graphical Analysis program as well as many Vernier data collection probes starting in our freshman-level Physics class so that students can learn to mathematically model their experimental data.

d. Type of School (or students you work with): Public

Other Type of School

e. What is the population of your annual audience or school (estimates are fine) 800

f. School Ethnicity:

3 % - American Indian or Alaska Native

1 % - Asian

1 % - Black or African American

10 % - Hispanic or Latino

1 % - Native Hawaiian or Other Pacific Islander

76 % - White

8 % - Multiracial

If your school uses other categories to describe race/ethnicity, please describe:

g. Percentage of students who receive free or reduced lunch: 44

h. Average class or audience size 28

i. Total number of students/audiences you teach in a year 300

j. If known, what are the approximate start and end dates of your school year or primary programs, etc. ? Include major professional vacation periods. i.e. Christmas break, summer break, etc.

Approximate dates: School year starts 9/9/2020 Winter Break 12/21/2020 to 1/1/2021 Spring Break 3/29/2021 to 4/2/2021 School year ends 6/17/2021

3. Teaching Experience and Education

a. What type of university degree or other academic experience or qualifications do you have?

Bachelor's Degree (Major): BA Biology, Wells College, 1989

Bachelor's Degree (Minor):

Masters Degree (Discipline): MA Math and Science Education, University of California at Berkeley, 1994

PhD Degree (Discipline):

Other Degree:

b. How many years of education experience do you have?: 19

c. How many years have you been working at your current institution?: 6

d. List up to 10 relevant professional licenses, certifications, registrations, awards or honors that you have received in your profession::

2018-present: M. J. Murdock Partners in Science Fellowship at Oregon Institute of Marine Biology, Charleston, OR
2017: Oregon Science Teachers Association Outstanding High School Classroom Teacher, Region 3 (Lane, Douglas, Coos, and Curry Counties)
2017: Portland Metro STEM Hub training in Biology for the Next Generation
2016: Portland Metro STEM Hub training in Chemistry for the Next Generation
2015: Portland Metro STEM Hub training in Physics for the Next Generation
Current Oregon Professional Teaching License with an Endorsement in Biology, exp 5/2024

4. Professional Assignment

a. What is your primary education assignment? Check all that apply

Secondary (Grades 9-12)

Other Primary Assignment

b. What subjects do you teach? Check all Secondary Biology, Secondary Chemistry

Other Subjects

5. Motivation for Participation

a. What motivates you to apply to PolarTREC and professionally, what do you hope to gain from the experience? (200 words maximum)

As a participant in the Partners in Science program, I spent the last two summers working with scientists at the Oregon Institute of Marine Biology, doing research on the effects of ocean acidification on juvenile Dungeness crabs. That experience has had such an immense impact on my teaching that I am actively seeking the opportunity to participate in research again. The PolarTREC program specifically came to my attention because my research partner at Oregon Institute of Marine Biology, Dr. Julie Schram, has been involved in several research projects in Antarctica. We discussed Antarctic research frequently, and I found it fascinating. Dr. Schram suggested that I apply for PolarTREC because she believes that I would be a good fit for what scientists are looking for in a teacher partner. I also had the opportunity to meet Dr. James McClintock last summer when he visited Oregon to speak about his research in Antarctica. We had a good conversation about teacher research opportunities in Antarctica and he highly recommended that I apply to PolarTREC. What I seek is the capacity to infuse my lessons with authenticity and relevance. The ability to build science knowledge and skills in the context of the day-to-day life of scientists doing real, current research is invaluable.

b. Aside from journaling/blogging, online photos, and webinars which all part of our program requirements, describe your ideas on how you will share this experience in your classroom or with the audiences you work with. (200 words maximum)

At my school we teach science through the lens of scientific inquiry, so I will have frequent opportunities to weave my experiences into daily instruction with students. I envision capitalizing on these examples of real-world scientific inquiry when we learn about topics such as experimental design, precision and confidence in our explanations, and data analysis, along with specific content depending on which research project I am placed with. I also plan to create a presentation about my experiences and deliver it formally in my classes, as well as at one of our Science National Honor Society chapter meetings.

c. Describe how you envision sharing your experience with other educators, your personal and professional communities, and the general public. (200 words maximum)

A couple of venues in my community have hosted science presentations in the past, and I expect they would be happy to help me share my experience with a wider

audience. Science on the Screen takes place at our local historic movie theater, and Science Pub is a regular event at our local brewery. I also have a good relationship with the education reporter at our community newspaper, and I am confident that she would be more than willing to help me tell the story of my experience through the print medium. I am active in several educator communities on Facebook, and I would like to share my experiences there as well. I also have a Twitter account (<https://twitter.com/StreetRacha>) which I created for the purpose of networking with researchers and educators who work in my areas of interest. It has been a great venue for communicating about highlights of my research experiences and for collaborating with other researchers, and it would be an ideal medium for sharing about PolarTREC. I am active in the Oregon Science Teachers Association and in the Partners in Science community. It would be fun to lead a session about my experiences and the PolarTREC program at the OSTA and/or Partners in Science conference.

d. Describe how you currently engage your audience and facilitate learning when educating on new and complex topics, concepts, or issues. (200 words maximum)

There are a few key elements I try to keep in mind: First, always try to build collaboration into the lesson. Finding out about the prior knowledge and experiences of the participants is critical. In the short term, I often use Google Forms or Poll Everywhere to gather opinions and assess background knowledge. Then, I generally lead a group problem solving activity or group analysis of something (a dataset, a diagram or graph, a photograph, a video of an interesting phenomena, or a hands on experience). Second, make an effort to find and make explicit the personal relevance of each topic. It helps to know your audience in order to do this, so relationship building must start right at the beginning of the school year.. Third, incorporate problem-solving and critical thinking. Students love to problem solve! When you see that "edge of the seat" engagement, it is almost always because they are trying to figure something out. Especially if the problems are real-world, teens feel that their time and intelligence has been respected. Finally, always try to include the human element. What does it mean in our everyday lives? What does it mean to a scientist who studies it? Who are they as people? Why do they care?

e. Describe the particular strengths you would bring to the PolarTREC program and to a field research team. (200 words maximum)

I am curious, enthusiastic, and energetic. I have a positive attitude and an upbeat personality. I am logical and thorough. I have a solid understanding of scientific inquiry, with a good general science background and particular strength in Biology.

The research experience I had at OIMB centered around ocean acidification. I have accumulated some life experience, and as a result I have become a good communicator, and I have also developed a realistic confidence in my abilities and an awareness of my limitations. I am not afraid to ask questions if I don't understand something. I am a good team player, willing to help as much as I can and not afraid to make the most of the expertise of my team. I am committed to the ideals of science and education as a means to making the world a better place. Most importantly, I am a very, very hard worker. Whatever I choose to do I try to do it well.

f. Using examples from your own experience including your role and the contributions you made to a team effort, describe how you work as a member of a team. (200 words maximum)

My science department is a true team. We made a decision about a new curricular direction in my first year at North Bend High School, and we have all worked very hard since then to fulfill our vision. We have attended workshops and conferences, developed new curriculum, written grant proposals, and introduced a model for differentiated instruction in our building. My role in the team has been as a visionary, spokesperson, and workhorse. I am often seen as the person on the team who guards the "big picture," so people often come to me for discussion about new ideas in order to see how they fit in. At the same time, I sometimes feel that it is easy to lose perspective when in the middle of focused work, so I am glad we have a team to keep us all on the right path. We all contribute according to our strengths, and we have had success at talking things out until we reach a consensus when we have disagreed about a course of action.

6. Communicating the Experience and Science

Write your journal entry for the general/lay audience. (200 words maximum)

On a chilly morning at Sunset Bay State Park, 40 junior Biology students and two teachers began a cautious climb across the tide pools exposed by the low tide. The rocks were slippery with seaweed and crowded with animals so we stayed low and planned where to place each foot before completing a step. It wasn't long before my progress was checked by a shoe-sized and shoe-shaped orange creature that appeared to be made of leather and filled the space where I had hoped to step - a gumboot chiton, known to some marine biologists as the "wandering meatloaf." Surprised to see such a cool creature so close to the edge of the tide pool area, we all gathered around to admire it and wonder how these chitons, which can live for 40 years, can grow so large, when other local tidepool species of chitons only reach a few inches in length. We continued traversing the area, making note of interesting species we found. In an area we dubbed "Crab Cove," we found three species of crabs under one rock: purple shore crabs, lined shore crabs, and porcelain crabs, which have claws as big as their body.

7. Scientific Interests and Research Area Preference

a. Where would you prefer to go on an expedition? Antarctic

Please explain your preference

I need to earn an income during my summer break from school and will not be available to travel from June through August.

b. How long would you prefer to participate in an expedition? (Most expeditions are AT LEAST three weeks.) List any dates or periods of time when you are NOT able to participate in a field expedition

Other than June through August, I could make just about anything work.

c. Briefly describe your scientific interests. Which scientific topics interest you the most and why? Please note that climate change has become part of nearly all expeditions so you may choose to be more specific about this topic, if applicable. (200 words maximum)

I am interested in biology in general. I could see myself enjoying just about any biological topic, but I am most interested in climate change, especially ocean acidification. I have a good handle on the methodologies used in recent research on the effect of ocean acidification on animal behavior, including the analytical chemistry needed for verifying pH and total alkalinity, the use of two-choice behavior test flumes, and the hypothesized role of GABA. I am also extremely interested in all other ecological subjects, including trophic ecology, population ecology, and evolutionary ecology. I also enjoy animal behavior and zoology. I like genetics and DNA science as well, and while I do not have recent experience with molecular biology techniques, I am a quick study and am not afraid to give just about anything my best.

Atmospheric Systems I am somewhat interested in this subject area

Cryospheric Systems I am somewhat interested in this subject area

Human and Social Systems I am somewhat interested in this subject area

Marine Systems I would really enjoy an expedition in this subject area

Terrestrial Systems I would really enjoy an expedition in this subject area

Ecology and Biotic Systems I would really enjoy an expedition in this subject area

Physics or Space Sciences I am somewhat interested in this subject area

Engineering and Technology I am somewhat interested in this subject area

Other (please specify)

Other Areas of Scientific Interest

e. Are you applying to work exclusively with a specific researcher? If yes, please list their full name, institution, and email address. (200 words maximum)

No

8. Background Information and Skills

a. Briefly describe your outdoor skills or experiences.

I have basic hiking, camping, and backpacking skills. I am a reasonably good swimmer. I am interested in SCUBA diving, and have been thinking about getting my open water certification. The nearest place to get certified is two hours from where I live, but if diving was a plus I would be willing to get it done this summer.

b. Provide a basic statement of your general health and physical condition.

I am healthy and active. For fitness I walk, do aerobics, bellydance and take hip hop dance classes. I don't have any chronic conditions or problems.

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.

I am most familiar with PC but I have used Mac and shouldn't have any trouble.

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.

I can use all of the Microsoft Office programs and I am pretty good at Excel and PowerPoint. I have done some minimal coding with R programming language. I really enjoyed it and hope to learn more. I use Google tools such as Classroom, Forms, Docs, Slides and Sheets everyday. I can use digital cameras. We use Vernier probeware regularly in school.

e. List any additional skills or information that you wish to be considered.

9. Previous Applications & Participation

a. Have you previously participated in a teacher research experience (e.g. NOAA Teacher at Sea, Earth Watch)? We do not accept applications from PolarTREC alumni. Yes

Program Information M. J. Murdock Charitable Trust Partners in Science program - <https://murdocktrust.org/grant-opportunities/high-school-science-teachers-and-research-partners/>

If yes, did you complete all program requirements? In progress

If yes, how do you see the PolarTREC professional development opportunity continuing to develop your professional skills, or how will it build on your previous research experiences?

My last requirement is to present my research at the Partners in Science conference in San Diego in January. I am a better teacher when I am involved with science research, and I think my skills as a scientist and as a teacher will continue to improve with each new experience. The specifics will depend on which research project I am placed with, but my general science inquiry skills will grow and deepen no matter the project.

10. Orientation Availability

Are you available to attend the Orientation during this time period? Yes

If no, please explain

11. How did you hear about PolarTREC?

Email listserve. Please provide the name and/or URL

Friend or colleague. Provide a name if you wish

Dr. Julie Schram, my mentor and partner in the Partners in Science program.

Former PolarTREC, TREC, or TEA teacher. Please provide their name

From a website. Please list the website name and URL

Conference or presentation. Please list the venue and/or presentation title

Other (please explain)

b. Please suggest other places we might advertise this opportunity for teachers

State science teaching association newsletters and conferences STEM Hub newsletters

12. References

Reference 1

Name Dr. Julie Schram

Title and affiliation Postdoctoral Researcher, Oregon Institute of Marine Biology

Email Address jschram@uoregon.edu

Phone Number 360-941-1195

Reference 2

Name Dr. Aaron Galloway

Title and affiliation Assistant Professor, Oregon Institute of Marine Biology

Email Address agallow3@uoregon.edu

Phone Number 541-888-2581 ext: 303

Reference 3

Name Jacob Smith

Title and affiliation Assistant Principal, North Bend High School

Email Address jsmith@nbend.k12.or.us

Phone Number 541-756-8328

2020-2021 PolarTREC Educator Application

Sarah Tao

1. Contact Information

Name: Ms. Sarah Tao

Email: sarah.ann.tao@gmail.com

Home Address:

7100 Almeda Rd. Apt 1922
Houston, TX 77054 US

Home Phone: 7138554772

Cell Phone : 7138554772

Institution Name: Rice Office of STEM Engagement

Institution Address:

6100 Main St.
Houston, TX 77005 US

Institution Phone:

Classroom/Office Extension:

Institution Fax:

Institution Website: <https://rstem.rice.edu/>

Other relevant websites:

Supervisor's Name: Allen Antoine

Supervisor's Email Address: ajantoine@rice.edu

2. Demographic Information

a. Gender: Female

Race: Hispanic or Latino

c. Briefly describe your primary audience and surrounding community (e.g. K-12, public, rural/urban, technology access, economics): The teachers I work with are primarily grades 7-10 math and science educators. Teachers are from public schools all over the Greater Houston area. The schools that participate have economic status varies widely.

d. Type of School (or students you work with): Public

Other Type of School Magnet

e. What is the population of your annual audience or school (estimates are fine) 20-30 teachers, about 2000 students (through teachers)

f. School Ethnicity:

% - American Indian or Alaska Native

% - Asian

% - Black or African American

% - Hispanic or Latino

% - Native Hawaiian or Other Pacific Islander

% - White

% - Multiracial

If your school uses other categories to describe race/ethnicity, please describe:

g. Percentage of students who receive free or reduced lunch:

h. Average class or audience size

i. Total number of students/audiences you teach in a year

j. If known, what are the approximate start and end dates of your school year or primary programs, etc. ? Include major professional vacation periods. i.e. Christmas break, summer break, etc.

3. Teaching Experience and Education

a. What type of university degree or other academic experience or qualifications do you have?

Bachelor's Degree (Major): Music Performance

Bachelor's Degree (Minor): English

Masters Degree (Discipline):

PhD Degree (Discipline):

Other Degree:

b. How many years of education experience do you have?: 8

c. How many years have you been working at your current institution?: 3

d. List up to 10 relevant professional licenses, certifications, registrations, awards or honors that you have received in your profession::

Houston Dynamo Classroom Champ, Conoco Phillips Outstanding Math Teacher, N.S.H.S.S. Educator of Distinction, 4 time Galena Park ISD Dazzling Diamond, Generalist Certification Grades 4-8, Math Certification Grades 9-12.

4. Professional Assignment

a. What is your primary education assignment? Check all that apply Middle School (Grades 6-8)

Other Primary Assignment

b. What subjects do you teach? Check all Middle School Math, Secondary Math

Other Subjects

5. Motivation for Participation

a. What motivates you to apply to PolarTREC and professionally, what do you hope to gain from the experience? (200 words maximum)

I am very passionate about the connection between math, science, and the real world. I hope that this research will provide me with a means of connecting it all and making learning more meaningful for students. I also believe in the importance of scientific research. Science continuously advances our society in many ways. I believe it is necessary for our continued survival and am certain of its importance. It is important for me to be a part of it if I can. It is my purpose to leave the world a better place than I found it. Encouraging students to pursue careers in STEM fields is a part of that. I have met many students that believe STEM to be out of their reach. I hope to use my PolarTREC experience to bring the possibility closer to them and show them that STEM is not only a dream, but a reality and a field they can pursue.

b. Aside from journaling/blogging, online photos, and webinars which all part of our program requirements, describe your ideas on how you will share this experience in your classroom or with the audiences you work with. (200 words maximum)

A part of my work with Rice is writing interdisciplinary (math and science) inquiry based lessons that are true to local curriculum and its requirements. These lessons and professional development on how to teach them is provided to a selected group of teachers from the greater Houston area. I hope to write a several days long comprehensive lesson, as well as several small warm ups that can be implemented by teachers with ease. I will get feedback on these materials from math and science educators. These teachers are trained for many days over a year. They are mentored and observed teaching these lessons. I will be able to share lessons that I write with many teachers, get valuable feedback, and create excitement about the polar regions. I also hope to present my work at several math, science, and STEM conferences.

c. Describe how you envision sharing your experience with other educators, your personal and professional communities, and the general public. (200 words maximum)

I plan to share my experience with teachers from the greater Houston area through professional development and local conferences. I would also like to host Q&A sessions at locally disadvantaged schools. I am passionate about encouraging minorities who are underrepresented in STEM fields to pursue jobs in math and science, especially women. I also believe in the power of social media. Having an

active presence on social platforms can create excitement and bring more exposure to the advantages of PolarTREC and research in the polar regions. I also would like to start a website for educators that encourages teaching interdisciplinary, inquiry based lessons, using relevant subject matter, including the polar regions and my research experience. Many resources exist, but fall short in their alignment with state standards. Teachers are pressured to teach to different tests, so they are reluctant to venture outside of their assigned curriculum. I would like to create a resource rich site through contributions from the professional community that provides relevant, creative, and exciting teaching materials that align with current standards.

d. Describe how you currently engage your audience and facilitate learning when educating on new and complex topics, concepts, or issues. (200 words maximum)

Providing staff development for teachers has taught me that participation is important. When teachers actually complete activities themselves, they are more likely to retain information, just like our students. Giving your audience opportunities to talk and work together is also important. Collaboration creates healthy and engaging discussion that leads to epiphanies and life changing ideas. Creating unique activities that are hands on, providing opportunities for your audience to teach and work together, and giving your audience the chance to be creative themselves is a sure way to get them engaged. I am also a huge advocate of many ed-tech tools including apps, interactive websites, and youtube. With a wealth of technology at our fingertips, we are able to tailor lessons to the needs of any group.

e. Describe the particular strengths you would bring to the PolarTREC program and to a field research team. (200 words maximum)

As a musician, I am disciplined and receptive to criticism. Teaching math, every grade from 7th-11th, I practiced patience, planning, and organization. I developed a strong work ethic and empathy for others. I served as department chair and team lead, and was active in local professional development programs. I grew as a leader and team member, working to nurture collaboration and fulfill common goals. I learned the importance of communication, flexibility, and community. My musical background gave me a unique perspective. I see the beauty in STEM and can creatively work through problems. In writing interdisciplinary investigative lessons, I connected math and science and applied them using research and experiments that could be done in any classroom. My diverse background also gives me a unique perspective on the disadvantages of minority groups and cultivating interest in STEM. I have experienced the power of education, more specifically, the power of

science and math to cultivate the future. I am currently furthering my education, pursuing a degree in engineering while working as a contractor with Rice University. Working with Rice, I have experience as a program facilitator and content writer. The technical knowledge I am acquiring in engineering at the University of Houston is also something I hope to bring to PolarTREC.

f. Using examples from your own experience including your role and the contributions you made to a team effort, describe how you work as a member of a team. (200 words maximum)

Curriculum writing in my district was done with teachers from each campus as experts and a math specialist as supervisor. It was usually a contentious meeting. Teachers made suggestions for the curriculum based on their personal feelings and not necessarily on what was best for a student encountering the material for the first time. Despite this, we were successful in our revisions every year. The first item that contributed to this success was preparation. It was important for everyone involved, including myself, to be an expert in their content and be prepared for the meeting. We all arrived with studies and comments on the past curriculum, and most importantly, solutions. It is important when presenting a problem to provide any possible solutions or support that you can. Success is not dependent on any single individual, it is a group effort. What also made us successful was a common goal: to do what was best for students. If a teacher veered away from the goal, they only needed a gentle reminder. I made sure to be prepared, show up with solutions, focus on the goal, and believe in the ability of others to achieve that goal.

6. Communicating the Experience and Science

Write your journal entry for the general/lay audience. (200 words maximum)

The weather was terrible today. My phone kept buzzing/honking “FLASH FLOOD!!!” warnings. I drove to school, hoping for a cancellation notice. I have to cycle from the garage, and although I wore a raincoat and boots, I was afraid to step outside. The sky was doomsday gray and there were regular puPOW!s of thunder and lightning. My engineering group was waiting for me though, so I got on my bike, let the rain slap me in the face, and pedaled hard. The first thing we did was go around the circle and share design ideas. The topics ranged from fantastical, “The vibranium train from Black Panther!” to...fantastical “Teleportation!?” I came home and talked to my husband about it. He works in a neurodegenerative research lab and expressed to me that many of the tools they use are, in his words, “D.I.Y”. Much of the equipment needed is very expensive, or just doesn’t exist yet. So, basically, he said, “make something for me!” His second suggestion was an asteroid mining design. I have a feeling that my group will be more interested in exploding asteroids than in heart monitors for mice.

7. Scientific Interests and Research Area Preference

a. Where would you prefer to go on an expedition? Antarctic

Please explain your preference

The extreme Antarctic climate will help me develop strong research and observational skills. The Antarctic also holds the greatest potential for me to make an impact on teachers here in Houston. The effects of climate change felt by us here are mostly heat and flooding. I feel the experience in Antarctica will broaden my perspective and give me tools to excite my community in science and mathematics. The experience I gain in the Antarctic will be unique and such a climate will not be available to me again in my lifetime. Antarctica is also incredibly important to our world and needs more exposure and preservation.

b. How long would you prefer to participate in an expedition? (Most expeditions are AT LEAST three weeks.) List any dates or periods of time when you are NOT able to participate in a field expedition

Any length of time is acceptable as long as it is not from August 20-December 12 or January 11-May 7.

c. Briefly describe your scientific interests. Which scientific topics interest you the most and why? Please note that climate change has become part of nearly all expeditions so you may choose to be more specific about this topic, if applicable. (200 words maximum)

I am very interested in space exploration and space science. I have long been passionate about space and have used it regularly as a tool to connect math and science. Actually participating in research involving this is a dream of mine. I feel space exploration is important to our progress as a species here on Earth and the technological advances and scientific discoveries made during the process are vital to human legacy. I have also found that physics is the subject that challenges my students the most and is often what causes them to change majors. I would like to better understand that field in order to better support them. I am also interested in electrical engineering, as that is my current field of study and hope I can contribute academically to the team. The effects of climate change on cryospheric systems is also something I am interested in. It is our responsibility to act to improve our climate.

Atmospheric Systems I am somewhat interested in this subject area

Cryospheric Systems I would really enjoy an expedition in this subject area

Human and Social Systems I am somewhat interested in this subject area

Marine Systems I am somewhat interested in this subject area

Terrestrial Systems I am somewhat interested in this subject area

Ecology and Biotic Systems I am somewhat interested in this subject area

Physics or Space Sciences I would really enjoy an expedition in this subject area

Engineering and Technology I would really enjoy an expedition in this subject area

Other (please specify)

Other Areas of Scientific Interest

e. Are you applying to work exclusively with a specific researcher? If yes, please list their full name, institution, and email address. (200 words maximum)

8. Background Information and Skills

a. Briefly describe your outdoor skills or experiences.

My main experience with the outdoors is hiking. I have regularly hiked the mountains in Mexico throughout my life. I recently went on a very active tour of Hawaii. In Hawaii, we hiked through many types of terrain including rainforests, freezing mountains, and rocky beaches. I have also cycled and kayaked across Guam. In Houston, I cycle regularly and paddle-board in the summer.

b. Provide a basic statement of your general health and physical condition.

I have no health conditions other than needing glasses. I exercise regularly, am a non smoker, non drinker.

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.

My personal computer is a Mac, however, I worked on a PC at school as a teacher and students were issued Chromebooks. I am fluent in Microsoft Word, Excel and Powerpoint. I am a level 1 Google Certified educator, proficient in Google's tools including Docs, Slides, Sheets, and Youtube. I am very comfortable with apps and online web tools. I am also Flipped Classroom Certified, proficient in creating online learning tools for students. I have an iPad, but my phone is an Android so I am familiar with both operating systems.

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.

I have a large iPad that I use to take notes and give instruction. Through it, I share live presentations with students and can easily access other tools in the middle of a presentation. At home, most of the tools I use to build lessons are web based and can be accessed from any type of computer. I use online presentation tools that maximize audience participation (Nearpod), video editing software (Camtasia), illustration tools (Canva), and website builders (Weebly). I have also used a GoPro to record action video and used it in lessons using Vernier Video Physics and various probes. Personally, I use note taking apps to enhance my learning (Notability) and engage in learning with lessons already available online (Khan Academy).

e. List any additional skills or information that you wish to be considered.

I am fluent in Spanish and studied Mandarin Chinese for 2 years.

9. Previous Applications & Participation

a. Have you previously participated in a teacher research experience (e.g. NOAA Teacher at Sea, Earth Watch)? We do not accept applications from PolarTREC alumni. No

Program Information

If yes, did you complete all program requirements?

If yes, how do you see the PolarTREC professional development opportunity continuing to develop your professional skills, or how will it build on your previous research experiences?

10. Orientation Availability

Are you available to attend the Orientation during this time period? Yes

If no, please explain However, I may have to miss a day depending on the attendance requirements for school.

11. How did you hear about PolarTREC?

Email listserve. Please provide the name and/or URL

Friend or colleague. Provide a name if you wish

Former PolarTREC, TREC, or TEA teacher. Please provide their name

From a website. Please list the website name and URL

Conference or presentation. Please list the venue and/or presentation title

I was at SEEC, the Space Exploration Educators Conference, and I overheard some teachers discussing it.

Other (please explain)

b. Please suggest other places we might advertise this opportunity for teachers

Conferences would be a great place. Texas Instruments holds an international conference yearly and has a wide reach. They also advertise their connection with Vernier probes and devices, so the focus on STEM collaborations and student investigation is encouraged.

12. References

Reference 1

Name Allen Antoine

Title and affiliation Associate Director of Mathematics & Computer Science at Rice
Office of STEM Engagement

Email Address ajantoine@rice.edu

Phone Number 5044600076

Reference 2

Name Gerard Kwiatkowski

Title and affiliation Math Specialist at Crosby Middle School

Email Address gkwiatkowski@crosbyisd.org

Phone Number 7137753987

Reference 3

Name Carolina Uranga

Title and affiliation Secondary Math Specialist Humble ISD

Email Address curanga@humbleisd.net

Phone Number 9152762111

2020-2021 PolarTREC Educator Application

Erin Towns

1. Contact Information

Name: Erin Towns

Email: etowns@auburnschl.edu

Home Address:

107 Commercial St. #2
Augusta, ME 04330 US

Home Phone: 207-215-6383

Cell Phone : 207-215-6383

Institution Name: Edward Little High School

Institution Address:

77 Harris St.
Auburn, ME 04210 US

Institution Phone: 207-783-8528

Classroom/Office Extension: 1

Institution Fax: 207-784-9243

Institution Website: <http://elhs.auburnschl.edu/>

Other relevant websites:

Supervisor's Name: Scott Annear

Supervisor's Email Address: sannear@auburnschl.edu

2. Demographic Information

a. Gender: Female

Race: White

c. Briefly describe your primary audience and surrounding community (e.g. K-12, public, rural/urban, technology access, economics): I teach at a 9-12 urban public high school in Western Maine. My primary audience are students ages 14-18. There are 23 cultures represented in our high school community of 948 students, however, Auburn's racial composition is predominantly white (90.95%). All students are given a laptop while enrolled in our system and we are a 1:1 laptop state. About 23,000 people live in the small city of Auburn. Based on data from the American Community Survey, the median income for households in Auburn is \$48,000. The overall poverty rate is 15.24%. The largest employers in the city are TD Bank and Walmart. Auburn is home to secondary resettlement communities of Somali, Congolese, Angolan, and Iraqi immigrants.

d. Type of School (or students you work with): Public

Other Type of School

e. What is the population of your annual audience or school (estimates are fine) 100

f. School Ethnicity:

1 % - American Indian or Alaska Native

2 % - Asian

10 % - Black or African American

3 % - Hispanic or Latino

1 % - Native Hawaiian or Other Pacific Islander

83 % - White

NA % - Multiracial

If your school uses other categories to describe race/ethnicity, please describe:

g. Percentage of students who receive free or reduced lunch: 41

h. Average class or audience size 20

i. Total number of students/audiences you teach in a year 100

j. If known, what are the approximate start and end dates of your school year or primary programs, etc. ? Include major professional vacation periods. i.e. Christmas break, summer break, etc.

We start on or around August 26 every year and end on or around June 19.

3. Teaching Experience and Education

a. What type of university degree or other academic experience or qualifications do you have?

Bachelor's Degree (Major): Bachelor of Science Secondary Education

Bachelor's Degree (Minor): History

Masters Degree (Discipline):

PhD Degree (Discipline):

Other Degree:

b. How many years of education experience do you have?: 24

c. How many years have you been working at your current institution?: 20

d. List up to 10 relevant professional licenses, certifications, registrations, awards or honors that you have received in your profession::

Certification: Professional Social Studies 06-Grades 7-12. Maine Department of Education
Certification: National Geographic Certified Educator. National Geographic
Education Award 2018: Maine Department of Education Teacher Leader in Social
Studies Education. Maine Department of Education Social Studies Division.
Fellowship 2018: National Geographic Grosvenor Teacher Fellow Program. National
Geographic Fellowship 2018: Education in Germany 2018: German-American
Fulbright Commission. Award 2017: Kristin Alvarez Memorial NCGE President
Scholarship: National Council for Geographic Education Fellowship 2017: Fulbright-
Hays Groups Project Abroad: Ethiopia. US Department of State & University of
Pittsburgh. Fellowship 2014: Fulbright-Hays Seminars Abroad: China. US Department
of Education and the National Committee on US-China Relations. Fellowship 2013:
Teachers For Global Classrooms Program: Kazakhstan. US Department of State's
Bureau of Educational and Cultural Affairs and the Fulbright Program. Fellowship
2008: Japan Fulbright Memorial Fund Teacher Program. Government of Japan.

4. Professional Assignment

a. What is your primary education assignment? Check all that apply
Secondary (Grades 9-12)

Other Primary Assignment I facilitate a foreign policy program, Camden Conference in the Classroom, offered to students from four area high schools. I also serve as Social Studies Department Head.

b. What subjects do you teach? Check all Secondary World and U.S. History, Secondary Geography, Secondary Social Studies

Other Subjects UN Sustainable Development 9-12

5. Motivation for Participation

a. What motivates you to apply to PolarTREC and professionally, what do you hope to gain from the experience? (200 words maximum)

I am motivated to apply to advance my knowledge and understanding of cryospheric systems in order to help Maine students and citizens effectively address environmental, political, social, and economic issues related to the Gulf of Maine. I want to study polar regions first hand and acquire practical STEM strategies that can be used and shared with colleagues to increase implementation of polar studies, environmental science, and climate studies into social studies classrooms across the state. I am hoping to encourage more engagement of students and community members by using storytelling to communicating what I learn during field research experiences. I want to use the experience to create new visual resources that help explain polar phenomenon, climate studies, and glaciology that appeal to the teenage mind and general public and increase comprehension of complex topics that are important to understand for citizens of Maine. I am motivated to use the experience to continue to build an educator science identity that students can relate to and use the opportunity to practice doing and talking about science. I am hoping to gain more interdisciplinary strategies for the social studies classroom that help students developing their science identities and seek future careers in STEM related professions that help preserve human and natural worlds.

b. Aside from journaling/blogging, online photos, and webinars which all part of our program requirements, describe your ideas on how you will share this experience in your classroom or with the audiences you work with. (200 words maximum)

I would like to create a series of scientific sketches and models that visualize scientific practices, concepts, and phenomenon for adults and students who have limited or vague knowledge about glaciology, polar studies, and climate and environmental science. I want to create profiles of diverse examples of scientists and show students specific pathways that polar research team members took to get to where they are today in order for students to better relate to the field itself. I want to visually model for students an authentic opportunity to study glaciology and gain experiences using appropriate tools, pose, and research that can be later shared with my colleagues and community through workshops at professional state and national social studies conferences. I will help Maine students by bringing back classroom strategies and specific tasks that they can do themselves to increase interest in polar-related STEM careers that may be the key to solving large social,

political, and economic issues. It is my experience that using 360 imagery to stimulate questions leads to increased student engagement and as such I would also like to collect a series of 360 images about climate change impact on glaciers that can be used by students with VR viewers in the classroom.

c. Describe how you envision sharing your experience with other educators, your personal and professional communities, and the general public. (200 words maximum)

I am Vice President of the Maine Council for Social Studies and will share this experience statewide writing articles that introduce new ideas for practical STEM strategies that educators can incorporate easily into existing social studies curriculums. I will share the experience leading workshops about the experience at state and national conferences and will interweave the experience into my National Geographic Educator and Geo-Inquiry Program workshops at district and state levels. I will create a sustainable learning community of state educators interested in addressing social, economic, and political issues between the state's government and indigenous Wabanaki peoples. I want to increase understanding of polar climate issues and how they relate to the Gulf of Maine providing a new starting point for effective conflict resolution. I will use the experience to create vivid and relatable stories that increase understanding and knowledge and inspire the general public to act in collaborative ways that are informed and make sense. Lastly, I will use the experience to partner with the Gulf of Maine Institute and explore possibilities of creating a teacher-led workshop about the impact of melting glacial ice on rising sea levels and species migration in Maine and contemporary social, political, and economic implications.

d. Describe how you currently engage your audience and facilitate learning when educating on new and complex topics, concepts, or issues. (200 words maximum)

Student engagement requires invested interest in and relevancy of topics, concepts, and issues that are new. When introducing complex subject matter, students are more interested and process and analyze information at higher levels when a combination of storytelling, visualization, and first hand experiences are modeled. We regularly travel outside of my classroom for students to explore the world that is part of a given topic or issue. We use sketching, sketch noting, GIS, and scientific modeling to visualize information for those who, like me, found themselves lost in class when being educated on new and complex topics and issues. I teach students how to analyze and use photography that documents phenomenon and topics effectively and I push them to question what they see. Student engagement starts

with topics introduced at local levels, moving onto state, regional, national, and global perspectives as we explore and learn more. Opportunities for solutions based actions are offered as alternatives to traditional testing. An example of this is a project that resulted in students acquiring a new stoplight from the police department that allowed for safe passage across a busy intersection. This served as the summative to an introductory GIS unit and served as a stellar example of a practical solution that students made happen.

e. Describe the particular strengths you would bring to the PolarTREC program and to a field research team. (200 words maximum)

I have participated in numerous professional development opportunities related to geospatial technologies and learning about the natural and human worlds. I have traveled the world and have experience working on international collaborative projects. I have participated in online certification courses with National Geographic about environmental and climate studies and have explored on site with an expedition previously. I bring the ability to recognize numerous perspectives, willingness, and a flexible attitude having spent considerable time with traveling teaching peers in close and sometimes uncomfortable accommodations. I have a strong interest in learning as much as I can about polar regions because of where I live and what is happening as a result, in part, of glacial melt and have an audience that is in vital need of the knowledge the PolarTREC program and field research team can provide. I am detailed, coachable, and I follow directions well. Having completed six professional teacher development programs, I possess a successful record of meeting deadlines and understand well the importance of project follow through. I bring twenty years of classroom teaching experience to the team and knowledge of incorporating geographic issues and concepts into disciplines that traditionally avoid them. I have a large professional network to share information gained from the experience with.

f. Using examples from your own experience including your role and the contributions you made to a team effort, describe how you work as a member of a team. (200 words maximum)

I traveled to Ethiopia in 2017 as part of a Collaborative Groups Project Abroad Program sponsored by the US Department of State to develop resources for K-12 teachers to use to strengthen the teaching of East Africa. As part of a team I had to think in creative ways that would relate to primary, elementary and high school students. As a member of an interdisciplinary team I had to use my social studies and GIS expertise while considering and learning from people outside of my discipline about best practices. I had to be willing to concede when necessary for the

greater group vision. The team also included Ethiopian teachers and I had to learn to use strategies and perspectives that lay outside of my own cultural understanding to ensure authenticity. I had to be willing to check my own assumptions and remain flexible and calm when navigating unfamiliar surroundings. I needed to remain focused on our collective goals and to the best of my ability communicate effectively when disagreements arose. It was challenging and rewarding and resulted in final products that included a documentary film and introductory GIS lesson that both featured Ethiopian indigenous culture and contemporary society.

6. Communicating the Experience and Science

Write your journal entry for the general/lay audience. (200 words maximum)

I put my house on the market last week because frankly, National Geographic ruined my life. Last year I traveled aboard the National Geographic Sea Lion to Alaska and British Columbia, learning from Canadian First Nations, Native American elders, and naturalists about environment and sustainability. We connected to nature examining indigenous interdependence and reverence for the natural world. I saw first hand the impact of warming climate on glacial retreat. Once home, I completed two National Geographic certification courses about environmental science and climate studies and remade my social studies curriculum. Everything I learned made me think about things that I talked about for years and what I thought sustainability was. In the end it forced me to realize I was all talk really. The great stoic, Marcus Aurelius once said, "Words are opinion, not fact. Action is the only truth." It is time to put my money where my mouth is. I am moving to an apartment in Augusta while I navigate building a shipping container home. Adoption of a minimalist lifestyle will afford more experiences and foster future stewardship of Maine's precious resources and reduce the amount of things that clutter, damage, and destroy peace, life and planet.

7. Scientific Interests and Research Area Preference

a. Where would you prefer to go on an expedition? Arctic

Please explain your preference

The Arctic region and the melting of Greenland's ice sheet is impacting the Gulf of Maine directly. According to the Gulf of Maine Institute, the Gulf of Maine is warming faster than 99% of the rest of the ocean. This phenomenon is having numerous economic impacts on our state's fishing and lobster industries, has led to fights among lobstermen and the State of Maine over regulations, has played a role in the spread of an opiate crisis in coastal communities, and has even led representatives of Maine's indigenous Wabanaki leadership to cut ties with state government. I believe my time would be best spent in the Arctic region due to proximity and relevance that this experience would have for my students' and Maine's future.

b. How long would you prefer to participate in an expedition? (Most expeditions are AT LEAST three weeks.) List any dates or periods of time when you are NOT able to participate in a field expedition

I would prefer to participate in an expedition that is three to four weeks in length to give me enough time upon return to create lessons, presentations, and articles that can be ready to implement and share upon the start of the new school year. I am willing to participate in expeditions that last longer given available opportunities and research projects.

c. Briefly describe your scientific interests. Which scientific topics interest you the most and why? Please note that climate change has become part of nearly all expeditions so you may choose to be more specific about this topic, if applicable. (200 words maximum)

I am interested in cryospheric systems, glaciology, and the impact of warming ocean temperatures in the Gulf of Maine as a result of melting polar and glacial ice. I want to know how scientists are measuring changes in salinity that depress the Gulf Stream and I want to know more about the impact of Greenland's massive range of ice melts on North Atlantic circulation patterns. Because I have incredibly limited knowledge and formal education in glaciology, I would like to learn, document, and share knowledge about glacial retreat, glacier microclimates and river systems, and the ways scientists are trying to figure out how ice interacts with warm and cold ocean water. Although I do recognize that scientists still do not fully understand the Atlantic Meridional Overturning Circulation itself, I am still interested in learning as much as I can about how AMOC may be responding to the influx of fresh water, rising

sea levels, and changes in air and water temperatures and learn more about the rate of ice sheet melt and how it relates to species migration. Aside from content knowledge, I want to examine how research scientists collect data, organize daily expedition findings, and share information with audiences.

Atmospheric Systems I am somewhat interested in this subject area

Cryospheric Systems I would really enjoy an expedition in this subject area

Human and Social Systems I would really enjoy an expedition in this subject area

Marine Systems I would really enjoy an expedition in this subject area

Terrestrial Systems I am somewhat interested in this subject area

Ecology and Biotic Systems I am somewhat interested in this subject area

Physics or Space Sciences I do not want to be considered for an expedition in this subject area

Engineering and Technology I am somewhat interested in this subject area

Other (please specify)

Other Areas of Scientific Interest

e. Are you applying to work exclusively with a specific researcher? If yes, please list their full name, institution, and email address. (200 words maximum)

No.

8. Background Information and Skills

a. Briefly describe your outdoor skills or experiences.

I have extensive experience camping, hiking, and boating growing up in Northern New England. I was a waterfront director for ten years in Maine. I am an accomplished competitive swimmer and was certified as a Water Safety Instructor and lifeguard by the American Red Cross. I have basic first aid and CPR certification and am a participant in a professional development course that prepares Maine teachers to sit for the Registered Maine Guide exam. I am a long distance outdoor runner during the winter and I love to spend my time cross-country skiing. I like to hike through the woods and mountains of Western Maine and New Hampshire.

b. Provide a basic statement of your general health and physical condition.

I am physically fit and do not have any health or physical complications. I use yoga, swimming, running, skiing, waitressing, and meditation to stay in shape.

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.

I use an Apple MacBook Air with OS X El Capitan operating system, version 10.11.6. I am very comfortable and most familiar with this system. I would say that I have a more advanced skill level using technology than the majority of my counterparts and as such I regularly lead technology PLC meetings.

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.

I use a MacBook Air laptop computer for school business and social communication with family and friends. I am also proficient in using iPads for education and served for a number of years as an Apple Teacher Leader for my school district. I use Google Classroom for logistical course organization and communication and digital cameras, 360 cameras, and iPhone cameras to collect imagery for use in the classroom. I use 360 cameras to photograph local businesses that want to be seen on Google Street View. I am proficient with the use of Internet browsers, PowerPoint, Excel, iMovie, iClips, Google Slides, Garage Band, and have created a number of websites for different projects using WordPress, Blogspot, and Wix.

e. List any additional skills or information that you wish to be considered.

I am proficient in the use of GIS technologies in the classroom. I use ArcGIS Online and Google Maps regularly.

9. Previous Applications & Participation

a. Have you previously participated in a teacher research experience (e.g. NOAA Teacher at Sea, Earth Watch)? We do not accept applications from PolarTREC alumni. No

Program Information

If yes, did you complete all program requirements?

If yes, how do you see the PolarTREC professional development opportunity continuing to develop your professional skills, or how will it build on your previous research experiences?

10. Orientation Availability

Are you available to attend the Orientation during this time period? Yes

If no, please explain

11. How did you hear about PolarTREC?

Email listserve. Please provide the name and/or URL

Friend or colleague. Provide a name if you wish

Former PolarTREC, TREC, or TEA teacher. Please provide their name

Wendi Pillars

From a website. Please list the website name and URL

Conference or presentation. Please list the venue and/or presentation title

Other (please explain)

b. Please suggest other places we might advertise this opportunity for teachers

Use state Department of Education email listings to push out information to teachers. You may opt to also approach state organizations dedicated to different disciplines.

12. References

Reference 1

Name Katy Grondin

Title and affiliation Superintendent Auburn School Department

Email Address kgrondin@auburnschl.edu

Phone Number 207-784-6431

Reference 2

Name Shelly Mogul

Title and affiliation Director of Curriculum Auburn School Department

Email Address smogul@auburnschl.edu

Phone Number 207-784-6431

Reference 3

Name Scott Annear

Title and affiliation Principal Edward Little High School

Email Address sannear@auburnschl.edu

Phone Number 207-783-8528

2020-2021 PolarTREC Educator Application

Misty Tucker

1. Contact Information

Name: Ms. Misty Tucker

Email: mistygal27@yahoo.com

Home Address:

1605 Northpoint Dr Apt. 9
Aurora, IL 60504 US

Home Phone: none

Cell Phone : 630-640-6780

Institution Name: Thayer J. Hill Middle School

Institution Address:

1836 Brookdale Rd.
Naperville , IL 60504 US

Institution Phone: 630-428-6200

Classroom/Office Extension: 9411

Institution Fax: 630-428-6201

Institution Website: <http://hill.ipisd.org/>

Other relevant websites: <https://www.middlegradesforum.org/illinois>

Supervisor's Name: Mike Dutdut

Supervisor's Email Address: Mike_dutdut@ipisd.org

2. Demographic Information

a. Gender: Female

Race: White

c. Briefly describe your primary audience and surrounding community (e.g. K-12, public, rural/urban, technology access, economics): Hill is located in the west suburbs of Chicago. in Indian Prairie School District 204. Hill is a designated Illinois Horizon School by the Schools to Watch program for our academic excellence, social equity, developmental response, and organizational support. We are a grade 6-8 public school that services students of diverse backgrounds, ethnicities, socio-economic status, and needs. We are a one-to-one district, with each student being assigned a Chromebook for academic use. We have strong community support and involvement.

d. Type of School (or students you work with): Public

Other Type of School

e. What is the population of your annual audience or school (estimates are fine) team size of 130-150, school community is 900

f. School Ethnicity:

0.1 % - American Indian or Alaska Native

28.7 % - Asian

11.5 % - Black or African American

12.2 % - Hispanic or Latino

% - Native Hawaiian or Other Pacific Islander

42.8 % - White

4.7 % - Multiracial

If your school uses other categories to describe race/ethnicity, please describe:

g. Percentage of students who receive free or reduced lunch: 22.5

h. Average class or audience size 28

i. Total number of students/audiences you teach in a year 130-150

j. If known, what are the approximate start and end dates of your school year or primary programs, etc. ? Include major professional vacation periods. i.e. Christmas break, summer break, etc.

School starts middle of August through first week of June. Thanksgiving break the four days that week. Winter break is generally the week of Christmas and the week after. Spring break is the last week of March.

3. Teaching Experience and Education

a. What type of university degree or other academic experience or qualifications do you have?

Bachelor's Degree (Major): Elementary Education (k-9)

Bachelor's Degree (Minor): Physical Science

Masters Degree (Discipline): MA in Curriculum and Instruction and MAT in Biological Sciences

PhD Degree (Discipline):

Other Degree:

b. How many years of education experience do you have?: 21

c. How many years have you been working at your current institution?: 21

d. List up to 10 relevant professional licenses, certifications, registrations, awards or honors that you have received in your profession::

Nalco Excellence in Education Award STEM Leadership Certification Article Published in NCSS Middle Level Learner "Whose job is it to Protect the Rainforest: Using the C3 Framework to Teach Complex Issues"

https://www.earthexpeditions.org/system/files/Tucker_Misty_Middle%20Level%20Learning_20

Ecology Project International Teacher Fellow National Geographic Certified Educator Sustainable Development Goals Ambassador

4. Professional Assignment

a. What is your primary education assignment? Check all that apply Middle School (Grades 6-8)

Other Primary Assignment

b. What subjects do you teach? Check all Middle School Science, Middle School Social Studies

Other Subjects

5. Motivation for Participation

a. What motivates you to apply to PolarTREC and professionally, what do you hope to gain from the experience? (200 words maximum)

I have several goals for myself that have motivated me to apply for this experience. First, I have found after teaching for 21 years, that there is value in investing in myself as an educator and as a scientist. Teaching, while one of the most rewarding professions, can also be one of the most draining. Learning, adventure, and finding my “inner scientist” are the things that keep me fresh, excited, and inspired to bring my best to my students. They help drive my passion for teaching and sharing this passion with students. Through previous experiences, I have developed a basic understanding and a love for fieldwork. This opportunity would allow me to grow that understanding and passion exponentially. Classrooms are a place for students to develop a sense of the interconnectedness between humans and their environment. It is a place to help students become more globally minded and begin to develop both the skills and the confidence to become problem solvers and change-makers. Through this program, I can use the curiosity and adventure associated with polar research to enhance my community’s understanding and awareness of global issues and potentially inspire change.

b. Aside from journaling/blogging, online photos, and webinars which all part of our program requirements, describe your ideas on how you will share this experience in your classroom or with the audiences you work with. (200 words maximum)

I would like to engage my students throughout every step of the program. From the beginning stages of preparations and hard work that goes into a scientific expedition to the final outcome and take-aways. I would want my students to feel a part of the expedition. I would engage my students by having them participating in research by developing questions, seeing data if possible, and trying to determine what it all means. I envision using google classroom as a way to keep students informed and allow them to ask real-time questions if there was an opportunity. The Arctic and Antarctica appeal to not only students' innate curiosities but hold the key to so much scientific data about our changing planet. After return, I would love to develop an integrated, problem based-learning unit for future students to delve into. I feel that students learn best when learning is real-life, meaningful, and challenges their thinking.

c. Describe how you envision sharing your experience with other educators, your personal and professional communities, and the general public. (200 words maximum)

I envision sharing this experience in multiple ways. First, I would love to write an article about my experience or about ways to bring Polar science into classrooms. My article "Whose Responsibility is it to Protect the Rainforest: Using the C3 Framework to Explore Complex Issues" was published in a national education journal last February. It has lit a spark in me as a writer to continue using this type of publication with the goal of encouraging teachers to include conservation into all subject areas. I would love to use my voice to educate and inspire other teachers to learn more about and incorporate Polar science into their classrooms. Second, I would love to do a TedTalk, or similar format. I have been told that I am a compelling presenter, and presenting information that I am passionate about is something that I enjoy; I love the story-telling aspect. I love to share my passion for science and endeavors to understanding our earth and the complex relationship humans have with their environment. I would also seek the opportunity to present at the Illinois Science Teachers Association conference, The Illinois Geographic Alliance conference, as well as the National Council for Social Studies conference.

d. Describe how you currently engage your audience and facilitate learning when educating on new and complex topics, concepts, or issues. (200 words maximum)

When teaching students or other educators and new and complex topic or issue, I first like to get them interested. By using some type of discrepant event, or attention-grabbing photo, video, story, or fact, I can hook them and get them to want to know more. Make it meaningful, something that connects to the bigger picture. Get them asking questions, but don't respond with answers. Science is all about the drive of curiosity, about inquiry. To me, it is important to give time to that part of the process. Once they care, I help them discover information that will help them understand the concept in organized, bite size chunks. I like to students to be engaged in learning. not just sitting and getting information told at them. I like to have students work with information in a variety of ways such as visuals, written passages, hands-on activities, experiments when possible, or even getting out into the field when appropriate. I believe that people can only "digest" so much information at once. It is important to give them time to think, problem-solve, or process. For this, often, a collaborative approach works best to allow for hearing multiple ideas and perspectives before drawing conclusions.

e. Describe the particular strengths you would bring to the PolarTREC program and to a field research team. (200 words maximum)

I am a teacher who is intrinsically motivated and hard working. I love learning new things and enjoy pushing myself outside of my comfort zone. I am driven,

enthusiastic, easy to get along with, fun, intelligent, supportive. I think that I am the perfect fit for PolarTREC because I am well rounded in the skills needed for this opportunity, and willing to learn the ones I may not have yet. I enjoy improving my written and verbal communication skills, I possess a deep understanding of standards and writing curriculum, and I have developed a love for field work and an interest in the methods used in collecting data. As a member of the district's curriculum writing team, I am familiar with both the Next Generation Science Standards as well as the New C3 Standards for Social Science. I believe that I am the perfect blend of adventure seeker, public speaker, educator, and scientist and I know I would work hard for this opportunity.

f. Using examples from your own experience including your role and the contributions you made to a team effort, describe how you work as a member of a team. (200 words maximum)

I have worked on many teams and in many different roles from team leader, team member, to rookie. I feel comfortable in each of these roles and feel I have plenty to offer in each. I have been told by peers and supervisors that a strength of mine is perseverance and keeping the team moving forward, no matter which role I am in. Sometimes that means offering ideas, sometimes taking the lead on a project, and sometimes supporting another team member, sometimes providing a little comic relief. I am good at reading personalities, and taking the role needed at the time. I am level-headed and calm in most situations. I like to talk through challenges. Being a member of the curriculum writing team at the district level has allowed me to improve my collaboration skills. This committee has a lot of strong-willed, strong-minded members, and I feel that I am one of the members who can take ideas from a variety of people on the team, and pull the strengths from each idea and find the glue that binds them all together. I like when people challenge my thoughts and help me think of other perspectives.

6. Communicating the Experience and Science

Write your journal entry for the general/lay audience. (200 words maximum)

After coming to the realization that I understand more about the ecosystems in far off places more than in my own backyard, I set off to a local forest preserve. After all, before I can teach my students to love the nature around them, I must do so myself. As I walked along the path, my bias against flatland began to kick in. My heart has always belonged to the mountains. How I am still living in Illinois is a mystery to me. On my walk, I heard my inner voice, "This path is so flat. The land is so flat. Even the trees and tall grasses... flat!" I had to stop. Literally, I stopped walking and changed my inner voice. "Give it a chance, all nature has beauty." Immediately my senses kicked in. I could smell that musty, earthy smell that happens right after a rain. I could hear the birds and the sound of the wind blowing through the grasses. Some of the plants were beginning to change to their fall hues of golds and browns. But there were still flowers and butterflies. I was seeing the prairie on the brink of a season change, and it was beautiful.

7. Scientific Interests and Research Area Preference

a. Where would you prefer to go on an expedition? Either

Please explain your preference

In all honesty, I would definitely prefer an Antarctic expedition. Antarctica holds a certain mystique and allure that can't be rivaled by any other place on the planet. It is a place that is supposed to be reserved for science and inquiry. But there is just as much to be learned in the Arctic and I would jump at the chance to participate in either location.

b. How long would you prefer to participate in an expedition? (Most expeditions are AT LEAST three weeks.) List any dates or periods of time when you are NOT able to participate in a field expedition

I would prefer an expedition that ran three to four weeks. There are no periods of time that I am not available.

c. Briefly describe your scientific interests. Which scientific topics interest you the most and why? Please note that climate change has become part of nearly all expeditions so you may choose to be more specific about this topic, if applicable. (200 words maximum)

My interests in science are many. I have a deep interest in ice core samples and the information stored within. Any sciences having to do with water, as it is one of our most important resources. But mostly, I am interested in the interconnectedness of humans and their environment. How what we do impacts not just our direct environment, but global well-being. Human health and human rights, economics, political policies, endangered species, food availability, freshwater systems, our oceans, artistic endeavors, are all intertwined and all call out for the need for more sustainable practices. My interest in science is helping others see the implications of what science tells us.

Atmospheric Systems I would really enjoy an expedition in this subject area

Cryospheric Systems I would really enjoy an expedition in this subject area

Human and Social Systems I am somewhat interested in this subject area

Marine Systems I am somewhat interested in this subject area

Terrestrial Systems I am somewhat interested in this subject area

Ecology and Biotic Systems I would really enjoy an expedition in this subject area

Physics or Space Sciences I am somewhat interested in this subject area

Engineering and Technology I am somewhat interested in this subject area

Other (please specify)

Other Areas of Scientific Interest

e. Are you applying to work exclusively with a specific researcher? If yes, please list their full name, institution, and email address. (200 words maximum)

8. Background Information and Skills

a. Briefly describe your outdoor skills or experiences.

I have experience in a variety of outdoor experiences. I have camped in different climates including tent camping in cooler climates in Northern Wisconsin, in the heat of Kenya, to sleeping on a cot under the stars in Baja Mexico. I enjoy hiking flat areas as well as mountains and have experience hiking Mt. Machu Picchu, the Rif Mountains, Atlas Mountains. I have some experience canoeing, kayaking (sea and lake), and am a decent swimmer. I have limited experience repelling, but would love to do more. I also have some experience snowshoeing. I am first aid /CPR certified.

b. Provide a basic statement of your general health and physical condition.

I am in general good health. I do have high blood pressure because of genetics, but it has been managed through medication and is not a concern. Being turned down last year motivated me to spend the last year focused on physical fitness and being physically prepared for this type of experience. I make sure to work out 3-5 days a week, including walking on a treadmill at full elevation since we don't have a lot of hills and mountains in Illinois. I sought out opportunities to do some more challenging hikes over the summer including the Blue Ridge Mountains, the Rif and Atlas mountains.

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.

Because I use a Mac at home and a PC at school, I am extremely comfortable with going back and forth between both operating systems.

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.

I use my macbook air as my personal laptop, my PC docking laptop at work. I use my iPhone, as well as a point and shoot digital camera, as well as a DSLR camera which I am becoming better as using, I am comfortable with internet browsers, Google classroom, GoogleDrive, google docs, Google Sheets and Excel, Google Slides and Power Point, Google forms. I can use various photo editing tools as well as iMovie or WeVideo for movie/video editing. I am comfortable with uploading video to youtube when or if necessary. I learn new technology fairly easily.

e. List any additional skills or information that you wish to be considered.

9. Previous Applications & Participation

a. Have you previously participated in a teacher research experience (e.g. NOAA Teacher at Sea, Earth Watch)? We do not accept applications from PolarTREC alumni. Yes

Program Information Ecology Project International Teacher Fellowship Yellowstone Winter 2018

If yes, did you complete all program requirements? Yes

If yes, how do you see the PolarTREC professional development opportunity continuing to develop your professional skills, or how will it build on your previous research experiences?

I feel that between my MAT in Biology through the Global Field Program and my Teacher Fellowship at Yellowstone National Park have supplied me with an understanding of the basics of field science and provided me with an emerging sense of a science identity. I am hoping that an expedition with PolarTREC would not only build on that, but allow me to be fully immersed in the field and experience data collection, observation, and putting it all together at a higher level and build my confidence as a scientist, educator, and facilitator for conservation programs at my school.

10. Orientation Availability

Are you available to attend the Orientation during this time period? Yes

If no, please explain

11. How did you hear about PolarTREC?

Email listserve. Please provide the name and/or URL

Friend or colleague. Provide a name if you wish

I heard about the program from another teacher fellow during my EPI Yellowstone Fellowship experience.

Former PolarTREC, TREC, or TEA teacher. Please provide their name

From a website. Please list the website name and URL

Conference or presentation. Please list the venue and/or presentation title

Other (please explain)

b. Please suggest other places we might advertise this opportunity for teachers

12. References

Reference 1

Name Mike Dutdut

Title and affiliation Principal

Email Address mike_dutdut@ipsd.org

Phone Number 630-428-6200

Reference 2

Name Nancy Spring-Epley

Title and affiliation colleague

Email Address Nancy_spring@ipsd.org

Phone Number 630-428-6200

Reference 3

Name Jessica Walsh

Title and affiliation Instructional Specialist at the District Level

Email Address jessica_walsh@ipsd.org

Phone Number 630-375-3886

2020-2021 PolarTREC Educator Application

Michelle Vanhala

1. Contact Information

Name: Ms. Michelle Vanhala

Email: michellevanhala@gmail.com

Home Address:

4836 Washtenaw Ave C6
Ann Arbor, MI 48108 US

Home Phone: 12312878186

Cell Phone : 12312878186

Institution Name: Washtenaw Technical Middle College

Institution Address:

4800 East Huron River Drive
Ann Arbor, MI 48105 US

Institution Phone: 17349733410

Classroom/Office Extension: 17349733410

Institution Fax: 7349733464

Institution Website: <http://www.themiddlecollege.org>

Other relevant websites: School Profile:

<http://www.themiddlecollege.org/sites/default/files/WTMC%20Profile%202013-2014.pdf> My classroom website: <https://sites.google.com/view/vanhala-science/> My Twitter account: <https://twitter.com/MsVanhala>

Supervisor's Name: Karl Covert

Supervisor's Email Address: kacouvert@wccnet.edu

2. Demographic Information

a. Gender: Female

Race: White

c. Briefly describe your primary audience and surrounding community (e.g. K-12, public, rural/urban, technology access, economics): Washtenaw Technical Middle College (WTMC) is a Michigan Public School Academy chartered by and located on the campus of Washtenaw Community College (WCC) in Ann Arbor, MI. By their tenth or eleventh grade year, WTMC students are jointly enrolled as full time students at WCC , and are required to meet all pre-requisites, requirements and conditions of Washtenaw Community College students. WTMC students graduate with a high school diploma and a certificate and/or an associate degree from WCC. As part of this unique teaching team, my role is that of 9th grade science teacher on a team of six teachers total who work together to create and implement a 9th grade curriculum centered around the theme of sustainability. We work with approximately 100 racially and socio-economically diverse students for their 9th grade year before they go on to matriculate into college level classes in future years.

d. Type of School (or students you work with): Other (describe below)

Other Type of School Washtenaw Technical Middle College (WTMC) is a Michigan Public School Academy chartered by and located on the campus of Washtenaw Community College (WCC) in Ann Arbor, MI.

e. What is the population of your annual audience or school (estimates are fine) 800

f. School Ethnicity:

0 % - American Indian or Alaska Native

5 % - Asian

25 % - Black or African American

15 % - Hispanic or Latino

0 % - Native Hawaiian or Other Pacific Islander

50 % - White

5 % - Multiracial

If your school uses other categories to describe race/ethnicity, please describe:

g. Percentage of students who receive free or reduced lunch: 30%

h. Average class or audience size 25 students per class

i. Total number of students/audiences you teach in a year 100 students

j. If known, what are the approximate start and end dates of your school year or primary programs, etc. ? Include major professional vacation periods. i.e. Christmas break, summer break, etc.

Approximate start - August 24th, 2019 Winter break - December 14th, 2019 through January 8th, 2020 Spring breaks - February 22nd - 26th, 2020 and May 3rd - 7th, 2020 Approximate end - June 26th, 2019

3. Teaching Experience and Education

a. What type of university degree or other academic experience or qualifications do you have?

Bachelor's Degree (Major): Integrated Science for Secondary Education and English for Secondary Education

Bachelor's Degree (Minor): Biology for Secondary Education

Masters Degree (Discipline): Masters of Science in Science Education

PhD Degree (Discipline):

Other Degree:

b. How many years of education experience do you have?: 6

c. How many years have you been working at your current institution?: 1

d. List up to 10 relevant professional licenses, certifications, registrations, awards or honors that you have received in your profession::

AWARDS and HONORS: Michigan Science Teachers Association (2014 - Present) • Nominated for 2020 Michigan Science Teacher of the Year CarbonTIME Cohort, Michigan Educational Association (July 2017 - July 2019) • Trained in implementing a curriculum aligned to the Next Generation Science Standards created through Michigan State University • Executed science lessons designed to construct an understanding of processes that transform matter and energy in organisms, ecosystems, and global systems • Reflected upon student data and discourse routines to refine teaching practices Teach to Lead, US Department of Education (April 2019) • Applied for and was accepted to attend the 2019 Teach-to-Lead Summit as part of a collaborative team of five teacher leaders Knowles Teacher Initiative Fellowship Recipient (January 2014 to July 2019) • Selected as a member of the 30-person 2014 Teaching Fellow Cohort out of hundreds of applicants in a national, competitive search for early-career math and science teachers dedicated to improving education in their classroom and beyond • Provided with professional development opportunities, networking, and financial support in order to develop our own teaching expertise and capacity as teacher leaders • Attended national cohort meetings and conferences three times a year for five years to engage in intensive and cohesive trainings • Awarded nearly \$50,000 in grants for professional development, classroom materials, and leadership to improve education in my own

classroom and beyond Central Michigan University Honors Program (August 2009 to May 2014) • Received the Honors Program graduating class of 2014 Academic Excellence Award Central Michigan University (August 2009 to May 2014) • Received the College of Education and Human Services 2014 Learning and Leading Award • Honored as part of the Central Michigan University Dean's List every semester, from 2009 to 2014 • Selected as one of 20 to receive the 2009 Centralis Scholarship, a highly competitive, four-year "full-ride" academic undergraduate scholarship to Central Michigan University CERTIFICATIONS: Google Level 1 Certified Educator (January 2019- Present) National Geographic Certified Educator (December 2019 - Present)

4. Professional Assignment

a. What is your primary education assignment? Check all that apply

Secondary (Grades 9-12)

Other Primary Assignment

b. What subjects do you teach? Check all Secondary Biology, Secondary Earth Science, Secondary General Science, Secondary Physical Science

Other Subjects The specific title of my class is "environmental science," and I teach standards that include life sciences, physical sciences, and earth science as well as some engineering standards.

5. Motivation for Participation

a. What motivates you to apply to PolarTREC and professionally, what do you hope to gain from the experience? (200 words maximum)

Science is about doing; it's about finding patterns and figuring out what those patterns mean. It's about questioning, modelling, and communicating. Science is about generating and analyzing data and about identifying and solving real-world problems. These are the experiences that I try to give learners in my science classroom: they aren't memorizing and regurgitating, but instead are acting as scientists as they think critically about the world around them. I need to practice what I preach to my students, and PolarTREC is an amazing opportunity to do exactly that. Not only is it an opportunity to contribute to the field of science, but it is also a chance to further my own content knowledge as a lifelong learner by engaging in hands-on research. I hope to inspire some of my learners to consider a career in a science field by sharing my PolarTREC experiences with them and connecting them with the primary investigators on my team. Moreover, I am confident that the lessons learned while researching abroad will help my colleagues and I to shape and refine the innovative curriculum centered around the theme of sustainability that we have created.

b. Aside from journaling/blogging, online photos, and webinars which all part of our program requirements, describe your ideas on how you will share this experience in your classroom or with the audiences you work with. (200 words maximum)

I am confident that engaging in the research process myself and collecting global data will generate ideas for extensions in which my students can be involved. Inviting the primary researchers to communicate with my students to expose them to careers in science is a must, and I will also seek out ways to directly involve my learners in the research we conduct as well. With sustainability being a primary component of the ninth grade curriculum at WTMC, we are trying to create units that challenge students to solve real world problems and communicate their solutions with the world, just as I will be doing within PolarTREC. Climate change is a recurring issue to which my students are exposed as they form conclusions about global data patterns and learn how their individual choices affect matter cycles. Several PolarTREC expeditions investigate climate change, so there are clearly connections that could be made between the learning happening in my classroom and the research in the field. Specifically, I am envisioning a project-based learning unit that challenges learners to collect data regarding their choices and implement a solution

to mitigate the effects of climate change inspired by and grounded in my PolarTREC experiences.

c. Describe how you envision sharing your experience with other educators, your personal and professional communities, and the general public. (200 words maximum)

I am incredibly active on Twitter (check out @MsVanhala!): I tweet often to share about the learning happening in my classroom and beyond for my 1100 followers. I absolutely would maintain this practice all along my journey, sharing glimpses of life in the polar regions as a researcher for the world back home. I have been a guest tweeter for @NGSS_Tweeps, a national rotating account of science educators with an audience of over 4,000 education professionals. I could easily arrange to be the host of this account while abroad on my PolarTREC journey. I also have been recruited as a blog writer for the Buck Institute of Education and I have presented at state, national, and even international conferences. I would love to continue to brainstorm additional educator audiences with whom to share my experiences, such as the Michigan Science Teachers Association Conference and National Science Teachers Association Conference. Finally, as a Knowles Science Teaching Senior Fellow, I am connected with hundreds of other math and science educators across the nation who are a part of a life-changing professional development network. I plan to present at a Knowles meeting to share what I have learned and recruit future participants.

d. Describe how you currently engage your audience and facilitate learning when educating on new and complex topics, concepts, or issues. (200 words maximum)

My science teaching colleague and I have thrown out our old textbook-based materials and collaborated together to design a curriculum based on observation of phenomena aligned to the Next Generation Science Standards. We know how important it is to get our learners thinking about global data and patterns, and have worked to integrate a theme of sustainability across not just our own science classes, but in our students' 9th grade English and Social Studies classes as well. In our classes, our students work together to build their understanding of how matter cycles and energy flows from an organismal to global scale while discovering their own place and impact in the world. Our lessons have a predictable pattern - students observe a phenomena, generate noticings and wonderings, and then engage in a series of mini-lessons designed to purposefully build their understanding of what they have observed. They are challenged to communicate their understandings with one another as they refine their ideas, building on collaborative practices to come to a class consensus. Throughout this process, students are engaging in hands-on

research, modelling, and argumentation as they answer authentic questions about the world we live in.

e. Describe the particular strengths you would bring to the PolarTREC program and to a field research team. (200 words maximum)

My foundational understanding of the research process comes from the training and support I have received from the Knowles Science Teacher Initiative and the work that went into earning my Masters Degree. Combined with my strong writing skills, my research experience has led to several publications in state and national journals, including the Michigan Science Teachers Association Journal, the Journal of Teacher Action Research, and the Knowles publication Kaleidoscope. On a personal level, I would describe myself as a lifelong learner. The growth-mindset that I work to instill in my learners is something that I model on a daily basis; learning from mistakes is the best way to grow. Our school's dean would affectionately describe me as a perfectionist, and my colleagues have told me that I lead by example. In working with a team, I see myself as a visionary who actively works to support others. I have experienced firsthand how innovation is necessary to create a truly powerful education for all, and ensuring that all voices have a chance to contribute is vital for an inclusive process. I have worked to create such a collaborative environment in my own school, and I will do the same on the PolarTREC team.

f. Using examples from your own experience including your role and the contributions you made to a team effort, describe how you work as a member of a team. (200 words maximum)

In my school context, I have been worked closely with colleagues to design and implement a new educational framework. Traditional curricula have been thrown out the window, replaced by a learning environment in which learners are researching, communicating, and collaborating across subject areas. Needless to say, this work is easier said than accomplished - we have spent countless hours working together to design and refine this type of learning. In this process, I have pushed to keep our student-centered vision in mind and have coordinated logistics in such a way to ensure that all team members have a shared voice. On multiple other occasions, I have presented to the whole staff and to the science department on teaching practices designed to increase student engagement, and I have previously collaborated with an English teacher to create a biology/English block class that specifically focused on science literacy across the two subjects. Currently, I am working closely with the other science teacher on our freshman team to adapt our curriculum in the best interest of our learners. Across all of these experiences, I see myself as a creative visionary who also breaks down a task in order to ensure that it

gets done by the team, and is done well.

6. Communicating the Experience and Science

Write your journal entry for the general/lay audience. (200 words maximum)

“What did I get myself into?” I think as I jog down the hallway. It is the first day of school, and life is hectic, to put it mildly. I need to set up for the next rotation of freshmen - which starts in less than 5 minutes. Flying into the room, I greet learners who are already bouncing off the walls and gear up for a series of fire demos that will eventually lead students to an understanding of combustion. “Ms. Vanhala - what chemicals are in ethanol? Does it freeze like water?” Ethan turns away from his group’s conversation to consult me after the demos, and my morning’s stress dissipates as I fail to hold back my grin. “Let’s leave ethanol in the freezer overnight and see. I love that question, Ethan!” This is what it is all about: the moments when students are scientists - asking questions and making connections and giving me the privilege of guiding them to an understanding of the world around them. With anticipation of the year ahead, I place a beaker of ethanol into the freezer and turn back to my classroom of scientists.

7. Scientific Interests and Research Area Preference

a. Where would you prefer to go on an expedition? Either

Please explain your preference

I want to be involved in PolarTrec in any way I can!

b. How long would you prefer to participate in an expedition? (Most expeditions are AT LEAST three weeks.) List any dates or periods of time when you are NOT able to participate in a field expedition

I am completely flexible and open as far as participation goes. I am available to participate in a field expedition on any date, and my administration has already voiced support for my participation in PolarTREC. I would have no problem participating in a three week program, and I have able to use substitute days in order to take off up to six weeks (or perhaps even longer) if needed.

c. Briefly describe your scientific interests. Which scientific topics interest you the most and why? Please note that climate change has become part of nearly all expeditions so you may choose to be more specific about this topic, if applicable. (200 words maximum)

My students are learning about systems thinking and sustainability as they discover their role in the world through connections between the biosphere, hydrosphere, atmosphere, and lithosphere. In their English and Social Studies classes, they are reading and considering the implications that a changing system has on society and their own lives, as well as how they can take action to make a difference. We have specifically used Lake Erie algae blooms as a case study this past fall as we collect water quality data and consider the role of the Huron River Watershed, and we will continue to look at local case studies that show the impacts of climate change at various levels. Specifically, I am interested the roles that different processes play in the cycling of carbon, contributing to climate change. I am curious to learn more about the effects of climate change on various organisms across the globe, and/or how ecosystems have responded. Mitigating climate change is obviously a passion of mine as well, and so I would be interested to be part of any expedition in which the research being conducted in the field by researchers and teachers alike is helping to solve this global issue.

Atmospheric Systems I would really enjoy an expedition in this subject area

Cryospheric Systems I am somewhat interested in this subject area

Human and Social Systems I am somewhat interested in this subject area

Marine Systems I am somewhat interested in this subject area

Terrestrial Systems I would really enjoy an expedition in this subject area

Ecology and Biotic Systems I would really enjoy an expedition in this subject area

Physics or Space Sciences I am somewhat interested in this subject area

Engineering and Technology I am somewhat interested in this subject area

Other (please specify)

Other Areas of Scientific Interest

I wish I could click "really interested" for all of them! :)

e. Are you applying to work exclusively with a specific researcher? If yes, please list their full name, institution, and email address. (200 words maximum)

8. Background Information and Skills

a. Briefly describe your outdoor skills or experiences.

I have some hiking experience and am definitely comfortable spending time outside.

b. Provide a basic statement of your general health and physical condition.

I am very healthy. I attend an hour-long, high-intensity interval training workout class three to five times a week during which I am challenged to lift weights and run sprints and long distances. I regularly run one to two miles as part of my workouts.

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.

I have worked with both Macs and PCs and am entirely competent with both for general day-to-day use. I do not know how to code, but I am confident enough in my skills as a learner to say that I could pick up anything fairly quickly if you need me to! My personal preference is with a PC, as that is what I own and use most often.

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.

As an educator, I constantly utilize technology in my classroom through my laptop, iPad, phone, and more. My students all have their own chromebooks, so most of my lessons are designed to take advantage of technology as a means of modelling, checking for understanding, researching, and more. I maintain a Twitter handle to share my daily experiences and a Google website with Google Calendar to communicate important information about my classroom to my learners. I am particularly experienced with Google Drive and its extensions and often create hyper-linked Google Docs that guide students through projects at their own pace. I use technology as a formative assessment tool to check for understanding and am regularly learning new tools and tricks to help my 21st-century learners.

e. List any additional skills or information that you wish to be considered.

I am proud of my writing and communication skills, and I hope to use them to share with others both informally and formally about these experiences! As a Knowles Senior Fellow, I have spent the last five years delving into inquiry in my own classroom, and I am confident that this mindset and skills that I have cultivated will support PolarTrec.

9. Previous Applications & Participation

a. Have you previously participated in a teacher research experience (e.g. NOAA Teacher at Sea, Earth Watch)? We do not accept applications from PolarTREC alumni. Yes

Program Information I was selected to be a part of the Earth Watch teacher fellowship, but unfortunately was ultimately unable to attend as their research experience conflicted with a school sponsored exchange trip to China that I was also nominated to be a part of. While an undergrad student at Central Michigan University, I worked as part of a Research Experience for Teachers summer program for two years. In this program, I worked closely with a team of engineering professors, students, and other teachers to engage as a learner in the engineering process and develop classroom lessons from our research experience.

If yes, did you complete all program requirements? Yes

If yes, how do you see the PolarTREC professional development opportunity continuing to develop your professional skills, or how will it build on your previous research experiences?

My previous research experience focused primarily on engineering and the engineering process. It challenged me to ask questions, be unafraid of failure, and to persist to learn from mistakes. I see PolarTREC as a natural extension of this prior experience, as it will give me an opportunity to act as a scientist out in the field.

10. Orientation Availability

Are you available to attend the Orientation during this time period? Yes

If no, please explain

11. How did you hear about PolarTREC?

Email listserve. Please provide the name and/or URL

Friend or colleague. Provide a name if you wish

Katey Shirely, from Knowles

Former PolarTREC, TREC, or TEA teacher. Please provide their name

From a website. Please list the website name and URL

From your website! :)

Conference or presentation. Please list the venue and/or presentation title

Other (please explain)

b. Please suggest other places we might advertise this opportunity for teachers

12. References

Reference 1

Name Paula Gentile

Title and affiliation Science teacher, colleague

Email Address paula.gentile@knowlesteachers.org

Phone Number 19898544444

Reference 2

Name Jacob Anastasoff

Title and affiliation Principal of Tecumseh High School

Email Address janastasoff@tps.k12.mi.us

Phone Number 15174236008

Reference 3

Name Karl Covert

Title and affiliation Dean/Superintendent, Washtenaw Technical Middle College

Email Address kacouvert@wccnet.edu

Phone Number 17349733410

2020-2021 PolarTREC Educator Application

Sam Wheeler

1. Contact Information

Name: Dr. Sam Wheeler

Email: wheeler@ncssm.edu

Home Address:

1907 Carnation Drive
Durham, NC 27703 US

Home Phone: 9196223308

Cell Phone : 9196223308

Institution Name: North Carolina School of Science and Math

Institution Address:

1219 Broad St
Durham, NC 27705-3577 US

Institution Phone: 9194162600

Classroom/Office Extension: 9194162693

Institution Fax:

Institution Website: www.ncssm.edu

Other relevant websites:

Supervisor's Name: Amy Sheck

Supervisor's Email Address: sheck@ncssm.edu

2. Demographic Information

a. Gender: Male

Race: I do not wish to respond

c. Briefly describe your primary audience and surrounding community (e.g. K-12, public, rural/urban, technology access, economics): NCSSM is the only public, residential high school in North Carolina. We are a STEM certified school that focuses on making sure that every student leaves with a very strong science and math foundation. Our primary focus is to bring a rigorous, intellectually stimulating, educational experience to our students concentrating on the integration of the sciences, math, and computational sciences. Every student who is accepted comes to NCSSM for their junior and senior years free of charge. We have an incredibly diverse student body that represents every congressional district of NC, every ethnic demographic, and every socio-economic demographic. The application process is very competitive and rigorous, and because of that not everyone who applies can come. As a consequence we reach out to those schools and communities to students who may not have been accepted, but who would benefit from what we offer through our distance ed and online program. Our school truly touches every part of NC.

d. Type of School (or students you work with): Public

Other Type of School

e. What is the population of your annual audience or school (estimates are fine) 680 residential and ~500 online

f. School Ethnicity:

% - American Indian or Alaska Native

33 % - Asian

12 % - Black or African American

4 % - Hispanic or Latino

% - Native Hawaiian or Other Pacific Islander

47 % - White

4 % - Multiracial

If your school uses other categories to describe race/ethnicity, please describe:

g. Percentage of students who receive free or reduced lunch: 100

h. Average class or audience size 21

i. Total number of students/audiences you teach in a year 100

j. If known, what are the approximate start and end dates of your school year or primary programs, etc. ? Include major professional vacation periods. i.e. Christmas break, summer break, etc.

Thanksgiving Break: Nov 20, 2020 - Nov 28, 2020 Christmas Break: Dec 19, 2020-Jan 3, 2021 Summer Break: June 2, 2021

3. Teaching Experience and Education

a. What type of university degree or other academic experience or qualifications do you have?

Bachelor's Degree (Major): Physics

Bachelor's Degree (Minor): Math

Masters Degree (Discipline): Applied Mathematics

PhD Degree (Discipline): Physics/Science Education

Other Degree: MA Biological Sciences

b. How many years of education experience do you have?: 25+

c. How many years have you been working at your current institution?: 7

d. List up to 10 relevant professional licenses, certifications, registrations, awards or honors that you have received in your profession::

NC Teaching License NBPTS AYA Physics Presidential Award for Excellence in Math & Science Teaching Sigma Xi Outstanding Science Teacher Award Albert Einstein Distinguished Educator Fellowship Kenan Fellowship NCSTA Nancy Wynne Distinguished Service Award NC-AAPT Walter C Connolly Award for Excellence in Pre-College Teaching NASA Certified Lunar Sample Handler NC Museum of Natural Science Educator of Excellence

4. Professional Assignment

a. What is your primary education assignment? Check all that apply
Secondary (Grades 9-12), Four-Year College or Institution

Other Primary Assignment

b. What subjects do you teach? Check all Secondary Physics

Other Subjects

5. Motivation for Participation

a. What motivates you to apply to PolarTREC and professionally, what do you hope to gain from the experience? (200 words maximum)

I'm applying to PolarTREC for several reasons, early in my career I did a lot of external professional development, but as time and life happened, I haven't been able to do that until recently. A PolarTREC would be exactly what I need to recharge my "professional batteries" and it would give me a unique opportunity to learn and work with scientists on world class, leading edge science. I feel that science teachers have a primary duty to share science with the public, including the science of climate change, and how that science is conducted. I want to bring my experiences, and the science I learn, back home and make the Arctic/Antarctic a personal experience to the people that I know. If people are able to establish a personal connection to the Arctic/Antarctic, then they are more likely to support conservation efforts for these environments and they will be more understanding of the importance of the research being done there. I want to be that personal connection for my students and community. Personally, I would hope that this experience would inspire me in ways that I can't yet predict or understand. I'm looking for this to reignite that spark.

b. Aside from journaling/bloggng, online photos, and webinars which all part of our program requirements, describe your ideas on how you will share this experience in your classroom or with the audiences you work with. (200 words maximum)

There are several ways that I envision sharing my experience with my students and other classrooms. I want to incorporate what I learn during the program into my physics curriculum and adapt examples from the research project that I'm assigned to. When students are given examples and material that incorporate real life examples into the material makes them more interested and engaged subject. My PolarTREC experience will give me first hand knowledge and examples that I can use to show others the interdisciplinary approach to doing science in the form of lessons and examples. I also see sharing my day-to-day experiences through a series of short video logs and posting that on my YouTube channel for students to watch and posting on our school's website. We have a distance learning department that connects daily with students across the state through CCTV & online. I want to tie in my experience with elementary students at my daughter's school. I will be able to engage her school and share with the elementary kids my experience and show them the things that I did on the expedition. Finally, I would love to write a series of children's books on science of the polar regions.

c. Describe how you envision sharing your experience with other educators, your personal and professional communities, and the general public. (200 words maximum)

I'm a past president of NC's chapter of NSTA and I continue to be active in that organization. I plan on giving presentations at our state conference, and sharing my experiences with our members through the organization's website. On top of presenting at my state conference, I intend to share my experience at a national and/or regional NSTA conference. I have ties with NCSU, where I occasionally teach a summer class, and can arrange to give presentations there. I intend to reach out to our local media to share my experience through them and can arrange this through our media liaison at my school. The NC Museum of Natural Sciences runs programs for educators and I've worked with them in the past and will be able to make arrangements with them to share my experiences with the educators they reach. I will make full use of social media (Reddit, FB, Twitter, etc) to share my experiences and get the word out. I would like to make a series of short videos documenting my expedition, and share them through YouTube when I get back. NC's teachers are hungry for information about the world's polar regions and the science being learned.

d. Describe how you currently engage your audience and facilitate learning when educating on new and complex topics, concepts, or issues. (200

words maximum)

The best way to engage students and facilitate learning is through hands-on collaborative projects and real world problems that allow students to build upon their fundamental conceptual understanding. To teach a new topic I must ensure that students have a firm grasp of the fundamental concepts and ensure they understand how to use tools to assist their learning. In physics I start out by making sure students understand how to make graphs of real data and how to interpret the data-skills that are important to all sciences. Students use these skills to better understand the concepts of motion, forces, etc. Without a fundamental understanding of these concepts to build upon, students have difficulty understanding new topics. For example, to understand collisions they must understand the conservation of momentum and the conservation of energy and if they understand these principles, then the students can solve problems ranging from car crashes to collisions in the LHC. I teach students to follow a problem solving procedure whenever they are faced with an unknown situation or problem. This process helps them frame the problem and organize the information to make sense of it from the standpoint of what they already know.

e. Describe the particular strengths you would bring to the PolarTREC program and to a field research team. (200 words maximum)

I understand the need for holding to a rigorous schedule and realize the need to be flexible during the experience. I am prepared mentally and physically for the stresses that may occur on the PolarTREC opportunity. I understand that on these types of expeditions it is important to acknowledge the leadership hierarchy and to follow through with the expectations and duties assigned. I bring along a great curiosity and a love for learning and doing science as well as a love for the experience itself. I worked at DOE and with NASA and am experienced working with government teams and scientists in non-educational settings. I bring a strong background in science and math and a solid history for adapting PD experiences into curriculum. I am comfortable around, and can quickly adapt to using any kind of technology. Finally, I also like to think that I bring a sense of humor and a warm personality. My students think that my sense of humor only consists of bad physics jokes and puns, but I'm working on branching out. I was told to bring chocolate with me on an expedition to more easily win friends. I'm also persistent and patient.

f. Using examples from your own experience including your role and the contributions you made to a team effort, describe how you work as a member of a team. (200 words maximum)

I know that it is vital to adhere to the schedule assigned on an expedition like this

because a lot of money, time, and research will be riding on the fact that everybody needs to be on the same page. I was part of a 4 person team selected to fly an experiment on NASA's Zero-G aircraft-(the Weightless Wonder). Our experiment was designed to examine the behavior of coacervates in a variable gravity environment. My role was that of technology specialist/engineer. I handled the equipment that measured the 'g's and captured video of the experiment. I was part of the crew that flew on day 2 of the experience. As a team we had to design the experiment in such a way to meet NASA flight safety specifications and to perform the tasks we needed. We succeeded in these goals and our design passed all of NASA's reviews. Also as part of the 2nd day crew, my job was specifically important because the prime crew got sick and did not activate the equipment properly, so the burden of success was on me to operate the experiment in a weightless environment. But alas, Texas humidity wasn't on our side.

6. Communicating the Experience and Science

Write your journal entry for the general/lay audience. (200 words maximum)

Last week saw the culmination of an opportunity that I took advantage of seven years ago when I became a Certified Lunar Sample Handler. This certification allows me to order and showcase lunar regolith brought back by the Apollo missions. On Monday, I presented the samples to all my classes and told them the backstory and history of the missions. We compared earth samples of basalt and anorthosite to the lunar basalt and anorthosite and students closely examined each of these under the dissecting microscopes and the document camera. The students were able to see, with their own eyes, the direct evidence of the Moon's origin. Later I gave another presentation to faculty members and let them examine the regolith and soil samples. Both groups were very inquisitive about the samples, but while the faculty were more interested in the geologic origins of the samples, the students were more interested in the history of the Apollo program and what the Astronauts had to contend with on the Moon. Afterwards, I had to pack up the samples and send them back to NASA, the most stressful part of the entire experience was finding the required, mandatory, brown paper packing tape.

7. Scientific Interests and Research Area Preference

a. Where would you prefer to go on an expedition? Antarctic

Please explain your preference

I would prefer to go to the Antarctic mainly because if I'm going to do PolarTREC, well I'm going to go to a place that I wouldn't be able to go to in any other program.

b. How long would you prefer to participate in an expedition? (Most expeditions are AT LEAST three weeks.) List any dates or periods of time when you are NOT able to participate in a field expedition

Three weeks would be great, and I might be able to go longer if needed. However, if I'm gone too long my wife will renovate the entire house without telling me anything about it, and make me pay for it when I get back. I would prefer not to be gone over Christmas, but if I have to go, then I'll go during this time.

c. Briefly describe your scientific interests. Which scientific topics interest you the most and why? Please note that climate change has become part of nearly all expeditions so you may choose to be more specific about this topic, if applicable. (200 words maximum)

I have a wide variety of scientific interests that range from very specific interests in physics to the earth and life sciences. I have an academic background and interest in physics and have followed up with these interests with visits to CERN and the Large Hadron Collider. I have a strong interest in cosmology, gravitational waves, and other similar areas of physics. Ultimately physics must connect the big scale with the small scale. I am interested in climate change mainly because that is the one issue which we are dealing with today and an issue that my children will have to contend with but more importantly because the issue of climate change has been deliberately denigrated. In 2002 I worked with my state's science museum to create an exhibit on the role of CO₂ in climate change and ever since then I have tried to incorporate the science of climate change in my curriculum when possible. I am very interested in astrobiology, due to its interdisciplinary nature, and took part in a NASA Astrobiology expedition in Death Valley where we focused on cryptocyano algae and how understanding cryptobiotic soil crusts serves as an Earth analogy for extraterrestrial life.

Atmospheric Systems I would really enjoy an expedition in this subject area

Cryospheric Systems I would really enjoy an expedition in this subject area

Human and Social Systems

Marine Systems I would really enjoy an expedition in this subject area

Terrestrial Systems I am somewhat interested in this subject area

Ecology and Biotic Systems I would really enjoy an expedition in this subject area

Physics or Space Sciences I would really enjoy an expedition in this subject area

Engineering and Technology I would really enjoy an expedition in this subject area

Other (please specify) I would really enjoy an expedition in this subject area

Other Areas of Scientific Interest

Anything that someone would see me fitting into based on my application.

e. Are you applying to work exclusively with a specific researcher? If yes, please list their full name, institution, and email address. (200 words maximum)

no specific researcher

8. Background Information and Skills

a. Briefly describe your outdoor skills or experiences.

I am very comfortable outdoors and often seek out professional development opportunities that take me outdoors. I enjoy skiing, hiking, biking, and, in the past, rock climbing too. I am an Eagle Scout, so I have had a long history of being outdoors. All of those experiences had me outdoors in various climates. I also have taken part in an Outward Bound experience which was a 10 day hike through the mountains of North Carolina. I have also had desert survival training from experiences in the Mojave, Namibia, and Kenya. I've taken part in a two week field courses into the rainforests along the Amazon River, and in the jungles of Guyana. I've hiked in Glacier National Park to examine the effects of climate change on the park's disappearing glaciers. Finally, I was also in high school and college Navy/Marine ROTC where I had many outdoor experiences and learned other skills as well which give me experience outside. I was first aid and CPR certified (I need to seek recertification). I'm also comfortable around guns and can use them (real ones not just ones from video games).

b. Provide a basic statement of your general health and physical condition.

I am in very good health and make a point to work out for at least an hour (cardio and weights) nearly every day of the week at my local gym.

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.

I am highly experienced with PC computers and their uses. I can use Macs as well. I am familiar and comfortable with Windows. I would rate my skill level as high with using and operating computers.

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.

I can easily use Google Docs, MS Office, Excel, PowerPoint, all internet browsers. I have created instructional movies of physics phenomena with high speed cameras that are used and analyzed in LoggerPro software. I use VPython/Glowscript to create simulations of various physics examples and problems ranging from orbital mechanics to electric fields. I have a variety of experiences using software packages such as Matlab, SAS, Excel, and STATA, to analyze data sets both as part of the training I received for my graduate work, but also as part of the work I did when I was an Einstein Fellow at the Department of Energy. I used STATA to analyze data that was collected for my PhD project and dissertation. In addition, for my PhD

project I used Camtasia Studios video editing software to create videos used in my research.

e. List any additional skills or information that you wish to be considered.

A few years ago, I built an electric guitar from scratch over the course of five months in part because it forced me to learn how to use a wide variety of power tools. I now know and have plenty of experience using a variety of power tools found in any workshop such as saws, drills, sanders, chisels, etc for precision work. Now the challenge is to learn how to use the guitar, but my wife won't let me play it or sing in the house until I'm good enough at it that I won't annoy anyone.

9. Previous Applications & Participation

a. Have you previously participated in a teacher research experience (e.g. NOAA Teacher at Sea, Earth Watch)? We do not accept applications from PolarTREC alumni. Yes

Program Information NASA Spaceward Bound Astrobiology Expedition 2007 NC Museum of Natural Sciences Educator of Excellence Program to the Amazon, Peru 2012 Earth Expeditions (graduate course): Guyana 2011 Earth Expeditions (graduate course): Kenya 2009 Earth Expeditions (graduate course): Namibia 2008

If yes, did you complete all program requirements? Yes

If yes, how do you see the PolarTREC professional development opportunity continuing to develop your professional skills, or how will it build on your previous research experiences?

These experiences gave me the foundations of field work skills and taught me to be adaptable and flexible and how to roll with the unexpected. They also taught me that time is of the essence during one of these expeditions and that it's important to maximize the time on task for the science being done. I see building on these skills with a PolarTREC expedition, but more importantly I see myself learning something completely new through PolarTREC. I also see PolarTREC giving me access to a new cadre of people who are a lot smarter than I am and whom I can form professional relationships with that will continue on for years.

10. Orientation Availability

Are you available to attend the Orientation during this time period? Yes

If no, please explain

11. How did you hear about PolarTREC?

Email listserve. Please provide the name and/or URL

Friend or colleague. Provide a name if you wish

Tim Spruck, Lynn Reed

Former PolarTREC, TREC, or TEA teacher. Please provide their name

Tim Spruck,

From a website. Please list the website name and URL

Conference or presentation. Please list the venue and/or presentation title

NSTA Conference

Other (please explain)

from applying before

b. Please suggest other places we might advertise this opportunity for teachers

reddit, twitter

12. References

Reference 1

Name Mike Bowman, Ed.D

Title and affiliation Physics Instructor, Buncombe County Schools

Email Address michael.bowman@bcsemail.org

Phone Number 1-828-779-0884

Reference 2

Name Jeff Milbourne, Ph.D.

Title and affiliation Consultant and Former Senior Policy Advisor to The Honorable Mike Honda, Congressman, CA

Email Address milbournej@gmail.com

Phone Number 1-919-260-7007

Reference 3

Name Amy Sheck

Title and affiliation Dean of Science

Email Address sheck@ncssm.edu

Phone Number 9194162768

2020-2021 PolarTREC Educator Application

Stacy Williams

1. Contact Information

Name: Stacy Williams

Email: stacywave@gmail.com

Home Address:

208A WASHINGTON STREET, APT 5
Somerville, MA 02143 US

Home Phone: 607-592-9744

Cell Phone : 607-592-9744

Institution Name: Belmont High School

Institution Address:

221 Concord Ave
Belmont, MA 02478 US

Institution Phone: 617-993-5901

Classroom/Office Extension: n/a

Institution Fax: 617-993-5909

Institution Website: <https://www.belmont.k12.ma.us/bps/bhs/>

Other relevant websites:

Supervisor's Name: Elizabeth Baker

Supervisor's Email Address: ebaker@belmont.k12.ma.us

2. Demographic Information

a. Gender: Female

Race: White

c. Briefly describe your primary audience and surrounding community (e.g. K-12, public, rural/urban, technology access, economics): My primary audience is students in grades 9-12 in a suburban public school. The town of Belmont is a fairly affluent community outside of Boston, but a number of students are admitted and bused in from the Boston Public school district area.

d. Type of School (or students you work with): Public

Other Type of School

e. What is the population of your annual audience or school (estimates are fine) 1300

f. School Ethnicity:

0.1 % - American Indian or Alaska Native

18 % - Asian

3.7 % - Black or African American

4.2 % - Hispanic or Latino

0 % - Native Hawaiian or Other Pacific Islander

69 % - White

5 % - Multiracial

If your school uses other categories to describe race/ethnicity, please describe:

g. Percentage of students who receive free or reduced lunch: 7.4 (this is the percent termed "economically disadvantaged" - cant find stat for lunch)

h. Average class or audience size 28

i. Total number of students/audiences you teach in a year 5

j. If known, what are the approximate start and end dates of your school year or primary programs, etc. ? Include major professional vacation periods. i.e. Christmas break, summer break, etc.

The start is usually the Wednesday after labor day in September and we end mid-

June depending on number of snow days. We have two days off for Thanksgiving, at least one week from Christmas to New Year's, one week off in February, and one week off in April.

3. Teaching Experience and Education

a. What type of university degree or other academic experience or qualifications do you have?

Bachelor's Degree (Major): B.S. Biological Sciences (Concentration in Ecology and Evolutionary Biology, specialization in Marine Biology)

Bachelor's Degree (Minor):

Masters Degree (Discipline): Ed.M. Teaching and Curriculum

PhD Degree (Discipline):

Other Degree:

b. How many years of education experience do you have?: 13

c. How many years have you been working at your current institution?: 12

d. List up to 10 relevant professional licenses, certifications, registrations, awards or honors that you have received in your profession::

MA Professional Licensure in Biology 8-12, Chemistry 8-12; MA initial licensure in Sheltered English Immersion, MA Initial Licensure in Health k-12; Member of Massachusetts Marine Educators Association and Massachusetts Teachers Association. Least professional (but most rewarding) award ever = being voted "favorite teacher" by the seniors 5+ times.

4. Professional Assignment

a. What is your primary education assignment? Check all that apply
Secondary (Grades 9-12)

Other Primary Assignment

b. What subjects do you teach? Check all Secondary Biology, Secondary Chemistry

Other Subjects Neurobiology and Zoology (both grade 12 electives)

5. Motivation for Participation

a. What motivates you to apply to PolarTREC and professionally, what do you hope to gain from the experience? (200 words maximum)

I was poised to become a marine biology researcher after graduating from undergrad, but felt like I could better serve by sharing my enthusiasm for science with others. This has not dampened my passion for science, and every few years I develop an intellectual wanderlust and start considering graduate programs. When I read about this program, it seemed like the perfect way to continue as an educator while also sating my hunger for learning and real science. There are three things I hope to gain from this experience: 1) relevant, first-hand experiences to tie into my classes (particularly zoology or chemistry), 2) exercise for the curiosity penned up in my brain. I am also really excited about the idea of polar adventures!, and 3) adventure!! I love outdoor adventures in almost any form.

b. Aside from journaling/blogging, online photos, and webinars which all part of our program requirements, describe your ideas on how you will share this experience in your classroom or with the audiences you work with. (200 words maximum)

I already try to weave current research, particularly on the effect of climate change on the different phyla, into my zoology curriculum. I'd love to use research in which I have actually participated to create materials on the methods of scientific exploration and analysis. Additionally, our chemistry curriculum is desperately lacking in relevance to real life. Showing students what sorts of research have ties to chemistry that do NOT involve green fluids in a flask in the lab may actually spark their interest in a subject that is often the top of the "most hated classes" list. Specific ties to current curriculum would be evaluated upon learning the nature of the specific studies.

c. Describe how you envision sharing your experience with other educators, your personal and professional communities, and the general public. (200 words maximum)

I would love to present on the methods and findings of polar research to the science faculty of our district. I'm sure there are relevant ties to all grade levels of science, and having a familiar ambassador as a presenter may make the research more interesting to students. I also intend to be an advocate for teachers exploring their own intellectual curiosity using external programs. High school educators generally started off with enthusiasm for a specific subject matter. Over a career of repeatedly teaching the same classes, that subject matter we once loved can become pretty

dull - and how can we expect our students to dive headlong into material when we can't sell it? Teachers should be encouraged to seek out new avenues to keep that initial fire alive. I would happily share my experiences with the faculty and community if the opportunity presented itself.

d. Describe how you currently engage your audience and facilitate learning when educating on new and complex topics, concepts, or issues. (200 words maximum)

Before jumping into complex new topics, I try to remind students of what they already know - whether from previous classes or life experience. If possible, pull in personal anecdotes to make the subject matter more relatable (my ridiculous stories and tangents are well-known). I love leading discussions if there's something on which we can explore opinions - I actually created and taught a science ethics class for just this reason. Before we wrap up for the day, I'll check for understanding either formally with "exit tickets" or informally with questions to the class.

e. Describe the particular strengths you would bring to the PolarTREC program and to a field research team. (200 words maximum)

My main strength is being able to find the humor in any situation (and knowing when to keep a particularly dark bit to myself). Beyond that, I'm a quick and eager learner, and am completely in love with the ocean and every animal, even the ones that are gross and creepy (especially the ones that are gross and creepy). I am also reflective and work constantly to improve myself - hence seeking polar adventures outside my comfort zone. Finally, as a hiker, runner, climber, and person who struggles with anxiety, I've learned that I'm pretty damn tough. As a rather grotesque example, I recently fell while trail running and managed to snag my pinky and crush it under my body. I knew it didn't look right, so as I was walking the remaining few miles out of the wood covered in dirt and blood, I was working on re-setting what I think was a slightly dislocated finger myself. As I told the story to my students (now clad in a purple cast from the ER), a student whispered "she's a savage." "Yes," I thought proudly, "I kind of am."

f. Using examples from your own experience including your role and the contributions you made to a team effort, describe how you work as a member of a team. (200 words maximum)

I am usually not the first person to take a leadership role in a group, but can step up when needed. I'm more content to take orders and support leaders. As a camp counselor for several different camps, I absolutely loved the team environment. Each counselor played to their strengths and tagged in others when they needed a break.

Never was this more fluid than when I worked for four summers at the New England Aquarium's Harbor Discoveries camp. One unfortunate day stands out for our impeccable teamwork. Driving campers down to Cape Cod, our van ended up in a 4 car accident. No one was seriously injured, but our van was totaled, the highway was backed up nearly to Boston, and we had kids with us (in addition to a group in another van that was farther along and a full bus of younger kids traveling separately). Myself and the other adult in the van split up tasks - check the kids, call the boss, call 911, get the big bus to turn around. I accompanied a few kids to the hospital while he took the others to join the rest of our group and continue with our day. In the end, everyone made it to the beach!

6. Communicating the Experience and Science

Write your journal entry for the general/lay audience. (200 words maximum)

Even as my eyes were pawed open by my cat on Thursday morning, I felt the weight of the day. I had four high-maintenance lessons, one hundred forty progress reports due Friday morning, and a class worth of hand-drawn brain diagrams to grade, many reminiscent more of Picassos than human anatomy. Naturally, I'd also signed up spontaneously for an online physiology course in one of those "I'm no longer nauseatingly full, so I must be hungry" moments. I steeled myself in the mirror knowing that the busier I am, the more efficient I get. I promised myself ice cream and kittens on the other side. With the help of the "hard stuff" (black tea instead of my usual green), I charged into the day. Brain diagrams - done. Grades - entered, comments - minimal, but one for every student. Progress reports - sent. Physiology - you made your bed, this is what weekends are for. Students - enlightened (probably?). As I had hoped, the higher pressure day had yielded a near-euphoric sense of accomplishment. A little too much caramel pumpkin pie ice cream awaited, as did a shelter full of kittens in need of playtime. Nailed it.

7. Scientific Interests and Research Area Preference

a. Where would you prefer to go on an expedition? Either

Please explain your preference

I would prefer to work over the summer in the Arctic when I don't have to miss a great deal of school. Were I accepted to the program, I could discuss other possibilities with my supervisors.

b. How long would you prefer to participate in an expedition? (Most expeditions are AT LEAST three weeks.) List any dates or periods of time when you are NOT able to participate in a field expedition

Three weeks would be ideal, and over the summer would minimize curriculum disruption. Subs are wonderful, but don't actually often get through material.

c. Briefly describe your scientific interests. Which scientific topics interest you the most and why? Please note that climate change has become part of nearly all expeditions so you may choose to be more specific about this topic, if applicable. (200 words maximum)

I am totally enamored with animals, particularly marine life, though would rather work from land than on a boat, as I'm sometimes prone to seasickness. The effects of climate change on population densities or ecology would be a wonderful topic, but I am open!

Atmospheric Systems I am somewhat interested in this subject area

Cryospheric Systems I am somewhat interested in this subject area

Human and Social Systems I am somewhat interested in this subject area

Marine Systems I would really enjoy an expedition in this subject area

Terrestrial Systems I would really enjoy an expedition in this subject area

Ecology and Biotic Systems I would really enjoy an expedition in this subject area

Physics or Space Sciences I do not want to be considered for an expedition in this subject area

Engineering and Technology I do not want to be considered for an expedition in this subject area

Other (please specify)

Other Areas of Scientific Interest

anything involving living things (especially animals) makes me happy

e. Are you applying to work exclusively with a specific researcher? If yes, please list their full name, institution, and email address. (200 words maximum)

No

8. Background Information and Skills

a. Briefly describe your outdoor skills or experiences.

I run, hike and camp regularly in the white mountains of New Hampshire, and have completed 42 of the 48 four thousand plus foot peaks. I've also hiked in Iceland, Colorado, and the Pacific Northwest (among other less exciting places). I have experience with canoes, kayaks, paddleboards, and motorboats. I was once certified in Wilderness First Aid, but that has since lapsed (and I would love to do it again). I adore rock climbing, work in a gym, and get outside when I can. Basically - I do difficult outdoor things on purpose for fun.

b. Provide a basic statement of your general health and physical condition.

I run four days a week, have run a road marathon and many road and trail half marathons. If the knee gods are in a good mood (and I'm keeping up with physical therapy) I'm planning to run a trail 50K in the spring. I do yoga regularly and am a certified yoga instructor. I rock climb regularly and have taught classes on climbing and belay technique (in short, I exercise a lot). I am a little bit afraid of what admitting all of this would set me up for on a polar expedition.

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.

I work with macs at home and PCs at work. My skill level is fairly basic - I am not a tech wizard by any standard, but am a quick learner if necessary.

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.

At work - PC, SMART Board, Document camera - I'll use powerpoint, video, excel, and other programs to accent my classes, but do try to cut screen time when I can because the students are already glued to their phones, laptops, and school-provided iPads. At home - Mac, iPhone, barely fluent on Instant Pot.

e. List any additional skills or information that you wish to be considered.

I love karaoke, but will not force it on anyone.

9. Previous Applications & Participation

a. Have you previously participated in a teacher research experience (e.g. NOAA Teacher at Sea, Earth Watch)? We do not accept applications from PolarTREC alumni. No

Program Information

If yes, did you complete all program requirements?

If yes, how do you see the PolarTREC professional development opportunity continuing to develop your professional skills, or how will it build on your previous research experiences?

10. Orientation Availability

Are you available to attend the Orientation during this time period? Yes

If no, please explain I'm not sure I can get an entire week off during the school year approved, but I'm sure that some portion could be negotiated.

11. How did you hear about PolarTREC?

Email listserve. Please provide the name and/or URL

Friend or colleague. Provide a name if you wish

Former PolarTREC, TREC, or TEA teacher. Please provide their name

From a website. Please list the website name and URL

Conference or presentation. Please list the venue and/or presentation title

Other (please explain)

Honestly I can't remember....possibly the Massachusetts Marine Educators Association? Maybe a google search?

b. Please suggest other places we might advertise this opportunity for teachers

NSTA if you don't already

12. References

Reference 1

Name Elizabeth Baker

Title and affiliation Science Director - Belmont High School

Email Address ebaker@belmont.k12.ma.us

Phone Number 617-993-5970

Reference 2

Name Heather Deschenes

Title and affiliation Director of Community Engagement at New England Aquarium

Email Address hdeschenes@neaq.org

Phone Number 617-973-5200

Reference 3

Name Lindsey DeFarias

Title and affiliation Chemistry Teacher - Belmont High School

Email Address ldefarias@belmont.k12.ma.us

Phone Number 774-644-4193

2020-2021 PolarTREC Educator Application

Samantha Willsey

1. Contact Information

Name: Ms. Samantha Willsey

Email: sjwillsey@gmail.com

Home Address:

503 South Center Street
Bremen, IN 46506 US

Home Phone: (574) 229-3668

Cell Phone : (574) 229-3668

Institution Name: Northwood Middle School

Institution Address:

301 North Elkhart Street
Wakarusa, IN 46573 US

Institution Phone: (574) 862-2710

Classroom/Office Extension: 808

Institution Fax: 574-862-2327

Institution Website: http://www.wanee.org/northwoodmiddleschool_home.aspx

Other relevant websites:

Supervisor's Name: John Payne

Supervisor's Email Address: jpayne@wanee.org

2. Demographic Information

a. Gender: Female

Race: White

c. Briefly describe your primary audience and surrounding community (e.g. K-12, public, rural/urban, technology access, economics): I live and work in a rural community in northern Indiana. I teach a public middle school, grades six-eight.

d. Type of School (or students you work with): Public

Other Type of School

e. What is the population of your annual audience or school (estimates are fine) 700 students at the middle school, about 2,600 in the district (K-12).

f. School Ethnicity:

0 % - American Indian or Alaska Native

1 % - Asian

2 % - Black or African American

8 % - Hispanic or Latino

% - Native Hawaiian or Other Pacific Islander

85 % - White

4 % - Multiracial

If your school uses other categories to describe race/ethnicity, please describe:

g. Percentage of students who receive free or reduced lunch: 30

h. Average class or audience size 22

i. Total number of students/audiences you teach in a year 130

j. If known, what are the approximate start and end dates of your school year or primary programs, etc. ? Include major professional vacation periods. i.e. Christmas break, summer break, etc.

Start date is early August, end date is late May. Major vacation periods include 2 weeks at the end of December, and one week in April, and the months of June and July for summer break.

3. Teaching Experience and Education

a. What type of university degree or other academic experience or qualifications do you have?

Bachelor's Degree (Major): Earth-Space Science Education

Bachelor's Degree (Minor):

Masters Degree (Discipline):

PhD Degree (Discipline):

Other Degree:

b. How many years of education experience do you have?: eleven

c. How many years have you been working at your current institution?: three

d. List up to 10 relevant professional licenses, certifications, registrations, awards or honors that you have received in your profession::

Certified Project Lead the Way Principles of Biomedical Science Instructor
Certified Project Lead the Way Human Body Systems Instructor
Recipient of a Lily Endowment
Teacher Creativity Fellowship (2015)
Recipient of Martins Supermarket One School at a Time Grant

4. Professional Assignment

a. What is your primary education assignment? Check all that apply Middle School (Grades 6-8)

Other Primary Assignment

b. What subjects do you teach? Check all Middle School Science, Secondary Biology, Secondary Chemistry, Secondary Earth Science, Secondary General Science, Secondary Physical Science

Other Subjects

5. Motivation for Participation

a. What motivates you to apply to PolarTREC and professionally, what do you hope to gain from the experience? (200 words maximum)

Curiosity and discovery have been my driving force since I was a child. As I study the world, I am continuously intrigued and desire to know more. PolarTREC would provide an opportunity to learn and grow both personally and professionally by renewing my natural sense of discovery. The thought of working with a research team in Antarctica excites me to my core. My mission as a science teacher is for my students to develop an explorer mindset. I will take advantage of every opportunity to collect pieces of knowledge from my team and return to my classroom and inspire my students in the most meaningful manner. My most valuable learning experiences have taken place beyond the walls of a classroom; I want to continue to set that example for my students. Aside from the obvious thrill that comes from working with researchers in Antarctica, I want to be a contributing piece of this community. I am fully capable of taking on an active role on any team, especially when I can connect with the significance of the task and goal. I hope to gain a professional and adventurous community of like-minded mentors and friends.

b. Aside from journaling/blogging, online photos, and webinars which all part of our program requirements, describe your ideas on how you will share this experience in your classroom or with the audiences you work with. (200 words maximum)

A large part of my curriculum standards are based on the human impact on the planet. The research I will take part in will undoubtedly connect with this curriculum. Sharing the research being done with my classroom will replace pages in the textbook. Students currently read about and watch videos of analyzing ice core samples and carbon dioxide monitoring. Adding what I have done to what other scientists are doing in the field, will have a much larger impact in my lessons. I am constantly finding ways to make connections between the human and natural world in my classroom. Not only does this make the learning more meaningful for the students, but they become empathetic towards global issues. I not only want to share stories and pictures with my students, but also new techniques, research, and ideas. Using what I've learned, paired with sustained relationships with my team, I will be able to continue with work in my classroom through my students. I want them to be involved and engaged so that it is just as meaningful to them as it will be to me.

c. Describe how you envision sharing your experience with other educators, your personal and professional communities, and the general

public. (200 words maximum)

Monthly, I collaborate with a team of twelve science teachers at our school. We are always eager to learn from one another. I envision them to be very enthusiastic to learn from my experience and apply ideas and research methods I have learned in their own classrooms. I am lucky to have a great rapport with a local news anchor. She enjoys visiting my classroom to highlight the importance of science education and science literacy. I imagine she would be excited to feature a story of my experience on a broadcast. This would give me a great platform to share with a large audience.

d. Describe how you currently engage your audience and facilitate learning when educating on new and complex topics, concepts, or issues. (200 words maximum)

Students are most active and engaged in the learning process when the content is relevant and meaningful. Science is more than just a body of knowledge; rather, it is a way of thinking. In my classroom students are encouraged to be adventurous, curious, and develop an explorer mindset. I accomplish this by focusing the framework of my lesson planning towards specific attitudes, skills, and knowledge that I want students to gain. These include students taking responsibility, collaborating, problem solving, and using effective communication platforms. This framework allows me to accomplish my mission as a science educator which is to increase the science literacy of our future generations. Whether the content of the subject be atomic structure, gas laws, genetic modification, animal adaptation, or human impact on the planet, the goal is always skills over test scores.

e. Describe the particular strengths you would bring to the PolarTREC program and to a field research team. (200 words maximum)

I am courageous and adventurous. My friends would probably label me as a hippie adrenaline junkie science nerd. No task is ever too difficult; the more challenging it is, the more my brain strives to accomplish. In fact, I think I thrive in the most demanding and uncomfortable scenarios. My greatest memories and everything worthwhile I have ever achieved are things that sparked a bit of fear. Not only do I have a diverse science content background that would allow me to best approach the research topic, but I also have an innate desire to learn and willingness to overcome a challenge.

f. Using examples from your own experience including your role and the contributions you made to a team effort, describe how you work as a member of a team. (200 words maximum)

My role on any team is usually one of leadership. As a volleyball coach, trip leader for student international tours, and athletic supervisor, I constantly find myself in a position of setting expectations and motivating others. As a leader, I first build trust with my team so that members feel confident and encouraged. I have been a volleyball coach for eleven years and have always had a winning season. I have gained the trust of my community to lead students on educational tours around the world to the Galapagos Islands, Costa Rica, and Australia. I want to take on a role in which I can learn from others. I will take initiative and go beyond what is asked of me. No matter what my role is, I will be an active participant working toward the goal of the team.

6. Communicating the Experience and Science

Write your journal entry for the general/lay audience. (200 words maximum)

I woke up this Friday morning feeling the need to push pause on the chemistry curriculum to have my students start class by searching #climatestrike. For one minute, take in as much visual information as possible. Immediately I heard “that’s so many people, this is happening right now, they’re all kids, over 150 countries!” One student asked, “who is this?” The picture was of Greta Thunberg. This led into a discussion about how young people have a voice and can be change agents in the world. I could sense the awe and inspiration radiating from my 15-year-old students. Proud teacher moment. Back to the curriculum, today’s lesson was Boyle’s Law. I decided that while I’m feeling rejuvenated, we should take the classroom outside to enjoy one of the last sunny days of the year. The students eagerly joined me in kicking off our shoes in the grass and followed along as I wrote notes on the pavement with sidewalk chalk. We continued with demonstrations, data gathering, and drawing graphs in the school parking lot. When the bell rang, the students reluctantly went back into the school building proclaiming that was the best class! I love my job.

7. Scientific Interests and Research Area Preference

a. Where would you prefer to go on an expedition? Antarctic

Please explain your preference

The remoteness of Antarctica paired with the current and unique research piques my curiosity. I am an advocate for science literacy and women in STEM. The more knowledge and experience I gain, the better the advocate I will be. This expedition would allow me to use my creativity to explore science and expand my imagination beyond normal boundaries.

b. How long would you prefer to participate in an expedition? (Most expeditions are AT LEAST three weeks.) List any dates or periods of time when you are NOT able to participate in a field expedition

I am available any time of the year, for any length of time. In fact, I would prefer an expedition to last longer than three weeks in order to be fully immersed in the topic of research and study.

c. Briefly describe your scientific interests. Which scientific topics interest you the most and why? Please note that climate change has become part of nearly all expeditions so you may choose to be more specific about this topic, if applicable. (200 words maximum)

I have always been very curious about the natural world. I studied geology and astronomy at Indiana University. After a couple of years teaching biomedical science, I have gained a huge interest in genetics and evolution. These topics are most interesting to me because of the relevant implications that can stem from better understanding the genome and the potential medical advances in genome editing. Any topic relating to the geological world has always interested me because of my desire to better understand our planet, as well as the added perk of studying outside in nature!

Atmospheric Systems I would really enjoy an expedition in this subject area

Cryospheric Systems I am somewhat interested in this subject area

Human and Social Systems I am somewhat interested in this subject area

Marine Systems I am somewhat interested in this subject area

Terrestrial Systems I am somewhat interested in this subject area

Ecology and Biotic Systems I would really enjoy an expedition in this subject area

Physics or Space Sciences I would really enjoy an expedition in this subject area

Engineering and Technology I am somewhat interested in this subject area

Other (please specify) I would really enjoy an expedition in this subject area

Other Areas of Scientific Interest

Geology/Geologic History Neutrino detection

e. Are you applying to work exclusively with a specific researcher? If yes, please list their full name, institution, and email address. (200 words maximum)

N/A

8. Background Information and Skills

a. Briefly describe your outdoor skills or experiences.

If I could live in a tent in a beautiful location, I would! I grew up camping every weekend, have lived in a mud hut in Kenya, and spent a summer hitchhiking around the African continent. Being outside in nature is what ignites my soul. As I stated earlier, I am a bit of an adrenaline junkie. I've been white water rafting and kayaking on the Nile river and Zambezi river, abseiled numerous cliffs and waterfalls, zip-lined and hiked in a forest through Laos, and randomly find myself bungee jumping or skydiving. Perhaps "bit" of an adrenaline junkie is an understatement.

b. Provide a basic statement of your general health and physical condition.

I've always been an athlete and am currently in the weight room at least one hour four times a week. I have always maintained great health, and have no concerns or problematic medical history.

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.

My school is a Microsoft school and we use all Microsoft operating systems. Personally, I've always used Mac products and operating systems. I would be equally familiar with either at an above average skill level.

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.

At school, I incorporate technology in most of my lessons. I use Vernier lab equipment to enhance data-collection in the form of temperature probes and gas pressure sensors. Data is collected and visually presented to students real time using LoggerPro graphing analysis software. Personally, aside from cell phones and computers, I regularly use my Canon DSLR camera and enjoy landscape photography.

e. List any additional skills or information that you wish to be considered.

CPR and AED trained and certified

9. Previous Applications & Participation

a. Have you previously participated in a teacher research experience (e.g. NOAA Teacher at Sea, Earth Watch)? We do not accept applications from PolarTREC alumni. No

Program Information

If yes, did you complete all program requirements?

If yes, how do you see the PolarTREC professional development opportunity continuing to develop your professional skills, or how will it build on your previous research experiences?

10. Orientation Availability

Are you available to attend the Orientation during this time period? Yes

If no, please explain

11. How did you hear about PolarTREC?

Email listserve. Please provide the name and/or URL

Friend or colleague. Provide a name if you wish

Former PolarTREC, TREC, or TEA teacher. Please provide their name

From a website. Please list the website name and URL

Conference or presentation. Please list the venue and/or presentation title

Other (please explain)

I learned of PolarTREC while doing a general google search for research opportunities for teachers in Antarctica.

b. Please suggest other places we might advertise this opportunity for teachers

12. References

Reference 1

Name John Payne

Title and affiliation Principal

Email Address jpayne@wanee.org

Phone Number 574-862-2710

Reference 2

Name Steve Bowser

Title and affiliation Assistant Principal

Email Address sbowser@wanee.org

Phone Number 574-862-2710

Reference 3

Name Dawn Slein

Title and affiliation science teacher

Email Address dslein@wanee.org

Phone Number 574-862-2710

2020-2021 PolarTREC Educator Application

Kate Wilson

1. Contact Information

Name: Kate Wilson

Email: ronkatezach@gmail.com

Home Address:

237 Cashdollar Road
Mars, PA 16046 US

Home Phone: 724-312-0168

Cell Phone : 724-312-0168

Institution Name: Ryan Gloyer Middle School

Institution Address:

122 Seneca School Road
Harmony, PA 16037 US

Institution Phone: 724-452-6043

Classroom/Office Extension: 3097

Institution Fax: 724-452-0331

Institution Website: www.svsd.net (Choose Ryan Gloyer Middle School)

Other relevant websites: Mrs. Wilson's Website, <https://www.svsd.net/domain/646>

Supervisor's Name: Mr. Tony Babusci

Supervisor's Email Address: babusciak@svsd.net

2. Demographic Information

a. Gender: Female

Race: White

c. Briefly describe your primary audience and surrounding community (e.g. K-12, public, rural/urban, technology access, economics): I teach in a district that started out as a rural community 30 miles north of Pittsburgh. As years went on, our district grew because of people moving out of Pittsburgh and into our area. We are now primarily a very large suburban district, surrounded by farms. Our campus is about a 15-minute drive from the major population, but the district is so large that it takes approximately 45 minutes to drive from one side to the other.

d. Type of School (or students you work with): Public

Other Type of School

e. What is the population of your annual audience or school (estimates are fine) I have a team of 110 students. My 8th grade population is approximately 550 students. There are five teams in my building.

f. School Ethnicity:

0 % - American Indian or Alaska Native

2 % - Asian

1 % - Black or African American

2 % - Hispanic or Latino

0 % - Native Hawaiian or Other Pacific Islander

94 % - White

1 % - Multiracial

If your school uses other categories to describe race/ethnicity, please describe:

g. Percentage of students who receive free or reduced lunch: 16

h. Average class or audience size 22

i. Total number of students/audiences you teach in a year 110

j. If known, what are the approximate start and end dates of your school year or primary programs, etc. ? Include major professional vacation periods. i.e. Christmas break, summer break, etc.

Students started August 27, 2019 and their last day will be June 5, 2020. Staff started August 22 and our last day is June 8. We have 11 In-service days during the year and 17 holidays days off. Our summer break is about 10 weeks long.

3. Teaching Experience and Education

a. What type of university degree or other academic experience or qualifications do you have?

Bachelor's Degree (Major): B.S. degree in Business Administration, Indiana University of PA and B.S. degree in Secondary Science Education, University of Pittsburgh.

Bachelor's Degree (Minor):

Masters Degree (Discipline): Master's of Environmental Science, Slippery Rock University, Slippery Rock, PA

PhD Degree (Discipline):

Other Degree:

b. How many years of education experience do you have?: 30

c. How many years have you been working at your current institution?: 30

d. List up to 10 relevant professional licenses, certifications, registrations, awards or honors that you have received in your profession::

Permanent teaching certification for General and Earth and Space Science.

Distinguished Recognition Award, Pennsylvania State Education Association M.A.C.

Grant Award Recipient

4. Professional Assignment

a. What is your primary education assignment? Check all that apply Middle School (Grades 6-8)

Other Primary Assignment

b. What subjects do you teach? Check all Middle School Science

Other Subjects

5. Motivation for Participation

a. What motivates you to apply to PolarTREC and professionally, what do you hope to gain from the experience? (200 words maximum)

I want to really know what a scientist does, not just read about it. I have done so many things in my life, but I have never actually participated in a real-life scientific endeavor. I teach my students how to behave like scientists in the classroom, but sometimes I feel like I am not giving them the full experience. When I meet a scientist, which in my family is quite a few, I annoyingly question them about their daily activities. I want to know if they stick with the scientific method all of the time, for example. I am constantly showing my students how to get involved as citizen scientists, but I myself have not done it, except during graduate and undergraduate science classes. My son is an environmental science major, and I am so excited to see his data collection and work. He is doing real research and using data to solve problems.

b. Aside from journaling/blogging, online photos, and webinars which all part of our program requirements, describe your ideas on how you will share this experience in your classroom or with the audiences you work with. (200 words maximum)

I will be sharing the PolarTREC website with my department, because I know they are not aware of this opportunity. I will go through the website with them and the use of the webinars and show them what is available. If I am chosen for the team, I will use my experiences and data to produce Power Point presentations, and share it with the science departments in all of my district buildings, K-12. I am hoping that other teachers will seize this opportunity and apply next year. Hopefully, they will use the materials, even if they do not, they can make others aware of the program. For my classes, I plan on using my experience as a connection with real science and scientists. The students will enjoy participating in the webinars and listening to researchers way up in Alaska. So many of their lessons have a connection to these research topics. In my curriculum, we cover the scientific method of problem solving, the greenhouse effect and its chemistry, thermal energy, electromagnetic radiation and its uses, and other physical and chemical science topics.

c. Describe how you envision sharing your experience with other educators, your personal and professional communities, and the general public. (200 words maximum)

We have an excellent public relations department at our school, and I plan to get in touch with them as soon as I hear that I have been accepted. My school district is

very progressive when it comes to teachers doing unusual educational programs and will help me to spread the word through a variety of media exposure. They or I will contact the local and the Pittsburgh newspaper and news stations. I will make a power point presentation of my own and share it with all of the science departments in my district, from elementary to high school. I will also make sure, even if I am not chosen, that every teacher in this district knows about the PolarTREC program. I will also share my experience on the school's Twitter and Instagram accounts, and send them updates as often as possible. If other teacher's are interested in applying for the program, I will share my knowledge and experiences with them to help them fill out the application and choose a project. We have district -wide e-mail system, so I will be using it to spread the word about program, as long as my supervisors' approve it.

d. Describe how you currently engage your audience and facilitate learning when educating on new and complex topics, concepts, or issues. (200 words maximum)

I usually start a new topic by either showing the kids something fun or having them examine something weird, but hard to figure out. Since I have been teaching so long, I can usually foresee preconceived ideas that students may have about subjects, and use that to stimulate interest. I might also have them talk about or write down what they know about a concept first and brainstorm a bit. I strive to use inquiry as a basis for all lessons. I have the students try to figure things out, before I give them answers. I even try to let them experiment, within safety limits, to see if they can come up with reasons that a phenomenon occurs. When I see where they are incorrect about a topic, I make sure we do lots of labs to give them a chance to prove what really happens. Sometimes, even though we have done many labs and activities, it is interesting to see how ingrained a notion can be. When that happens, that is when I really must get creative!

e. Describe the particular strengths you would bring to the PolarTREC program and to a field research team. (200 words maximum)

I am thinking of how people have described me at different places where I have worked. Most say I work too hard, which I don't think there is such a thing. Most say I can talk to anyone and make them feel at ease. I do have a degree in marketing and was in sales before I became a teacher. I guess it is in my blood. When working with a team of people, I usually help things move along smoothly. I love learning, and truly think you should learn something new every day. If I go on vacation, it is never just for relaxation. I enjoy finding out about places and things everywhere. I have not been to a lot of different countries, but I have been to France, Australia, Belize, and I

have seen most of the United States. If we are collecting data, I am neat and accurate. Even though I have not been on a scientific research team before, I do understand statistics, and the idea of what the numbers can or cannot tell us.

f. Using examples from your own experience including your role and the contributions you made to a team effort, describe how you work as a member of a team. (200 words maximum)

I do actually work with two teams of teachers at my school each day. I meet daily with my team's teachers during our team plan period. I have been the team leader for years now because my team knows I can get the job done, or find someone that can. If I say I am going to do something, I usually do it. I delegate jobs to each of my team members. I know the strengths of my teammates, and try to give them jobs that they will be good at. I meet twice a week with my science department. It is much different as we all teach the same subject. Instead of having different jobs, our job is to focus on a good curriculum. We all listen to each other and make decisions based on whose ideas seem best. We are a very congruent group and it is easy to work with them. Since a research team of scientists will be new for me, I believe I will do a lot of listening before I offer suggestions. I would hope to become a contributing member of the group eventually, and make good suggestions.

6. Communicating the Experience and Science

Write your journal entry for the general/lay audience. (200 words maximum)

Up at 6 a.m., dressed for school, and rushed out to feed. Got a new horse yesterday and was worried about it getting along with the old horse, but both made it through the night. My lab on dilution of copper chloride went fine today. I am always glad when no one gets it on them. I found out, through a survey, that almost all of my students spend their days on You-tube and other social media, so after 4th period, I took them outside. Today, we are on the look for Japanese Knotweed along the stream behind the school. I am obsessed with it, as it is ruining my trails! After school, rode horses, but had to be home early as friends were teaching me how to make sauerkraut. As we were chatting and smashing, I mentioned that a mountain lion had been seen not far from here. Unbelievably, he had seen one, too! That is an extremely rare animal to see in our area, so the buzz was on. A friend sent me a picture of a mountain lion cub that had been killed near us, so I called the Game Commission. Then it got interesting!

7. Scientific Interests and Research Area Preference

a. Where would you prefer to go on an expedition? Arctic

Please explain your preference

I would like to work with my nephew, Dr. Ryan Toohey, who works for the U.S.G.S in Anchorage.

b. How long would you prefer to participate in an expedition? (Most expeditions are AT LEAST three weeks.) List any dates or periods of time when you are NOT able to participate in a field expedition

I am free from June 8, 2020 to approximately August 28, 2020.

c. Briefly describe your scientific interests. Which scientific topics interest you the most and why? Please note that climate change has become part of nearly all expeditions so you may choose to be more specific about this topic, if applicable. (200 words maximum)

Even though I teach physics and chemistry, there are really no science topics that I am not interested in. My favorite topics to teach are geology, astronomy, and meteorology, and I taught those subjects for 15 years to middle school students. I do not feel as knowledgeable when it comes to biological sciences, as I am an Earth and Space scientist at heart. I feel that every rock tells a story, and so there is a lot to be learned about our past by studying them. My nephew, Dr. Toohey, is greatly involved in the use of water chemistry to understand changes in permafrost and glaciers with respect to climate change. My students perform water quality testing on the stream behind my school, so I am familiar with the basic tests. It is quite exciting to have the students determine that the health of our stream is good each year. This is the data that is needed to back up theories about climate change and the effects it will have on all aspects of our Earth. I will be so excited if I am chosen to be a part of his team!

Atmospheric Systems I would really enjoy an expedition in this subject area

Cryospheric Systems I would really enjoy an expedition in this subject area

Human and Social Systems

Marine Systems

Terrestrial Systems I would really enjoy an expedition in this subject area

Ecology and Biotic Systems

Physics or Space Sciences

Engineering and Technology

Other (please specify)

Other Areas of Scientific Interest

e. Are you applying to work exclusively with a specific researcher? If yes, please list their full name, institution, and email address. (200 words maximum)

Dr. Ryan Toohey US Geological Survey AK Climate Adaptation Science Center 907-865-7802

8. Background Information and Skills

a. Briefly describe your outdoor skills or experiences.

I worked for an outdoor store for many years before I started teaching. During that time, I outfitted customers for climbing, trekking, camping, canoeing, kayaking, cross country and downhill skiing, sailboarding, and bicycling. I currently participate in all of those activities, except for rock climbing, and I have traded in the windsurfer for a paddle board. Except for a few summers, I worked in Yellowstone National Park for 20 years. While there, I was a scenic cruise boat driver and worked on the docks. Two of my Yellowstone summers, I worked as a wrangler at the Canyon Area of the park. I took care of stock and took guests on horse rides. On days off, I did many back country hikes and boat trips and fly fished most of the rivers in and around the park. During one of the summers I did not work in Yellowstone, I worked for Dave Duncan and Sons as a fly-fishing guide out of Quinhagak, Alaska. We ran boats up the Kanektok River with guests, food, and equipment and fly fished all summer. Another summer, I was a horseback and fishing guide in the Bob Marshall Wilderness Area in Montana. Again, I took care of stock and took guests riding and fly fishing. I currently own a small horse farm and maintain horses, fencing, pastures, and downed trees. When working in Alaska, I had a 44-Magnum hand gun in my tent, although I never had to use it. I have shotguns, rifles, and hand guns at my home, and I am comfortable using them. I have had many first aid classes, but would have to brush up on wilderness care.

b. Provide a basic statement of your general health and physical condition.

My general health is good, and I am in good aerobic shape. I am strong enough to lift bales of hay and 50-pound bags of horse feed, but I could not lift more than that.

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.

I have had both systems, but at school we use PC's. I am extremely familiar with PC's, and with a little refresher, will be good at MAC's again.

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.

I use computers for all aspects of teaching. I use my computer for keeping track of lesson plans, grades, presentations, grading student work, posting assignments, and communication. All students in my school are given a laptop. In my class, they use them for making presentations, researching, drawing, note-taking, test-taking, reading their on-line text books, and viewing review materials. I use all Microsoft

programs, although I am not very good at movie making, but I am working on it.

e. List any additional skills or information that you wish to be considered.

9. Previous Applications & Participation

a. Have you previously participated in a teacher research experience (e.g. NOAA Teacher at Sea, Earth Watch)? We do not accept applications from PolarTREC alumni. No

Program Information

If yes, did you complete all program requirements?

If yes, how do you see the PolarTREC professional development opportunity continuing to develop your professional skills, or how will it build on your previous research experiences?

10. Orientation Availability

Are you available to attend the Orientation during this time period? Yes

If no, please explain

11. How did you hear about PolarTREC?

Email listserve. Please provide the name and/or URL

Friend or colleague. Provide a name if you wish

Former PolarTREC, TREC, or TEA teacher. Please provide their name

From a website. Please list the website name and URL

Conference or presentation. Please list the venue and/or presentation title

Other (please explain)

Nephew, Dr. Ryan Toohey, USGS, who is applying jointly with me.

b. Please suggest other places we might advertise this opportunity for teachers

I receive most of my workshop and program opportunities through e-mails from my department chairs. They get the information from our district administrators.

12. References

Reference 1

Name Bob Ceh

Title and affiliation Former principal, current principal Senior High School

Email Address cehrp@svsd.net

Phone Number 724-452-6041 ext. 1001

Reference 2

Name Dr. Louis Nagy

Title and affiliation Biology teacher and Technology Facilitator at my school

Email Address nagyla@svsd.net

Phone Number 724-452-6040 ext. 3074

Reference 3

Name Pam McCarthy

Title and affiliation Middle School reading teacher and co-worker

Email Address mccarthypr@svsd.net

Phone Number 412-335-6956

2020-2021 PolarTREC Educator Application

Karen Romano Young

1. Contact Information

Name: Karen Romano Young

Email: wrenyoung@gmail.com

Home Address:

22 Long Meadow Lane
Bethel, CT 06801 US

Home Phone: 203 673 3119

Cell Phone : 203 673 3119

Institution Name: none

Institution Address:

,

Institution Phone:

Classroom/Office Extension:

Institution Fax:

Institution Website:

Other relevant websites:

Supervisor's Name:

Supervisor's Email Address:

2. Demographic Information

a. Gender: Female

Race: White

c. Briefly describe your primary audience and surrounding community (e.g. K-12, public, rural/urban, technology access, economics): Middle school and middle grade students and their teachers, as well as students and teachers at younger and older levels, from preschool to graduate school. Teachers, librarians, museum educators, and scientists attend and host my presentations and work. My comics and books are available to all audiences -- public, educational, and trade.

d. Type of School (or students you work with): Other (describe below)

Other Type of School I visit private and public schools over the course of a usual year, and participate in presentations and workshops for these students in informal education settings as well.

e. What is the population of your annual audience or school (estimates are fine) not applicable

f. School Ethnicity:

% - American Indian or Alaska Native

% - Asian

% - Black or African American

% - Hispanic or Latino

% - Native Hawaiian or Other Pacific Islander

% - White

% - Multiracial

If your school uses other categories to describe race/ethnicity, please describe:

g. Percentage of students who receive free or reduced lunch:

h. Average class or audience size

i. Total number of students/audiences you teach in a year

j. If known, what are the approximate start and end dates of your school year or primary programs, etc. ? Include major professional vacation periods. i.e. Christmas break, summer break, etc.

3. Teaching Experience and Education

a. What type of university degree or other academic experience or qualifications do you have?

Bachelor's Degree (Major): Bachelor of Science in Education, K-8, Syracuse University

Bachelor's Degree (Minor): English

Masters Degree (Discipline):

PhD Degree (Discipline):

Other Degree:

b. How many years of education experience do you have?: I've been working for and with educators and children since I volunteered, then worked at a children's library in high school... through education school (college), and on to educational publishing. I continue to work as writer and informal educator.

c. How many years have you been working at your current institution?: I'm self-employed for 35 years.

d. List up to 10 relevant professional licenses, certifications, registrations, awards or honors that you have received in your profession::

National Science Foundation Antarctic Artists and Writers Grant, 2018 Waypoint Fellow (science and art), the Waypoint Foundation, 2014-2018 Ocean Science Journalism Fellow, Woods Hole Oceanographic Institution Creative Nonfiction Award, University of Connecticut Junior Library Guild selection Connecticut Book Award winner and three-time finalist Green Earth Book Award American Association for the Advancement of Science/Subaru Science Book and Film prize honoree Society of Children's Book Writers and Illustrators Work-in-Progress Grant, Nonfiction Publishers Weekly Flying Starts, showcase of children's authors

4. Professional Assignment

a. What is your primary education assignment? Check all that apply Other
(Describe Below)

Other Primary Assignment Creating materials for learning and outreach through writing, art, and multimedia communications; workshopping and teaching visual storytelling; presenting about visual storytelling and science research processes, concepts, and personnel

b. What subjects do you teach? Check all Elementary Education, Middle School English/Language Arts, Middle School Science

Other Subjects Writing, graphics in writing support, writing for children, writing nonfiction, art journaling I teach as a mentor in a low-residency Masters of Fine Arts program at Western Connecticut State University, Danbury, Connecticut

5. Motivation for Participation

a. What motivates you to apply to PolarTREC and professionally, what do you hope to gain from the experience? (200 words maximum)

Hello. I'm a children's author and illustrator with some 30 books to my credit, including novels; graphic novels; and nonfiction books about the ocean — science, navigation, mapping, deep-sea exploration and technology, and marine biology. I've written science articles and curriculum materials. Publishers include Scholastic (where I worked as a magazine editor), National Geographic (seven titles), Greenwillow (five titles), and Chronicle, with whom I am working on my third book. I'm also the creator of two science comics — Humanimal Doodles, for middle school science magazines Muse and Odyssey, and #AntarcticLog, a science comic for general audiences as well as students, posted digitally. The subject of my comic — polar research and worldwide climate science — has led to conversations with reading, writing, science, and science educators' organizations. I have been increasingly called upon to work with educators and workshop with students on using visual storytelling in learning and communication. I am working to develop better understanding of what the public needs in terms of climate studies and how to facilitate this through my comics.

b. Aside from journaling/blogging, online photos, and webinars which all part of our program requirements, describe your ideas on how you will share this experience in your classroom or with the audiences you work with. (200 words maximum)

#AntarcticLog audiences get a jolt of energy from comic reports from the field. As a PolarTrec participant, I will be able to report in detail about the work of scientists and their support teams. Twice-weekly posts from the field gain traction quickly through shares, views, and the invitation to print out, follow, and to interact. Viewers can send questions and comments that can be answered in comics or posts. Through photo journaling, webinars, or Skypes, more audiences can be drawn in. I hosted a Science Comics Contest for students ages 10 to 18, and wish to do this again. I partnered with Smithsonian Ocean Portal, Muse magazine, and Science Friday to present how-to's and theory about science comics, then invited students to try comics and enter the contest. Entries were received from the U.S., Canada, and England. My website features my past comics, posters about creating comics, ideas from teachers, and a Science Friday educational resource about visual storytelling in science that is centered on my work. I believe these resources and activities will help bolster the visibility of my work in the field, and thereby the work of diverse groups

of scientists and support people.

c. Describe how you envision sharing your experience with other educators, your personal and professional communities, and the general public. (200 words maximum)

I work at the intersection of science, education, and publishing, with frequent involvement in both formal and informal education. Prior to, and subsequent to, PolarTrec deployment in the field, my comics and children's books will open doors to school visits, library and museum presentations and workshops, presentations, panels, and posters sessions at the like of the American Geophysical Union annual conference, American Library Association, and National Council of Teachers of English, National Science Teachers Association, and National Marine Educators Association allow me a broad but focused platform. I speak to thousands of students and hundreds of teachers each year, as well as numerous scientists. In these presentations I work to increase understanding of opportunities in the sciences and the arts for students. I see enthusiasm and involvement in upper elementary, middle school, and high school, but am aware of the lack of diversity in graduate school and professional science. One of my goals as a PolarTrec teacher is to help create new pathways to college science/art/communication experiences and majors so that this gap can be bridged.

d. Describe how you currently engage your audience and facilitate learning when educating on new and complex topics, concepts, or issues. (200 words maximum)

As a young graduate of a fine education school, I moved directly to Scholastic, where I learned how to "scan" a story for the appropriate hooks for audiences across age and experience ranges. A broad background in writing, visual storytelling/comics, curriculum materials, presentations, and professional level public outreach for science has led to a deftness with engaging audiences — from preschool to senior citizens — and increasing access, understanding, and confidence with science topics. I often start with examples of how good the smallest children are at interpreting pictures and comic symbols, and move on to ways that graphics offer entry points to a variety of learners, increasing impact and welcoming different thinkers to the stories that shape our times. As a science outreach officer aboard several research trips, I've developed my skills on camera, in voice (hosting), interviews, and through my graphics and writing, and have these abilities at my fingertips for a variety of multimedia interactions.

e. Describe the particular strengths you would bring to the PolarTREC program and to a field research team. (200 words maximum)

My writing, comics, communications and outreach work has taken me into the field aboard numerous ships and to labs on land and ice. I'm strong, flexible, patient, uncomplaining, resourceful, creative, and hard-working — and this is what it takes to succeed in these environments. While contributing to the science (as part of my job and as needed), I'm a good interviewer and a perceptive observer, and carry these skills into my work reporting — whether through blogging (I've blogged for NASA What on Earth?, Climate Central, and the websites of the organizations hosting my expeditions), on-camera interactions, broadcast hosting, photo journaling, or comics — in ways designed both to entertain and inform, as well as to portray the activities and purposes of scientists. I believe I've figured out how to please audiences as well as the subjects! What's more, my interaction with students and educators seems to open doors for all, increasing a sense that children with all kinds of abilities and backgrounds can find a place in the exciting world of exploration.

f. Using examples from your own experience including your role and the contributions you made to a team effort, describe how you work as a member of a team. (200 words maximum)

During my two-month Antarctic Artists and Writers grant-sponsored deployment to a research station, I was “embedded” with Peter Countway and Patricia Matrai of the Bigelow Laboratory for Ocean Sciences. I worked as a lab assistant, going to sea to deploy CTD casts and gather water samples that would be used to grow and examine phaeocystis, phytoplankton involved in processing dimethyl sulfur into a substance involved in cloud formation. Back on shore, I processed samples for DNA analysis. I researched, designed, drew and wrote #AntarcticLog comics that told the story of the Bigelow team's work. I also worked with the other scientists and support personnel on station to cover their work through my comics, and to research a book on Antarctic science that will be published in the future. And, when an injury to a key scientist left a team of fish scientists shorthanded, I went to sea with them for a week and assisted with catching and caring for ice fish. Before and after my trip, I created comics about the science and scientists I teamed with, and have presented their work ever since at national and international conferences for audiences including teachers, scientists, and students.

6. Communicating the Experience and Science

Write your journal entry for the general/lay audience. (200 words maximum)

At times I get starstruck-speechless. Once, at a children's writers' dinner, I sat with Robert McCloskey, the author/illustrator of *Make Way for Ducklings*. (Luckily my husband was there to ask McCloskey whether he had really kept ducklings in his bathtub while sketching out the book.) It happened again when I phoned astronaut Franklin Chang-Diaz. (Luckily I'd jotted down a question: "What's it like up there?" Brilliant, huh?) Then last week I met Guy Guthridge, who created the Antarctic Artists and Writers program. (Luckily such rockstar-type people are used to striking awe, and they're kind.) I asked Guy for his favorite Antarctic memory (again, not a brilliant question). In answer he offered a moment so personal I felt privileged, and so universal I felt included. He described parting ways with a colleague at the South Pole. Despite the sub-zero weather, Guy stood watching as the other guy trudged away in his Extreme Cold Weather-issue "bunny boots." He realized that, even as the distance increased, he could hear not only his friend's every trudge, but every beat of his own heart, and even the very blood in his very veins. Of course, I made a comic.

7. Scientific Interests and Research Area Preference

a. Where would you prefer to go on an expedition? Either

Please explain your preference

I would most welcome an experience that took place during the 20-21 austral summer season in Antarctica, but would also be very pleased to go to Greenland or Svalbard. But honestly, you can send me ANYWHERE and I will be absolutely overjoyed! I would be thrilled to return to Palmer Station, as well.

b. How long would you prefer to participate in an expedition? (Most expeditions are AT LEAST three weeks.) List any dates or periods of time when you are NOT able to participate in a field expedition

6 weeks. I have a prior commitment in April 18-20, and am not sure yet of my summer commitments. June-July Arctic or austral summer 20-21 would be best.

c. Briefly describe your scientific interests. Which scientific topics interest you the most and why? Please note that climate change has become part of nearly all expeditions so you may choose to be more specific about this topic, if applicable. (200 words maximum)

Glaciology, ice -- I learned a great deal about these subjects from sediment cores and scientists studying them aboard the JOIDES Resolution in the Amundsen Sea this year, and would relish the opportunity to work with these topics from closer up, i.e. Greenland. I would also like to work with scientists who are collaborating with native experts in the Arctic on any number of topics. Past subjects have included polar bears, bowhead whales, and beluga. Very interested also in musk oxen. I would welcome the opportunity to work with seal researchers at either pole, as well as extremophile biologists and anyone studying hydrothermal vents. On and on. I love it all. Plate tectonics, glaciers, biology, whatever!

Atmospheric Systems I am somewhat interested in this subject area

Cryospheric Systems I would really enjoy an expedition in this subject area

Human and Social Systems I would really enjoy an expedition in this subject area

Marine Systems I would really enjoy an expedition in this subject area

Terrestrial Systems I am somewhat interested in this subject area

Ecology and Biotic Systems I am somewhat interested in this subject area

Physics or Space Sciences I would really enjoy an expedition in this subject area

Engineering and Technology I would really enjoy an expedition in this subject area

Other (please specify)

Other Areas of Scientific Interest

waste management native peoples and knowledge changing ranges and diets of animals

e. Are you applying to work exclusively with a specific researcher? If yes, please list their full name, institution, and email address. (200 words maximum)

Not at this time.

8. Background Information and Skills

a. Briefly describe your outdoor skills or experiences.

I'm a good boat crew member, but have no certifications. I'm a good hiker. I'm inexperienced as a camper but a willing learner. I'm good with dogs? ? ? No firearms training. Limited first aid with lapsed certifications.

b. Provide a basic statement of your general health and physical condition.

Excellent. I p.q'd in 2018 and 2019 seasons. Ready to go.

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.

Mac. Sufficient skills for my needs.

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.

Map laptop, cellphone, Adobe Suite.

e. List any additional skills or information that you wish to be considered.

Writing Art I'm often called upon to make signs or costumes or some other spectacle.

9. Previous Applications & Participation

a. Have you previously participated in a teacher research experience (e.g. NOAA Teacher at Sea, Earth Watch)? We do not accept applications from PolarTREC alumni. No

Program Information Although I entered as an informal educator, I participated in the Ocean Exploration Trust Science Communications Fellowship, which is often populated by teachers. I was an SCF in 2014 and a lead SCF in 2015. I worked as a shipboard outreach officer for the Extreme Project (University of Delaware expedition to hydrothermal vents) in 2004 and 2008. And I was an outreach officer and artist-in-residence for the International Ocean Discovery Program aboard the JOIDES Resolution in 2019.

If yes, did you complete all program requirements?

If yes, how do you see the PolarTREC professional development opportunity continuing to develop your professional skills, or how will it build on your previous research experiences?

Because I am increasingly a liaison between classrooms and scientists, I wish to learn more about the needs of both sides. This year I used my comic to report on research on parents' wishes for climate education and on the disparity with levels of teaching on this subject. I want to figure out how my visual storytelling and book writing can help bridge this gap, how I can provide informal education materials that will address it, and how scientists and educators can improve communications.

10. Orientation Availability

Are you available to attend the Orientation during this time period? Yes

If no, please explain

11. How did you hear about PolarTREC?

Email listserve. Please provide the name and/or URL

Friend or colleague. Provide a name if you wish

Former PolarTREC, TREC, or TEA teacher. Please provide their name

Nell Herrmann.

From a website. Please list the website name and URL

Conference or presentation. Please list the venue and/or presentation title

Other (please explain)

b. Please suggest other places we might advertise this opportunity for teachers

12. References

Reference 1

Name Peter D. Countway

Title and affiliation Senior research scientist, Bigelow Laboratory for Ocean Sciences

Email Address pcountway@bigelow.org

Phone Number 2073152567 ext. 392

Reference 2

Name Julia Smith Wellner

Title and affiliation Department of Earth and Atmospheric Sciences, University of Houston

Email Address jwellner@uh.edu

Phone Number 7137432887

Reference 3

Name Ariel Zych

Title and affiliation educational director, Science Friday

Email Address azych@sciencefriday.com

Phone Number 9712194705

2020-2021 PolarTREC Educator Application

Erin Zarko

1. Contact Information

Name: Ms. Erin Zarko

Email: erinzarko@gmail.com

Home Address:

250 East Third Ave

Durango, CO 81301 US

Home Phone: 970-903-8990

Cell Phone : 970-903-8990

Institution Name: Vista Nueva High School

Institution Address:

315 Ash St Suite 100

Aztec, NM 87410 US

Institution Phone: 505-599-4393

Classroom/Office Extension: 2005

Institution Fax: 505-334-9861

Institution Website:

https://www.myvnhs.com/pf4/cms2_site/view_deployment?d=x&theme_id=i5g91wgwj5v1pt&

Other relevant websites:

Supervisor's Name: Rocky Torres

Supervisor's Email Address: vntorroro@aztec.k12.nm.us

2. Demographic Information

a. Gender: Female

Race: White

c. Briefly describe your primary audience and surrounding community (e.g. K-12, public, rural/urban, technology access, economics): My school is a public alternative high school set in a small rural town in northern New Mexico. The school serves 9-12 graders that are at risk of graduating for a variety of reasons. The student population is very diverse with a high percentage of Hispanic and Native American families. Families at our school tend to be of low socioeconomic status, with all of our students on the free lunch program. Our school is fortunate that we are able to have a laptop computer for every student to use in school.

d. Type of School (or students you work with): Public

Other Type of School

e. What is the population of your annual audience or school (estimates are fine) 70

f. School Ethnicity:

12 % - American Indian or Alaska Native

2 % - Asian

2 % - Black or African American

46 % - Hispanic or Latino

0 % - Native Hawaiian or Other Pacific Islander

38 % - White

0 % - Multiracial

If your school uses other categories to describe race/ethnicity, please describe:

g. Percentage of students who receive free or reduced lunch: 100

h. Average class or audience size 15

i. Total number of students/audiences you teach in a year 60

j. If known, what are the approximate start and end dates of your school year or primary programs, etc. ? Include major professional vacation periods. i.e. Christmas break, summer break, etc.

School year is Aug 12 - May 22 Thanksgiving Break Nov 25-29 Winter Break Dec 23-
Jan 6 Spring Break Mar 16-20

3. Teaching Experience and Education

a. What type of university degree or other academic experience or qualifications do you have?

Bachelor's Degree (Major): Geoscience, Secondary Education

Bachelor's Degree (Minor):

Masters Degree (Discipline): Master's of Science Teaching, Biology

PhD Degree (Discipline):

Other Degree:

b. How many years of education experience do you have?: 9

c. How many years have you been working at your current institution?: 5

d. List up to 10 relevant professional licenses, certifications, registrations, awards or honors that you have received in your profession::

New Mexico Teacher Licence, Level 3 Health Education endorsement Golden Apple
Teacher Grant award ECO Classroom Fellowship Fund For Teachers Fellowship
Earthwatch Fellowship

4. Professional Assignment

a. What is your primary education assignment? Check all that apply

Secondary (Grades 9-12)

Other Primary Assignment

b. What subjects do you teach? Check all Secondary Biology, Secondary Chemistry, Secondary Earth Science, Secondary Physical Science, Secondary Physics

Other Subjects Environmental Science, Geology

5. Motivation for Participation

a. What motivates you to apply to PolarTREC and professionally, what do you hope to gain from the experience? (200 words maximum)

I am always searching for new experiences that will improve my teaching and classroom curriculum, such as bringing authentic field techniques and data to my lessons. I have participated in several professional development opportunities that included a research and citizen science component, and these have always resulted in new lessons or projects that students have been able to interact with and explore. I find that students engage at a higher level with activities that stem from real world experiences, and my students like it when I have a personal connection with the activity. My students are faced with so many disadvantages that I work to find ways that will inspire them to look beyond their small town and aspire to something bigger. I have a similar background as my students, and I hope that when they see me participate in meaningful experiences abroad, it will inspire them as well. I hope to gain new field techniques and data that can be used in a project that will impact my students in a global manner.

b. Aside from journaling/blogging, online photos, and webinars which all part of our program requirements, describe your ideas on how you will share this experience in your classroom or with the audiences you work with. (200 words maximum)

I will share this experience with my students through a hands on project that will incorporate the data and techniques I bring back from this research opportunity. I am the only science teacher at my school, so it will eventually impact all of our students. Additionally, I work with the regular high school science department to share best practices and projects, which could also impact a larger population of students at the high school. For example, about 5 years ago I participated in the ECO Classroom professional development with Conservation International. I studied for two weeks in Costa Rica with three other local science teachers and we created a cross-school project that focused on climate change. The project's culminating activity had students measure a variety of trees in our town in order to calculate the carbon sequestered by those trees. The information was shared across schools, and the data was used by students to create a plan that addressed future development and deforestation in the area. This project is used yearly with my students, and was recently developed into a module that is being shared with science teachers in my district, as well as across the state.

c. Describe how you envision sharing your experience with other educators, your personal and professional communities, and the general

public. (200 words maximum)

I am very meticulous with an attention to detail, especially when creating activities and projects. I feel that the project created from this experience will be easy to understand and accessible to other secondary science teachers. This expedition will be shared with the science educators in my district through our Small Learning Community teams. I can provide the teachers with a complete project, including lesson plans and lab activities, and help facilitate use of the project in their own classroom. Additionally, I work to find local scientists or experts that I can incorporate into the project. For example, I often partner with a local non-profit organization, Mountain Studies Institute, which assists with activities both in the classroom and outside. The ecologists present information and lead activities on a range of topics, including climate change, river studies, and mine reclamation.

d. Describe how you currently engage your audience and facilitate learning when educating on new and complex topics, concepts, or issues. (200 words maximum)

I have a variety of methods that I use to engage my students in new topics. New units or projects are introduced through the lens of a real world problem, something that needs to be solved. Usually an inquiry lab or simulated activity is involved with initial engagement. For example, when we start exploring the carbon cycle, I use a game that I created in order for students to experience the different processes that move carbon. When we start investigating climate change, I start with a lab that simulates a warming atmosphere inside a bottle. For some topics, especially those that are part of current events or considered controversial, I start with the "Take a Stand" activity, in which students agree or disagree with a variety of statements. I find this engages students at a high level, as young adults often want to share their own opinions. As we move through a topic or concept, I work to break down complex ideas through a variety of activities, including real hands-on labs, online simulations, videos, articles, data analysis, and sorting or matching games. Students also engage in academic reflection in order to better understand their learning.

e. Describe the particular strengths you would bring to the PolarTREC program and to a field research team. (200 words maximum)

I have a wide array of strengths that I can bring to the program and team. I'm not afraid to get out of my comfort zone and work with people and situations that are unfamiliar. I am very reflective on my work and strive always to improve. I am a quick learner, and I am comfortable with technology. I am able work independently when required, and can easily assimilate into a team role. I communicate effectively both orally and in writing. I have received several grants for my school in the past

few years, so I have been improving my writing skills. I also describe myself as an “outdoors-person”, so I feel confident that I can easily handle the physical demands that might be required during this program. I enjoy other people and I’m easy to get along with, but I’m not afraid to speak up and offer academic critique when necessary.

f. Using examples from your own experience including your role and the contributions you made to a team effort, describe how you work as a member of a team. (200 words maximum)

I feel comfortable in different roles on a team. At my school I tend to fall into the role of the leader. I often initiate conversations around issues that we need to resolve, and collaborate with other teachers to analyze solutions. I work to offer suggestions to our team that will increase areas of growth, such as student engagement and achievement, family involvement, and community outreach. I am able to manage a plan and delegate responsibilities to the other teachers and staff, while offering appropriate support. I also feel comfortable working on a team in a supportive capacity. For example, last year I participated in a collaborative effort with the state of New Mexico to create an online resource that houses science modules to meet Next Generation Science Standards. I was partnered with one other teacher to design our module, as well as being placed in a larger team that offered support to other pairs of teachers. My role was more supportive as we offered critique and suggestions on each other’s modules. I appreciated this team experience as it helped me to improve my climate change project, and get it out to other teachers.

6. Communicating the Experience and Science

Write your journal entry for the general/lay audience. (200 words maximum)

The morning was cool and sunny as we loaded into the car, including the dogs, to head into the mountains to take in the fall colors. The first stop took us to the trail head of a short hike, about a mile, up to a small mountain lake. The mid-morning air was fresh and damp, and still smelled of rain from the night before. The hike to the lake had very little in the way of fall colors, maybe 20% of the trees had changed so far. The lake was crystal clear and cold. The dogs played around the edge of the water, chasing the dragonflies and the occasional chipmunk. After that quick hike we decided to continue to higher elevations hoping for more fall splendor. We drove about another 1000 feet up in elevation and stopped at an easy hiking spot along a small creek. This proved even more stunning. Not only was there between 50% and 75% of color change, there were also a few mushrooms along the way; chanterelles, puffballs, hawk's wings, and a few mushrooms that looked like coral. While it was now warm down in town, the altitude offered pleasant temperatures.

7. Scientific Interests and Research Area Preference

a. Where would you prefer to go on an expedition? Either

Please explain your preference

My preference is for either. While it would be easier for me to be away during summer, my school would be supportive if I participated during the school year as well.

b. How long would you prefer to participate in an expedition? (Most expeditions are AT LEAST three weeks.) List any dates or periods of time when you are NOT able to participate in a field expedition

My preferred length of time would be 3-4 weeks. At this time, there are no dates that I would not be available.

c. Briefly describe your scientific interests. Which scientific topics interest you the most and why? Please note that climate change has become part of nearly all expeditions so you may choose to be more specific about this topic, if applicable. (200 words maximum)

Generally I have been the most interested in ecological studies, especially any dealing agricultural issues. I have several close friends that are local organic farmers, as well as former colleagues that are working in the urban gardening movement. I believe food production is one of the most important issues that face our society today, and I want to be a part of any solutions. I also want to explore more about our food system as it relates to climate change. I also have a very keen interest in fungus and mushrooms and how we can use them to relieve a number of ecological problems. I have also been interested in oceanography, but have very little opportunity to incorporate it into my classes. Another passion lies with water systems, especially groundwater. Mapping groundwater and wells in my town was one of my first college projects and I have continued to study water issues. I am also interested in chemistry, especially areas that explore sustainable technologies. I also love botany. I am a gardener, I care for nearly 50 houseplants, and I recently acquired a greenhouse for use with students.

Atmospheric Systems I would really enjoy an expedition in this subject area

Cryospheric Systems I would really enjoy an expedition in this subject area

Human and Social Systems I am somewhat interested in this subject area

Marine Systems I would really enjoy an expedition in this subject area

Terrestrial Systems I would really enjoy an expedition in this subject area

Ecology and Biotic Systems I would really enjoy an expedition in this subject area

Physics or Space Sciences I would really enjoy an expedition in this subject area

Engineering and Technology I am somewhat interested in this subject area

Other (please specify)

Other Areas of Scientific Interest

e. Are you applying to work exclusively with a specific researcher? If yes, please list their full name, institution, and email address. (200 words maximum)

No

8. Background Information and Skills

a. Briefly describe your outdoor skills or experiences.

I have extensive outdoor experience. I spend my summers hiking, camping, backpacking, boating, and biking. In the winter I enjoy skiing and snowshoeing. I have been a certified raft guide, and I also work at the local ski resort in the winters. I have basic knowledge and familiarity with most winter sports gear.

b. Provide a basic statement of your general health and physical condition.

My overall general health is good and I am good physical condition. I am able to hike in mountainous areas with a pack for extended periods of time, and I can also sit and stand for long periods of time with little discomfort.

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.

I am familiar with both Mac and PC, as I have used both operating systems in school and on personal devices. I am more familiar with a PC, as that is my current operating system at school. I feel comfortable using most applications on a PC or Mac, including editing word documents and spreadsheets. I am also comfortable enough with technology to be trained on applications not previously used.

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.

I most often use my PC laptop and an iPad. I finished my Master's degree last year and this required extensive use of Excel. I am most familiar with the software and applications used in schools, such as PowerPoint, building websites, google classroom, and video editing.

e. List any additional skills or information that you wish to be considered.

I have very basic fluency in Spanish, and familiarity with most general hand and power tools. I am also a gardener so I have knowledge of seeds and plant germination.

9. Previous Applications & Participation

a. Have you previously participated in a teacher research experience (e.g. NOAA Teacher at Sea, Earth Watch)? We do not accept applications from PolarTREC alumni. Yes

Program Information 2014, Costa Rica, ECO Classroom 2015, Costa Rica, Fund for Teachers (self designed professional development to study ecotourism, included an Earthwatch expedition) 2018-2019 I was an Alternate for the NOAA Teacher at Sea Fellowship 2019, Costa Rica, Earthwatch Project Kindle Fellowship

If yes, did you complete all program requirements? Yes

If yes, how do you see the PolarTREC professional development opportunity continuing to develop your professional skills, or how will it build on your previous research experiences?

Most of the citizen science fellowships I have participated in were in the tropics, Costa Rica. PolarTREC would add an additional aspect to some of my classroom activities and projects by including a polar component. This opportunity would also add more depth to my climate change unit. I could also see this experience enhancing other areas of my curriculum through new field techniques and unique data sets. I also believe that this experience would be more scientific and hands on than the other citizen science experiences, and would provide a more authentic exploration into scientific field research.

10. Orientation Availability

Are you available to attend the Orientation during this time period? Yes

If no, please explain

11. How did you hear about PolarTREC?

Email listserve. Please provide the name and/or URL

Friend or colleague. Provide a name if you wish

I initially heard about PolarTREC through one of the facilitators of the ECO Classroom Fellowship, Peggy Lubchenco.

Former PolarTREC, TREC, or TEA teacher. Please provide their name

From a website. Please list the website name and URL

Conference or presentation. Please list the venue and/or presentation title

Other (please explain)

b. Please suggest other places we might advertise this opportunity for teachers

Colleges that offer Master's programs for educators would be great places to advertise.

12. References

Reference 1

Name Rocky Torres

Title and affiliation Principal Vista Nueva High School

Email Address vntorroro@aztec.k12.nm.us

Phone Number 505-599-4393 ext. 2010

Reference 2

Name Annamarie Dusenbery

Title and affiliation English Teacher, Colleague at Vista Nueva High school

Email Address vndusean@aztec.k12.nm.us

Phone Number 505-599-4393 ext. 2002

Reference 3

Name William Camp

Title and affiliation Fort Lewis College, Education Coordinator

Email Address camp_w@fortlewis.edu

Phone Number 970-247-7281

2020-2021 PolarTREC Educator Application