Robert Fest

1. Contact Information

Name: Mr. Robert Fest

Email: robertfest@gmail.com

Home Address:
213 Hunters Road
Medford Lakes, NJ 08055 US

Home Phone: 856-220-1328

Cell Phone : 856-220-1328

Institution Name: George School

Institution Address:
1690 Newtown Langhorne Road
Newtown, PA 18940-2414 US

Institution Phone: 215-579-6500

Classroom/Office Extension: 215-579-6723

Institution Fax: 215-579-6789

Institution Website: https://www.georgeschool.org/

Other relevant websites: www.mtaala.org I serve on the board of directors of this non-profit organization. We help support the Awegys Secondary School in Kigo, Uganda.

Supervisor's Name: Polly Lodge

Supervisor's Email Address: plodge@georgeschool.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): "George School is a private Quaker boarding and day high school located in Newtown, Bucks County, Pennsylvania. Besides the usual college preparatory courses, including an International Baccalaureate program, the school features several distinct programs deriving from its Quaker heritage. These include community service requirements, an emphasis on social justice and environmental concerns, required arts courses, and community-based decision making." - www.georgeschool.org The surrounding area is a mix of suburban and rural farmland but the students who attend the school literally come from around the world. Our student population is 29% international coming from 47 different countries. Even though it is a private school, students come from all economic backgrounds. Over 50% of students receive financial aid to attend the school.

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
22 % - Asian
18 % - Black or African American
6 % - Hispanic or Latino
0 % - Native Hawaiian or Other Pacific Islander
44 % - White
10 % - Multiracial
If your school uses other categories to describe race/ethnicity, please describe:

g. Percentage of students who receive free or reduced lunch: 0%. This does not apply to our school because meals are included in tuition.

h. Average class or audience size 14

i. Total number of students/audiences you teach in a year 70

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: Sept. 2 End: June 10 Thanksgiving Break: 11/27 – 12/2 Winter Break: 12/21 – 1/6 Spring Break: 3/9 – 3/23

3. Teaching Experience and Education

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

Bachelor's Degree (Major): Biology

Bachelor's Degree (Minor):

Masters Degree (Discipline): Biology

PhD Degree (Discipline):

Other Degree: AAS Nursing (RN)

b. How many years of education experience do you have?: 19

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::
1. Miller & Levine Scholar, La Selva Field Station, Organization for Tropical Studies, Costa Rica, 2015 2. Bilateral US-Arab Chamber of Commerce TEACH STEM Fellow, UAE, Bahrain and Qatar, 2014, STEM Advisor/Co-Coordinator TEACH Program, 2015 - 2017 3. Cornell Lab of Ornithology Celebrate Urban Birds Grant, 2014 4. Teacher Advisory Council Member, Philadelphia Zoo, Philadelphia, PA, 2008 – 2011 5. United States Department of State Teaching Excellence and Achievement (TEA)/International Leaders in Education Program Fellow, Medan, Sumatra, Indonesia, 2011 6. ING Unsung Hero Award, 2010: Awarded a grant to create "Connections to Global Conservation Science". 7. Japan Fulbright Memorial Fund Scholar, Tokyo, Japan, 2007 8. Geraldine R. Dodge Teacher Fellow, Mt. Kilimanjaro Summit Expedition, Tanzania, 2007 9. The Songbird Connection-Global Connections Teacher Fellow, Costa Rica, 2004 10. Earthwatch Institute Education Fellow, Lakes of the Rift Valley Project, Lake Naivasha, Kenya, 2003 and Wechiau Community Hippo Sanctuary, Ghana and Burkina Faso, 2001

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 IB SL Environmental Systems & Societies

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 for applying to PolarTREC lies in my deep-seated sense of adventure and my strong desire to challenge myself to continuously seek knowledge from novel sources. I would venture to say that Antarctica qualifies as one of the most adventurous and novel places one could find themselves. I have been drawn to the Southern Pole since I was a teenager having just read Ernest Shackleton's account of his 1914-1917 expeditions. The pull South has yet to cease even after so many years. Professionally, working in Antarctica would fill a major void of experiential knowledge that I have been lacking. As an Environmental Science teacher, it strengthens my standing in the classroom to have direct, hands-on experience working in the fields I teach. I have been fortunate throughout my career to participate in many ecological studies; from studying bullet ants in the Costa Rican rainforest to counting fish eagles on Lake Naivasha, Kenya, but my contact in the polar regions, a region of immense importance as an Environmental Science teacher, is limited and my experience in Antarctica is nil. Through PolarTREC, I hope to gain the knowledge and experience I feel that I am missing in order to better serve my students.

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)

My colleagues and I are currently collaborating on a school-wide interdisciplinary unit focused on the Congo. I envision using this same model but with Antarctica as region of study. Each teacher will develop a curricular course focusing on Antarctica through the lens of his/her respective IB course. The duration of the unit will be as the teacher sees fit, but will most likely fall between two and four weeks. Courses will approach this region of the world using terminology and concepts applicable to its specific discipline, and minor assignments and assessments specific to the individual course will be given: - Economics will concentrate on an Antarctica case study on international fishing treaties and whaling in the Southern Ocean. - ESS focus will be dictated by the PolarTREC research project that I am assigned. - Global Politics will study the seven countries laying claims to Antarctica and explore the question "what do they all want from this frozen land?" - Literature will analyze Antarctica through literary representations, which set a foundational stage for contemporary politics and

attitudes. Courses will also align curriculum with the participating classes both implicitly through natural overlap and explicitly through stated pedagogical goals and focal points as well as a capstone project.

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 fortunate to work at a school that values exposing its students and community to varied points-of-views and life experiences. Each Friday we have a school wide assembly that brings speakers from around the world to share their unique gifts, works, and knowledge with the school community. I would utilize the assembly time to present my work in Antarctica with the school. It is also a possibility for me to bring the polar researchers I worked with to the school to speak to the community and to visit with various classes. The school also has evening speaker events where alumni, parents, and the local community are invited to attend. A talk on my work in Antarctica would merit such an event. My PolarTREC colleagues would also be able to attend. A colleague has a radio show called “Geographical Imaginations”. He would welcome an opportunity to interview Antarctic researchers and educators. There is also a student run podcast where I would be interviewed about my Antarctic adventure. My work with the polar researchers could potentially lead to student expeditions to the poles. George School runs several international trips a year but none to the polar regions. As the school’s “Polar Expert” I would be primed to facilitate such an expedition.

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 advocate students doing authentic (fun) science as often as possible. I am not interested in lecturing to the students or having them memorize vocabulary words. That is boring. Science shouldn’t be boring. The pedagogical methodologies I use in my classes most often are: Argument-Driven Inquiry (ADI) and Project/Problem-Based Learning. Both models allow students to think and work like scientists. The ADI model gives the kids an overarching question like “why do great white sharks travel great distances” and then sets them free to work in groups to make a claim, collect evidence that supports their claim, design a method to analyze their data, develop an argument that supports their claim with their evidence, visit with other groups asking clarifying questions, revise their claim if needed, and finally participate in the argumentative session where students defend and justify their claim to the entire class. The kids really get into this work. The PPL my students are doing now is a Semi-

Aquatic Turtle Population Survey. Students are learning ecology by are capturing turtles in the river next to campus and collecting morphometric data. They can explain the life cycle of semi-aquatic turtles, the environmental pressures on semi-aquatic turtle populations, and are reporting data to a citizen science database we are creating.

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

I consider myself a positive self-starter who is willing to do anything to help the team succeed. I'm not a complainer, even when situations are difficult or are not working out the way they were planned. I am far more interested in finding a workable solution to any issue I'm faced with, in consultation with my teammates. I'd say I have a growth mindset, always willing to try and learn new things. I am flexible in the field, able to adjust to the situation at-hand. I am also handy. I can fix and build all kinds of things using whatever supplies are available. For example, I recently build a very realistic, articulated, life size Tyrannosaurus Rex out of up-cycled furring strips, tarps, chicken-wire, pulleys, and a few 2x3s that I then put on a platform atop two canoes that was paddled around a large lake in town for a crazy event called "Medford Lakes Canoe Carnival". I think another strength is that I have a good sense of humor. When it's time to be serious, I'm serious, but otherwise I try to have fun and smile while enjoying and appreciating life to the fullest.

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 on a number of teams at the moment, from social league beach volleyball to the interdisciplinary planning committee at work. Regardless of the team, I always try to seek consensus with my teammates when deciding on how to proceed. I am willing to voice my opinion and provide expertise when I think can but I'm also very open to listening and considering other people's views and ideas. If needed I can, and have been, the leader or captain of a team, but I am just as happy filling in any position required to get the job done. During my career, I have excelled at keeping teams on task and moving forward in a deliberant and throughout manner. Because of this, I was selected to be the school's new Student Council Advisor. They wanted a teacher who could serve as a model and guide on how to come together and work as a coherent team in order to achieve positive results for their student-driven initiatives. So far, the kids are working together splendidly, even though as individuals they are very different.

6. Communicating the Experience and Science

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

Day 2: GS Aquatic Turtle Survey Today was a great day! When the kids and I got down to the Neshaminy River this morning we could see immediately that we had some turtles in the trap. The kids were super excited to actually get their hands on some real turtles and collect data. Yes, they were actually excited to collect data! That's a win for science in my book. Angel and Hyatt were selected to put on waders and hop in the river to collect the trap. After a little effort and a near head first fall into the drink, they got the trap ashore. We had two turtles that neither I nor the kids had ever seen around the campus. The kids used the Seek App by iNaturalist to help identify the species. The verdict: Spiny Softshell Turtles! They were really neat. The kids got into their assigned teams began to collect data. "River Team" took water measurement using the Vernier LabQuest 2. They recorded water temp., flow rate, and DO. "Turtle 1" and "Turtle 2" teams used calipers and measuring tapes to collect plastron length, carapace length, width at widest point, and shell height at tallest point.…

7. Scientific Interests and Research Area Preference

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

Please explain your preference
I have desired to work in Antarctica since I was in high school. It is like no other place on earth, in its remoteness, challenge, and awesomeness. I'm not sure I will feel complete in my life's work until I step foot on the Antarctic continent as part some type of meaningful scientific endeavor.

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
3-5 weeks but I'm flexible.

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 really excited by almost all aspects of ecology and wildlife conservation. Currently I am most interested in researching the question of “how do ecologically similar species coexist in freshwater ecosystems?” I have my students studying niche partitioning and examining the interconnectedness of ecological communities via the GS Aquatic Turtle Survey project to help answer this question. I find it fascinating to study the dynamics of native species coexistence without invasive species present versus the dynamics of invasive species and native species both present within an ecosystem. Our study has recently found that we have a population of invasive red-eared slider turtles on campus that are potentially outcompeting our native and endangered northern red-bellied cooter. This finding has opened an entirely new line of inquiry regarding conservation management in class and on campus. Since humans introduced the red-eared sliders to this ecosystem, is it the job of humans to remove them now that they are possibly causing ecological harm and pushing native species towards extinction? I am deeply interested in studying human-mediated ecological disturbances and how, using science-based research practices we can potentially restore the damaged ecosystems and wildlife populations. These are the questions and problems that excite me about ecology.

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 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 prefer to be outside rather than inside. I currently live in the Pinelands of New Jersey where I have access to miles of trails, streams, and rivers that run through the unique Pine Barrens ecosystem. My family and I are always in the woods, camping, fishing, hiking or paddling. Each summer since my daughter turned 10 she and I have been section hiking the Appalachian Trail. We started at Springer Mountain in Georgia and have since worked our way into North Carolina. My son and I have been climbing one or two of New Hampshire's Presidential Peaks each summer since he turned eight. I am experienced in rock climbing, spelunking, winter backpacking, surfing, backcountry skiing, paddling, orienteering, and trekking through areas of wilderness. This past July I completed the Laugavegur 55K Ultramarathon that is run through the southern highlands of Iceland, connecting the nature reserves Landmannalaugar and Thorsmork. I also climbed Wheeler Peak, New Mexico's highest mountain at 13,159 feet this past June. I have lead crews of college freshmen through the backwaters of the Algonquin Provincial Park in Ontario, Canada on Salisbury University's 12-day New Student Wilderness Orientation. I also climbed the 19,365 foot Mount Kilimanjaro, with a summit camp at 18,500 feet. I have completed the State of New Jersey Marine Law Enforcement boating safety certification course and am fully certified to operate small water craft in New Jersey waters.

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

I am completely fit and healthy with no allergies.

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

Mac but I am well versed with PC as well.

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

• EnviroDIY Mayfly Data Logger with the Arduino IDE software - We use this equipment in our new freshwater, student constructed stream monitoring station on campus. Our data will be uploaded to the Monitor My Watershed app for the public to use. (https://monitormywatershed.org/browse/) • Vernier LabQuest 2 interface and Logger Pro Software with the following sensors and probes: Relative humidity sensor, Turbidity sensor, Conductivity probe for water quality studies, pH sensor (aquatic), Soil moisture probe, Temperature probe, Light intensity probe, Dissolved oxygen

probe (aquatic environments), Conductivity probe for total dissolved solids in a waterway, Flow rate sensor – I have my students use the equipment extensively in IB SL Environmental Systems & Societies during their independent and group ecological research projects. • Google Forms, Google Sheets, Google Docs – My biology students are collecting morphometric data on the native and invasive aquatic turtles found on campus as part of an Aquatic Turtle Population Survey Project that I initiated this year. They are using the Google Suite to input their data, analyze their data, and to share their data with their peers. • We use numerous Apps on our smartphones such as: Seek by iNaturalist, Avenza Maps, Journey North, Zooniverse, Biomeviewer, Water Quality by Stroud Water Research, and Merlin Bird ID by Cornell Lab of Ornithology. We also use our smartphones to record video and take photos for our research. We also use iMovie to make short science related digital films. The class and the kids are super plugged in.

e. List any additional skills or information that you wish to be considered.
I am a Registered Nurse in the State of Pennsylvania, although I am non-practicing.

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 La Selva Field Station, Organization for Tropical Studies, Costa Rica (Summer 2015) Research Project: Inquiry of Tropical Rainforest Program – Bullet Ants Lakes of the Rift Valley Project, Earthwatch Institute, Lake Naivasha, Kenya (Summer 2003) Research Objective: To understand how human-impacted biological processes in the lake (e.g. alien species, over-fishing, population fluctuations, and epidemics of birds) disturb biodiversity and conservation management of the lake. • Assisted in the creation of a sustainable development and management plan for the lake and its resources with the goal of understanding how human-impacted biological processes in the lake (e.g. alien species, over-fishing, population fluctuations, and epidemics of birds) affect biodiversity and conservation management of Lake Naivasha while measuring ecological health in the lake and its watershed. Wechiau Community Hippopotamus Sanctuary Project, Earthwatch Institute, Ghana and Burkina Faso (Summer 2001) Research Objective: Conduct the first botanical and wildlife survey of the Wechiau Community Hippo Sanctuary. • Worked with local Lobi villagers and Ghanaian biologists on a botanical and wildlife population survey to determine which portion of the sanctuary could be developed for ecotourism with minimal impact on wildlife. Conducted a hippopotamus census that monitored the few remaining hippos in the Upper North Region of Ghana with the goal to build a community run wildlife sanctuary by surveying and recording hippo behavior along several river transects via dugout canoe.

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?
As in science, all new knowledge builds off of previous knowledge. Participating on a PolarTREC expedition will strengthen my field work skills dramatically while placing me in an entirely different ecosystem than my previous teacher research experiences placed me. I worked primarily in Central America and Sub-Sahara Africa, places very different than the polar regions. Being able to authentically compare and contrast jungle and savanna field work with polar field work will strengthen my

ability to inspire my students to become scientists, for science truly can take you anywhere in the world.

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
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
Instagram

12. References

Reference 1

Name John Glennon, M.Ed.

Title and affiliation Headmaster, Georgetown Preparatory School

Email Address jglennon@gprep.org

Phone Number 301-214-1229

Reference 2

Name David Bosso, Ed.D.

Title and affiliation History Faculty & 2012 Connecticut Teacher of the Year, Berlin Public Schools, Berlin, CT

Email Address davidbosso@gmail.com

Phone Number 860-930-6668

Reference 3

Name Courtney Quinn, PhD

Title and affiliation Decadal Climate Forecasting Researcher at CSIRO Oceans and Atmosphere, Tasmania, Australia (and my former student)

Email Address cquinn2785@gmail.com

Phone Number 61407541217

2020-2021 PolarTREC Educator Application

Jennifer Field

1. Contact Information

Name: Ms. Jennifer Field

Email: jfield@mursd.org

Home Address:
15 Rocky Pond Road
Princeton, MA 01541 US

Home Phone: 508 341-3376

Cell Phone : 508 341-3376

Institution Name: Nipmuc Regional High School

Institution Address:
90 Pleasant St
Upton, MA 01568 US

Institution Phone: 508 529-2130

Classroom/Office Extension: 1220

Institution Fax:

Institution Website: mursd.org

Other relevant websites: https://sites.google.com/mursd.org/jfield/home
https://biocsbridge.wpi.edu/website/home

Supervisor's Name: John Clements

Supervisor's Email Address: jclements@mursd.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 teach 9-12 science at a regional high school with about 650 students. The high school is located in a mid to upperclass suburban area, many parents work in the science (medical or engineering) field. Nipmuc Regional High School is a 1-1 school ; each student has an iPad and all classrooms have projectors and AppleTVs. Internet access is basically universal in both towns and at all schools. Most students who attend Nipmuc (~95%) go on to college.

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

Other Type of School Regional (2 towns)

e. What is the population of your annual audience or school (estimates are fine) About 650 students

f. School Ethnicity:
0 % - American Indian or Alaska Native
2 % - Asian
0 % - Black or African American
4 % - Hispanic or Latino
0 % - Native Hawaiian or Other Pacific Islander
92 % - White
2 % - Multiracial
If your school uses other categories to describe race/ethnicity, please describe:

g. Percentage of students who receive free or reduced lunch: 9

h. Average class or audience size 24

i. Total number of students/audiences you teach in a year 125

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.

Winter 12/23-1/2/20120 February 2/17 - 2/21 2020 April 4/20 - 4/24/2020 Summer 6/16 - 8/24/2020 2021 will have similar dates

3. Teaching Experience and Education

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

Bachelor's Degree (Major): BS Natural Resources

Bachelor's Degree (Minor):

Masters Degree (Discipline): MS Biomedical Forensic Sciences

PhD Degree (Discipline):

Other Degree: MAT Secondary Education

b. How many years of education experience do you have?: 20

c. How many years have you been working at your current institution?: 16

d. List up to 10 relevant professional licenses, certifications, registrations, awards or honors that you have received in your profession::
MA Teaching license 8-12 Biology MA Teaching license 8-12 Earth Science Nipmuc Regional High School Science Department Chair Mass Institute of Education Partners in Excellence Award Phylotastic Educator Workshop Participant National Science Teachers Association Member Massachusetts Association of Science Teachers Member Council of Forensic Science Educators Member Mendon Upton Education Foundation Grant recipient Ruth and Martin Levine Scholarship (Boston University)

4. Professional Assignment

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

Other Primary Assignment Science Department Chairperson

b. What subjects do you teach? Check all Secondary Biology, Secondary Chemistry, Secondary Earth Science, Secondary Gov/Political Science

Other Subjects AP Environmental Science Forensic Sciences

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 the Arctic and the people who live there. My recent participation in a symposium “Bridging Science, Art, and Community in the New Arctic” (UVA) has renewed and expanded my interest in the effects that climate change has on polar communities. I feel strongly that I can not only contribute, but also disseminate information that would help people understand how climate change is affecting communities. I am entirely vested in helping other people understand and become EXCITED BY SCIENCE! I bring as much real-world science into my classroom as possible, in fact I have made climate change education a department-wide goal so that each teacher will use their curriculum to reinforce students’ understanding – I have even dragged the art department into this goal! I believe it is important for people to be able to apply their basic understanding of science to global systems and problems. Through PolarTREC, I would continue to experience how science is used to study the world. I hope to meet like-minded colleagues and bring new ideas and resources back to Nipmuc and to my school community. I look forward to the personal and professional growth offered by this opportunity.

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 continuously endeavor to bring real issues and scientific procedures into my classroom and to incorporate them into interdisciplinary learning. I can imagine myself encouraging other teachers in my school to use real data, current methods, or scientific papers written from this or similar research in many classes at Nipmuc. With this new experience, I can help students and teachers to explore polar science and the role it plays in a better understanding of global systems. I am hopeful that I can maintain a connection with my team and use SKYPE to connect my students with them. This would enable students to ask questions and understand that scientists are people (just like they are - therefore they could be a scientist too). It would be exciting to connect students with researchers in Antarctica or the Arctic! Students would gain first-hand knowledge about how what they are learning in school actually works in the field. Depending on my program with PolarTREC, I could continue similar field studies at Nipmuc and compare data, or just get students familiar with the processes involved in polar field studies. I am excited about being part of a long-term

connection with my team and my project.

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 excited about being able share my experiences with other educators as well as with the school community and the general public. I am adept at promoting my activities through social media (see Twitter: @jfieldscience) and am frequently involved with professional development opportunities both at my own school and at other schools in my region. These opportunities would provide me with a perfect venue for sharing out my experiences and the work done by PolarTREC to other teachers as well as to their students. Nipmuc also hosts a community open house when I could meet with the public and provide information about my experiences and the importance of Polar research. I have presented to teachers in conjunction with my collaboration with WPI (NSTA, MAST, and AweSTEM). I have also some experience with public presentations about research. After a research trip with Earthwatch, I held a presentation at my local library about the research in which I was involved. I really enjoyed this type of venue. Many non-scientists think science is complicated and hard to understand. Research with PolarTREC would give me another opportunity to reach out to my community and help dispel this myth.

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 believe that learning takes place on a personal level for all people. Therefore, I encourage students to think about how science relates to their own life. For example, when teaching students about municipal waste and its impact on the environment, it is difficult for students to think about how they influence the problem. Because teens typically only think about their daily trash, it does not seem like much. I have students collect their own trash for 24 hours. We then examine the trash, sort it, weigh it, and do calculations which show them their own personal contribution to the waste problem on a yearly basis. I have students research waste in other countries to discover what the differences in waste and waste management are. I also take my students to visit the trash to energy plant in a nearby town, so they can see (and smell) a “days-worth” of trash from their own region. This year, I have also taken it a step further by reaching out to a teacher on Unalaska Island in order to have students exchange narratives about their environment and how they live in it. I am hopeful it will make climate change more personal.

e. Describe the particular strengths you would bring to the PolarTREC

program and to a field research team. (200 words maximum)

I am an ideal candidate for the PolarTREC program because I am a great communicator. I have been an educator for almost 30 years and have experience with both formal and informal education settings. I have worked as an interpretive naturalist in two National Parks (Alaska and Colorado) and was also a Registered Maine Guide (sea kayaks) while in college. I have experience working in the field (with and without high school aged students) and working in and around Arctic flora and fauna. I am adept at identifying many arctic plants. I have participated in population surveys, glacial deposit stratigraphy documentation, wetland sediment coring and analysis, and many other field studies throughout my life. My educational background spans both biomedical sciences and environmental sciences so I work well in the field and in the lab. I am a hard worker and a team player - I like working with other people, but don't mind working alone. I am comfortable being in a leadership role or in a support role. I don't mind sharing quarters, sleeping in tents, or getting dirty. In a nutshell; I am experienced, flexible, resourceful, creative, and have a good sense of humor.

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 an experienced and efficient team worker. I communicate well, am goal oriented, and am a hard worker. I am currently working as a member of an NSF funded committee to create an interdisciplinary high school curriculum of biology and computer science (BIO-CS). As a member of the BIO-CS Bridge team, I work with three other high school teachers, four faculty from Worcester Polytechnic Institute, and various graduate students. We have recently rolled out our new curriculum to other teachers in the state to pilot. This has pushed me a little beyond my comfort zone as my first challenge was to overcome my fear of computer coding. We are implementing the use of Starlogo NOVA in classes in order that students learn to code and use simple pollinator/flower ecosystem models to test hypotheses. I am working with my biology counterpart to formulate and pilot lesson plans and activities in the classroom. These lessons are the result of integrating CS and Biology standards and will be available on the WPI BIO-CS Bridges website in the future. This summer, we trained 10 other teachers how to implement this curriculum in their classes.

6. Communicating the Experience and Science

Write your journal entry for the general/lay audience. (200 words maximum)
September 13, 2019: Forensic Science students are in the midst of their Forensic Entomology exploration. Students were given two store bought chickens with which to explore how changes in a body's position could influence the rate of decomposition. Yesterday, students noticed a huge writhing "maggot mass" in the corpse of the "control" chicken (placed on the ground). The combined activity of these maggots increased the internal temperature of this chicken by 12□C compared to the ambient temperature! As a result, when we returned this morning, the whole chicken was brown and shriveled; all of the maggots were leaving the corpse in order to pupate. While we expected the increase in temperature to speed decomposition, this drastic change was a surprise for all of us. Meanwhile, the test chicken which hangs from a tree, had little decomposition or temperature variation. From this experiment, the students have observed first-hand how the position of a body affects the rate of decomposition. Unlike TV, real forensic entomologists need to have concrete data that relates directly to all of the variables in order to determine how long a body has been decomposing. For actual blogs: 2015 visit: http://nipmucopwall.blogspot.com/ 2019 visit: https://nipmucgalapagos.blogspot.com/

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 preference; I would be happy to go to either place. I have discussed time away from the classroom with my administration and have received approval for this.

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 restrictions on length of trip and can travel up to 8 weeks. My school is very supportive of professional development and life-long learning I am not available 8/3/2020 - 8/7/2020 and 4/23 - 4/26/2020

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 have a wide variety of scientific interests, though my strengths are clearly in ecology and natural history, I am also interested in geology, paleoclimatology, and human geography. I am most interested in how climate change is currently affecting polar ecosystems and what these changes might mean for the future, especially for indigenous people. At a recent symposium, I was fortunate enough to hear about arctic research in the permafrost due to the melting of ice wedges this was interesting to me as it influences the entire ecosystem. I would be interested in taking sediment or ice cores to look at paleoclimate in either the Arctic or the Antarctic.

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 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 a MA state license to carry a firearm I am comfortable in and around boats/sea kayaks/sailboats/canoes I hike and camp I can cook on a camp stove and/or fire I snowshoe and downhill ski I can use a map and compass I like Plant/invertebrate ID I am comfortable on horseback Experiences: I was a Registered Maine Guide (lapsed license) – sea kayaking around Mt. Desert Island, ME I was a lifeguard (lapsed license) I have experience camping and hiking in the backcountry of Denali National Park Glacier hiking (Iceland & Alaska) Spelunking/ Cave first aid training Rappelling (minimal) Canyoning (minimal) Archeological dig experience (minimal – Colorado)

b. Provide a basic statement of your general health and physical condition.
I am in good health (no daily or prescription meds) I am in good physical condition (daily light exercise – walking/hiking and stretching and/or core exercises)

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.
I currently use both a MAC (school) and a PC (home) I use windows and google docs for both and am proficient on either type I also use an iPad and many of the apps available I am adept at learning new computer programs

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.
As a teacher in a 1-1 Google school I use: • Google Classroom to post and collect assignments as well as communicate with the class and as a venue for student questions and input. • Google Calendar to plan my day to day learning activities (I share these with students and colleagues), as well as to plan my personal activities and responsibilities. • Google Sites (https://sites.google.com/mursd.org/jfield/home) to provide information to students and parents. • Google Sheets or Excel to create spreadsheets for data and budgeting and to help students with graphing. • Google Drive to collaborate with colleagues and students. • Google Forms to collect feedback from students. • Twitter (@jfieldscience) to communicate publicly about what is happening in my classroom daily. • Power Point and Prezi to create presentations. • Starlogo NOVA & Netlogo to teach coding and to run simulations and modeling • iMovie to create trailers for students. • In class I use compound light & dissecting scopes frequently. • I use lab equipment related to PCR methods & running DNA gels (miniPCR) • Personally, I use my smart phone (Android) Instagram, Facebook, What’s App, and SnapChat to keep in touch with friends and family. • I am

versed in digital camera use (automatic or manual), but usually use my phone.

e. List any additional skills or information that you wish to be considered.
I am good at problem solving/trouble shooting, jury rigging equipment, or thinking outside the box to find a solution. I am artistic and creative I have some knowledge of small engines and small engine repair and can do some simple (wood) construction and plumbing. I am comfortable in small planes and helicopters. I was in the Peace Corps (Senegal, West Africa).

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
I first heard of it through a colleague, and was encouraged to reapply this year by an ARCUS member

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
Bridging Science, Art, and Community in the New Arctic (Helen Wiggins)

Other (please explain)

b. Please suggest other places we might advertise this opportunity for teachers
At MAST and NSTA conferences also, MAST has a monthly email with PD opportunities

12. References

Reference 1

Name John Clements

Title and affiliation Principal, Nipmuc Regional High School

Email Address jclements@mursd.org

Phone Number 508 529-2130

Reference 2

Name Elizabeth Ryder, Ph.D.

Title and affiliation Associate Professor, Dept. Biology and Biotechnology; Associate Director, Program in Bioinformatics and Computational Biology, Worcester Polytechnic Institute

Email Address ryder@wpi.edu

Phone Number 508 831-6011

Reference 3

Name Alison Clish, MFA

Title and affiliation Nipmuc Regional High School, Electives Department Chair

Email Address aclish@mursd.org

Phone Number 508 529-2130

2020-2021 PolarTREC Educator Application

Eric Filardi

1. Contact Information

Name: Mr. Eric Filardi

Email: efilardi@nenanalynx.org

Home Address:
110 Tozitna Ave
Nenana, AK 99760 US

Home Phone: (631) 988-6504

Cell Phone : (631) 988-6504

Institution Name: Nenana City School

Institution Address:
2nd and C Streets
Nenana, AK 99760 US

Institution Phone: (907) 832-5464

Classroom/Office Extension: 158

Institution Fax: (907) 832-5625

Institution Website: http://nenanalynx.org

Other relevant websites:

Supervisor's Name: Annalee Coy

Supervisor's Email Address: acoy@nenanalynx.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): Located 55 miles southwest of Fairbanks and 304 miles northeast of Anchorage, Nenana City Public School District (NCPS) serves the remote, rural town of Nenana, Alaska. With a population of less than 500 persons, more than 40 percent of the year-round jobs in Nenana are government-funded. Besides the local public school, the town has a health clinic, mental health clinic, fire department, public library and State Troopers office. The School District has a vision of being a community of opportunity, preparing students for life. Nenana School’s mission is to provide all students with the tools and learning environment necessary to commit to achieving success. Currently there are about 200 students attending the K-12 school with 70 students in grades K-8 and 130 students in grades 9-12. This number includes the 80 Alaska Native students representing nearly 40 remote Alaskan villages residing at the Nenana Student Living Center (NSLC), one of several statewide boarding facilities for high school students living in remote communities in Alaska. In addition to core academic offerings, in recent years our district has taken a greater interest in how childhood trauma (ACEs) impacts kids and their ability to learn. 21st Century Skills, socio-emotional learning (SEL) and the Grit & Growth Mindset now seem to be more important than ever. A good number of our students have not been taught - or are completely unaware - of what a core value even means. Now that these SEL elements have been integrated, they are equally important to core course offerings, helping us to redefine what it means to provide a complete and quality education. Students are better able to thrive as individuals and community members through this personalized-learning approach to teaching and studying. The students at our Nenana Student Living Center come to Nenana City Public School due to the extensive programs, high academic quality, vocational studies, and availability of after school activities. The NSLC provides room and board (also structure and support) for up to 100 high school students who attend Nenana City School. For many of the students living at NLSC, this is their first real exposure to the 'outside world.' At the Center, they live in dormitory-style rooms and are provided with round-the-clock adult supervision. The Nenana City Public School is committed to preparing our students to be successful in the real world. We are a STEM-based school, funded largely by the Alaska Native Education Grant, that integrates science, technology,

engineering, and math into every class (including English, History, Art, & Music), and utilizes project-based learning to enable students to make real life connections and real world applications. With Project Lead the Way (PLTW) as our foundation, we are able to offer students courses in Computer Science, Engineering, Bio-Medical Science, Human Body Systems, Robotics, Forensics, 3-D Design & Printing, Physics, and college-level math such as Pre-Calculus, Calculus, and Trigonometry. We are also proud to offer an Aviation Pathway that includes ground school, aircraft mechanics, and private pilot training. Finally, we offer numerous CTE courses, including Welding, Small Engine Repair, Auto Shop, and Construction Trades & Building Sciences, which afford our students the opportunity to receive state certification in those fields. Given the highly rural and remote nature of the Alaskan communities from which many NSLC students come, their skill sets are typically markedly different from those of typical urban, suburban or even rural schools. Many of our students are able to help their families survive by trapping and skinning small animals or catching and smoking salmon, a traditional sustenance lifestyle. Although intelligent and capable, they are often not prepared to excel in an academic environment, in particular, mathematics, science and technology. Most importantly, our youth have higher rates of mental health and substance use problems than other ethnic groups. More information on our school can be found at http://nenanalynx.org. Many of the students who come to Nenana often arrive without goals and unsure of their future. However, these same students usually graduate four years later confident of their career choices and prepared for the post-graduate training required to make them successful. Much of this can be attributed to our excellent tutoring opportunities. The Nenana Student Living Center provides one hour of mandatory study hall/tutoring, facilitated by a certified teacher, for all students who have poor or failing grades. Additionally, certified teachers from the high school provide their tutoring at the Living Center. The Nenana Student Living Center (NSLC) provides infinite opportunities for students to experience campus-style living while learning valuable time management and independent life skills in high school before they go away to college or enter the workforce. Add a strong sense of community, a family atmosphere, and a nurturing and supportive environment, and the NSLC becomes an ideal home-away-from-home for each student. The NSLC is used to house our students, who come from villages large and small from all over Alaska. Their parents, who know their children will receive a challenging, rewarding, enriching, and relevant 21st century education in a safe and positive environment, often make large sacrifices to send their children here. Our school and community works diligently to provide: A staff that has adapted the instructional program to local priorities and conditions. An environment in which students will be able to

spend most of the day on demanding academic tasks. Community members who express support for the staff and the instructional program and feel welcome at the school. Local teachers who express enthusiasm for the program and facilitate serious curriculum-based learning taking place. A community and school that have forged an educational partnership and support each other. A school that has developed some clear focus that unifies and gives purpose to the educational program. The school staff consists of enterprising educators who are not hide-bound to a single image of what a high school looks like and who can design a program fitted to a particular situation. A school staff that has the broad intellectual range and broad interests (such as dog mushing, taxidermy, writing, art, music, house building, flying a plane) that add variation to the program. A school district where the central office administrators encourage local professionals to consult with the community and to fit the instructional program to community priorities.

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) 214

f. School Ethnicity:
90 % - American Indian or Alaska Native
% - Asian
% - Black or African American
% - Hispanic or Latino
% - Native Hawaiian or Other Pacific Islander
8 % - White
2 % - 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 20

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

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: August 15, 2019 Winter break: December 23, 2019 – January 3, 2020 Spring break: March 9, 2020 – March 13, 2020 End date: May 15, 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): BA English; BA Education; BA Theater

Bachelor's Degree (Minor):

Masters Degree (Discipline): MA Business Administration; MA English

PhD Degree (Discipline):

Other Degree: Occupational Endorsement in Sustainable Energy

b. How many years of education experience do you have?: 14

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::
Working Group Member, ARCUS Culturally Responsive Outreach To Indigenous Alaska K-12 Students Top Three Finalist, Alaska State Teacher of the Year 2017 STEM Director, Nenana City School District English Chairperson, Nenana City Public School Engineering Chairperson, Nenana City Public School Project Director, Nenana City High School Counseling Grant Teaching Certificate, English Language Arts GR 7-12; Theater GR K-12 Project Lead the Way (PLTW) Engineering Teaching Certification AP Computer Science Certification Teacher of the Year, Remah School for Boys, Al Ain, UAE 2013/2014 School Year

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 English/Language Arts, Middle School Social Studies, Secondary English, Secondary Theatre

Other Subjects - Secondary Engineering - 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)

The Alaska K-12 science/STEM education community has a long history of evidence-based instruction and curriculum development that is responsive to the cross-cultural nature of K-12 education in Alaska communities. Despite these advances, researchers and research grantors generally lack awareness that cultural responsiveness is an effective component of interactions among researchers, K-12 educators and students. Despite more recent attention to cultural education in K-12 education, awareness seems generally lacking among researchers and research grantors that cultural responsiveness is a required, and effective, component of interactions among researchers, K-12 educators and students, or any cross-cultural audience. I am constantly working to accommodate the diverse requirements of connecting my students to the world around them and to broaden the scope and contexts through which I develop my own teaching style and effectiveness in the classroom. I envision a STEM learning environment where youth play an active role in understanding Arctic science and stewardship of Arctic-issue influenced resources in their own community. Changes in the Arctic and our global climate have already influenced the lives of rural and indigenous communities in the Arctic, and climate change in the Arctic has a profound impacts and feedbacks within the global climate system.

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)

Arctic science is usually not well-communicated outside the walls of research institutions, and public knowledge of the Arctic is poor. Additionally, our students are falling behind in STEM subjects, and classroom teachers are struggling to develop curriculum that engages individual students and meets teaching standards. Through PolarTREC, I hope to be able to provide a connection between these issues, with activities targeted to educate teachers, students, communities, and other stakeholders about the Arctic. Place-based education that includes cultural responsiveness to Alaska’s diverse Indigenous cultures can narrow the academic gap for Alaska Native students. I plan to guide youth in interdisciplinary learning on Arctic issues they identify with elders and data gathered through my participation in this program. I plan to design and implement a PolarTREC-influenced science

investigation, and learn more about the issue through curriculum that braids Western science and Alaska Native knowledge and traditions. I will apply the in-depth learning and data I collected to stewardship projects related to the core science-based issues of our community. My key goals are to: 1) Improve STEM instruction, 2) Increase scientific literacy, 3) Increase engagement of underrepresented youth and adults in STEM, particularly rural and indigenous educators and youth, and 4) Increase capacity for communities to respond to arctic 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 strive to broaden participation in science and to make the results of Arctic research projects widely accessible to my students and the public. Though participation in PolarTREC, I seek to support the engagement of diverse students, educators, and the public in polar research projects. I will encourage education research and development proposals that make use of innovative technologies and pedagogies to give large groups of students, educators and the public access to polar research efforts in the polar regions. I want to use my experiences to help lead my colleagues to the edge of their own wisdom, whether they are teaching English, engineering, geometry, history or aeronautics. I want to provide meaningful community events with the public to share these high expectations, outline appropriate support strategies for our school, and properly oversee new initiatives within our district. I would like to use this experience to develop a curriculum that ties our students closer to our natural world, and culminates in a environmental-based service project to benefit our community. In addition to providing service and fulfilling helping other people at all times, one of the primary purposes of a service project is to demonstrate or hone, or to learn and develop, connection to our natural lands and leadership skills.

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 aim to provide rich opportunities for youth, educators, and community members from rural and indigenous communities in Alaska and beyond to learn about, observe, and act upon locally important science issues. I work to develop a STEM learning process that integrates modern, relevant pedagogical approaches that best fit the issue, local and traditional ecological knowledge, historical and current scientific data, direct contact with subject matter experts, and collaboration with a

team of educators, community elders, and other partners such as the Association of Interior Native Educators and the other youth programs. Additionally, as many of our adolescents face unique and diverse challenges that have an impact on academic achievement, I let my students know that learning involves a great deal of struggle. Additionally, to meet the challenges of ever-increasing global connections and to be a front-runner in a global economy now and in the 21st century, our students must communicate in an environmentally-aware and culturally appropriate manner with people from both around their communities and around the world. In my classes, I promote knowledge of our environment, global mindedness and cultural competency among my students by encouraging them to embrace cross-cultural diversity and driving collaborative relationships within and beyond our classroom.

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

I feel my dedication, integrity, creativity, and passion for kids makes me a strong asset to the PolarTREC program and to a field research team. During the course of my education, my fieldwork positions, and my international teaching positions, I have gained extensive practice and understanding of how to accommodate the diverse requirements of students in need of strong academic and social skills. I currently serve as a member of the working group for Culturally Responsive Outreach To Indigenous Alaska K-12 Students, during which discussions center on how best to be inclusive of Indigenous educators and viewpoints in scientific research and outreach. With a rapidly-changing Arctic, while educational equity considerations remain relevant and pressing, I have learned that it is critical to equip and engage K-12 students as active Arctic community members, and to prepare more Alaska Native students to pursue STEM careers away from their communities. Additionally, I know that our Alaskan and Arctic communities have repeatedly expressed needs for their youth to be engaged in the work of monitoring environmental change and community resilience and adaptation to climate change. I have worked to promote students in Arctic communities to be doing “real science” and seeking and communicating science-based and engineered solutions to community problems.

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 currently collaborate to form educational partnerships with the community, and design education that fits our specific, rural school needs. As such, I oversaw our Federal Department of Education G5 grant reporting for a multi-million dollar high

school federal counseling grant and worked to implement Project Lead the Way (PLTW) Engineering courses. Additionally, I facilitated purchases and implementation of new technology, such as Canvas LMS and a one-to-one student Chromebook program. I work to focus on my students' efforts, and when my students fail, I give feedback about grittiness or strategies - what they think they did wrong and what they could do now. This is a key ingredient in creating mastery-oriented students; and critical for team success. The more I have worked together and come to value the contributions of Nenana’s diverse population, the more I understand the importance of team building and see a need to develop new connections in our school and in our community. I see especially that we need to develop leadership among our young people and encourage them to be participants in the life of our community. Helping be a part of something that's bigger than myself has delivered happiness in my life.

6. Communicating the Experience and Science

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

Denali National Park hosts an event called the "Road Lottery." Winners of the lottery are given a chance to drive as much of the Denali Park Road as weather allows. Last week, I was one of the lucky few able to do so. It was overcast, which might have been disappointing if I wasn't so excited to be able to drive the whole highway on my own. Traffic was moderate, and despite the primitive road, I didn't see anyone stuck or with a flat. That's good, because there's no cell coverage inside the park; any motorists who come to grief have to rely on rangers patrolling the road to radio for what one assumes is a rather sizeable towing bill. This far north, the seasons change quickly. I had visited two weeks earlier, and the colors of the tundra were already vastly different. Wildlife wasn't as plentiful as mid-summer; I wasn't quite sure if it was the change in seasons or the preceding few days' of vehicle traffic that had caused the animals to head elsewhere. Clouds and shy wildlife aside, I was grateful to have had the chance to experience the park in such a unique fashion.

7. Scientific Interests and Research Area Preference

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

Please explain your preference
Climate change is faster and more severe in the Arctic than in most of the rest of the world. The feedbacks from the Arctic are increasing global sea levels, they are predicted to change global climate and precipitation patterns, and the effects of climate change on Arctic species are likely to be felt globally. I want to work in the Arctic to help understand the effect of climate change on people, species and landscapes; and to inspire students to assist in development and implementation of adaptation strategies for species, ecosystems, and cultures coping with a changing climate in the Arctic. I feel that Alaska Native students are an underserved audience in proposals, and want to encourage researchers in the Arctic to reach out to rural Alaska communities and classrooms. Providing STEM education in a culturally responsive way with cultural values taught side by side with knowledge derived using western science methods has the benefits recognized in Alaska’s cultural standards as well as other societal benefits.

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 open to participation in any length 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)
As teaching about climate change can be a challenge, I am interested in understanding the current patterns in both the oceans surrounding the Polar Regions, understanding how difficult it would be to live on the ice, navigating through the Polar region, and how the climate and precipitation patterns change can threaten agriculture and food security. With a background in K-12 education, I am interested in how we can communicate climate change to our young people and get them engaged in up-to-date climate science. Specifically, the analysis of analyzing ancient ice and sediments fascinates me, as scientists can predict what our future planet might look like. Ice cores mesmerize me, filled with bubbles of early atmosphere trapped in the ice as it formed, as they may reveal whether Antarctica's ice sheet melted fully the last time Earth's climate warmed to the temperatures the

planet is predicted to reach in the next two centuries. I feel as if the race is on to access these records before the opportunity literally melts away. I am captivated by the engineering required to pick the spot, check the ice's thickness and layers, and drill into the ice. Additionally, I am interested in evidence that increased plastic production is impacting the Arctic in new, unforeseen ways.

Atmospheric Systems

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 am somewhat interested in this subject area

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

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

Other Areas of Scientific Interest
Any!

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.

I am an EMT1, and have completed Wilderness Medical Associates International's Wilderness First Responder (WFR) course in medical training for outdoor educators, guides, military, professional search and rescue teams, researchers, those involved in disaster relief, and others who work in remote areas. Additionally, I have practiced my American Heart Association AED/CPR/First Aid skills on several occasions; I assisted in the use of an AED machine in Rocky Point High School October, 2008, when a student became unresponsive in the school gymnasium. I have administered the use of First Aid on trails and in the backcountry of New York, Virginia, and Alaska in May, 2010; August, 2014; October, 2014; June, 2015; August, 2016; and September, 2016. I have treated colleagues for the effects of frostbite in January, 2017. I have accomplished many backcountry hiking and camping trips including the Appalachian Trail in New York, July, 2008; July, 2009; May, 2010; Kesugi Ridge in Denali State Park, July, 2015; Haleakalā National Park, December, 2015; Volcano National Park, December, 2015; Denali National Park in August, 2014; September, 2014; November, 2014; December 2014; March - September, 2015; December, 2015; March - December, 2016; January - February, 2017. These have included a mix of terrains, such as desert sands, tundra, old growth forest, and shale mountain. I can establish direction, use a compass, develop hiking maps, operate other navigation equipment, handle a gun, shoot an arrow, build a fire, paddle a canoe, build a shelter, use a knife, save a life and many other skills. Currently, based on several years of backpacking and mountaineering experience in Alaska's mountains, I have continued to use and refine these skills as well as learned to establish trails to remote regions of the state's wildernesses and traverse trail-less terrain linking one trail with another. Living in Alaska has helped me to further cultivate my backcountry skills, form a discipline for safety, and gain an understanding of wilderness equipment and survival techniques, from simple rock scrambling to solid route finding ability. Not only have I hiked many areas on foot in the summer and fall, but I have accomplished many treks on snowshoes and cross-country skis in the winter and spring. As a seasonal Backcountry Ranger in Denali National Park and Preserve with the National Park Service, I employ understanding of wilderness travel, general principles of ecology, land use, natural and cultural resource management, conservation, and park and visitor management.

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

I am in good health and physical condition, am a distance runner, and am a Yoga

Alliance 200-hour certified yoga instructor.

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.
I have employed years of use of both Mac and PC systems; I am highly skilled with most types of computer equipment and many other technological devices. I am competent with the Python programming language.

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.
I use Android devices, Chromebooks, laptop computers, desktop computers, digital cameras, Google suite, Firefox browser, Chrome browser, Autodesk Inventor mechanical design and 3D CAD software, Adobe suite, Python and Scratch programming software, Resin and Extrusion 3D printers, SMART devices, and more on a regular basis, both professionally and personally. Many of these devices help deepen classroom learning with differentiation and by using resources my students are interested in. Personally, I enjoy keeping up-to-date with new emerging technologies and learning how to embrace and use them in my daily life.

e. List any additional skills or information that you wish to be considered.
Intermediate-level Spanish speaker Valid driver's license Can operate small and large machinery Can drive manual transmission vehicles Can operate power tools Can take off in small aircraft

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
Janet Warburton, Education Project Manager ARCUS; Sarah Bartholow, Former Education Project Manager ARCUS; Jens Jacobsen, STEM Director NCPS

Former PolarTREC, TREC, or TEA teacher. Please provide their name
Tina King, Teacher, West Wilson Middle School, Mt. Juliet, TN; Bob King, Teacher, Friendship Christian Schools, Lebanon, TN; Joanna Hubbard, Teacher, Mears Middle School, Anchorage, AK

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
Alaska CTE Coordinators List, cte_coordinators@list.state.ak.us

12. References

Reference 1

Name Annalee Coy

Title and affiliation Principal, Nenana City School

Email Address acoy@nenanalynx.org

Phone Number (907) 832-5464

Reference 2

Name Eric Gebhart

Title and affiliation Education Program Consultant, SPDG Director at Iowa Department of Education (Former Superintendent, Nenana City Public School)

Email Address eric.gebhart@iowa.gov

Phone Number (515) 281-3021

Reference 3

Name Sierra McLane

Title and affiliation NPS Director, Murie Science and Learning Center; Education Coordinator, Denali National Park and Preserve

Email Address sierra_mclane@nps.gov

Phone Number (907) 683-6436

John Filcik

1. Contact Information

Name: Mr. John Filcik

Email: john.filcik@gmail.com

Home Address:
Calle 112 #11A-55
Bogota, CO

Home Phone:

Cell Phone : +57-314-616-5166

Institution Name: Colegio Nueva Granada

Institution Address:
Cra. 2 Este #70-20
Bogota, CO

Institution Phone: +57-031-212-3511

Classroom/Office Extension:

Institution Fax:

Institution Website: cng.edu

Other relevant websites:

Supervisor's Name: Ashley Barker

Supervisor's Email Address: ashley.barker@cng.edu

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): I live in Bogota, Colombia where I teach at an American school, Colegio Nueva Granada (CNG). CNG is a K-12 school in a very urban setting. In the middle school, where I teach science, there is ample technology access. Students have 1:1 laptop computers. The economic background of the students varies. Bogota has the second largest U.S. Embassy in the world, and most of the children of U.S. embassy employees attend CNG. Besides these American students, there are 30 other countries represented in the middle school. Many students come from Colombia, but there are others from Russia, Croatia, Venezuela, etc.

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) 1200 students

f. School Ethnicity:
% - American Indian or Alaska Native
5% % - Asian
5% % - Black or African American
65% % - Hispanic or Latino
% - Native Hawaiian or Other Pacific Islander
20% % - 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: N/A

h. Average class or audience size 16

i. Total number of students/audiences you teach in a year 80

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.

This year, the school year started on August 6. Christmas break is from December 14 until January 6. School ends for the summer on June 12.

3. Teaching Experience and Education

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

Bachelor's Degree (Major): International Studies

Bachelor's Degree (Minor): Pre-Medical

Masters Degree (Discipline): Secondary Science Education

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?: 2

d. List up to 10 relevant professional licenses, certifications, registrations, awards or honors that you have received in your profession::
Setting the Standard award - schoolwide award Corpsmember Award - upon completion of Teach for America training Apple Certified Teacher Deeper Learning Certification -- Harvard Graduate School of Education Building the Empathetic School - presenter at Tri-Association Conference in Monterrey, MX

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)

My science classroom is a place where I value question-asking. Curiosity is vital to true inquiry. Every year, this is a major emphasis with my students, and I do my best to track their growth related to curiosity. In a perfect world, I would be able to take all my students on a science field trip to the Arctic/Antarctic, but at this point, that isn't possible. I hope that by working with PolarTREC, I might be able to expose my students to a level of inquiry and curiosity beyond their normal scope of experience. I hope to gain an avenue by which to increase their curiosity. I hope that by participating in PolarTREC and bringing those experiences back home to the classroom, it might cause my students to ask more questions about the world, to be motivated to answer those questions, and to dream big dreams for their futures.

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 my students to feel as if they are a part of this journey to the Arctic/Antarctic as well. I plan on having my students assist me in the preparation process for this experience. Leading up to the trip, I will brief students on my preparation. I will have them read articles about the research we will be doing and about the region I will be traveling to. I will invest them in this at the beginning, so that when I am in the Arctic/Antarctic, they will be interested in the experience and the results of the research. More than anything, I want them to feel a part of it all, as well. Just like new scientific knowledge only ever comes about through teamwork, so I want my students to feel a part of the research team for this expedition.

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

Through my experience as a science educator, I have formed many different networks. Some of these networks are more personal than others—like the science department at my school that I have the privilege to lead—and others are less personal and more virtual—like the national Schoology group for science educators. I will harness all of these networks to share my experience. I will also utilize my social media accounts to share my experience with friends, family, and the public. Additionally, as a Teach for America (TFA) alum as well, I will be able to share my

PolarTrec experience with teachers working in urban or low-income contexts. Regardless of the network with which I am sharing my experiences, it will be important for me to be open about the experience so that other educators might learn and be inspired by arctic science as well.

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 embark on teaching a challenging topic or concept, I first need to motivate students to persevere to reach full understanding. To do this, I help them understand why they ought to care. This often means that I share a big picture vision for the topic or unit, prior to getting into the details. Then, I refer back to this bigger vision throughout our study together. This way, students don't get lost in the trees, at the expense of seeing the forest. Often it's seeing and understanding the forest that students reach a level of deep learning that I desire for them to have. Additionally, it is important that I motivate students by encouraging them through the learning process as well. Learning, if done right, is hard. And as I always tell my students, if you're not asking questions, you're not learning. With this mindset students feel free to fail, be confused, or struggle in the pursuit of understanding complex topics or issues.

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

I am an excellent interpersonal communicator, I am able to persevere toward obtaining objectives, and I work well with a team. Good communication is vital on a field research team. I am able to express myself when challenges arise and communicate positive and negative outcomes well. I practice this daily when I talk to parents of my students. It is vital to ensure their understanding of positive and negative issues going on in their child’s class. Additionally, I am able to communicate well through writing, both informally with parents and formally in research settings. I am able to persevere toward obtaining objectives. As an educator at a Title 1 school for three years, the barriers to success were often greater and more difficult to surmount than barriers at some other schools. Rather than use this as an excuse for lack of student achievement, I used it as motivation. Lastly, I work well in a team. I am teachable, allowing those with more experience and differing experiences from myself to teach me. I also have experience working with people of many cultural backgrounds, through work I have done in the Amazon Rainforest, rural China, and Bogota, Colombia. I have experiences both leading and being led.

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 teams both personally and professionally. I attended college on a Division 2 athletic scholarship to play tennis. I was an important part of the team dynamic and culture, eventually becoming team captain my senior year. That year I led the team to our first qualification for the national tournament in recent history. In 2015, I led a team of ten college students on a month-long service trip to the Amazon Rainforest. In the Amazon, we focused on learning the culture and participating in community development with full-time workers in that region. My school community is also exceptionally team-focused. I lead the middle school science department and foster teamwork among all the teachers and support staff in the department. I am a dependable and valuable contributor to our school leadership team, giving new and fresh ideas that will improve our practice as a school and as teachers. Overall, as a member of a team, I am known for encouraging my teammates, valuing collaboration, minimizing unproductive conflict, and leading with humility.

6. Communicating the Experience and Science

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

Dear Journal, Waking up early on a Sunday is never easy. But it's worth it if you like to cycle, and you live in Bogota, Colombia. You see, on Sunday mornings in Bogota, the city shuts down hundreds of kilometers of streets to cars, so that cyclists can take advantage of traffic-less roads. My wife and I chugged down some coffee that morning, and strapped our 10-month-old son, Theodore, into his bike seat on the back of my bike. Our goal this morning was to do a loop around the city before the roads got busy with cyclists later in the morning. As we rode, we passed food vendors selling all kinds of local fare--such as arepas, bunuelos, and--my personal favorite--salpicon (a fruit salad type of treat). During our 2-hour ride, Theodore slept in his seat almost the entire time. When we arrived home, my wife and I were winded. We were ready to lie down and take a nap! But, as you might expect, Theodore was recharged for his 2-hour nap and ready to play. "Well," I said, " I guess we'll just drink another cup of coffee and continue on with the day." We were tired from the early morning ride, but it was worth 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 the location of Antarctica because of its proximity to South America (where I live). I am open to working in the Arctic, as well, though.

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 a three-week-long expedition, but I am open to any length of time. Because of my role as a father to my son, I cannot participate in an expedition that takes place over the Christmas holiday.

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 taught various science classes from 7th grade through 10th grade at various schools over the course of my career. Each course has involved different content and skills, and each course has increased my fascination with the sciences in general. Much of my undergraduate training was in biology. I enjoy learning about the characteristics that are present in all living things, as well as the intricacies that make all living things distinct, especially in extreme environments. I am interested in oceanography, and the physics behind ocean currents and glacial development. More than anything, I am interested in the process that scientists follow in the field and elsewhere to answer questions about the natural world--and this is something that spans all the disciplines.

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 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)

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 have done a lot of hiking and camping. A few summers ago, my wife and I camped and hiked for the entire summer. We hiked many trails-from Half Dome in Yosemite National Park to Angel's Landing in Zion National Park. The outdoors is a true love of ours.

b. Provide a basic statement of your general health and physical condition.
I run daily and am very fit. I recently ran my first marathon.

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.
I am equally familiar with Mac and PC operating system. I use a PC at work at a Mac at home.

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.
My school encourages its teachers to have entirely paperless classrooms. Each student has a device. Much of the work done throughout the day is done on student devices. I am very comfortable with education and science-related apps and programs--like LoggerPro, Vernier, and simulation software.

e. List any additional skills or information that you wish to be considered.
I am proficient 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. 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
Michael League

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 Christine Eisenhauer

Title and affiliation Dean of the Relay Graduate School of Education

Email Address ceisenhauer@relay.edu

Phone Number (267) 979-2271

Reference 2

Name Ashley Barker

Title and affiliation Principal of Colegio Nueva Granada Middle School

Email Address ashley.barker@cng.edu

Phone Number (253) 507-0403

Reference 3

Name John Greenly

Title and affiliation Assistant Principal at Howard High School of Technology

Email Address john.greenly@nccvt.k12.de.us

Phone Number (302) 463-1877

Erik Fowler

1. Contact Information

Name: Mr. Erik Fowler

Email: e@efowler.com

Home Address:
615 E. 17th St
Houston, TX 77008 US

Home Phone: 7133987948

Cell Phone : 7133987948

Institution Name: Yes Prep Public Charter Schools

Institution Address:
13703 Aldine Westfield Rd
Houston, TX 77039 US

Institution Phone: 7139678800

Classroom/Office Extension:

Institution Fax:

Institution Website: www.yesprep.org

Other relevant websites:

Supervisor's Name: Matthew Corban

Supervisor's Email Address: matthew.corban@yesprep.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): I teach at a low-income, open-enrollment, public, college preparatory, charter school in urban Houston, Texas. My students are 98% Hispanic, 80% qualify for free or reduced lunch (Title 1). 90% graduation rate. 85% of students are accepted to a college or university, and 90% are first generation to go to college. Many go to regional colleges and universities, and a few of my students will go to Top-Tier universities with substantial financial aid including (specifically students I have taught) - Yale, Princeton, Stanford, Northwestern and Rice University.

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) District: 15,000+, School: 1,100, My senior class: 130

f. School Ethnicity:
0 % - American Indian or Alaska Native
0 % - Asian
1 % - Black or African American
98 % - Hispanic or Latino
0 % - Native Hawaiian or Other Pacific Islander
1 % - White
% - Multiracial
If your school uses other categories to describe race/ethnicity, please describe:

g. Percentage of students who receive free or reduced lunch: 85

h. Average class or audience size 20-30

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.

Aug. 1 - May 30 (plus 2 week winter 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, Cognitive Science & Psychology, U.C. Berkeley

Bachelor's Degree (Minor):

Masters Degree (Discipline): MEM, Environmental Science & Policy, Duke University

PhD Degree (Discipline):

Other Degree:

b. How many years of education experience do you have?: 3

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::
Texas Life Science Educator License Association of Energy Engineers Professional Certification Master's Paper selected at first annual Department of Energy Sunshot Forum for panel discussion National Defense Service Medal

4. Professional Assignment

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

Other Primary Assignment 12th grade high seniors only.

b. What subjects do you teach? Check all [webform_submission:values:subjects]

Other Subjects -AP Environmental Science -Environmental Science *Full time, all sections. School requires 4 years of science to graduate and my course is a core course requirement (AP or not) to graduate.

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 teach AP Environmental Science (and non-AP) to high school seniors at a nationally recognized, public, open-enrollment, low-income charter school in Houston whose mission is to create the leaders of tomorrow. I love my discipline and have the rare opportunity to teach this subject – my industry and academic discipline of choice - full-time, every day. The first science term paper I ever wrote was in middle-school science and I chose Antarctica – and I have been fascinated ever since. Of course, as a student and teacher of Earth and Environmental Science, my students and I spend nearly 8 weeks on climate change, stratospheric ozone depletion, ocean warming, ocean acidification and ocean pollution. I make a sincere effort to bring the practicing world of science to my classroom and have signed my class up in the past for more than one PolarConnect live events. My goal and hope if selected for this program are that through helping a researcher do science in the Arctic or Antarctic, I will have a richer understanding of Arctic or Antarctic biomes, atmospheric science, or climate science and the day-to-day people-doing-science that inform these - ultimately with the goal of bringing this experience back to my classroom and exposing students to more STEM career fields.

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 use of variety of materials and resources in teaching. One resource all high school teachers need is more time. Creating engaging, relevant, rigorous, pertinent classwork that engages students on critical subject matter is always top of the list. Students learn better when engaged with ambitious activities that are strategically organized according to the way we learn. Many schools, including mine, have limited budgets for expensive kits. However, POGILs (Process Oriented Guided Independent Learning) classwork sets have been made for nearly every AP subject (I use some from AP Bio), but none exist for AP Environmental Science. These classwork activities conform to Next-Generation Science Standards and require a solid amount of model and data analysis and making testable predictions. They are great tools when made well. I personally would love to see a few POGILs made on any of the topics related to this expedition – climate change (an updated version), ocean acidification, ocean warming, ocean pollution or other topic – in the context of Arctic/Antarctic area

research. In fact, if selected, I'll commit to making at least one or more and distributing it to my science content team across 15 high school campuses that teach my subject and/or AP Biology, and of course you.

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

I meet regularly with a science content team across 15 high school campuses. In addition to the specific deliverable I proposed in answer b) above to develop a classwork POGIL activity relating to the science topic of my expedition in its unique setting, I will also share my personal and learning experience through my regular meetings here in Houston such as the Lone Star Chapter of the Sierra Club, the Duke Houston Alumni meetings, and any teaching professional development engagements that I often attend.

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 use a 5-E lesson plan model with STEM modifications to teach Environmental Science daily in a 50-minute block, 6 times per day (yes, 6). For example, in the context of climate change, students might do the "engage" 5-minute portion looking at raw data and asking questions. This might be CO2 ppm concentration data from the Mauna Loa Observatory since 1950 coupled with ice core sample data from the last 200-400,000 years. Then, I explain (or "lecture") on the science of climate change for 15-20 minutes, often with a guided notes handout (high school seniors often still need prompts, and research shows people learn better this way anyway). Then, another 20 minutes is dedicated to students engaged in "practice," where they learn to apply what they have learned or gain depth via an exercise– often in paper format but also in hands-on labs once or twice per 6-weeks. Most non-lab days end with a 2-3 minute "exit" ticket where students must concisely describe in a few sentences, in their own words, the learning objective they just mastered. This format often works well, but I sometimes deviate to dive deeper into a topic when students are hooked. Or just to be creative and follow my instincts.

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

I think my closest friends and colleagues would describe me as tenacious, smart, and open minded. I would describe myself as these and a lifelong learner who enjoys travelling all over the world. I became a teacher a few years ago after a prior tour of

public service and several years in the private and non-profit sectors (in the discipline which I now teach). I understand the importance of a good team, and I also appreciate the value of hard work. I have the discipline of someone who spent 4 successful years in the Navy, and the academic aptitude of someone who went to a top-tier university (and paid for it myself, with the help of the GI Bill). I mention the latter because I appreciate the difference in perspective that comes with building something from the ground up with limited resources and a sense of urgency.

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 work with a science content team where, in addition to teaching full-time, I contribute curriculum and teaching resources for AP Environmental Science. I am currently working on Energy & the Environment curriculum which was my broader sub-specialty before I started teaching. I do my best work when I feel valued and when my colleagues are high performing, committed individuals with a common sense of mission. It took me a few years to learn this, and to find a place where I thrive. Although teaching has some autonomy, our charter school puts great emphasis on regular observations and constructive feedback by peers. I also have a personal teaching coach (well, he is shared with 14 other teachers too). When one works in a high-performing organization like Yes Prep (built on the same model as KIPP), there is very little that is done alone. I firmly believe we do our best work when challenged and working with a supporting, common sense of mission. I try to come every day with a positive attitude. When I get frustrated, I center my focus on why I teach – to be my best for the students who count on me showing up every day and do their part to study and learn.

6. Communicating the Experience and Science

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

Think you can handle teaching at a high-performance, inner-city, public charter school like Yes Prep? You just may want to visit first and find out. We start our day on campus around 7:30 a.m. (we leave at 4:30 pm) - often in line at copiers (if they work), whilst popping into the teacher's lounge to grab a quick cup of coffee before students arrive. Oops! I forgot to buy more K-Cups (our school doesn't provide coffee). Looks like I'll just be getting by on water today. At least I have filtered water and not the stuff that comes out of those water fountains. After I make a hundred or so copies (half of my classes don't have textbooks), get my laptop setup, post my lesson plan (daily), and . . . I just keep telling myself I really need to start coming in earlier, but I was up until 10 last night lesson planning. The copier jams and so now it's a mad scramble with 20 other teachers to the other building across the parking lot. Have you ever tried to cross a school parking lot at 7:30 in the morning? We teachers help each other out, and somehow it all gets done 1 minute before the bell. It's now 8a.m. and I have six periods to teach today, one coverage period (not enough subs) and, oh yes – lunch duty!

7. Scientific Interests and Research Area Preference

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

Please explain your preference
I am available Dec. 21- Jan. 5 (inclusive of travel days) and May 30 – July 30 of 2020. Yes, I am available for the Spring training March 16-20 of 2020 (that is our Spring break). Please understand it is very difficult for me to accept an assignment outside of this window given the nature of my school's mission and resources, although a couple of days on either side is doable. School starts Aug. 1 of 2020. **My ideal time frame is early as possible in June of 2020, and I appreciate your consideration on this if at all possible.

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
No more than 3 weeks, mostly because I have a shorter break than most teachers. I am available Dec. 21- Jan. 5 (inclusive of travel days) and May 30 – July 30 of 2020. Yes, I am available for the Spring training March 16-20 of 2020 (that is our Spring break). Please understand it is very difficult for me to accept an assignment outside of this window given the nature of my school's mission and resources, although a couple of days on either side is doable. School starts Aug. 1 of 2020. **My ideal time frame is early as possible in June of 2020, and I appreciate your consideration on this if at all possible.

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)
For the last 10 years, my area of focus both in work and academically has been the intersection of energy and the environment. I've worked recently at a think-tank (Rocky Mountain Institute), an energy efficiency consulting firm (ICF), and I completed my master's degree in 2012 in Environmental Science & Policy at the Nicholas School at Duke University. I wrote my master's paper on solar energy adoption in the United States and have studied the environmental impacts of decarbonizing our energy system. I now teach AP Environmental Science and love the interdisciplinary approach the course takes. My areas of interest are or course climate science – particularly ice core research. I'm also interested in changes in Arctic ecosystems due to warming, ocean pollution (including plastics) and effects on

marine ecosystems and food webs. I’m still very interested in energy and environmental impacts, so in the chance that you have research underway on something related to that, great. If not, I am a generalist with scientific acumen and an eye for detail – so I can contribute anywhere I imagine.

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

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
Energy and the environment - including environmental impacts of oil and gas drilling, fossil fuel atmospheric GHG and air pollution impacts, broader oceanic impacts (CO_2 uptake, warming, acidification), decarbonization schemes for energy sector and potential for mitigating environment impacts on Arctic ecosystems, climate, etc.

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 enjoy camping and hike annually in the Sierras or Rockies. I completed an Outward-Bound trip several years ago in Alpine Mountaineering, though I don’t profess to being quite that fit any more. I cycle weekly 1-2 hours. I deep-sea fish most years in the Gulf of Mexico. When I was in the Navy, I qualified in shipboard firefighting and firearms training. I’m certified in CPR and First Aid and can pilot a small boat.

b. Provide a basic statement of your general health and physical condition.
I am physically fit with no health problems that would prevent me from travelling anywhere in the world including remote destinations. I “passed” my routine annual physical in March. I jog 3 miles or cycle 10-12 miles 1-2 times per week and use modest weights to remain fit.

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.
Comfortable with both. Prefer PC. Good proficiency with most Office programs and basic spreadsheets, though I am not an Excel "quant jockey" but am good at telling those who are what we need and then improving it.

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.
Microsoft Office 365 Suite, blogging, 2 laptops, social media.

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)

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

12. References

Reference 1

Name Matthew Corban

Title and affiliation Dean of Instruction, Yes Prep Public Schools

Email Address matthew.corban@yesprep.org

Phone Number 713-967-8638

Reference 2

Name Sherri Nevius

Title and affiliation Associate Dean, Nicholas School of the Environment, Duke University

Email Address sherri.nevius@duke.edu

Phone Number (919) 613-8063

Reference 3

Name Stacy Sebert

Title and affiliation Science Teacher Colleague

Email Address seberts@scolonie.org

Phone Number 518-459-1333

Obed Fulcar

1. Contact Information

Name: Mr. Obed Fulcar

Email: ofulcar@yahoo.com

Home Address:
41 Bennett Ave
NY, NY 10033 US

Home Phone: (212)7408810

Cell Phone : (917)5361275

Institution Name: INTERNATIONAL SCHOOL FOR LIBERAL ARTS ISLA

Institution Address:
2780 RESERVOIR AVE
BRONX, NY 10468 US

Institution Phone: (718) 329-8570

Classroom/Office Extension: ROOM B86

Institution Fax: (718) 329-8570

Institution Website: www.islaschool.com

Other relevant websites: http://mrfulcar-teacheratsea2010.blogspot.com/2010/07/

Supervisor's Name: Francine Cruz, Principal

Supervisor's Email Address: Fcruz32@schools.nyc.gov

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): PUBLIC SCHOOL LOCATED IN THE URBAN NEIGHBORHOOD OF KINGSBRIDGE, BRONX, NY.

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

Other Type of School BILINGUAL TRANSITIONAL SCHOOL FOR ENGLISH LANGUAGE LEARNERS (ELLS)

e. What is the population of your annual audience or school (estimates are fine) ABOUT 400 STUDENTS.

f. School Ethnicity:
0% % - American Indian or Alaska Native
% - Asian
.5% % - Black or African American
99% % - Hispanic or Latino
0% % - Native Hawaiian or Other Pacific Islander
0% % - White
.5% % - Multiracial
If your school uses other categories to describe race/ethnicity, please describe: N/A

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

h. Average class or audience size 30

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.
SEP 5 TO JUN 28. DEC 24-JAN 2 CHRISTMAS BREAK, FEB 17-21 MIDWINTER BREAK, APRIL 21-29 SPRING BREAK, JUNE 28-SEPT 3 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): , BA SCIENCE EDUCATION

Bachelor's Degree (Minor): .

Masters Degree (Discipline): MED INTERDISCIPLINARY STUDIES

PhD Degree (Discipline):

Other Degree:

b. How many years of education experience do you have?: 20

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::
BILINGUAL EDUCATION CERTIFICATE. GENERAL EDUCATION 6-9TH GRADE TEACHING LICENSE 2005 CITIZEN CONSERVATION AWARD, COLUMBIA UNIVERSITY CENTER FOR ENVIRONMENTAL RESEARCH (CERC) 2005 SHERMAN CREEK SPECIAL ED CORPS OF YOUNG ENVIRONMENTALISTS GRANT AWARD, ENTERGY ENERGY/TOSHIBA FOUNDATION OF AMERICA/NYC ENVIRONMENTAL FUND 2007 ENVIRONMENTAL EDUCATOR EZERSKY AWARD, NYC COUNCIL OF THE ENVIRONMENT 2010 NOAATEACHER AT SEA FELLOW, ALASKA POLLOCK SURVEY BERING SEA, NATIONAL OCEANIC AND ATMOSPHERIC AGENCY (NOAA) 2012 POLATREC TEACHER 2013-2014, ICE CUBE NEUTRINO EXPEDITION ANTARCTICA, SOUTH POLE, UNIVERSITY OF WISCONSIN RIVER FALLS. 2012-2014 TEACHER, NASA SPACE CAMP IZMIR, TURKEY, GLOBAL FRIENDSHIP THROUGH SPACE EDUCTION LEADING STUDENTS INTERNATIONA COLLABORATION. 2016- BOP TEACHER FELLOW BILLION OYSTER P EDUCATION ROJECT CITIZEN SCIENCE SCHOOL INITIATIVE LEADING STUDENTS IN MONITORING GROWTH AND WATER QUALITY OF OUR SCHOOL MINI OYSTER REEF AT SHERMAN CREEK WATERFRONT PARKS ON THE HARLEM RIVER, NYC.

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 [webform_submission:values:subjects]

Other Subjects BILINGUAL ED, COMPUTER SCIENCE/COLLEGE CAREERS.

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 IS MY PASSION FOR THE ENVIRONMENT AND FOR OUR OCEANS. MY DREAM AS A CHILD WAS TO BECOME A MARINE BIOLOGIST AND EXPLORE OCEANIC LIFE. I WAS INSPIRED BY MY CHILDHOOD HERO JACQUES COUSTEAU, AND HIS UNDERWATER ADVENTURES. MY PASSION FOR EXPLORING THE ARTIC REGIONS AND ANTARCTICA HAS BEEN INSPIRED BY MY OTHER HEROES: LORD SHAKELTON, PEARY, AND HENDERSON. I HOPE TO GAIN FIRST HAND EXPERIENCE ABOUT HOW CLIMATE CHANGE IS AFFECTING THE SOUTH POLE AND THE IMPACT ON SEA LEVEL RISING. LASTLY I WANT TO INSPIRE MORE LATINO STUDENTS, AFRICAN AMERICAN AND MORE GIRLS FROM INNER CITY AND URBAN AREAS TO BECOME SCIENTISTS AND OURSUE CAREERS IN CONSERVATION.

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)

ONE WAY I CAN SHARE MY EXPERIENCE IN MY CLASSROOM AND/OR WITH AUDIENCES I WORK WITH WILL BE USING SOCIAL MEDIA. PLATFORMS SUCH AS FACEBOOK, TWITTER, INSTAGRAM, AND WASAPP, ARE COMMONLY USED BY MY STUDENTS, THEIR FAMILIES AND FRIENDS AND SUPPORTERS, AS WELL AS THE COMMUNITY AT LARGE, WILL BE A GREAT MEDIUM TO SHARE MY POLARTREC EXPERIENCE BOTH LOCALLY, AND INTERNATIONALLY. LASTLY, ANOTHER WAY THAT I CAN SHARE MY EXPERIENCE AT POLARTREC WILL BE BY DEVELOPING A VIRTUAL/AUGMENTED REALITY MOBILE APP IN UNITY PLATFORM VIEWABLE ON THE OCULUS RIFT OR MICROSOFT MIX REALITY HEADSETS. THIS APP WILL ALLOW STUDENTS, PARENTS AND TEACHERS TO EXPERIENCE ANTARCTICA IN AN INMERSIVE WAY.

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 PLANNING TO SHARE MY POLARTREC EXPERIENCE WITH OTHER EDUCATORS, MY PERSONAL AND PROFESSIONAL COMMUNITIES USING ONLINE PLATFORMS SUCH AS LINKEDIN, SLACK MESSAGING APP, PADLET, NYCDOE EMAIL, WORD PRESS, SKYP, FACE TIME AND WASAPP VIDEO. ADDITIONALLY, REACH OUT TO MY LOCAL NEWS MEDIA THW

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

ONE PLATFORM THAT I USE TO ENGAGE MY AUDIENCE AND FACILITATE LEARNING WHEN EDUCATING NEW AND COMPLEX TOPICS, CONCEPTS OR ISSUES IS GOOGLE CLASSROOM. AS A BLENDED LEARNING TEACHER, I USE ONLINE LEARNING AS PART OF MY COMPUTER SCIENCE COURSES I TEACH TO MY MIDDLE AND HIGH SCHOOL STUDENT. I POST ALL MY ASSIGNMENTS, ANNOUNCEMENTS AND PROJECTS ONLINE, AND MY STUDENTS POST THEIR COMMENTS, QUESTIONS AS WELL AS THE URLS OF THEIR PROGRAMMING PROJECTS. IT IS A GREAT DIGITAL TOOL!

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

I AM A CONSENSUS BUILDER, AND A TEAM PLAYER, AND I BRING TO POLARTREC MY HIGH ENERGY, POSITIVE ATTITUDE, ENTHUSIASM, STAMINA, AND LOVE FOR THE OUTDOORS. THIS IS EVIDENCED BY MY STUDENTS EXCITEMENT WHEN THEY DISCOVER MY PICTURES ONLINE FROM MY NOAA TEACHER AT SEA EDUCATIONAL BLOG, MY NASA SPACE CAMP TURKEY BLOG AS WELL AS MY BILLION OYSTERS PROJECT NEWSPAPER ARTICLES. I AM CONSTANTLY LOOKING FOR OPPORTUNITIES TO LEARN NEW SKILLS AND I AM ALWAYS OPEN TO NEW LEARNING EXPERIENCES. AS A MEMBER OF A FIELD RESEARCH TEAM I CAN BE TRUSTED WITH FULFILLING MY DUTIES AND RESPONSABILITIES AND BEYOND.

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)

THE CONTRIBUTIONS I CAN MAKE TO MY RESEARCH TEAM INVOLVE MY ABILITY TO WORK UNDER PRESSURE, IN EXTREME ENVIRONMENTS, AND BE ABLE TO CONTRIBUTE TO THE RESEARCH TEAM’S MISSION IS EVIDENCED BY MY SUCCESSFUL PARTICIPATION IN MY NOAA TEACHER AT SEA ALASKA POLLOCK EXPEDITION,

HAVING SPENT 22 DAYS ON THE RESEARCH SHIP OSCAR DYSON, WHERE I WAS AN ASSET TO THE CHIEF SCIENTISTS, AS WELL AS TO THE NOAA OFFICERS AND CREW. MY DUTIES INVOLVED: ASSISTING THE LEAD SCIENTIST AT THE SCIENCE LAB MONITORING THE SONAR AND SCREENS SHOWING THE FISH SCHOOLS LOCATION, ASSISTING THE RESEARCHERS IN CONDUCTING CTD ACTIVITIES, AS WELL AS XTD 9EXPENDABLE CTD) MONITORING CONDUCTIVITY, TEMPERATURE AND DEPTH ANALYSIS, WORKING ON THE WET LAB, MEASUREING AND DISECTING POLLOCK TO DETERMINE SIZE AND GENDER OF EVERY CATCH, AS WELL AS REMOVING THE ODOLITH BOTH TO DETERMINE AGE OF THE SPECIMENS.

6. Communicating the Experience and Science

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

MR./ FULCAR LOG JOURNAL ENTRY SUNDAY-10/6/19 1300 HOURS “HEY THERE. I AM SO EXCITED AND HAPPY TO REPORT THAT YESTERDAY, SATURDAY OCTOBER 5, 2019, I BEGAN TEACHING MY NEW SATURDAY ACADEMY “MOBILE APP DEVELOPMENT” COURSE FOR HIGH SCHOOL STUDENTS AT LEHMAN COLLEGE! I WILL BE WORKING WITH ABOUT 12 HIGH SCHOOL STUDENTS, BOYS AND GIRLS, MOSTLY FROM THE BRONX, TEACHING THEM BASIC CODING AND PROGRAMMING ANIMATIONS, VIDEO GAMING, 3D VIRTUAL REALITY AND MOBILE APP. I AM SURPRISED THAT 4 BOYS ARE ACTUALLY FROM MY OWN SCHOOL CAMPUS, AND ALREADY THEY HAVE EXPRESSED INTEREST IN EVEN JOINING MY AFTERSCHOOL ROBOTICS CLUB. THIS IS GREAT BECAUSE WE WILL BE PARTICIPATING IN A ROBOTCS COMPETITION NEXT YEAR, AND I WAS HOPING TO BUILD A STRONG TEAM THIS YEAR. I WILL KEEP YOU POSTED ON HOW OUR VERY FIRST ROBOTICS TEAM COMES ABOUT.”

7. Scientific Interests and Research Area Preference

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

Please explain your preference
I AM FACINATED BY ANTARCTICA EVER SINCE I TAUGHT A LESSON TO MY 8TH GRADERS ABOUT LORD SHAKELTON'S AMAZING EXPEDITION TO THE SOUTH POLE, AND THE ADVENTURE OF THE ENDURANCE SHIP. I WAS CAPTIVATED BY HOW LORD SHAKELTON KEPT HIS CREW ALIVE AND MANAGED TO RESCUE ALL OF THEM IN SUCH AS HARSH AND BEAUTIFUL ENVIRONMENT. EVER SINCE I HAVE BEEN FASCINATED BY THE WONDERS AND BEAUTY OF ANTARCTICA, ITS WILD LIFE AND EXTREME WEATHER. I WOULD LOVE TO RESEARCH MARINE MAMMALS SUCH AS HUMPBACK WHALES, SEA LIONS AND BIRDS SUCH AS THE MAJESTIC EMPEROR PENGUINS. I BELIEVE THE MODEL OF ANTARCTICA AS A PATRIMONY FOR HUMANITY, WHERE IT CAN ONLY BE USED FOR SCIENTIFIC EXPLORATIONS, NEVER TO BE EXPLOITED FOR ITS NATURAL RESOURCES, SHOULD BE THE SAME MODEL FOR LUNAR EXPLORATION.

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 READY, WILLING AND ABLE TO PARTICIPATE IN ANY FIELD EXPEDITION LASTING 3 WEEKS OR MORE.

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 ANY RESEARCH INVOLVING EXPLORING THE ANTARCTIC ICE SHEET, ITS MARINE LIFE, AS WELL AS RESEARCH INVOLVING EXPLORING SPACE IMPACT ON THE SOUTH POLE SUCH AS METEORITES, AND NEUTRINOS. HAVING SPENT 22 DAYS ON THE BERING SEA, BETWEEN ALASKA AND RUSSIA, ABOARD THE NOAA RESEARCH SHIP OSCAR DYSON IN 2010, AS PART OF THE POLLOCK SURVEY CRUISE, AS A NOAAA TEACHER AT SEA, HAS REALLY INSPIRED ME TO PURSUE MORE STUDIES ABOUT OUR ARCTIC ECOSYSTEMS, AND THEIR IMPACT ON THE REST OF THE WORLD. LASTLY, I WOULD LIKE TO SEE FIRST HAND THE EFFECTS OF CLIMATE CHANGE IN OUR POLAR CAPS, AND TO REPORT BACK TO MY STUDENTS, AND COMMUNITY THE DIRECT IMPACT THAT ICE MELTING AND SEA RISING CAN HAVE ON COASTAL CITIES LIKE NEW YORK. I LIVE IN UPPER MANHATTAN AND SOME PARTS OF MY NEIGHBORHOOD WERE FLOODED DURING SUPER STORM SANDY IN 2012, AS

WELL AS LOWER MANHATTAN. ICE CAP MELTING COULD PERMANENTLY FLOOD PARTS OF OPUR CITY. THAT IS WHY IS SO IMPORTANT TO BUILD LIVING SHORELINES (WETLANDS AND OYSTER) AS GREEN BARRIERS AGAINST FUTURE STORM SURGE. THERE IS A DIRECT CONNECTION BETWEEN WHAT IS GOING ON ON THE ARTIC REGIONS AND THE REST OF THE PLANET.

Atmospheric Systems

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

Ecology and Biotic Systems

Physics or Space Sciences

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)
N/A

8. Background Information and Skills

a. Briefly describe your outdoor skills or experiences.
I AM AN AVID HIKER, KAYAKER AND SAILOR. I HAVE CERTIFICATIOSN IN KEELBOAT SAILING AS WELL AS COASTAL CRUISING. ALSO I AM CERTIFIED AS OPEN WATER DIVER. I HAVE CPR AND 1ST AID/AED TRAINIG AND BASIC WILDERNESS SURVIVAL TRAINING.

b. Provide a basic statement of your general health and physical condition.
I AM A 53 YEARS YOUNG MAN, CURRENTLY IN GOOD HEALTH. I AM CURRENTLY WILLING AND ABLE TO MEET THE PHYSICAL REQUIREMENTS OF AN EXPEDITION TO ANTARCTICA.

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.
I AM VERY FAMILIAR WITH BOTH MAC OS AND PC OS. I OWN A MACBOOK PRO AND AN ACER VR READY PC WITH WINDOWS 12.

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.
EVERYDAY I USE MY MACBOOK AIR TO CHECK MY SCHOOL EMAIL, AND PLAN MY LESSONS. I USE GOOGLE CLASSROOM EVERYDAY TO POST MY ASSIGNMENTS AND PROJECTS FOR MY STUDENTS TO COMPLETE. I USE GOOGLE APPS FOR LEARNING SUCH AS GOOGLE DOCS, SLIDES, FORMS EVERYDAY FOR MY LESSON PRESENTATIONS, SHARING DOCUMENTS AND MORE. I AM ALSO FAMILIAR WITH MICROSOFT OFFICE SUITE, LIKE WORD, POWERPOINT, EXCEL, ETC… I AM FAMILIAR WITH MOVIE MAKER SOFTWARE AS WELL, AS ARDUINO SOFTWARE CODING LANGUAGE C+, JAVASCRIPT, PYTHON, C#, HTML/CSS, ETC...

e. List any additional skills or information that you wish to be considered.
I AM FLUENT IN BOTH ENGLISH AND SPANISH AND BASIC KNOWLEDGE OF ITALIAN. CAN ALSO HANDLE POWER TOOLS, BAD SAW, SANDERS, SAW 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. Yes

Program Information NOAA TEACHER AT SEA, 2010 ALASKA POLLOCK SURVEY.

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 SEE POLARTREC AS A NATURAL CONTINUATION OF MY NOAA TEACHER AT SEA 2010 ESPEDITION. MY NOAA TAS BILINGUAL INTERACTIVE BLOG WAS UNIQUE BECAUSE IT WAS WRITTEN IN ENGLISH/SPANISH, AND ALLOWED MY ENGLISH LANGUAGE LEARNERS (ELLS) TO PARTICIPATE AND INTERACT BY POSTING COMMENTS IN THEIR NATIVE LANGUAGE AS WELL AS IN ENGLISH. ADDITIONALLY, MY EXPERINECE AS A TEACHER RESEARCHER HAS ALLOWED ME TO EMBRACE CITIZEN SCIENCE AND LEAD MY OWN STUDENTS INTO CONDUCT SCIENTIFIC RESEARCH ON THE HARLEM RIVER, AS PART OF THE BILLION OYSTER PROJECT, WHERE WE ARE GROWING AN OYSTER REEF, MONITORING GROWTH OF OYSTERS, AND THE WATER QUALITY, SHARING THE DATA WITH SCIENTISTS. ONE COOL PROJECT SCIENTIFIC PROJECT I WANTED TO IMPLEMENT WITH MY STUDENT WAS BUILD A CTD (CONDUCTIVITY. TEMPERATURE, DEPTH) WATER SAMPLER USING ARDUINO PROGRAMMING BOARD. I AM CURRENTLY BUILDING ONE USING THE OPEN SOURCE CTD, AND I AM PLANNING TO USE IT FOR REMOTE SENSING DATA COLLECTION ON WATER QUALITY OF THE HARLEM/HUDSON RIVER ESTUARY. I AM MOST INTERESTED IN THE OPPORTUNTY TO USE IT IN MY EXPEDITION TO THE SOUTH POLE TO TEST IT ON ARCTICT WATERS. IT WOULD BE AWESOME TO SEE THE KIND OF DATA WE CAN COLLECT AND REPORT.

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
JANET WARBURTON.

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

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
UFT NEWSPAPER/NEWSLETTER

12. References

Reference 1

Name JOHNNY VELOZ

Title and affiliation MATH TEACHER ISLA MIDDLE SCHOOL

Email Address JVELOZINFANTE@SCHOOLS.NYC.GOV

Phone Number 347.592.0883

Reference 2

Name LUI YI

Title and affiliation SCIENCE TEACHER ISLA HIGH SCHOOL

Email Address LYI@SCHOOLS.NYC.GOV

Phone Number 845.216.7572

Reference 3

Name ANGELO GUZZO

Title and affiliation SCIENCE TEACHER ISLA MIDDLE SCHOOL

Email Address AGUZZO@SCHOOLS.NYC.GOV

Phone Number 914.602.4878

Tricia Goode

1. Contact Information

Name: Tricia Goode

Email: aicirtp@aol.com

Home Address:
16715 NE Leaper Rd
Vancouver, WA 98686 US

Home Phone: 360-567-7404

Cell Phone : 360-567-7404

Institution Name: McLoughlin Middle School

Institution Address:
5802 MacArthur Blvd
Vancouver, WA 98661 US

Institution Phone: 360-313-3600

Classroom/Office Extension: 360-313-3600

Institution Fax:

Institution Website: https://mac.vansd.org/

Other relevant websites:

Supervisor's Name: Travis Boeh

Supervisor's Email Address: Travis.boeh@vansd.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): McLoughlin Middle School is located in an urban area, in the city of Vancouver Wa. Vancouver is across the river from Portland Or., One hour drive to Mt Hood and one hour drive to the Pacific Ocean. Vancouver School District is the 7th largest district in the state of Washington, which has 22 elementary schools, 9 middle schools, 4 high schools as well as iTech Preparatory 6th-12th and Arts and Academic 6th-12th. In total 24,000 students attend Vancouver School District. The district is both socioeconomically and ethnically diverse. All students 3rd-12th grade are 1:1, 3rd- 8th grade students have iPads, high school students have Chrome books.

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) 1,011 students currently attend McLoughlin Middle School

f. School Ethnicity:
1 % - American Indian or Alaska Native
3 % - Asian
3 % - Black or African American
48 % - Hispanic or Latino
6 % - Native Hawaiian or Other Pacific Islander
32 % - 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: 73

h. Average class or audience size 30

i. Total number of students/audiences you teach in a year 140

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 school a couple days before Labor Day, Last day of school is around June 10th. Spring Break is almost always the first week in April. Thanksgiving break begins the Wed before Thanksgiving. Christmas Break is 2 weeks, and shifts depending when Christmas falls.

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

Bachelor's Degree (Minor): Equestrian Science

Masters Degree (Discipline): Technology and Curriculum

PhD Degree (Discipline):

Other Degree:

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

c. How many years have you been working at your current institution?: 10

d. List up to 10 relevant professional licenses, certifications, registrations, awards or honors that you have received in your profession::
Professional Certificate of Teaching in the State of Wa Awarded 21ST Century Technology grant through the Vancouver School District- 2 year grant to purchase new technology for my classroom.

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)

Last school year I signed up for a Professional Development course- The Impacts of Climate Change and Human Health. I was curious. I wanted to gain knowledge to help teach my students. From the moment that Heidi Roop started her slide show educating the group on ice cores, I was hooked. Heidi had so much passion for her work that I was inspired. I walked away wanting to know more. My passion is teaching my students science. My why is to create meaningful experiences for my students that will challenge them to explore and seek answers to their questions. I hope to gain experiences in the field that I can share and bring back into the classroom. How cool would it be to put together my own slide show and bring the experience to my students, to have my students want to know more, to ask "why" and possibly present to them the opportunity to pursue a career in 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)

This experience would be shared with my students in every aspect of my teaching. I would have first hand knowledge of assisting a scientist to collect and analyze data . All of my students have iPads, and could access and follow current PolarTREC expeditions. I would bring valuable knowledge to my Professional Learning Community of science teachers in my school and district. We have designated time every Monday of the school year to meet as a team to share expertise, and work collaboratively to improve teaching skills and the academic performance of students . Through this experience I would gain knowledge to help facilitate the discussion oh how to implement the NGSS. On a broader scope, I would share in a presentation at the annual Science Night that I put on at my school, open to all students, parents and siblings. I have many educator friends at other schools within the Vancouver School District, I would love to present my experience to other schools and/or classes.

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

I have been an active participant in the newly developed Washington State initiative ClimeTime. ClimeTime is a network for climate science learning that helps teachers

and their students understand climate science issues affecting Washington communities. I will be able to share my experience with hundreds of other educators throughout the state of Washington through ClimeTime networking. For the past 10 years I have taken students on field trips to the local stream for watershed monitoring. My students collect data throughout the school year and present at Watershed Congress held at Washington State University Vancouver. Watershed Congress would be an exciting event to share my new experiences with hundreds of students across grade levels, educators, members of the science community and multiple districts in Clark County.

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 majority of my students are English Language Learners, with very limited English proficiency. When I teach new concepts I utilize the ABC model, which is activity before concept. This model involves hands on activities, projects and experiments allowing students to grapple with the phenomena and begin making meaningful connections with the concept. An important next step once students have some connections is to check for and address misconceptions. I rely heavily on visuals, illustrations and video demonstrations. Students then process information through forming a claim, collecting evidence and providing reasoning.

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

I consider myself a leader in my science educator community, consistently seeking out new and innovative experiences. My role as a leader requires me to effectively communicate with peers, students and parents. I am passionate about sustaining and protecting the environment, as well as instilling that desire in my students. Along with my passion for the environment I have strengths in field research which I utilize with my students monthly water monitoring. Through my work with a diverse middle school population I have strengthened my skills of flexibility, organization and determination.

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)

The staff at my school has been aware for several years that we pride ourselves on making positive connections and relationships with our students. However with the push for more rigor and higher test scores very little time was allotted for social

emotional learning. I am a member of our Site Based Leadership Team(SBLT). At the end of the school year we proposed to our staff the concept of Homeroom. The staff voted, and Homeroom was adopted. I volunteered to be on the development team. Over the summer we met as a team and created Homeroom. Homeroom meets first thing Monday mornings, and end of the day on Fridays.On Mondays students do a social emotional check-in, organize their backpack, and set a goal. I was specifically on the team of 4 teachers developing Friday plans. Fridays are all about making connections. Each group rotates weekly through a STEM activity, an in class competition and a gym competition. I created the STEM activity and Connect 4 class competition. I created the master schedule and pass out supplies to teachers on a weekly basis. The Friday team continually meets to discuss improvements. Based on staff surveys, the program is very successful.

6. Communicating the Experience and Science

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

Today was an important day. My son's soccer team Pacific Pride won their first game of the season. They won big 6-2. This was a huge accomplishment for them. The Pride had lost the last 11 games in a row. Some they just barely lost. Some they lost by a lot. After every loss, the boys walked across that field laughing and supporting each other. These boys are friends, great friends. Some have played together for 5 years, some just joined the team. The coach would send an email after every game stating what they boys did well and what his plan was to work on the upcoming week at practice. The practices got more intense. Guest coaches came to work on foot skills. This morning, as the boys warmed up to Journey blasting through the speakers at 8:30 am, I realized how grateful that Caden's coach never put blame or shame for losing. Youth sports consumes some parents and coaches, and the love of the game is lost. Today as I watched those boys walk across the field after a win, they were still laughing, still supporting each other and sharing the affect of hard work and still loving the game.

7. Scientific Interests and Research Area Preference

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

Please explain your preference
I am open to either.

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 3-4 weeks. I have two children 8 and 11 years old, and feel that is the longest I can be away.

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 really became interested in the topic of ice cores. I have attended 4 sessions of ClimeTime Climate Change professional development. Heidi Roop has presented at each session. Each time, I gain a little more knowledge about ice cores and the information we can gain form studying them. I am fascinated on how scientist can know so much from a tiny bubble of air! I want to learn more. I want to be able to share with my family, friends, coworkers how amazing ice can be. I also find myself an advocate for Climate Change, explaining the importance to know whats happening around the world, and how it impacts you.

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 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 enjoy being outside and in nature. I love to hike, mostly 10 miles or less. I enjoy camping, but have never camped outside of a campsite. I grew up around water, I can drive a boat, canoe and kayak.

b. Provide a basic statement of your general health and physical condition.
I consider myself a physically fit, active person. I ride horses and clean stalls 6 days a week. A few months ago I ran Hood to Coast, 12 person relay that runs from Mt. Hood to Seaside- 199 miles. In July I did have my gall bladder out. I do not smoke or drink.

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. I use a PC for work, and have a Mac at home. I consider myself proficient.

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.
professionally- I use a computer and iPad daily. In my classroom I use a document camera and projector. I teach my students how to use iphoto, imovie and PowerPoint. Within my PLC we utilize Google Docs.

e. List any additional skills or information that you wish to be considered.
I consider myself to be a hardworking dedicated person. I am passionate about creating science experiences for my students.

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
Heidi Roop

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 Heidi Roop

Title and affiliation UofW Climate Impacts Group Lead Scientist for Science Communication

Email Address hroop@uw.edu

Phone Number 206-616-1352

Reference 2

Name Stacy Meyer

Title and affiliation ESD112 Science Coordinator

Email Address Stacy.meyer@esd112.org

Phone Number 360-750-7500

Reference 3

Name Travis Boeh

Title and affiliation Principal of McLoughlin Middle School

Email Address travis.boeh@vansd.org

Phone Number 360-313-3600

Miranda Graceffa

1. Contact Information

Name: Miranda Graceffa

Email: mgraceffa@crosslakekids.org

Home Address:
9183 1st Ave
Breezy Point, MN 56472 US

Home Phone: 2183306154

Cell Phone : 2183306154

Institution Name: Crosslake Community School

Institution Address:
35808 Cty Rd 66
Crosslake , MN 56442 US

Institution Phone: 218.692.5437

Classroom/Office Extension:

Institution Fax:

Institution Website: www.crosslakekids.org

Other relevant websites:

Supervisor's Name: Todd Lyscio

Supervisor's Email Address: tlyscio@crosslakekids.org

2. Demographic Information

a. Gender: Female

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): K-12 public schools in a rural area, qualify for Free and Reduced Lunch and Title One, One-to-One access to tech, ability to reach whole state through our online program

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) 250

f. School Ethnicity:
% - American Indian or Alaska Native
% - Asian
1.9% % - Black or African American
.6% % - Hispanic or Latino
% - Native Hawaiian or Other Pacific Islander
95.5% % - White
1.9% % - Multiracial
If your school uses other categories to describe race/ethnicity, please describe:

g. Percentage of students who receive free or reduced lunch: 36.1%

h. Average class or audience size 19 students per class

i. Total number of students/audiences you teach in a year 72, plus ability to reach more

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.

Sept. 3rd-May 22nd Christmas break @ December 23rd-January 2nd Spring Break March 9-13

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 Education/Interpretation

Bachelor's Degree (Minor): Camp and Youth Administration Minor

Masters Degree (Discipline): Curriculum and Instruction

PhD Degree (Discipline):

Other Degree:

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

c. How many years have you been working at your current institution?: 10 years

d. List up to 10 relevant professional licenses, certifications, registrations, awards or honors that you have received in your profession::
K-8 science teaching lisence Highly Reliable Teacher Certification Levels 1 and 2 EnVoy Certification Level 1 Project WET, WILD, PLT certifications NSTA member MnSTA member

4. Professional Assignment

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

Other Primary Assignment Environmental Education Coordinator

b. What subjects do you teach? Check all Middle School Science

Other Subjects Environmental Education

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 particular interest in the polar regions, I believe, is fueled by stories and pictures from my childhood. I met my stepdad in the late 80s, who had just returned from Antarctica on a 3-year stint installing telephone communications. Moreover, I believe my motivation comes from wanting to be as relevant as a teacher as I can. I want to bring as much of the real-world into the classroom as possible (I do aspire to be Ms. Frizzle). To work with scientists means I will bring into the classroom modern scientific thinking and a deeper understanding of the biomes that I teach. I also wish to have a deeper understanding of polar regions and climate change. We live in the middle of 3 Minnesota biomes, which are the fastest changing in the lower 48. Within the 15 years that I have lived here, there have been many changes in the flora, fauna, and weather patterns. I would like to be able to have hands on knowledge to help students understand what is happening.

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)

My main aim for the students I will be sharing this experience with is to hopefully have them fall in love and have a passion for the Arctic or the Antarctic, so that they want to protect it. My second aim would be to teach the students any science I have learned from the area and any scientific techniques. I will bring cross-cutting concepts into their learning to teach them about how these areas impact the world ecologically, economically, and socially. To do this, I will use any new real world resources that I learn about through this experience with my students and beyond. I will use the real data that was collected to create lessons and units. Students will be engaged in any sampling techniques I could teach them and we will use Google Earth to find the area that I went to so students can experience as much as they can.

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

The charter school that I work at is authorized by the Audubon Center of the Northwoods (ACNW). A pillar to our mission is to educate environmentally aware, community conscience, citizens of action. It is our job to promote environmental education. I plan on working with the ACNW to educate other teachers all over

Minnesota who are authorized by the Audubon Center through our Environmental Education conference. I am also a member of Minnesota Science Teacher Association, where I will apply for a slot to educate teachers on ways to implement knowledge that was gained and lessons that were created through this process. There is also a strong community education program, where I would have a seminar to reach out to the general public.

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 had the opportunity through the Center for Great Lakes Literacy (CGLL) to learn about Lake Huron's water quality with scientists and other teachers on the EPA's S/V Lake Guardian for a week. Since then, I have utilized what I learned by creating a field trip based water quality unit for grades 5-8. Students in grades 5-6 learn about aquatic macroinvertebrates by collecting them on 3 different lakes to compare and contrast water quality. They compare macroinvertebrates in lakes invested with zebra mussels and lakes without. Seventh and 8th grade students compare and contrast water quality such as nitrites/nitrates, dissolved oxygen, and phosphorous in different local lakes. We compare Great Lakes water quality using water quality data online. We also compare and contrast Great Lakes weather and inland weather using actual data from buoys online. This helps us understand how weather affects land use. In all grades, we learn how our actions affect lakes around us, the Great Lakes, Mississippi River, and the Gulf of Mexico and how we could help.

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

Although I am not a scientist, I do have some field experience in field science. I have had seasonal jobs in various states, including Alaska, in which I have collected water quality data on various lakes, cruised timber, searched for birds, and checked on archaeological sites. Through all of these seasonal jobs I worked for other scientists and carried out orders. Through my college course work in Environmental Education, I have learned a variety of sampling techniques including soil, water, and land survey. Lastly, I am also not a stranger to hard work in not ideal conditions. I have worked and camped in the cold, among (tons of) bugs, in various precipitation, and in rugged terrain.

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)

The most relevant way I have worked with a team outdoors is when I was a sea kayak ranger for the US Forest Service. For this job, a partner and I kayaked Misty Fjords National Monument to help educate visitors and survey the area for archaeological sites and wildlife. We had to take care of eachother while we kayaked and camped together for weeks at a time. Now, I am a lead teacher at our school. I help support other teachers logistically and emotionally, lead Profesional Learning Community, and spearhead initiative at our school including student data analysis. As a lead teacher, I make sure that all members of the team are heard and we all come to a consensus together. We also foster hard work, dedication to each one of our students, and celebration.

6. Communicating the Experience and Science

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

Last week, your teachers were lucky enough to kayak Lake Ossi! We loaded our 15 foot kayaks at 3pm to paddle the 3-mile lake. We were fortunate this time, because we had just enough wind to create a little chop on the water to create a little challenge. As we paddled, we were greeted by 2 common loons. They were close enough to see the red of their eyes! The funniest part was seeing a bald eagle. He/she decided to sit on top of an old fashioned antenna attached to a cabin, even though the lake is lined with many large white pines. I wonder when the eagle first caught sight of our yellow and red kayaks..? At the end of the paddle we decided to go down a small creek. The creek felt like a cavern, because it is surrounded by towering cedar trees, which lean toward the water. We were able to see a few largemouth bass darting among the aquatic plants. All in all, it took us 2.5 hours to paddle 6 miles with slight wind. I look forward to seeing how the lake changes throughout the fall and my new bird friends!

7. Scientific Interests and Research Area Preference

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

Please explain your preference
I would like to learn more about either of these fragile and important ecosystems.

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

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 interests, but I have gravitated more towards water quality and water ecosystems. I am open to any and all new learning!

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 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 taught outdoor education in Northern Minnesota, have been a sea kayak ranger in Southeast Alaska, as well as built trails in the same area. I have travelled via motor boat through Southeast Alaska. I continue to be an avid kayaker, camper, and cross country skier. I also have fire arms training.

b. Provide a basic statement of your general health and physical condition.
I consider myself a healthy, active person.

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.
I am fluent with computers and basic computer applications. Our school is a one to one school with Google Chromebooks, which I use almost daily with my students.

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.
All Microsoft applications (PowerPoint, Excel, etc), ArcView GIS, I-Pad, Youtube, Canon digital cameras, and Screencastify. I also use many Google applications including Google Classroom, Google Site, and Google Drive. I have worked often with hand held Global Positioning Systems. I feel I am a quick learner of technology.

e. List any additional skills or information that you wish to be considered.
I am conversational in German (and understand much more) and consider myself a proficient sea kayaker. I am also not a stranger to basic building and outdoor 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.

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
I attended a seminar with a teacher who did Polartrec at an NSTA conference in 2017.

Other (please explain)

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

12. References

Reference 1

Name Angela Schultz

Title and affiliation math teacher and former coworker

Email Address angela.schultz@isd.181.org

Phone Number 218.839.1420

Reference 2

Name Lance Swanson

Title and affiliation Social studies teacher and coworker

Email Address lswanson@crosslakekids.org

Phone Number 218.821.1220

Reference 3

Name Ronda Veit

Title and affiliation Language Arts teacher and coworker

Email Address rveit@crosslakekids.org

Phone Number 612.987.7625

Lily Hajialiakbar

1. Contact Information

Name: Ms. Lily Hajialiakbar

Email: lhajiali@gmail.com

Home Address:
1040 S Spring Meadow Dr
West Covina, CA 91791 US

Home Phone: 6266656697

Cell Phone :

Institution Name: Covina High School

Institution Address:
463 S Hollenbeck Ave.
Covina, CA 91723 US

Institution Phone: 6269746020

Classroom/Office Extension: 801807

Institution Fax:

Institution Website: https://www.c-vusd.org/Domain/21

Other relevant websites:

Supervisor's Name: Kenneth Stratton

Supervisor's Email Address: kstratton@c-vusd.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): Covina High School—a high needs, low socioeconomic status school, situated in the heart of the San Gabriel Valley in Southern California,—has a diverse school population, which mirrors her surrounding city of Covina. The school and students have a tight-knit supportive community in terms of activity within the community, parent involvement, and district-level involvement. Covina Valley Unified School District recently went 1:1 (Chromebooks:students) in an attempt to allow easy access to technology and best prepare our students for the 21st century.

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) Covina High School has roughly 1300 students in grades 9th through 12th and has a student teacher ratio of 26 to 1.

f. School Ethnicity:
1 % - American Indian or Alaska Native
8 % - Asian
4 % - Black or African American
74 % - Hispanic or Latino
1 % - Native Hawaiian or Other Pacific Islander
11 % - 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: 53

h. Average class or audience size 35

i. Total number of students/audiences you teach in a year 180

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 - End Date: August 16, 2019 – June 7, 2019 Thanksgiving Break: the week of the third Thursday of the month Christmas Break: December 22, 2019 – January 6, 2020 Spring Break: March 30, 2020 – April 7, 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): History

Bachelor's Degree (Minor):

Masters Degree (Discipline): History

PhD Degree (Discipline):

Other Degree: Second Master's Degree Education

b. How many years of education experience do you have?: 5 years (k-12), 7 years Community College

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::
1. Single Subject Teaching Credential (Social Science)/Cleared Credential 2. Pomona USD (Garey High School) Teacher of the Year 2016 – 2017 3. AVID Certified 4. Advanced Placement Summer Institute AP US History Certified 5. Advanced Placement Test Grader

4. Professional Assignment

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

Other Primary Assignment

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

PolarTREC offers a once-in-a-lifetime opportunity for me to participate—as a K-12 educator—in an innovative teacher research experience model with polar researchers that has the potential to transform the nature of education. Through this program, I hope to acquire the content knowledge, pedagogical tools, confidence, and understanding of both science and the social sciences in their broader contexts, and take my experiences with scientific inquiry and use that authentic research in my transformational classroom. I strive to create a classroom environment where my role is facilitating my students' active engagement in developing knowledge and skills, critical thinking, higher-order skills, and communication, and not simply preparing and transmitting information to them. Through this program, I hope to improve my effectiveness in advancing my students’ human potential and manifest critically appraising and synthesizing new ideas.

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 and foremost, I believe it important to work with and engage my students in the planning process before leaving for fieldwork. With their levels of interest peaked, my students and their respective families will, hopefully, follow my journey, both in and outside of school. During my time abroad, however, I would love the opportunity—if available—to participate in a digital lecture/class period with my students while co-teaching with the long-term substitute teacher. To take the experience one step further for not only my students, but others on campus, I believe working with and preparing a unit with a science teacher at my school site regarding the fieldwork I would be doing, would offer our students a once in a lifetime opportunity. Digitally co-teaching, LIVE, across content areas, with one teacher in the field would provide students the opportunity to experience learning through different lenses, perspectives, and locations.

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

There are various ways I envision myself sharing my PolarTREC experience with others. First and foremost, the written word is always a wonderful tool for reaching

others. I believe writing an article for publication that caters to my profession or education as a whole would be most beneficial. Starting a blog is also a viable option, as there is nothing more empowering than putting one's own thoughts out there for the world to see, especially since the internet attracts a global audience. Secondly, I envision myself being a resource. When I come across an exceptionally helpful article, stumble upon a useful new piece of information or a strategy, or find a more effective way of doing something content- or classroom-specific, that I believe to be beneficial to my colleagues, I will share it, whether in professional development teams, full staff meetings, or as a singular e-mail.

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

Underlying my teaching philosophy—as a Social Science teacher—is the belief that studying history involves both the instructor and student in interactive conversations about historical events created by the actions, often inactions, of normal people in the course of their daily lives. My job as an instructor is to allow my students to gain and understand a historical context through which they can further comprehend the motivations behind the decisions of these historical characters, critically evaluate their motivations, and assess and analyze the events and significance of their actions. In sum, my hope is for my students to understand that their present is as a result of the historical events they have been reading about and they think of themselves as historical actors for the present of future individuals. My goal is to be a motivating, entertaining, and stimulating teacher. The theme of interdisciplinary academic pursuits is pervasive in my teaching. I encourage students to bring skills and knowledge from other classes and outside experiences into my history class. I utilize diverse assignment types and . strive to make these interesting and relevant to student needs. Such a variety allows the strengths of different students to emerge and, as a result, allows a more accurate assessment of their abilities.

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

I was able to participate in an archaeological dig to study ancient Roman pottery shards from an artificial mound created by centuries of discarded amphorae in Monte Testaccio, Rome, Italy. In an attempt to reconstruct whole amphorae from fragments, I participated in site recording, gridding, excavating, and surveying (both surface and geophysical). I came back to the United States from the dig with a new perspective, which I owe to my dig directors who set high standards, and also my colleagues who allowed me the opportunity to learn how to work in a research-based

group setting. Through their insight and leadership, I learned patience, imaginative approaches to understanding and appreciating historic sites, how to give direct and clear feedback, and how to support all members of a team. Through my experiences as a teacher, I believe: I have incredible rapport with students and staff; I put in great effort to know people's backgrounds, interests, strengths, and needs; I anticipate problems and plan for successful management; I am a motivated and organized person; I value interdisciplinary connections among all subject areas and do my best to integrate them in all lessons; and I have an excellent sense of humor, smile often, and lead a balanced lifestyle.

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 certainly enjoy working with others; I am outgoing, enjoy team spirit, and am understanding of the needs of others. I believe I am good at helping the team to see the bigger picture – to see the wood from the trees – helping them to focus on what really matters rather than getting bogged down in irrelevant detail. Alternatively, I have a knack for helping the team to spot flaws in our approach—and potential problems and pitfalls. I believe I have strong communication skills and, having experience in various leadership roles, I do have a talent for liaising between different team members and resolving any disputes which may arise. Conflict between different team members is rarely very productive and is normally best avoided. During my time as Activities Director, Academy Director, and History Department Chair, I have facilitated effective teams, group projects, events, and built an academy school from the ground up, and have found features of an effective team include: combined group effort of all members, clear goals, group members focused on learning, mutual trust and support, open communication, and democratic processes.

6. Communicating the Experience and Science

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

19 August 2019 07:30 AM (15 minutes before students arrive): I’m not particularly sure why, but the only thing going on in my head right now is me chanting to myself: AHOO AHOO AHOO (for reference: https://www.youtube.com/watch?v=gI6sARmxEuc) ! Ladies and gentlemen… it is the FIRST DAY OF SCHOOL. Just that phrase alone brings up reactions spanning the emotional gamut from happiness and excitement, to fear and dread, and just about every other emotional state in between. What am I worried about? I’ve done this so many times before—PLUS, I have planned an entire school years’ worth of lessons, copied piles of papers, and already listened to my “kick-butt on the first day of school” song (for reference: https://www.youtube.com/watch?v=pAgnJDJN4VA) (which is what I do every year on the first day of school). Despite me essentially being a seasoned vet now ;), I think the nerves are as a result from my understanding that a good first start can set the tone and mood for the rest of the school year. I want to make sure that I can make this day as great as possible for the high school juniors that are going to be walking through my door in five minutes’ time. Wish me luck!

7. Scientific Interests and Research Area Preference

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

Please explain your preference
Having the privilege to potentially travel to either of the poles is an amazing experience and opportunity in and of itself. I would prefer, however, to go on an expedition to Antarctica: a place on this earth that has, for centuries, been reachable only by ship; the only continent on the planet that lacks a permanent population, with a land mass twice the size of Australia; and a continent at once desolate and beautiful. The Arctic's rich and interesting culture of Inuit people and Viking ruins, that have lived in such harsh conditions for centuries, would also be a site see and honor to experience. However, visiting Antarctica's research stations is also fascinating. Despite nobody living full time on Antarctica, the culture has evolved into a way of life unlike any other on 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 would like to participate in an expedition that lasts any length of time. I am available to go on expeditions during any time of the year, but would prefer if the expedition date overlapped/coincides with breaks during the school year.

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 pertain to topics that have played vital roles in our nation's history—atmospheric systems (like climate change), human adaption and culture (learning how different groups of people/animals adapted to their environments and determine reasons for locating to a particular region), and terrestrial systems (geography and its . impact on Colonial America, slavery, immigration, westward migration, etc.).

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 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 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

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 applying to work exclusively with a specific researcher.

8. Background Information and Skills

a. Briefly describe your outdoor skills or experiences.
My aim has always been to try and be outside as much as possible; I have a strong sense of adventure, and believe the outdoors to be the gateway. For the past 26 years, my family and I have gone camping (pitching tents and no bathrooms/showers-type camping) every summer. During these two-week camping trips, we would immerse ourselves into nature and continue our passion of hiking. As a result of my passion for being outdoors, I became trained in basic and advanced suturing techniques, including stapling and tissue . adhesives through Advanced Placement Prep. I have also been trained in skills and procedures, that cover basic suturing skills, basic biopsies, cryotherapy, joint injections, trigger point injections, basic casting and splinting, removing foreign bodies from eyes and treating Corneal Abrasions, removing foreign bodies and cerumen from ears, and the nose and treating basic nosebleeds.

b. Provide a basic statement of your general health and physical condition.
I am in good health and physical condition. I eat a well-balanced diet, stay . hydrated, workout 4 – 5 times a week, and have no current or pre-existing medical conditions.

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.
I am very comfortable with Microsoft Office suite including Word, Excel, and Power Point and have a lot of experience using such programs, both in and . outside of the classroom. I'm very comfortable using computers and am confident in my ability to learn any new programs quickly. I am familiar with using both Microsoft and Apple operating software, and have used many different—computer and web-based—programs from both operating software programs. I am very experienced in a variety of word processing programs and I'm an excellent typist. I am an expert at Microsoft Excel and Mac Numbers; I can create fully-functional spreadsheets and am familiar with organizing and analyzing large sets of data. In addition to basic computer skills and word processing, I am also familiar with photo and video editing software. I have used both Adobe After Effects and iMovie to edit short videos for instructional purposes and also high school rallies, and have received much praise from my students, colleagues, and administrators for my skill in these programs.

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

In my classroom, both my students and I utilize laptop computers, movie software, PowerPoint, Excel, internet browsers (Firefox, Safari, Explorer), projectors, ELMOs, and Smart Boards. Used to support both teaching and learning, technology infuses my classroom with digital learning tools, such as computers and hand held devices; expands course offerings, experiences, and learning materials; supports learning 24 hours a day, 7 days a week; builds 21st century skills; increases student engagement and motivation; and . accelerates learning. Technology also has the power to transform my teaching by ushering in a new model of connected teaching. This model links me to my students and to professional content, resources, and systems to help me improve my own instruction and personalize learning.

e. List any additional skills or information that you wish to be considered.
I know a total of 7 languages. I speak, read, and write four fluently: English, Farsi, Italian, and Latin. I am basic-proficient in three others: German, Ancient Greek, and 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. 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

12. References

Reference 1

Name Kenneth Stratton

Title and affiliation Principal, Covina High School

Email Address kstratton@c-vusd.org

Phone Number 714-392-0764

Reference 2

Name Bryan Stoops

Title and affiliation Dr., Garey High School

Email Address bryanstoops@yahoo.com

Phone Number 909-606-4315

Reference 3

Name Heather Clark

Title and affiliation Teacher, Covina High School

Email Address hclark@c-vusd.org

Phone Number 619-481-4550

Dacia Harris

1. Contact Information

Name: Dacia Harris

Email: dacia.harris@gmail.com

Home Address:
4006 Marble Way
Asheville, NC 28806 US

Home Phone: 828-230-9107

Cell Phone : 1-828-230-9107

Institution Name: Asheville High School

Institution Address:
419 McDowell St.
Asheville, NC 28803 US

Institution Phone: 828-350-2500

Classroom/Office Extension: 828-350-2620

Institution Fax: 828-255-5316

Institution Website: https://nc02214494.schoolwires.net/AshevilleHigh

Other relevant websites: N/A

Supervisor's Name: Dr. Jesse Dingle

Supervisor's Email Address: jesse.dingle@acsgmail.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): My general audience is a Pre-K-12 city school district inside of a larger county system. My direct audience includes 9th grade Earth & Environmental Science and 10th-12th grade Zoology courses with a department level Professional Learning Community (PLC). Our urban system supports 5 of the 6 subsidised neighborhoods in the county and is divided along racial (black/white) and socioeconomic levels (little to no middle class). We are a 1:1 (1 computer to 1 student) as a part of a grant program to help close the achievement gap.

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

Other Type of School N/A

e. What is the population of your annual audience or school (estimates are fine) 1400

f. School Ethnicity:
0 % - American Indian or Alaska Native
1 % - Asian
15 % - Black or African American
9 % - Hispanic or Latino
0 % - Native Hawaiian or Other Pacific Islander
68 % - White
7 % - Multiracial
If your school uses other categories to describe race/ethnicity, please describe: N/A

g. Percentage of students who receive free or reduced lunch: 18

h. Average class or audience size 26

i. Total number of students/audiences you teach in a year 157

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.

Last student day: May 29, 2020 Holiday Break: December 23-Jan 4 (this is tentative based on the new 2020-2021 school 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): Environmental Science Ecology & Environmental Biology

Bachelor's Degree (Minor): N/A

Masters Degree (Discipline): Masters in Arts and Teaching Biology Education

PhD Degree (Discipline): N/A

Other Degree: N/A

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::
National Board for Professional Teaching Environmental Education Certification Innovative Educator Award Teacher of the Year

4. Professional Assignment

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

Other Primary Assignment N/A

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

Other Subjects Secondary Zoology Secondary 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)

My main motivation for joining a PolarTREC experience is to bring authentic scientific studies to my students. Many of my students have never been outside of Western North Carolina and lack any opportunity(-ies) to participate in rigorous scientific studies, especially as science is not introduced until middle school for most. Participating in PolarTREC will enable me to create eye-opening lessons by bringing personal experiences of polar ecosystems, climate change, and human impact to my students from remote locations that they may never experience otherwise. Professionally, participating in a PolarTREC research opportunity allows me a chance to interact with ecosystems that I have studied in depth but never thought I would be able to personally experience. As a classroom teacher, I try to engage my students in content-related discussions to get them thinking on a global scale and with both poles undergoing such drastic changes due to human impact and climate change. This is the opportunity of a lifetime to participate in relevant research that is so pertinent to the curriculum that I teach which will allow me to bring real-world, hands-on experiences into my classroom for my students.

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)

Information and connections from the research experience will be brought back to our entire environmental team which includes teachers from two different high schools impacting all students, grades nine-twelve each year. In addition, our district has PLCs where like subject matter teachers work together to vertically align content to increase the students' foundational knowledge. The goal of the PLC will be to build direct instruction lessons as well as inquiry-based projects integrating my PolarTREC research experience. Our PLC's overarching goal is focused on gaining personal insight to create meaningful curricular and cross-curricular experiences focusing on worldwide human-environmental interactions. This means that the information and experiences that I bring back will be shared throughout the district at all grade levels. In addition, anthropogenic impacts on the polar regions fits into the Biology, Earth and Environmental Science and Advanced Placement Environmental Science curricula, and cross-curricular data analysis, ecological anthropology, research and writing connections can increase the understanding and relevance for students

across the curriculum. Being able to experience such a sensitive ecosystem will add more depth, personalization, and relevance to my teaching and my ability to share content with others.

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 the experiences gained in this experience with the community and the general public through an inquiry project that the students create in class (based on asking, investigating, reflecting, and creating). Our community is fantastic at showcasing experiential education and student work; therefore, this inquiry project will integrate my specific experience with student interest and research to create a documentary exploring and focusing on the natural cyclical patterns and the anthropogenic impacts on the poles. The purpose of this inquiry project is to allow students to expose these issues to a wider audience comprised of their peers, school, families, and community through film that personal environmental choices have resulting global impacts. There are two local theatres which have already agreed to showcase student work to the school community and the general public. As mentioned in the earlier section, our school district PLCs will allow me to disseminate the experience to other teachers within our district. In addition, I have the opportunity to share my research with other North Carolina Environmental Educators through a statewide PLC of certified Environmental Educators.

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 a new complex idea, I help students visualize the topic using key vocabulary and examples based in real life creating a personal connection to make the concept/idea relevant. For example, when teaching greenhouse gases, I introduce the topic; I then ask them to imagine a closed car in a large, open, outdoor parking lot during the summer. I ask what the inside of the car will feel like compared to the ambient air temperature outside. We work through how the car is warmer than the outside air temperature; we review angles of insolation and Earth's energy budget drawing connections between new ideas and previous content. At this point, we draw connections from our closed car to how the greenhouse gases in Earth's atmosphere act in the same fashion as the closed car windows. By using examples common to the students' lives and experiences, students can visualize a more complex concept at a level they understand. In addition, breaking down key terms and learning prefixes, suffixes, and root words help students draw connections

between similar scientific terminology. This leads to an overall increase in knowledge for the students as well as creating a more long-term holistic learning experience.

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

Strengths that I will bring to the program and the research team include an extreme love of learning paired with a solid foundation of ecological systems and technology resources. I will also bring a strong motivated spirit and a willingness to try new things. This is directly related to my inquisitive nature. I also pay close attention to details and am organized which helps significantly to put systems in place making processes run smoothly and consistently. I not only enjoy collecting information in the field, I also very much look forward to the analysis of that information. But more than my own learning, I am passionate about passing on my knowledge of the natural world to my students and the community. I have a keen ability to observe my surroundings and develop questions based on my observations. This is a skill that I have developed through multiple field research experiences over the past 20+ years with students, with research teams, and as an independent researcher. Each of the above all help me to anticipate possible outcomes for different scenarios which can streamline data collection, analysis, and can also help mitigate any possible issues that might arise.

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 a part of teams both academic and field research based. Over the past 12 years as a teacher, I have had a number of opportunities to serve in various capacities ranging from grade-level PLCs to school-wide committee chairs. As a member of our Earth and Environmental PLC, I am part of a collaborative pair to plan our courses with contextual strengths allowing our students to get the most out of our knowledge as our different educational backgrounds balance out individual contextual weaknesses. As a committee chair, I identify needs that students have as well and collecting, analyzing, and reporting school-wide data. Outside of the school, I have joined multiple field research groups as either a team leader helping those in my group with species identification, data collection and entry, or as a team player where I have done my part in data collection, entry, and reporting. For example, I spent three weeks volunteering in the Greater Kruger area of South Africa working in the field completing species census collection, data entry, and redesigned the collection forms to streamline the information collected for data entry.

6. Communicating the Experience and Science

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

Wow, today was a doozie of a day. Continuing PRIDE week, my students had an AMAZING discussion on the importance of kindness. Usually, 9th graders need prodding to discuss the impacts of their behaviors but today they wowed me by showing maturity, vulnerability, and overall kindness for the experiences that they and their classmates have dealt with. Right after school one of my students stopped by to find out where she made mistakes on a test and was receptive to the feedback with the goal that she would do better on her upcoming test. This folks, is what we look forward to when teaching! And lastly, a group of students from all of the area high schools (county and city both) stood up in front of the County School Board with almost 200 signed petitions requesting for them to allow the City/County Commissioners to utilize the blank rooftops on the area schools to integrate solar panels to meet the 100% renewable energies by 2030 plan. The students were articulate and honest about how this action helps decrease the unknowns of their future. It was such a PROUD moment seeing students step forward and take action for their futures.

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 location, Arctic or Antarctic, as both locations have unique ecosystems, both are experiencing drastic environmental changes, and having any opportunity to study in an authentic situation that would be life-changing.

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 for the minimum of three weeks and if schedules permit I'd love to be able to stay on for 4-6 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 interests include human impact, climate change, trophic cascades, greenhouse gases, albedo effect, and ecosystem connections. Teaching Earth & Environmental Science (EES) the connections between human impact and feedback loops are reiterated over and over again in our curriculum. I am very interested in learning more about how the decreased albedo effect will have on polar ecosystems. With a background in macroinvertebrates, I am also very interested to know what the increase in ocean temperatures will have on the feeding behaviors within the oceans, especially the cold water systems which provide the most nutrients for large mammals. In addition, I am very interested in learning if recent changes in human actions have had any effect on the polar systems as our EES PLC has adopted Drawdown edited by Paul Hawken as a resource for our students to help them see that taking specific actions can have positive results towards drawing down our carbon output.

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
Impacts of humans on fragile environments and climate change.

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 been hiking, biking, and remote camping for my entire life and am very comfortable in remote areas for long stretches of time. I have been the faculty hiking club sponsor for our school in the Appalachian Mountains for the past 7 years. This involves taking groups of 3-20 students out onto remote trails in Pisgah National Forest for half and full-day hikes using maps and trail guides to orient our trips. I have been CPR/1st Aid trained for the past 20 years and was previously licensed as an EMT B. I completed gun safety school as a young child and have been taught to shoot handguns, rifles (with and without scopes), and shotguns. I am also comfortable kayaking our local rivers and lakes (through class B rapids).

b. Provide a basic statement of your general health and physical condition.
I am in good general health and actively participate in daily/weekly physical conditioning in the form of hiking, mountain biking, weight lifting, and swimming. During my annual physical my tests all came back normal with no concerns of any health impairments.

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.
My computer is used on a daily basis to present information using both Microsoft and Google platforms, Mac and PC. Therefore, I am very comfortable using computers, smartphones, tablets, handheld navigation equipment, and basic science tools such as infrared guns and probeware. We have been a 1:1 school for 8 years, and I have served on committees for technology in the school. In that time I have attended and presented multiple trainings at the school and district level, attended 4 years of NCTIES (North Carolina Technology in Education Society), and 1 year of ISTE (International Society for Technology in Education). I am very familiar with ways to integrate technology into my daily lessons and how to troubleshoot when problems arise on both PCs and Macs as well as hand-held devices.

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.
I can format documents, powerpoints, and spreadsheets to present information to students, clip videos to show only parts of larger videos or splice several videos together. I use Excel for data analysis on a quarterly basis to analyze school-wide data. I am also proficient at word processing and digital research. On a personal level, I often take photos, digitally enhance them through photo editing software

(which varies depending on which computer or hand-held device I am using). I am also comfortable utilizing digital platforms (Facebook, Weebly, Instagram, etc…) to present information to the public.

e. List any additional skills or information that you wish to be considered.
I am proficient in using most hand and power 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 NOAA Teachers at Sea Deepwater Canyons, August 2013

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?
If given the opportunity to participate in a PolarTREC professional development I would be able to bring first-person experiences back to my classroom and to our PLCs aligning the content of the experience to our science curriculum at almost every level. This opportunity builds on the previous NOAA Teachers at Sea Deepwater Canyons experience by continuing a focus on the impact of human behaviors on wild environments. The research team from NOAA focused on the impacts of erosion, runoff, and terrestrial pollutants on deepwater environments off of the Eastern US continental shelf. If I am chosen to join a PolarTREC research expedition, I will be able to continue to observe and bring specific examples of the impact that we, as humans, have on more remote environments, specifically the poles, and what those long term effects could have on such fragile locations. These topics are directly related to my state and national standards and are key to helping my students understand that their habits on a local level have far-reaching impacts on a global level.

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
N/A

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

From a website. Please list the website name and URL
N/A

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

Other (please explain)
N/A

b. Please suggest other places we might advertise this opportunity for teachers
NSTA, NPS, NFS, Project Learning Tree and any state-based Environmental Education programs.

12. References

Reference 1

Name Dr. Jesse Dingle

Title and affiliation Principal (immediate supervisor)

Email Address jesse.dingle@acsgmail.net

Phone Number 828-350-2500

Reference 2

Name Carrie Buchanan

Title and affiliation Assistant Principal (past administrator)

Email Address csbuchanan99@gmail.com

Phone Number 828-337-9949

Reference 3

Name Sarah Duffer

Title and affiliation Teacher (PLC co-teacher)

Email Address sbdebruhl@gmail.com

Phone Number 828-253-6101

Theodore Robert Harris

1. Contact Information

Name: Dr. Theodore Robert Harris

Email: trharris@gatech.edu

Home Address:
1101 Defoors Mill Pl NW
Atlanta, GA 30332 US

Home Phone:

Cell Phone : 919-418-5364

Institution Name: Georgia Tech Research Institute

Institution Address:
400 10th Street N.W.
Atlanta, GA 30332 US

Institution Phone: 4044078290

Classroom/Office Extension:

Institution Fax:

Institution Website: https://gtri.gatech.edu/

Other relevant websites: https://computermuseumofamerica.org/

Supervisor's Name: Ben Yang

Supervisor's Email Address: Benjamin.Yang@gtri.gatech.edu

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): K-12, urban, targeting under-represented and disadvantaged students in the greater Atlanta metro region

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

Other Type of School Nonprofit Museum

e. What is the population of your annual audience or school (estimates are fine) 1000

f. School Ethnicity:
1 % - American Indian or Alaska Native
3 % - Asian
47 % - Black or African American
4 % - Hispanic or Latino
0 % - Native Hawaiian or Other Pacific Islander
35 % - White
10 % - 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

i. Total number of students/audiences you teach in a year 300 – (50 per 2 semester year at Georgia Tech university level; 200 K-12 level impressions on class field trips at Computer Museum of America)

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.

Year round

3. Teaching Experience and Education

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

Bachelor's Degree (Major): Electrical Engineering, UNCC 2005

Bachelor's Degree (Minor): Mathematics, UNCC 2005

Masters Degree (Discipline): Electrical Engineering, NCSU, 2007

PhD Degree (Discipline): Electrical Engineering, NCSU 2011

Other Degree:

b. How many years of education experience do you have?: 15

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. IEEE Senior Member, 2016 2. Certificate in Teaching Techniques (CITT) for Postdoctoral Scholars, 2015 3. Brandeis Collegiate Institute American Jewish University Fellow 4. Benjamin O. Hood Engineering Service Award, Annual Lee College of Engineering Award 5. Back-to-back NSF Small Business Innovation Research (SBIR) Postdoctoral Fellowship Awards, 2011–2013 6. NSF Debating Science Award for study of Nanotechnology, University of Montana, 2008 7. Summer Research Undergraduate Program, NIST National Institute of Standards and Technology, 2004 8. Completion of UNC Engineering Leadership Academy two year program 9. HKN Electrical and Computer Engineering Honors Society, ODK Leadership Honors Society 10. AOC Electronic Warfare and Tactical Information Association, SPIE Society of Photographic Instrumentation Engineers

4. Professional Assignment

a. What is your primary education assignment? Check all that apply Informal Education (Science or Nature Center, Museum, etc.), Four-Year College or Institution

Other Primary Assignment

b. What subjects do you teach? Check all [webform_submission:values:subjects]

Other Subjects Informal position as docent at Computer Museum of America: History and Overview of Electrical and Computer Engineering and 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)

It is my mission in life to leave this world a better place when I leave it to when I came into it. I want to improve life for all through science and technology. I have realized that I can have the greatest impact not only though technical contributions, but by teaching. As the climate situation reaches crisis levels, we must acknowledge that as scientists, it is our duty to inform the public of the situation, why it is happening, and what must be done. I am research faculty at the Georgia Tech Research Institute (GTRI) as an electrical engineer focused on microelectronics, semiconductors, and electromagnetics for defense applications. I am also a docent and chairman of the program management committee at the newly opened Computer Museum of America (CMoA) The CMoA is non-profit and expected to become Smithsonian Associated. I have two goals in applying to the program: (1) to teach and engage with students at the CMoA by sharing polar research stories, an building polar science exhibits, and (2) to link my own work and capabilities at GTRI to polar researchers through collaboration and shared program development. Through PolarTREC I have further my impact and help both the environment and future generations of scientists and engineers.

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 enthusiastically reaching audiences through program requirements, I plan to make polar science come alive by building exhibit space at the Computer Museum of America (CMoA) with support of the museum. I helped to open the CMoA earlier this year, when it became the largest technology museum in the Southeast. In Phase 2, we will become the largest East Coast technology museum. We hold the world’s largest collection of Cray Supercomputers (in addition to much more). It is difficult to excite children about science and technology by displaying what appears to be simple “boxes”. Therefore we want to make the capability “come to life” by displaying what is possible: large models of supersonic jets hanging over machines that made their design possible, cotton swirling clouds of hurricanes with flashing lightning, and environmental models representing climate change simulation. I want to tell a story that teaches a lesson, and inspires the next generation to STEM fields and environmental activism. I have the support of the museum leadership to build

Polar Science Research exhibits which will tell the stories of the researchers that I would encounter on the PolarTREC program. The goal is to create interactive and engaging exhibits with donated artifacts and showcasing Ant/arctic programs in permanent exhibits.

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

The goals of the PolarTREC program align with the pillars of the CMoA museum's mission: to make effort to engage underrepresented minority populations in order to educate, inspire, and involve. We are bringing minority community school field trips into the museum weekly. Furthermore, with a lack of funds for transportation, we are taking the museum to under-served communities and schools with an extension portable "museum on wheels" where teachers and parents can bring their children onboard. I am also in talks to create mini-exhibit displays in Atlanta Heartsfield Airport, the busiest airport in the world, with over 107 million passengers annually. I would like to showcase polar and climate change research and the importance of computer simulation here, which provides a tremendous opportunity for a high number of impressions and therefore impact. It will require time and effort, but we can create a real difference by representation to the public.

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 am a firm believer in conveying enthusiasm and passion of any topic to my students. If I can show my passion for a subject, they also will become passionate. This is done through my showing that I personally value each student as a person, and my explanation of why the topics that I am covering are important. Here, we can show that the world is connected through the environment, and that we and our offspring will be affected by it. I use hands on examples and actives whenever possible. We have students of all levels entering our electrical and computer engineering program. Teaching circuits by theory alone on the chalkboard is insufficient compared to students handling resistors, microelectronics, and devices. This way they will feel more comfortable with theory. I explain how exactly devices are fabricated. I believe that to deeply understand a subject, we must also understand the history of development to show where the understanding of the science came from. We ourselves must remember what it was like to be students. I make use of optional field trips and career advisement in my classes, for which students appreciate and continue to thank me.

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

I am an eager helper, hard worker, and will bring new perspective. I have a proven record of research with over 24 publications, over 100 citations, and a patent. I am passionate about science communication, and believe that we have a duty to inform the public. I am in a unique situation bby being both an informal educator at the CMoA, and faculty at GTRI. My passion lies in science communication to the public; at the computer museum I am impactful by engaging with diverse students. PolarTREC will enable me to bring new engaging material to students to inspire STEM development and interest in polar research topics. At GTRI my primary responsibilities are science and defense related support programs. The PolarTREC program will enable me to make new connections within the polar research communities to capabilities at GTRI, DoD, and DOE. I regularly work with partners at the Air Force Research Lab (AFRL), ARL NRL, and Sandia on microelectronics and radar programs. I firmly believe that increased connections between disparate programs can lead to increased collaboration and funding. My goals through PolarTREC are to segue my own research into polar applications, and to form deep connections between GTRI and the researchers involved in these areas.

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)

Last fiscal year, I have been Program Director of three projects where I have managed 14 research engineers and three students. The projects include semiconductor characterization of high Al GaN radiation hardened transistors, electro-thermal mixing of signals in free space for acoustic probing of materials, and ionizing radiation detection using vertically aligned carbon nanotube array transistors. Each of these projects required clear deliverables and were successfully completed. Furthermore I advised a master's student who completed a research thesis on CZTS Photovoltaics (carbon nanotube solar cells). Beyond technical contributions, I facilitated his work by organizing goals, removing road blocks, and defining expectations. These projects were successful because I value people over projects. As a team member, sometimes the simplest and most effective way to help move a project toward a goal is to be present, supportive, and involved. When team members feel valued, they are more collaborative and productive. Problems arising can often be mollified by increasing flexibility on either side of personnel friction points. Shifting effort of a performer to their preferred work while maintaining responsibility guards deliverable deadlines while keeping team members happy. I excel at finding a balance between management and flexibility.

6. Communicating the Experience and Science

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

It has been nearly 100 F for the past week, record level heat. Funny how every year is the hottest on record now. Lately I have heard science deniers use the flawed logic that “records are make for breaking.” I got away from the city this weekend to join Bryan for whitewater kayaking on the Chattooga River. Bryan is an expert kayaker who paddles every weekend. I have flat-water and whitewater rafted some, but this is my first time whitewater kayaking. I realized that I was distracting myself with my camera early on, and that I needed to focus solely on my control, trim, and balance. Bryan keeps using specialized vocabulary that I am unfamiliar with. I ask for clarification on jargon like “creeky moves, ascension, and lip roll”. It’s hard to hear voices over the rushing water. I am scared and anxious, but I am improving as the day goes on. I was disappointed that I “lost my roll” which I perfected years ago in my university pool. I depend on Bryan for the T-bone rescue, where if flipped, he must move his boat next to mine so that I can push off to right myself. It shows me that one must practice skills if one wants to keep them.

7. Scientific Interests and Research Area Preference

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

Please explain your preference
I am primarily interested in the Antarctic due to the geology of the continent, potential for intelligence recognizance. While keenly interested in the Antarctic, I will not discount the importance of polar science at either pole. It may be that more relevant research to my interests is being carried out in the arctic, and I look to the committee for help making that connection and recommendation.

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 flexible, and my faculty appointment allows flexibility including leave of absence if necessary for assignment. I prefer a long deployment so that I may make the greatest contributions.

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 broad scientific interests including electronics, physics, geology, and biology. I hold a Ph.D. in electrical engineering, where I have made numerous contributions to the field including heterogeneous integration of GaN, Si CMOS, and InP semiconductors, electro-thermal modeling of three-dimensional integrated circuits, UV LED flowing water disinfection, and electronic warfare. My experience with sensors and thermal simulation should have direct application to polar science. My expertise with computer simulation has wide application; during my PhD work I was able to speed up required simulation time from 340 years to 5 days of CPU time through development of macromodels and time transient compaction. My current ($25M combined) contract to IARPA under the Molecular Information Storage (MIST) program involves fabricating microfluidic chips which read and write DNA for computer memory for high density and longevity applications. Through my hobby of cave exploring and speleology I come into contact with professional geologists and groundwater hydrologists. As an amateur, I have studied karst geology with interest. I now wish to incorporate polar science into my breadth in order to create more connections and increase impact.

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) I am somewhat interested in this subject area

Other Areas of Scientific Interest
ISR (Intelligence, surveillance and reconnaissance, target acquisition)

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 have spoken with Patricia L Yager <pyager@uga.edu> at University of Georgia and have overlapping interest, but do not believe that she has current funding.

8. Background Information and Skills

a. Briefly describe your outdoor skills or experiences.
I am an avid hiker, capable kayaker, climb 5.10+. I have been caving for 15 years and am a member of the National Speleological Society. Competent rigger for vertical cave exploration and high angle rappelling. Some of the highest drops that I have rappelled and climbed and El Capitan, Yosemite NP, and El Sotano de las Golondrinas, SLP, Mexico. I have Open Water, Advanced, Nitrox, and Rescue Scuba diving certifications. American Red Cross First Responder, Oxygen Administrator, and AED. I value conservation, safety, training, and preparedness.

b. Provide a basic statement of your general health and physical condition.
With gratefulness, I am in excellent health.

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

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.
I am highly technically competent and adaptable to new software, hardware, and laboratory equipment. I have contributed to design standards for military avionics computer systems. I am currently tasked on a program to upgrade weapons control and navigation systems on the C-5 Galaxy. I code in a number of programing languages including C/C++, Pearl, Python, and Matlab. I am adept with electronics measurement equipment, and system integration.

e. List any additional skills or information that you wish to be considered.
DoD Clearance Level: Top Secret Languages: English, native Spanish, conversational, functional Hebrew, basic

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

12. References

Reference 1

Name Ben Yang

Title and affiliation Microelectronics Branch Chief, Georgia Tech Research Institute

Email Address Benjamin.Yang@gtri.gatech.edu

Phone Number 404-407-6737

Reference 2

Name Jonathan Wilkerson

Title and affiliation Senior Electrical Engineer, Sandia National Labs

Email Address jrwilk@sandia.gov

Phone Number 919-306-1939

Reference 3

Name Paul Franzon

Title and affiliation Cirrus Logic Distinguished Professor, Director of Graduate Programs, NSF CAEML Site Director at NCSU

Email Address paulf@ncsu.edu

Phone Number 919-515-7351

Carly Hein

1. Contact Information

Name: Ms. Carly Hein

Email: chein@oneidacsd.org

Home Address:
6108 Pools Brook Rd
Kirkville, NY 13082-9510 US

Home Phone:

Cell Phone : 315 559 7793

Institution Name: Otto Shortell Middle School

Institution Address:
200 Markell Drive PO Box 716
Wampsville, NY 13163 US

Institution Phone: 315 363 1050

Classroom/Office Extension:

Institution Fax: 315 366 0622

Institution Website: https://ottoshortellms.oneidacsd.org/

Other relevant websites:
https://ottoshortellms.oneidacsd.org/cms/One.aspx?portalId=316379&pageId=2210633

Supervisor's Name: Todd Widrick

Supervisor's Email Address: TWidrick@oneidacsd.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): Our public school and district is comprised of mostly white students. We have very small populations of American Indian, Black, Hispanic and Asian students. Within the student body, we have a wide range of socioeconomic groups. At our middle school, the percentage of our students receiving a free or reduced lunch has been above 65% for the last four years. Oneida previously had a strong industry, but times have changed and the manufacturing jobs moved out of the area. This left many of our families struggling to make ends meet. It is often difficult for our students to focus on their studies. They arrive home from school, get their siblings off the bus and have to tend to them while their parents work. We also have some very supportive and comfortable families whose students are involved in many extracurricular activities. Our district is a mix of a small urban setting, surrounded by an inner ring of suburban and an outer ring of rural homes and families. All of our students have access to technology at school. We are set to go one to one with ChromeBooks in the next year. About ⅗ of the students have access to a cell phones.

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) There are approximately 440 students in our 6-8 middle school this year.

f. School Ethnicity:
2 % - American Indian or Alaska Native
1 % - Asian
2 % - Black or African American
2 % - Hispanic or Latino
0 % - Native Hawaiian or Other Pacific Islander
90 % - White
3 % - 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 22

i. Total number of students/audiences you teach in a year 80

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 calendar for next school year has not been published yet. This year, our start date was Sept. 3, 2019 and the end date is scheduled to be June 25, 2020. Christmas break is Dec 23, 2019 to Jan 3, 2020, Winter break is Feb 17 - 21, 2020, and Spring break is April 6 - 13, 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): Bachelor’s Degree in Biology in the marine science tract from SUNY Stony Brook, Stony Brook, NY

Bachelor's Degree (Minor):

Masters Degree (Discipline): Masters of Science in Teaching for biology 7-12 from Le Moyne College, Syracuse, NY

PhD Degree (Discipline):

Other Degree:

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

c. How many years have you been working at your current institution?: In my 6th year

d. List up to 10 relevant professional licenses, certifications, registrations, awards or honors that you have received in your profession::
NYS Professional Teaching Certification Earth Science 7-12 NYS Professional Teaching Extension General Science 7-12 NYS Professional Teaching Certification Biology 7-12 New York State Master Teacher

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

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)

The opportunity to go out into the world and bring real science back to my students is what motivates me! Many of my students have not had the chance to leave the community they live in, often not even thirty minutes down the road. Showing them real scientists, doing real work at the extremes of our planet, how excited I am and exciting it is could potentially be the 20 seconds of courage they need to change their path and venture out in the future. It also helps them care about the world around them. We need our students to be global citizens, to the farthest reaches of our globe. If we can instill a sense of connection to that world, we will have done our part to make the world better and stronger. I truly believe that as a middle school science teacher, it is my job to develop curiosity and wonder in my students so they can make the world a better place. They might not all be scientists, but I need them all to care about the Earth. Showing them our Earth from every vantage point I can will be instrumental in directing their future decisions.

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 became a teacher when I was 30, so I have a pile of life to relate our content to. I have always found that the kids related to my experiences best. A real life story about being the undergrad grunt in a fisheries ecology study, helping to take care of all the fish in the lab and how it related to understanding which fish we should catch to sustain a population works way better than the population dynamics graph in the book! I am positive that a research experience to the end of our planet will provide me with stories that can be turned into lessons about the body’s reaction to cold, adaptations of organisms that live in that ecosystem and how they evolved! Having real science experiences to share with the students gives them a connection to their work. If we are graphing data collected from scientists that are in the same place that good ole Miss Hein was in in Antarctica, perhaps that data won’t be the most annoying thing in the whole world and we can learn how to make a proper graph because it is real and means something to us! The connection really matters!

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

As the experience is ongoing, I would send images via Instagram.,I use it with my students, middle school kids love Instagram! I could also post on my personal Facebook page, some science teacher Facebook groups I am a part of and on Twitter. I am sure my district would share the posts and pictures as I shared them. Having the abominable snowman as a teacher has to look pretty cool! Upon returning home, sharing my experience with the educators in my district and in the Master Teacher Program would probably be easiest during a professional development day and a MTP meeting. I would then be able to reach the largest number of individuals with the greatest efficiency. I could then charm them with the photos, stories and science of my experiences as a newly seasoned PolarTrec alumni! A Science Saturday at school would be a good way to share with the community. A model of the experiment or collection performed and a streaming video could be playing in addition to a science talk or a Zoom session with the primary researcher. I would also display photos of the trip in my classroom and hallway.

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 start a topic by asking the students what they know about it. Just a general what it is, what does it mean to you kind of conversation. As we venture into our new standards into New York, the way we teach is changing, but I still want to know what they know and where we are starting. It also gives me some ideas of what they are interested in and any misconceptions. It’s a listening session and I jot down notes. Then we move into an anchoring phenomena, the fancy way of saying something interesting. A video or a picture that we can launch into a why what is happening is happening kind of conversation. I always like to look at biology as a story. You have to find the story and how it connects to the rest of the moving part in our body, the environment, and the planet. It’s all connected. Right down to the molecules! But we start with the story and then break it down into pieces of smaller stories. I try really hard not to spill the beans and ask good questions to get the kids to figure out the story together.

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

I am a dedicated teammate. I am always willing to put in the time and effort to make a project work. I enjoy working with a team and am happy to be a small part of a big project or a big part of a small project. I worked on research projects in college ranging from beach seining up and down the Hudson River as part of a young of the

year fish survey for the Department of Environmental Conservation, to counting about a million rings on the otolith (tiny ear bones) and scales of bluefish, to tending to millions of dollars worth of bait fish in a saltwater lab on the North Shore of Long Island. I also worked as an associate environmental scientist after college hauling fish out of impingement baskets on power plants to see how they were impacting the local ecosystem. Twenty four hours in a construction trailer on the bitter north shore winter on Long Island was probably good preparation for the PolarTrec program!

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)

This summer, my Master Teacher cohort went on a retreat to the Adirondacks. As a new member, I didn't know everyone on the trip. Our first adventure was a high ropes course. As some of the members were working their way through, it was clear they were struggling. Everyone was harnessed in, but being on a telephone pole high up in the air is the real deal! I talked to them, told them how much farther and encouraged them as they worked through the obstacle. It seemed small, but it helped. When I climbed my silly self up there and ended up dangling like a Christmas tree ornament, I really needed them too! At school I have been working with the teachers to use the new NYS Science Learning Standards. It has been an adventure for all of us, but I have been leading the charge because I attended several workshops. I normally work with 7th and 8th graders, but with guidance from our 6th grade teachers, we fine-tuned the science, added in the new practices and we are developing a new 6th grade program! Together we are figuring it all out!

6. Communicating the Experience and Science

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

There was scritching. Nobody likes 3 am scritching! Is the scritching mice partying or bats returning from a night on the town or worse… squirrels? I was laying there trying to convince myself to go back to sleep. That the herd of squirrels that I now envision have returned to the attic won't dig through the ceiling above my bed and land on my Strawberry Shortcake blanket. Then I figured I better record the sound of the scritching for the critter guy. So I made seven videos of complete blackness and no scritching. It only happened when I gave up recording. Of course! So now it's 4 am and I should just get up for school. Bring on the crabby! But school was pretty mellow. My kids from last year laughed and laughed that the squirrels were back. I flunked them all! Later, I was security extraordinaire at the football game. I looked pretty tough in my fuzzy orange and white hat! We clobbered the other school and the kids were good, no major drama. Except that mouthy 5th grader, I better get a helmet for when he comes my way! At least he is good with colorful adjectives!

7. Scientific Interests and Research Area Preference

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

Please explain your preference
I believe that either destination would be good for me, and by extension my students. I would be happy to participate in any placement you felt I was a good fit for!

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 do not have a length preference. I am available any 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)
Marine biology and oceanography are my favorites! I have always been interested in the ocean, in all of its forms. The power and energy that it holds in its currents, its salty nature! So many perils and so much life, from a single celled plankton to a giant squid, to those weird looking shrimp around hydrothermal vents that never see the sun! There are so many mysteries held within the ocean. And in every extreme you find life living and working together, relying on each other for survival. It always reminds me of how far we have come as a planet and how we are just a tiny piece of a big system. I love the smell and the sound and the feeling you get when you are next to it! I also love ecology and evolution. How do we all fit together and how did we get to be the organisms we all are! How is it that chickens have dinosaur DNA? What will the next version of humans look like? Any biological project would keep my brain firing!

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 am somewhat interested 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
__1___ Adaptations to Life in Extreme Cold and Prolonged Darkness __2___ Understanding Environmental Change in the Polar Regions __3___ Engineering and Technology

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 am a good camper. I have camped with family and friends, as well as alone. I just recently learned that I like hiking and climbing. We climbed Whiteface Mt this summer and hiked and climbed around Belize and some Mayan ruins. I am a good canoer and kayaker. I can also handle a 15-20 ft boat, but probably need a refresher lesson, it's been a while.

b. Provide a basic statement of your general health and physical condition.
There is too much of me to love. But I have been working on it! And have been making progress. I won't finish the race first, but I will finish! The rest of me works just fine! I get migraines, but take preventative medication and have medication to take when I get them. My teeth are good!

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.
I am good with a computer. I am a PC girl and can navigate around a Mac, but I fumble around a little. I didn't love Windows 8 and am happy with Windows 10. Seems more normal!

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 school issued laptop. I use mostly Powerpoint for class presentations and Excel to manage data. I use Chrome as my browser. This summer, I completed the Google Level 1 Educator Certification. I use Google Docs and sheets more with my students and am planning on using Google classroom more in the future. Still don't totally love Google Slides, but I think I am just too comfortable with PowerPoint. We have used iPads and some stop action apps on our phones to make videos in class as well as a variety of apps to add a little flair to class time. I used Instagram a lot with the kids to share fun sciency things as well as what we are doing in class. Plus a little motivation. An added bonus has been additional communication with homework and lab questions. I used Google Photo to share pics with family and friends. I have a SONY SLR digital camera. One of my prized possessions! I established a school wide initiative of using Google Calendar to connect all of our students to their teachers. Now almost all of our teachers put their homework, upcoming tests and quizzes, etc on Google calendar and it feeds right into the kids' calendar. They can download the app or look at it online. It has been a labor of love, but really helpful!

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)
Dr. Sharon Bowers (Senior STEM Education Specialist, Associate Director, Center for Integrative STEM Education (CISE), National Institute of Aerospace (NIA)) has been leading us in an ongoing workshop, called Practical Strategies for Integrative STEM Education, for the New York State Master Teacher Program. She shared the program and recommended that I apply.

b. Please suggest other places we might advertise this opportunity for teachers
www.stanys.org Science Teachers Association of New York State

12. References

Reference 1

Name Todd Widrick

Title and affiliation Principal Otto Shortell Middle School Oneida City School District

Email Address TWidrick@oneidacsd.org

Phone Number 315 363 1050 w 315 382 6224 c

Reference 2

Name Tyler Steenburg

Title and affiliation Teacher Otto Shortell Middle School Oneida City School District

Email Address TSteenburg@oneidacsd.org

Phone Number 315 363 1050 w 315 360 0326 c

Reference 3

Name Christine Calogero

Title and affiliation Teacher Rome Free Academy Rome City School District

Email Address CCalogero@romecsd.org

Phone Number 315 725 9412 c

William Henske

1. Contact Information

Name: Mr. William Henske

Email: bill.henske@mrhschools.net

Home Address:
2621 Arkansas
Saint Louis, MO 63118 US

Home Phone: 3148525295

Cell Phone : 3148525295

Institution Name: Maplewood Richmond Heights School District

Institution Address:
7539 Manchester
Maplewood, MO 63143 US

Institution Phone: 3146444406

Classroom/Office Extension:

Institution Fax: 314 644-4406

Institution Website: https://www.mrhschools.net/

Other relevant websites: https://noaateacheratsea.blog/author/mrhsciguy/
https://www.eeestl.org/

Supervisor's Name: Michael Dittrich

Supervisor's Email Address: michael.dittrich@mrhschools.net

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): Our school is in a small urban district bordering St. Louis, Missouri. Maplewood is a working class community with a growing population after decades of decline. We have 180 7th and 8th grade students. Our student population is very diverse with 55% white, 35% African American, and 10% mixed race and other. Close to 50% of students are free or reduced lunch. We are an expeditionary learning school where all curricular units are tied to hands on experiences outside of the classroom. We spend over 20% of the school year out of the traditional classroom. Our school is 1:1 with Chromebook laptops.

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) 180 students

f. School Ethnicity:
1 % - American Indian or Alaska Native
4 % - Asian
30 % - Black or African American
5 % - Hispanic or Latino
0 % - Native Hawaiian or Other Pacific Islander
51 % - White
9 % - Multiracial
If your school uses other categories to describe race/ethnicity, please describe:

g. Percentage of students who receive free or reduced lunch: 39

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.

May 26 is 2020 end date August 24 is 2020 school start date Spring break March 14-21, 2020 Our 2020-2021 calendar is still in the works due to a new state start date law

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's Degree (Major): BA - Environmental Biology, Beloit College

Bachelor's Degree (Minor):

Masters Degree (Discipline): Masters Degree (Discipline): MS Secondary Education - Biology, Southern Illinois University, Edwardsville

PhD Degree (Discipline):

Other Degree: National Board Certification

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

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::
Monsanto Fund Missouri Science Teacher of the Year- 2012 National Board Certification - 2013 TEACH 2013 Fellow 3rd place 2014 Green Schools Quest 2015 NOAA Teacher at Sea MRH Middle School Teacher of the Year - 2016 2nd place 2016 Green Schools Quest 2018 Carol B. & Jerome T. Loeb Prize for Excellence in Teaching Science and Mathematics finalist

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, Middle School Science

Other Subjects Introduction to Sustainability

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 science and adventure. I teach in an expeditionary school where we believe students learn best as part of a community that investigates issues hands-on. As a role model for my students, I think it is very important to walk the walk. I have participated in several other teacher programs and found that they give me tremendous opportunities to put my students in touch with science. I want my students to be active learners, taking charge of the future with an active role in the future of our world. As one of their most powerful role models, I would like to share these experiences vicariously with my students. I hope to gain, for myself, a greater sense of the workings of our planet. I strive to be a part of understanding the world we live in and take an active role in working to secure the sustainability of our future.

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 have a series of expeditions in our program that tie together Earth's systems. In 7th grade I take students to the Smoky Mountains where they learn about weather, mountain building, and erosion. In 8th grade we travel to the Gulf of Mexico to learn about marine science and how it connects to their home in the midwest. After my experience as a Teacher at Sea I gave two talks to the community and school about my experiences and the research we conducted and have included my experiences into each year's Water theme of study. I am also active in TAS' alumni organization. I would like to create a unit of study that bridges these two experiences, looking at global issues such as climate change and how it relates to these two expeditions. After participating in the PolarSCI project I presented our instructional process at the 2019 Polar ICE summit. If I participate in the PolarTREC program I would be able to incorporate many unique insights into the classroom. I teach a unit on weather and climate in the 7th grade and want to create a citizen science component where students collect and share phenology data and begin an ongoing record of seasonal changes in and around the school.

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 a member of the Experiential Education Exchange (EEE) here in St. Louis. One

of our main goals it to share ideas and activities that bring our students closer to their subjects and help students develop their own sense of wonder and curiosity. I would like to share my experience through this organization as a speaker and resource for local schools and organizations looking to investigate issues of the arctic and global climate change. We have many events throughout the year and have been growing in membership and interest for the last several years. In the school community we have many ways of sharing our activities and experiences. We give talks, conduct presentations as school town halls, and publish articles for our district newsletters and websites.

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 am a constructivist, philosophically. I prefer to start students on their journey in learning with a problem. Students struggle making sense of decontextualized content and by creating some cognitive dissonance early on, I have found the lessons have a much higher level of student ownership and engagement. In our current unit I introduced the idea of water quality through an expedition to a waste-water treatment plant and a lock and dam. The text students use for the content of aquatic ecosystems introduces students to the concepts after they have all created an idea of the diversity of the types of aquatic ecosystems and the issues that impact them. With this background knowledge and the problematic nature of our relationship with aquatic ecosystems students have a foundation on which to apply their new understandings and their classroom lessons. Through the initial experience, through the learning cycle, we put together a complex understanding that is far from a discrete set of facts. I also push the importance of data analysis, providing data based lessons that require my students to use real world data to test questions and draw conclusions as with the Data Nuggets program or our homegrown pollinator study or the bigger Polar-ICE project.

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

I am an exceptionally hard working field researcher. I love adversity and discovery-this is the reason I entered the field of environmental biology. I communicate well with others and enjoy working on a team. I have a competitive academic spirit but greatly enjoy learning from experts in the field. I admire those who follow their passions and seek out their knowledge and experience. I admit when I do not know something but am quick to try to solve problems. I take pride in doing what needs to be done. I can focus on the mission at hand but also leave things undone that need

to be left for triage. I am often a quick study but I am persevering when things do not come to me right away. I have a lot of field experience and have led summer field research classes for the last 7 years- organizing, teaching, and leading student groups on backpacking and river trips. I have wilderness first aid certification and feel qualified and confident in leadership situations.

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)

For the last seven years I have worked with various colleagues in running a 3 week summer field study class for 25 students. The two staff members and I work together to plan several weeks of extended outdoor science investigations. While this has many challenges, the primary one is that we are all doing the bulk of the work during the school year with planning and scouting the different trips and experiments. I am the lead facilitator (as well as the originator) of the program, training new staff and helping them fill different roles and responsibilities in the program. This includes helping new staff develop activities and lessons that fit within the instructional and experiential goals of the program. I also recruit and train high school-aged students leaders to assist with instruction. I create the organizational structure each year, developing learning targets and key experiences. I make sure my co teachers have the background and training they need through shared documents, impromptu training and after school meetings.

6. Communicating the Experience and Science

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

Did you know the US Army is in charge of migratory bird habitat in St. Louis? When the US originally dammed the Mississippi to control flooding and protect transportation, it left aquatic ecosystems out of the plan. Our riverways were viewed as a means to get grains to the end. This mental model left fish and wildlife habitats out of consideration for a functioning riverway. Decades of disregard left our migratory birds inperil, as the ecosystems they depended on during their long journeys dwindled in size and quality. The Army Corps of Engineers (ACOE) is now working with biologists and conservation groups to recreate the complexity of habitats that once lined the river corridor. On Wednesday and Thursday, our 8th grade students travelled to the Riverlands Audubon bird sanctuary to study the ACOE efforts and learn about their role in balancing the needs of a strong economy and the health and well being of our aquatic ecosystems. Students hiked through the seasonal wetlands and investigated several different ecosystems. Students collected macroinvertebrates community data from an ephemeral pond for later comparison with other habitats. They discovered that these temporary water were teeming with life! Students then donned waders and seined fish from the Mississippi.

7. Scientific Interests and Research Area Preference

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

Please explain your preference
My administration is very supportive of profession endeavors and are willing to work with me in scheduling to maximize student impact and minimize disruption to school climate.

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
4-6 weeks but I am very flexible with a supportive family and district.

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 conducted investigations in the soil microorganism community, focusing on determining the variation of collembolan species in disturbed and undisturbed soils. I like that these organisms are capable in living in different environments, many of which are rather hostile to other organisms. I first learned about these creatures as a kid when I saw them hopping around on the surface of the melting snow. In graduate school I wanted to develop some profiles of the collembolan community that could be used to characterize environmental conditions. I did not know much about soil science, however, and just got good at raising them in a lab. I wonder now if the surface oriented springtails may be able to provide information on changing weather patterns or climate. Because many other organisms we would use are not present in arctic communities, I think the activity of springtails could be useful. I am interested in the flow of energy through ecosystems and conceptualizing these systems. I would also like to see if climate change is increasing the range and diversity of invertebrate fauna in polar regions.

Atmospheric Systems I am somewhat interested in this subject area

Cryospheric Systems I do not want to be considered for 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

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 wilderness first aid certified. I am a certified tree climbing facilitator and regularly lead groups. I am certified instructor in National Archery in Schools program. I have hunter education certification in Missouri. I am well versed in low impact camping. I have done some rock climbing but am a novice. I have been leading wilderness canoe and backpacking trips for 20 years. I have canoed from Wisconsin to Missouri on the Mississippi and taken many other back country trips with groups and solo. I am comfortable working in the wilderness alone or in teams.

b. Provide a basic statement of your general health and physical condition.
I am in good physical condition. I wear corrective lenses.

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.
I am very familiar with Macs. I have lots of aging experience with PCs and have never had difficulty operating one. I have a Mac and Iphone. I would say my skill level is well above average for Apple operating systems. I am comfortable with using PCs and still help people troubleshoot their 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 computers several hours a day. I use them for collaborating on projects and sharing information. I create spreadsheets and presentations, webcasts, blogs, Prezis, movies, etc. as a daily part of my professional duties. My students use Chromebooks so I am also quite familiar with those although I suspect they are of limited field use. I have used drones for student projects as well as basic robotics C program language.

e. List any additional skills or information that you wish to be considered.
I can use a chainsaw, drive an ATV, garden, compost, keep bees, throw an atlatl, remove a stuck egg from a chicken, and start a fire in wet conditions.

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 NOAA Teacher At Sea 2015, Florida Keys National Marine Sanctuary

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 have been designing my curriculum around the experiences I have had as a scientist. These programs invigorate me professionally, infusing new scientific excitement after 20+ years of teaching. I truly enjoy sharing my experiences with students and connecting them with the work that scientists are doing around the world and, hopefully, opening paths and opportunities for my students' futures. As a professional, I act as a resource for others and an advocate for STEM education and scientific investigation. Teachers who are excited about their subjects energize their students about their subjects. While I don't need to be any more excited about science I do look forward to even more experience I can use to excite my students and stimulate their curiosity.

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
Kristin Hunter-Thomson - Rutgers Jenn Annetta - NOAA NAtional Marine Sanctuary

Former PolarTREC, TREC, or TEA teacher. Please provide their name
Kevin Dickerson - PolarTrec

From a website. Please list the website name and URL

Conference or presentation. Please list the venue and/or presentation title
2019 Polar-SCI Summit - Several alumni were there 2019 NSTA convention - Several of the NOAA TAS alumni were also participants in the PolarTREC

Other (please explain)

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

12. References

Reference 1

Name Michael Dittrich

Title and affiliation Principal

Email Address michael.dittrich@mrhschools.net

Phone Number 3145650669

Reference 2

Name Scott McClintock

Title and affiliation Teacher at The College School - Colleague

Email Address smcclintock@thecollegeschool.org

Phone Number (314) 962-9355

Reference 3

Name Allison Hoffman

Title and affiliation Teacher

Email Address allison.hoffman@mrhschools.net

Phone Number 636-675-5395

Megan Hinz

1. Contact Information

Name: Ms. Megan Hinz

Email: meganhnz@gmail.com

Home Address:
696 Wetmore Rd
Columbus , OH 43214 US

Home Phone: 6142163852

Cell Phone : 6142163852

Institution Name: West High School

Institution Address:
179 S. Powell Ave
Columbus , OH 43204 US

Institution Phone: 614-365-5956

Classroom/Office Extension: N/A

Institution Fax:

Institution Website: https://www.ccsoh.us/WestHS

Other relevant websites:

Supervisor's Name: Greg Costello

Supervisor's Email Address: gcostello@columbus.k12.oh.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): I work on the west side of an urban inner city in a public inner city high school. Many of our urban students are considered "at risk" and they themselves struggle to deal with the many traumas they have faced in their young lives including: hunger, homelessness, abandonment, loss and abuse. However, despite what appears as statistics on a website, my students want and deserve the attention to extend themselves outside of their situation and to explore what would have been previously unattainable opportunities. My school's community is not well off, 100% of our students are on free or reduced lunch, but the community supports the students as best as they can and supports the school educating and keep students safe. Unfortunately our technology and building conditions are outdated and in declining disrepair.

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:
1 % - American Indian or Alaska Native
1 % - Asian
34 % - Black or African American
15 % - Hispanic or Latino
1 % - Native Hawaiian or Other Pacific Islander
43 % - White
6 % - 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 32

i. Total number of students/audiences you teach in a year 147

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.

For the 2019-2020 school year: School starts August 19th Winter Break is December 23-17th Spring break is April 10th -17th School ends May 29 For the 2020-2021 School year: (Dates are not official) School starts around August 20th Winter break is around December 20th Spring break is around Easter School Ends around June 1st

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 in Biology

Bachelor's Degree (Minor): Environmental Science

Masters Degree (Discipline): MAT in Biology Science

PhD Degree (Discipline):

Other Degree:

b. How many years of education experience do you have?: Completed 10, Started year 11

c. How many years have you been working at your current institution?: 10 years

d. List up to 10 relevant professional licenses, certifications, registrations, awards or honors that you have received in your profession::
Secondary Life Science License for state of Ohio, Elected Board of Governors for Ohio Union Membership, Ecology International Project 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 Earth Science

Other Subjects Advance 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)

Ever since I learned about the cold water reefs off of the Aleutian Islands during my masters program, I have been personally fascinated with cold climate research and conservation. Anytime the idea of conservation , it was almost always about conservation in the tropics (although that is important too). I feel as an educator cold climate research and conservation efforts are rarely shared in our primary and secondary academic institute, causing many future citizens to have little understanding or concern for what is occurring. I hope through this program, to gain experience and knowledge in cold climate science to share with my students to invigorate their curiosity, ignite their passion and help them find a sense of personal connection with the Polar Regions, thus leading them to a sense of responsibility as citizen scientists towards cold climate science. I along with my students are excited for the opportunity to learn about the Polar Region STEM practices, projects, opportunities and jobs, which can help take their learning outside of the four corners of our room. It is this hope and sincere aspiration to share and create something with my students, which will effect change that I am motivated to apply to Polar TREC this year.

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 fully intend to immerse my students in the experience by developing a four tiered project with them that takes them on a "similar" experience as the Polar TREC program. We are a class driven by data, so for the first tier students will use data collected from the trip to draw their own CER (Claim, Evidence, Rationale). For the second tier, students will use data, artifacts, journals and pictures to develop their own research question(s), reaching out to researchers in the cold climate field to help find data they themselves can not collect. Students will be encouraged to create a research project that can create solutions or be implemented in their own community. For the third tier students will implement their solutions or projects in the community. Finally, students will take part in a science symposium sharing their research with their peers, schools and committee.

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 a multi-layer sharing of my experience of the program, driven by my students and their projects and facilitated by me. Although I would gladly gush about the wonderful experience I would have with Polar TREC to just about anyone who would listen, I would like to show my colleagues the impact this opportunity has had on my classroom and students. I would share some of my work as well as my students's work and have the students create short videos about their projects to share at department, building and district wide professional developments. At these developments I will allow my colleagues the opportunity to experience and create something for their own classroom that they would share. I hope to engage our school community, community and general public by having students incorporate and involve them in their research and projects along the way. The community will have access to updates on the projects and will be a part of the science symposium, listening and learning from the students as well as sharing their own 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)

I engage my students in learning using student lead science modeling curriculum, which is driven by exploration and data. I believe students need to first experience topics, concepts, issues or phenomenons, then collect data and finally discuss their experience of their encounter. This encounter is hands-on for the students rather than sit and watch a demonstration. After the students experience we use a lot of class discussion and socratic seminar questions to disseminate our findings.

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

My collaborative nature is a great strength I could offer the PolarTREC program. I am very collaborative and thoroughly enjoy working with other teachers, informal educators and researchers. I have experience working face to face and via long distance communication with others to complete tasks and projects. I have also worked with my cross curricular colleagues to design and carry out grade based STEM projects at my school. My knowledge and creativity in the classroom has allowed me to help design district level curriculum and work with the Ohio Department of Education for designing, testing and rolling out our new state science modeling standards for the 2020-2021 school year. I have experience in field research in several diverse ecosystems including reefs of Australia, Serengeti of Kenya, tropical Belize and Costa Rica, many of these field research experiences have prepared me for the challenge of field work in extreme conditions.

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)

A few years ago my STEM team and I found the NASA centennial challenge to design a 3D habitat for Mars and we just knew our students needed to be a part of it. We teamed up english, math, social studies, science, engineering and special education teachers to help create a challenge that was appropriate for our students level but still provided a challenge. We met prior to the project start to lay out the specifics for each of our classes and our roles to help guide the development of the students progress. For my portion of the project, my students had to design a habitat for humans and needed to insure they had enough life support, including correct growing conditions, plant species and nutritional needs for up to 5 astronauts. We even tweeted with the international space station and Astronaut Scott Kelly during our project for some expert advice. At the end of the project students shared their project design, rationale and 3d printed habitats in a community wide presentation.

6. Communicating the Experience and Science

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

And then it began to rain... Today started out unremarkable. My drive into work ebbed and flowed with the traffic patterns, no major delays or break lights in the early morning light, only fields of faint pinks, purples and blues on the horizon. My students were designing their own experiments to test, and the morning flew by like their chatter, light and fun. The entire administration team, head principal, vice principal and the two brand new assistance principals joined my class 7th hour, curious about our lab and how our classroom works. Student's eyes sparkled as they shared their ideas and experiments, eager to answer the probing guest's questions. The hour was moving along smoothly and with out a hiccup, the clock on the wall ticked by unnoticed by the class with only 10 minutes left until dismissal. Student's were smiling, admin's pen's flew across their papers, jotting notes, it was any teachers dream really,I began to exhale... and then it began to rain... but not just the soft pitter- patter on the plastic windows, it began to rain inside our classroom. Our grey ceiling tiles opened up like clouds and a blanket of water began to fall into the room from our artificial sky. It was two tables from the center and to the left front of the room, and time stood still for just a moment as curious eyes turned to gaze, and then time speed up, small shrills and shrieks where let out as students grabbed their precious belongs and tried to move out of the way. As suddenly as it appeared, it stopped and became nothing but a soft drip,drip drip from above. Everyone still in shock, I handed the nearest student a pass and gave the marching orders to head up stairs to let the science teacher above us know his safety shower had gone off and the bell rang and I was left alone to tend the brownish red puddles pooling on the floor in my room.

7. Scientific Interests and Research Area Preference

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

Please explain your preference
Either opportunity would be valuable for my students and I know my principal would be very supportive during this 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 available for any of the allotted amount of time available three to six weeks. As of today there are currently no dates that would prevent me from participating in 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)
Through my masters program I became infatuated with what I saw as the mysterious world of cold climate research and conservation. The life scientist in me loves the uniquely adapted organisms and life suited for this environment past and present. The complexity of the conditions and the effect is has not only on life but the ecosystem and it's formation is memorizing. Unfortunately, but equally important we have a responsibility to investigate how the decisions we are making as a nation and a world are impacting this harsh yet fragile system. I am greatly interested in helping to research and collect data from many different facets of cold climate researching including: historical, present, atmospheric, ecological, marine, terrestrial or human/societal.

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 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 completed field research in Kenya, coastal and rain forest field research in Costa Rica, barrier reef work in Australia and mixed ecosystem work in Belize.

b. Provide a basic statement of your general health and physical condition.
I have a clean bill of health and am an active early 30 year old with no allergies or injuries.

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 operating systems for both Mac and PC and I am proficient in all office and google drive applications.

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 my smart panel in class which runs on an Android operational system and I utilize google classroom with my students for communication and to help them stay organized. I also utilize the google drive suit to help organize my lessons and work. My personal computer is a mac.

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 2015 Costa Rica Fellow

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?
Professional development on cold climate is something that not only personally interests me but I need to help me grow as a professional. It is from my past field experiences that I know that this Polar TREC professional development opportunity is the type of professional development I am looking for and suits my needs.

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

National Science Teachers Association conference (NSTA)

12. References

Reference 1

Name Erica Dodson

Title and affiliation Principal Arts Impact Middle School

Email Address edodson@columbus.k12.oh.us

Phone Number 614-365-5558

Reference 2

Name Lucas Cech

Title and affiliation Principal Marion Franklin High School

Email Address lcech8871@columbus.k12.oh.us

Phone Number 614-365-5432

Reference 3

Name Gregory Costello

Title and affiliation Principal West High School

Email Address gcostello@columbus.k12.oh.us

Phone Number 614-365-5957

2020-2021 PolarTREC Educator Application

L. Christine Hirst

1. Contact Information

Name: Ms. L. Christine Hirst

Email: christinelovesashton@gmail.com

Home Address:
27877 Wakfield Rd
Castaic, CA 91384 US

Home Phone: 8058229693

Cell Phone : 8058229693

Institution Name: West Ranch High School

Institution Address:
26255 West Valencia Blvd.
Stevenson Ranch, CA 91381 US

Institution Phone: 6612221220

Classroom/Office Extension: 305

Institution Fax:

Institution Website: www.westranchhighschool.com

Other relevant websites: www.hirstscience.com www.astrolessons.com

Supervisor's Name: Mark Crawford

Supervisor's Email Address: mtcrawford@hartdistrict.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 high school serves a dichotomous population; we are located in an affluent area less than an hour from Hollywood, so we have aspiring actors alongside children from two extremely impoverished communities in the mountains. These communities do not have WiFi access, and children ride a bus an hour each direction to and from school. Many students in these communities are classified as homeless. Drugs and gangs are prolific in each community. Alternately, many of the wealthy children are left with far too much freedom and little structure. Opiate addiction has plagued our school and taken numerous lives. Our school has moderate access to technology; most teachers have chromebooks in their rooms, however our school has very unreliable 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) 2400

f. School Ethnicity:
% - American Indian or Alaska Native
21 % - Asian
6 % - Black or African American
21 % - Hispanic or Latino
% - Native Hawaiian or Other Pacific Islander
65 % - White
12 % - Multiracial
If your school uses other categories to describe race/ethnicity, please describe:

g. Percentage of students who receive free or reduced lunch: 15

h. Average class or audience size 36

i. Total number of students/audiences you teach in a year 550

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.
Summer: June 4-August 10 Winter: Dec 18-January 13

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 and Earth Sciences

Bachelor's Degree (Minor): Geology, music, recreation

Masters Degree (Discipline): 1) Science Education 2) astronomy (planetary science)

PhD Degree (Discipline):

Other Degree: Geoscience credential coursework

b. How many years of education experience do you have?: 15

c. How many years have you been working at your current institution?: 13

d. List up to 10 relevant professional licenses, certifications, registrations, awards or honors that you have received in your profession::
California Department of Education Specialized Secondary Programs Grant Recipient (2016-2019) National Science Foundation Astronomy in Chile Educator Ambassador Earth/Space Content Specialist for Hart District Earth/Space Content Specialist for StemScopes Professional leader in California Science Project Selected to fly on NASA’s SOFIA Mission Two time Toshiba Innovation Grant Winner Introduction to Engineering and AutoCad educator certificate Culturally relevant teaching and learning certificate Teacher Liason-Space Foundation NASA Solar System Ambassador

4. Professional Assignment

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

Other Primary Assignment

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

Other Subjects High school: Astronomy, Honors Astronomy, Introduction to Engineering College: Physical science, astronomy lab

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 this new realm of digitization, bringing tangible experiences to students is crucial to combat growing disconnect and disregard of scientific truth. In Southern California in particular, students may never be exposed to polar science, or have the ability to connect this research with their everyday lives. The general public is increasingly skeptical of science, and my goal as an educator is to provide the foundation of respectful discourse which facilitates scientific literacy. If selected, I hope to bring the reality and relevance of polar studies to my region in the form of outreach, teacher trainings and conferences. My participation would equip me as an agent of truth to expose thousands of learners to the myriad of science performed in the poles. As an adventurous uterus bearing science teacher, I have an obligation to inspire girls of all backgrounds to explore and to redefine their own narrative. I am constantly encouraging my students to learn from the World around them and to step outside of their comfort zone. This experience would allow me to pass on the torch of knowledge and inspiration.

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 share the PolarTREC experience through social media, workshops and trainings, and community outreach. I feel the most important facet of science outreach is engaging those with minimal knowledge of the subject, so that they are inspired to continue the journey. My goal is to encourage followers or attendees to take the necessary first step and engage. I currently host outreach events at local community centers, and am in the process of establishing them throughout the area. Additionally, I founded the first Astronomy pathway in the State, and am constantly in search of citizen science projects for my students. In so doing, I readily acknowledge my lack of expertise in some areas, however my ability to network and unabashed pleading has forged connections with various experts of notable importance. Additionally, I lead numerous large teacher training activities in California throughout the year I will also be sharing my experiences as an astronomy ambassador at teacher workshops to empower educators to employ polar science in their classes. I am also hosting “stars at the bars” at a local pub. All of these events are focused on spreading truth, awareness and inspiring the next generation.

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

If selected, I would share my experience through teacher trainings, and curricular development. I currently facilitate numerous events, trainings and workshops for California science teachers, as well as developing curriculum at local, State and National levels. My lessons focus on inquiry and engineering practices while integrating scientific principles. If selected, I would immediately develop take and go lessons integrating polar science for use by any science teacher at both middle and high school grade bands. I currently moderate a teacher Facebook page, host an open source website sharing curricula and lead various teacher workshops throughout the State. This would bring my experience to thousands of classrooms. As a Solar System Ambassador, I founded quarterly free community science nights for families. These provide an immense platform to share my experiences with a sizeable audience. I also founded a legacy program of high school mentors, who now facilitate their own outreach program in elementary schools. This program was inspired by my flight aboard NASA’s SOFIA mission. The PolarTREC experience would surely yield countless other events and support in my region.

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 key to engaging learners is relevancy in content and presentation. Years ago, I embraced the use of technology in my courses. I abandoned lecturing in favor of a “flipped” model. I host a YouTube site which houses my lectures, and video instructions for design challenges and labs. I designed all of my curriculum, and use this medium as the explanatory element of my courses. I believe in students designing their own learning experiences. Through high altitude balloon experiments, my students have worked with various professionals to design over 60 authentic experiments. They have written graduate level research papers and presented their findings to NASA mission directors. They emerge with wisdom and maturity unrivaled in a typical science class. My unabashed ability to network and beg has allowed me to forge various connections for the benefit of my students. I have numerous mission directors and scientists on hand to “ask an expert.” While in Chile, I seized the opportunity to interview an incredible female Chilean PhD astrophysicist who has redefined the mechanics and size of the Milky Way. I hosted a live video feed from the observatory, and did a video chat with teachers at a JPL training.

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

I have the ability to honor and respect others while putting the work before people. While I am extremely social, I am also extremely hard working. My motivation, drive and persistence allow me to be the driving force and hardest worker of most projects, and I am often chosen as a leader. I am very organized, and have a macro vision over the majority of situations. I am extremely flexible and adaptable, and am a lifelong learner. When I am passionate about something, I have a laser focus. This allows me to learn quickly and adapt to changes in plan while keeping the goal in sight. I am also resilient and driven by failure, which would cause most people to balk and retreat. When faced with failure or discouragement, I double my efforts to conquer the problem. Finally, I have expert ability to multitask a myriad of conflicting responsibilities and tasks. For example, while in my final year of my second master’s degree, I was thrust into being a full time single mom while finishing my thesis and taking a second teaching job in the evenings at a community college. I thrive when I carry loads heavier than most can in their lifetime.

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 final year of my Master’s, I worked remotely with 5 strangers to write a NASA proposal over a 10 month period. While usually chosen as a leader, this time I was not. Additionally, the project focused on human components of a long duration space mission, while my focus of study was planetary science. I loathe the soft science of psychology, yet I had to immerse myself in studies of isolation, team cognitive function, stress indicators and trauma response. Every component of this project was entirely outside my comfort zone, however I had to learn an entirely new science, and challenge myself to work without acting as a leader. I saw this as an opportunity to humbly learn and grow. I had to learn to rely on others and to build up their strengths, while addressing and building upon my own weaknesses. Our work was demanding and time consuming. As an extrovert and people person, I encouraged participation while we were all getting to know each other, and formed positive relationships with all team members. I also provided all technical and digital support throughout the project. Finally, I provided coaching and support for members who were uncomfortable presenting our work to a NASA director and the science community.

6. Communicating the Experience and Science

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

I love Lego’s. Not only do they inspire creative thought, but they also prepare the most timid soul for the rigors of parenting. Aside from childbirth, there is no greater pain than a minefield of 2x4 bricks barefoot in the dark. Last week we went to LegoLand. This place is pure mom magic. Ride lines surround build centers, so I can securely leave my children waiting in a line while I build and play with other moms. Perhaps it was the fact that my parents feared the dreaded minefield, or perhaps simply because I was born with Ovaries, but I shamefully admit I did not play with Legos as a young lass. My boys build every Starwars fighter, various vehicles, and detailed scenes involving jetpacks and falling buildings. I, however, can build only pyramid roofs, multi-color pyramids, and sometimes even symmetrical pyramids. I can also build a mean staircase. Legoland features models of major US cities such as San Francisco, New Orleans, Washington DC and the Las Vegas Strip. This versatile 2 cm polypropylene brick is truly innovative, yet has also stood the test of time. The original bricks from 1954 snap perfectly to brand new 2019 bricks.

7. Scientific Interests and Research Area Preference

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

Please explain your preference
I generally teach in Hong Kong during the Summer, but due to continued political unrest I do not know if I am going this year. I will likely be designing and designing an international space camp program in the summer, if not in Hong Kong. I prefer Antarctic for the time frame of Christmas Break, as well as my interests in astronomical studies.

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
3-4 weeks due to my school schedule. Longer is an option as well. I could NOT go in mid August.

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 most interested any studies related to astronomy, planetary science and geological processes. I am fascinated by microscopic processes which shape macroscopic phenomena and affect global processes. I have conducted geochemical research on small bodies and am particularly interested in meteorite studies and recovery. I am also very interested in bulk scale changes to polar environments related to ice accumulation and movement and circulation systems. Honestly, I love to learn. I am very flexible in my research preferences and I will create and disseminate a variety of data driven inquiry lessons regardless of assignment .

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 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) I would really enjoy an expedition in this subject area

Other Areas of Scientific Interest
meteorite recovery

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 wilderness and outdoor experience. In my 20's, I was a backcountry ranger in Yosemite and I led trail crews of high schoolers for two summers (one in the Natchez Trace of Mississippi and the other in Golden Gate National Park). I had my Wilderness First Responder, but it has expired. I do have my Wilderness First Aid. I have reset numerous shoulers, splinted many joints and held spinal traction. I spent 30 days backpacking in the High Sierra in college with one resupply, and 2 weeks there this past summer on my honeymoon. I am extremely skilled at Leave No Trace and all aspects of wilderness travel. While in Yosemite, I received training in boating. I have extensive experience far from medical facilities and in a variety of outdoor settings. I camp, hike and mountain bike most every weekend.

b. Provide a basic statement of your general health and physical condition.
I am in exceptional health and physical condition. I was a professional mountain biker until 2016 when I “retired.” I am currently very into heavy weight training and power lifting. I run 10-20 miles per week and ride 30-50.

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.
I am very familiar with both Mac and PC operating systems. I am very comfortable with presentation and production tools in each platform.

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.
I am extremely versatile in all tools of technology. My favorites are iMovie and YouTube video creation, and I am learning how to do AstroPhotography. I have trained teachers in the integration of technology in science classrooms. I use an iPad to record my lectures, which I upload to YouTube, and embed in EdPuzzle with required questions and activities. For my college courses, I embed my lectures into Nearpod which allows me to use formative assessment during lecture. I use devices frequently for my astronomy courses to utilize augmented reality apps to analyze the differences in wavelengths of night sky. I also use physics apps for velocity and acceleration experiments, as well as student recording devices for them to create high caliber projects. Personally, I host a social media page for teachers in which I facilitate discourse and share lessons through Google Docs. I also created an open source website to share my resources.

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

I have intermediate Spanish skills, however I work at this daily and would be proficient by the dates of travel. I travel to Spanish speaking countries a few times a year and my husband is fluent. I have been learning for over a year and have immersed myself in this endeavor. I am an extremely well connected and experienced content developer and forged numerous connections through my selection as an astronomy ambassador. We currently have various plans to develop content and experiences for students and the public.

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 fly on the NASA SOFIA mission as an educator ambassador in 2017. I was selected as an Astronomy in Chile Educator Ambassador in 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?
This experience would truly allow me to unify my experience of astronomy with terrestrial studies. Connecting Earth to Sky is a crucial component to all new science course models (NGSS), as well as overarching scientific literacy. NGSS incorporates Earth and Space science into every new science course in the US, and in some cases comprise 40% of course material. This experience would allow me to connect my previous experiences to every day phenomena, while connecting to every component of the new National education standards. When students are exposed to and see the connections of science to their daily lives, they are more likely to invest their time and potentially their futures. This would also allow me to create high caliber lesson and professional development materials which I would disseminate to a vast audience of teachers and students. The goal of my upcoming PhD is to develop data driven astronomy and Earth science lessons as a capstone experience for all science courses. This experience would be the culmination of my own experience in order to create this curriculum.

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 am applying to be an Einstein Fellow, and had been investigating teacher research positions. This is how I discovered this opportunity.

b. Please suggest other places we might advertise this opportunity for teachers
It would be great to see this plugged on science teacher social media pages or targeting large districts.

12. References

Reference 1

Name Dr. Norman Herr

Title and affiliation Science Education Professor; California State University, Northridge

Email Address norm.herr@csun.edu

Phone Number he only uses email

Reference 2

Name Dr. Brian Foley

Title and affiliation Science Education Professor, California Science Project Director; California State University, Northridge

Email Address brian.foley@csun.edu

Phone Number (310) 3099979

Reference 3

Name David LeBarron

Title and affiliation Director of Curriculum and Instruction, William S Hart Unified School District

Email Address dlebarron@hartdistrict.org

Phone Number 6612590033

Maeve Hitzenbuhler

1. Contact Information

Name: Ms. Maeve Hitzenbuhler

Email: hitzenbuhlerm@westboroughk12.org

Home Address:
124B Main St.
South Grafton, MA 01560 US

Home Phone: 7743-368-0982

Cell Phone : 617-721-0525

Institution Name: Westborough Public Schools

Institution Address:
45 West Main St.
Westborough, MA 01581 US

Institution Phone: 508-836-7700

Classroom/Office Extension: 617-721-0525

Institution Fax:

Institution Website: www.westboroughk12.org

Other relevant websites: My blog: Botswana Fulbright botswana18.blogspot.com

Supervisor's Name: Daniel Mayer

Supervisor's Email Address: mayerd@westboroughk12.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): Culturally and linguistically diverse students, many recent immigrants. Approximate 1/4 of our district's student population are English language learners. We are a public school system. Of the English learners in our program, 98% receive free/reduced breakfast and lunch. I sit on my town's Diversity Committee which seeks to promote open dialog and community interaction, run our communities evening classes for parents and literacy nights in our districts' large housing complexes and trailer parks.

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) 4,000 students district wide

f. School Ethnicity:
% - American Indian or Alaska Native
20 % - Asian
2 % - Black or African American
40 % - Hispanic or Latino
% - Native Hawaiian or Other Pacific Islander
38 % - White
% - Multiracial
If your school uses other categories to describe race/ethnicity, please describe:

g. Percentage of students who receive free or reduced lunch: Of the students in our English learner program, 98%

h. Average class or audience size 27

i. Total number of students/audiences you teach in a year I team-teach in grades 6-12, approximately 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.

Start date end of August, end date third week in June. We have one week vacation surrounding the Christmas holiday, one week vacation the third week of February and one week vacation the third week 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.A. Political Science

Bachelor's Degree (Minor): Economics

Masters Degree (Discipline): Urban Planning and Policy

PhD Degree (Discipline):

Other Degree: One year certificate course at Johns Hopkins in environmental science

b. How many years of education experience do you have?: 23

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::
2019: Grosvenor Teacher fellow, National Geographic, focus of study, micro-plastics 2018: Fulbright Distinguished Awards in Teaching to Botswana to study the socio-linguistics of multiple languages in public school settings 2016: National Endowment for the Humanities fellowship to study Mesoamerican history in Oaxaca, Mexico 2011: Fulbright to Thailand, Vietnam and Cambodia to study culture and history 2010: National Endowment for the Humanities fellow to UC Santa Cruz, to study world environmental history. 2009: National Endowment for the Humanities fellow, Research Triangle Part, to study US Environmental history. 2005: Fulbright to Morocco and Tunisia to study the impact of globalization on the environment. 2001: Shulman Teaching Away: feeding the neighborhood, creating community vegetable gardens

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 I coordinator our English language learner program. In this capacity, I team-teach in science and social studies classrooms and develop curriculum for the program.

b. What subjects do you teach? Check all Middle School Science, Middle School Social Studies, Secondary Geography, Secondary Physical Science, Secondary 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)

Experiential learning translated into student learning and community activism, understanding of the polar regions of the world in a way that I might spark excitement and interest for my district's culturally and linguistically diverse students to engender exploration of the heartbeat of the world from a polar perspective through Polar TREC. I serve English learners who come to my district from throughout the world. Most experience trauma during their journeys as they navigate a world of borders, hunger, refugee camps, and detention centers often as unaccompanied minors. Our students routinely express their love for the United States, and a freedom they have not experienced previously during their young lives. In an effort to ensure student success, our English learners are placed in team-taught academic classes (an ESL teacher and a subject matter teacher--biology, health, chemistry and physical sciences). My work is to write curriculum that propels student understand of the sciences and humanities while they are learning English. In this capacity, I team-teach with subject matter teachers, train teachers, and write curriculum. I work with the state department of education to create model curriculum which shelters English so that students can develop deep understanding of science. We currently completed an in-depth "access to clean water unit".

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 have had the great fortune to participate in four Fulbright's during the course of my career and National Endowment for the Humanities fellowships. Each of these organizations has list-serves that reach hundreds of educators nationally. My blog, photos and journaling will be available to them. In addition, I am an active member of the National Geographic on-line educator's community. This on-line community posts daily the experiences of teachers working to instill best practices in environmental science, and student activism with regard to global environmental issues. As part of a world-wide community of educators who teach academic subjects while scaffolding English to make said subjects accessible to English learners, I am very active on the state level with two organizations (MATSOL, MA teachers of students who speak other languages and MELLC, a leadership network of teachers who work as coordinators of second language programs). I present at MATSOL and

MELLC conferences each year and would be honored to present about Polar TREC's mission and work in the field with researchers and educators. In our classrooms, the possibilities of creating an interactive unit on the Artic is endless, I would start with students painting and/or creating multi-media to present the story of Artic ice from the perspective of Artic ice.

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

In addition to presenting to a number of state-wide and international organizations listed above, I am very involved with my local community. I sit on the Diversity Committee of my town, which is a community based organization. I write grants each year to provide free English classes to over one hundred parents each Thursday evening and another grant for teachers to teach literacy during the evening in our housing complexes and trailer parks. During the evening parent classes we teach English while exploring current topics. Presenting and writing curriculum about the polar regions of the world could open new ways of embedding the sciences and scientific analysis into our adult curriculum. In the past, my students' work has been exhibited in our public library, fire department, police station and local supermarkets and town hall. I would utilize these same venues to share my experience with PolarTREC and our community at large. In addition, the Worcester Museum of Art seeks photographic exhibits of travel from around the world. My photographic exhibit from the Kalahari desert was exhibited last winter. This would be a great venue to share Artic experiences with PolarTREC.

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 generally begin class with a problem to solve and are group with local students and other students from throughout the world. Informational centers are set-up throughout the room including multimedia, research, readings, policy, data analysis tool centers and a creative arts center so that students might work through an issue, such as global warming, musing a multidisciplinary approach. Vocabulary is scaffold and tiered for the unit to meet students where they are in learning English and we build on that. Scaffold (multiple leveled) readings and reports are presented so that students have access, and students often develop their own inquiry based projects on topics/issues. Students utilize translation apps, paints, technology, and multimedia to show meaning in their discoveries and work. I often take students out of the classroom to local science museums and the community (the whaling

museum, the Boston Museum of Science, local farms, botanic gardens, community activists at work, and MIT's media lab), so that students have the opportunity to speak with people in the field. Students often pitch projects they will work on locally and appraise the global impact of their work.

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

During the course of my career in education, I have worked in leadership capacities, however, I don't believe there is true leadership without collaboration. Working in teams of multidisciplinary partners, I believe, will change the world. On the local level, multidisciplinary teams bring many perspectives to how school communities function and succeed. I have great respect for the natural world, and feel most alive when I am out in the world. Being able to work in diverse settings, in sometimes in harsh environments (while on Fulbright to Botswana, I lived in the Kalahari desert where I was taught by my local community how not to fear cobras, how to collect water and firewood, hot to be comfortable with not having enough to eat) is what I love. I have a keen sense of adventure, however, I am a very engaged worker. Although born and raised in Brooklyn, NYC where concrete jungles often overshadowed trees and parks, it is the great beauty of the natural world that has inspired me since I was very young: Central Park, I thought as a kid, would be what heaven would look like. I believe in the natural world, and will do all that I can to impact our young learners to ensure its survival.

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 an educator, team-teaching is the most exciting aspect of my work. To truly team and align curriculum, teacher personalities, work ethic and lesson delivery models take time, diplomacy and patience. The impact for students of this collaborative effort is multifaceted. Students observe their teachers negotiating, delivering lessons together and working through differences. They see the value in collaboration and in turn become more collaborative themselves. I also serve as the coordinator of our English language program. In this role, I work collaboratively with teachers and the community to develop many community based programs through grants including English classes for parents, literacy nights in the district's housing complexes and a summer program for our students to work in local botanical gardens. I co-teach a cultural proficiency course with a colleague from India in which we engage in conversations about culture and race. The course includes teachers, administrators, custodians, support staff and food service workers. As a tenant and community

organizer in Louisiana and Mississippi for eight years after graduating from college, I depended on my local community to help me understand the community needs. The community taught me about the culture of the 9th ward in Louisiana, the legacy of slavery and the daily burden of discrimination.

6. Communicating the Experience and Science

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

We started the school year more than a week late: four of our district's seven buildings had undergone construction during the summer and due to heavy rains and delays, school would not start on time. Some chaos ensued (the delay would change end of term dates, exam dates, the last day of school--and how would we schedule snow days?!) However, teachers, custodians and administrators all worked together to make our classrooms and buildings welcoming for students, parents and the community. When we finally received our building permits, school would start the next day! We stayed late into the night working. During this time, my dog of 17 years became very weak from cancer. Students knew of my dog, who had been picked up off the streets of Peru while I was teaching there. I let students know I would need to put my dog down. My students are the bravest human beings I know. They come to my district from countries throughout the world and have often lost a country, a culture and family as they struggle to adjust to a new school system and country. They talked about losing their own pets while living as refugees, fleeing gang violence and displacement due to environmental degradation. They made me feel so grateful to have had a dog for so many years. I put my dog down on the first day of school, peacefully. With all of the franticness in readying for a delayed started of the school year, I realized (once again) how schools are vibrant communities, how each one of us makes the other strong. Some of the greatest lessons in gratefulness and humility in my years of teaching has come from my students. And so, we begin the school year once again, full of expectation and adventure and seeing ourselves reflected in one another.

7. Scientific Interests and Research Area Preference

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

Please explain your preference
Students are keenly interested in the Artic and we are developing units of study grades 7-12. The Artic is in the news frequently and this generates deep student interest in how and why the Artic is degrading, how this will impact the health of the environment and people in the Artic and what does it mean as gross volumes of Artic ice is melting for the rest of the world. There is a real sense of urgency among students and teachers.

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
Up to a month or six 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 am deeply interested in climate change as seen in the Artic and its impact on the world, how climate change research is conducted and data analyzed, the impacts of climate change on ice sheets, and sea levels, and the six countries that are part of the Artic region. I am so very interested in how the native peoples of the region, the Inuits, the Sami and the Yaknuts have adapted to climate change and how climate change has impacted their daily lives and traditions. What impact has the change had on polar bear, artic foxes, caribou, snowy owls and musk ox? I have followed the blog of Kim Young, recently returned from the field with Polar TREC. (I met Kim through Fulbright and she has encouraged me to apply!) Her research team study of "Phenology and vegetation change in the warming Artic" has been included in the curriculum as we are writing it. Students and colleagues alike were fascinated by her blog. Students were captivated by PolarTrec research on sea ice loss and indigenous lives. I hope to be part of a PolarTREC research collaboration, to feel, develop insight, and to perceive the Artic and to mobilize my students and community to want to know more and to act.

Atmospheric Systems

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

Terrestrial Systems

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

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)
No.

8. Background Information and Skills

a. Briefly describe your outdoor skills or experiences.
Living in the Kalahari desert, Botswana, learning to collect water from plants and food from the desert. Kayaking (anywhere in the world), life guard in college, marathon runner, hiking throughout New England.

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

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.
Use daily data systems, PowerSchool and Ellevation. Two day training of overview of GIS systems at Framingham State. Attended a week long workshop at Harvard University's Global Studies Outreach program, entitle, "The Internet: Tangle Webs, Global Promise" to understand the impact of technology world wide.

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.
Google earth and maps, I-movies, 360 camera, digital camera, iPhone, laptop, power point, data systems, educational apps and translation apps.

e. List any additional skills or information that you wish to be considered.
Proficiency in Spanish, poet.

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
Kim Young, former PolarTREC participant.

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
Grosvenor Teacher fellow list serve, National Geographic educator community list serve, Fulbright teacher list serve.

12. References

Reference 1

Name John Mendes

Title and affiliation Principal

Email Address mendesj@westboroughk12.org

Phone Number 508-836-7760

Reference 2

Name Laura D'Elia

Title and affiliation Head librarian, Armstrong School

Email Address delia@westboroughk12.org

Phone Number 508-836-7760

Reference 3

Name Meg Maccini

Title and affiliation Senior program analyst, Brookline public schools

Email Address meg_maccini@psbma.org

Phone Number 413-695-8677

2020-2021 PolarTREC Educator Application

Janet Hollingsworth

1. Contact Information

Name: Janet Hollingsworth

Email: janet.s.hollingsworth@gmail.com

Home Address:
75 Heather Lane
Princeton, NJ 08540 US

Home Phone: 7208997011

Cell Phone : 7208997011

Institution Name: Washington Leadership Academy

Institution Address:
3015 4th Street NE
Washington DC, DC 20017 US

Institution Phone: 7208997011

Classroom/Office Extension:

Institution Fax:

Institution Website: washingtonleadershipacademy.org

Other relevant websites: bldg61.org janethollingsworth.com

Supervisor's Name: Stacy Kane

Supervisor's Email Address: skane@wlapcs.org

2. Demographic Information

a. Gender: Female

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): Urban high school environment, 80% of students are first in family college-bound. This public charter school is in the heart of DC serving underrepresented students with a focus on project-based learning, computer science education, and social justice. I serve as the director of making and innovation integrating maker education with curriculum across all grade-levels, working directly with students to fabricate projects in the makerspace and solve real-world problems, and facilitate community partnerships and internship opportunities for students.

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) 400

f. School Ethnicity:
% - American Indian or Alaska Native
% - Asian
80% % - Black or African American
10% % - Hispanic or Latino
% - Native Hawaiian or Other Pacific Islander
% - White
10% % - Multiracial
If your school uses other categories to describe race/ethnicity, please describe:

g. Percentage of students who receive free or reduced lunch: 90%

h. Average class or audience size 20

i. Total number of students/audiences you teach in a year 400

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.

Starting August 1 through June 19. Winter break: December 20 though January 6.

3. Teaching Experience and Education

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

Bachelor's Degree (Major): BS Civil and Environmental Engineering (magna cum laude)

Bachelor's Degree (Minor):

Masters Degree (Discipline):

PhD Degree (Discipline):

Other Degree: BA Architectural Studies (cum laude)

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

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::
Library Journal Mover and Shaker, 2019 City of Boulder Innovation Award, 2018 LEED Accredited Professional

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 [webform_submission:values:subjects]

Other Subjects Maker Education integration to all disciplines, with focus on computer science, project-based learning, and citizen 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)

Humans excel at making things and telling good stories. I believe the PoarTREC opportunity would provide an extraordinary opportunity to do both of these things. I am passionate about helping others and solving problems with limited resources through hands-on means and I am dedicated to creating spaces where people of all backgrounds and abilities are respected and encouraged to participate in skill-exchanges and share stories. It is through these connections that we can collaborate robustly and discover unexpected solutions to problems. In extreme environments, outside conditions and limited resources can intensify problems that need to be solved. A culture based in creativity, agility and respect for others provides the best conditions to move forward. This is what I will bring. What I hope to gain is relationships with new people and engagement in a specific scientific project at a detailed level, learning more about what it takes to work in extreme environments and sharing this with my students. I hope to also gain resiliency skills and experiences that can be applied directly to the classroom. I would like to find ways to have my students be engaged in real time with the work I do if I were lucky enough to have this opportunity.

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)

This year I will be receiving my HAM radio licence along with young women and student of color in my classroom. We are redefining what this audience looks like and will stay engaged with each other in real time through this means if possible. I also plan to challenge my students with a 1-inch cube challenge: to provide me with something they want me to contribute to the PolarTREC community and to request a similar cube of an object they would like to get back from the pole (if permissible). If I am able to bring or have access to a 3D printer (or laser cutter), I would like to activate that for students and scientists alike in design sprint challenges for items that need to be developed (this can extend past the scientific research and include challenges with the kitchen or cleaning staff or other individuals with specific needs). Through assessing every day problems and activating students and community members back in DC to get engaged we can create real connections at a distance.

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 this experience at relevant conferences like SXSW Edu, MakerEd Convening, and others to share how we can inspire students and researchers to collaborate and design together, even when at a great distance. This type of design exchange through maker education and fabrication is a new form of applied engineering and I will share this through blog posts and social media circles as well. The Washington Leadership Academy is also in the unique position of being an XQ Super School and receives attention from policy makers in DC, this would also be a part of the impact participating in PolarTREC would have. I would represent the school and this program as part of what citizen science engagement can look like.

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

It's all about finding the right analogy. Meet students where they are at. Find out what they are passionate about and develop the proper analogies. This takes dedication and time to build relationships with students, but once this base is laid it is a great foundation to provide inspirational and aspirational ideas. I have spent the past 8 years in public library makerspaces and know how to break complex problems down and scaffold learning environments. This can be explaining the gasses that work inside laser cutters or how a spindle on a CNC machine works to a young person. During the last internship I facilitated called Space Camp we taught 9th grade Latinx students with no prior coding experience how to blink an LED with Arduino, from there we explored sound piezos as the analogy for radio frequency and looked at signals in different ranges. We were then able to explore GPS and program sensors that would help us track/retrieve our payloads for high-altitude balloon launches and collect data on the environment (humidity, temperature, air quality, etc). Students also built their own yagi antennas using every day materials and hacked tape measure parts. These are ways that we can break down complex information and make it exciting and enthralling.

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

I believe everyone has unique experiences and skills that will benefit a team. Part of my contribution is fostering this type of environment for the best ideas to come forth. I am a team player in every sense, and love collaborating and learning from others. My unique background in engineering, furniture making, and education positions me to fill in many areas. Mostly what I bring is an exceptionally positive attitude (I don't know how to say no, and I love saying yes to figuring challenging

things out!) and a passion for hands-on making. I tinker with motors, bikes, computers, 3D printers, Arduinos, laser cutters, woodshop equipment and more in my spare time. I bring an engineering mindset that is very methodical to everything I do. I also bring my notebook everywhere because you never know when an impromptu brainstorm will happen, and sketching is sometimes worth a million words. I also have a great amount of endurance--I biked across the country when I was 16 and participate in ultra endurance bike races!

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 previous job was creative technologist at BLDG 61, the Boulder Library Makerspace. There I shared my title with two other colleagues. We worked brilliantly together, and took BLDG 61 to national and international recognition in less than four years. In the team, we trusted each other implicitly and would check in weekly to make sure our north star was still guiding us all the same way. We had unique strengths and celebrated each other and pushed each other to learn more and work more efficiently by leaning into the team without taking it out of balance. Sharing the same mission and vision was a vital part of this dynamic. We have often been asked what the 'secret sauce' to BLDG 61 was, and I believe it lies in the team dynamic. Space Camp, mentioned above, required that our team work 12+ hour days to keep the students on track. We developed curriculum for the subsequent day after each session to course-correct along the way and make sure we were optimizing student engagement and depth of learning. We had real demands like launching and retrieving with the students (50+ miles of driving a van of teens), visualizing the data, and presenting the findings to the community at a large event.

6. Communicating the Experience and Science

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

October 1, 2019: bruised and sleep deprived. It's so weird looking at all of your belongings nested together into 6x12 feet. My bike and toaster have never been so close before in space and time. I had been doing tetris for the past week making sure I could get it all to fit, and hoping the exact dimensions spec-ed online were in fact accurate. I put together a scale model of all my furniture and the van to make sure it would work. Mostly it prompted my friends to say, 'wow... we're so... different!' But it worked. And after a decade of living in Boulder Colorado, I was off to quite possibly the most opposite city in the US. Washington DC. And here the adventure begins...

7. Scientific Interests and Research Area Preference

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

Please explain your preference
Would need to time this for US summer, to avoid the school year.

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
Anytime mid June through early August.

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)
Anything that involves applied engineering, applied physics, biological adaptation, space sciences, marine development, cryospheric systems, ocean conservancy, impact of microplastics on polar marine zooplankton, and more. I am truly fascinated by a wide range of research happening in the antarctic and would be passionate about any team I end up on.

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 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)

Michael Gooseff, University of Colorado, michael.gooseff@colorado.edu I am open to any and all researchers! I just happen to have a connection with Michael.

8. Background Information and Skills

a. Briefly describe your outdoor skills or experiences.
Extensive outdoor experience back-country camping in the US and New Zealand (for up to 1 week self supported); extensive road biking expeditions including biking across the United States, China, and Russia. All of these experiences mentioned included camping and needing to plan for food and water for many parts of the trips.

b. Provide a basic statement of your general health and physical condition.
Excellent health and very active. I bike everywhere (do not own a car) and run, climb, and hike extensively. I am picking up ice hockey currently and love learning new things. I have no illnesses or health conditions. I am in my 30s.

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.
Proficiency with iOS and PC systems as well as Arduinos, Raspberry Pis and more. I am very skilled with computer and graphic design programs as well and interfacing with technologies like laser cutters, CNC machines, 3D printers and more.

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.
Use and teach students of all ages how to use laser cutter, 3D printers, sewing machines, screen printing equipment, looms and spinning wheels, vinyl cutter, CNC machine, tablesaw, jointer/planer, bandsaw, drillpress, and more safely and effectively. Digital design softwares include Adobe Creative Suite, SketchUp, AutoCAD, Solidworks, TinkerCAD, and more. I use technologies and machines every day and teach people of all abilities and learning styles how to safely use the tools to fabricate their ideas into reality.

e. List any additional skills or information that you wish to be considered.
I have been told that my enthusiasm for learning and solving problems is contagious. I love meeting new people and making up games with random objects. I am thrilled at the prospect of participating in 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. 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
Kathryn Riddle Penzkover

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

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 Aimee Schumm

Title and affiliation e-Services Manager Boulder Library

Email Address schumma@boulderlibrary.org

Phone Number 303.441.4103

Reference 2

Name Kathryn Riddle Penzkover

Title and affiliation Assistant Director CU Science Discovery

Email Address kathryn.penzkover@colorado.edu

Phone Number 303.492.0303

Reference 3

Name Adam Watts

Title and affiliation Creative Technologist BLDG 61

Email Address wattsa@boulderlibrary.org

Phone Number 720.899.7017

2020-2021 PolarTREC Educator Application

Susan Holt

1. Contact Information

Name: Ms. Susan Holt

Email: susan.holt@aol.com

Home Address:
PSC 2 Box 15032
APO, AE, 09012

Home Phone: +49 15229869983

Cell Phone :

Institution Name: Ramstein High School

Institution Address:
Unit 3243
APO, AE, 09094-3243

Institution Phone: (+49) 637-147-6951/2

Classroom/Office Extension: 2892

Institution Fax: (+49) 637-144-776

Institution Website: https://www.dodea.edu/RamsteinHS/

Other relevant websites:

Supervisor's Name: Mrs. Sharon O’Donnell

Supervisor's Email Address: Sharon.ODonnell@dodea.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): Department of Defense Education Activity (DoDEA) High School students of the American military community supporting Ramstein Airbase in Ramstein, Germany.

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

Other Type of School Department of Defense

e. What is the population of your annual audience or school (estimates are fine) 1200

f. School Ethnicity:
0.33 % - American Indian or Alaska Native
4.63 % - Asian
12.79 % - Black or African American
19.28 % - Hispanic or Latino
0.55 % - Native Hawaiian or Other Pacific Islander
61.95 % - White
0.47 % - Multiracial
If your school uses other categories to describe race/ethnicity, please describe:

g. Percentage of students who receive free or reduced lunch: 5%

h. Average class or audience size 24

i. Total number of students/audiences you teach in a year 126

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.

2020 Spring Break April 6-10 2020 Last Day of School June 12 2020 First Day of School August 17 2020 Winter Break December 21- Jan 1 2021 Spring Break March 26 – April 2 2021 Last Day of School June 10

3. Teaching Experience and Education

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

Bachelor's Degree (Major): Biology

Bachelor's Degree (Minor): Agriculture

Masters Degree (Discipline): Biological Science

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?: <1 (newly transferred from Vilseck High School in Germany where I was for 5 years)

d. List up to 10 relevant professional licenses, certifications, registrations, awards or honors that you have received in your profession::
National Geographic Certification 2018 Ongoing STEMposium mentor for European High School Students (Simulated crisis with students playing engineering roles) DoDEA Europe East $martmoney grant winner 2017 (Doctoring DNA project) and 2018 (What’s in a Watershed project) SET Sail United States Naval Academy teacher training 2015 Invited to participate on research cruise aboard R/V Knorr to investigate the use of a new technique for acquiring core samples off the New England coast. 2007 Selected and participated in ARMADA project research opportunity SEATOS (Sumatra Earthquake and Tsunami Offshore Survey) 2005. Founding member Arizona Project WET Advisory Board 2004 Arizona Biotechnology Committee, 2003-2005

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 General Science

Other Subjects 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)

The opportunity to work for the Department of Defense in Europe is one that brings a new level to personal and professional development because of the exposure to the history, the cultures and immersion in an environment where you cannot speak the language. As a science teacher, though, it has been difficult to find a strong professional development opportunity that I could attend for an exposure to scientific research and people who are passionate about sharing this information. Between teaching courses of environmental science and biology and mentoring for Junior Science and Humanities Symposium (JSHS), an original research competition for high school students, the lack of actively being involved in hands on research has caused me to feel out of touch. When participating in hands on research opportunities, I bring a renewed enthusiasm and creativity into my professional life. PolarTREC fits in perfectly with my goals and needs to accomplish this.

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)

It is necessary for a teacher to be a creative soul. In my opinion, good teachers are always thinking about how to incorporate experiences and new knowledge into the classroom in some creative, meaningful and challenging manner that exposes students to new ways of thinking or to a career they might not have known existed. In a prior research experience, each of the geologist I talked to told me how they did not know they would be interested in geology but found their career path by taking the class in college. One of my professional goals is to always take an opportunity to talk about possible careers in relationship to what is being taught. So the experience gained from participating in PolarTREC would trickle into my classroom in more ways than a planned lesson around the experience.

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 website, Facebook page and the district’s newsletter would be a way to share the experience with the community but, even broader exposure would be with the many soldiers hearing about it from the newspaper, Stars and Stripes, and the radio/ TV interviews that could be done with AFN (Armed Forces Network). Within the

Department of Defense European schools, as with many schools across the country, funding for professional development has been limited and teachers are often directing the professional development opportunities. The creation of a project based lesson around a research experience is challenging and fun. This could be shared during a professional development day for teachers in DoDEA schools in my area. Another means for sharing this experience would be participating with other PolarTREC participants' classrooms. We could collaborate on a lesson and share our data or projects with each other.

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 approaching a new lesson involving complexity, I use a blend of videos, games (like Kahoots or Quizlet) for vocabulary reinforcement, and hands on labs where students have to synthesize the pieces of information to solve a problem. An example is a lesson about pH. Students are shown a video (such as those by The Amoeba Sisters) to introduce the general concept. Students are guided to create a folded project explaining how pH is a range of numbers, what those numbers mean and how acids and bases are categorized. A hands on lab identifying which antacid would best treat indigestion would be conducted and then a concept review using an online game platform would be played.

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

When working with a team, my strengths include enthusiasm to experience and learn something new, a willingness to get dirty, and creativity to solve problems with a humbleness to realize others have many ideas which are better than mine. I listen, which is my greatest strength.

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)

Freshman academy was an effort to assist the incoming students new to the high school. As a team member of the academy, we met every week to identify and assist students that were struggling to succeed. As part of a team, we discussed the positive traits of the student identified, discussed where they seemed to be struggling within our classrooms, came up with a plan to help the student, and implemented the plan. My role was to identify problems, submit ideas, listen to suggestions made by others, and support the decision made while implementing the

plan. The follow through and communication between members resulted in reducing the number of freshmen failing one or more classes by 76%.

6. Communicating the Experience and Science

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

The rain had blown sideways, inundating every crevice of the large cherry tree in the backyard. When the sun broke, I took the opportunity to bask in the cleansed air and coolness, standing in the grass with the sound of dripping around me. A slight rustling sound and movement in the branches of the waterlogged tree caught my attention. Looking up, a bedraggled, feathered mass peered back at me with huge yellow eyes. She was peering at her biggest fan for she is the catcher of mice and the ultimate reducer of holes in the manicured space where I stood. The owl did not look as regal as she did on the nights she patrolled the darkened evenings but she still looked dignified. What could I do for her? I could only walk away to let her regroup and dry her feathers before night came where she could once again fly in majestic arcs, cleaning up the space I borrow during the day.

7. Scientific Interests and Research Area Preference

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

Please explain your preference
If it is possible to reduce the number of days I am not in the classroom, the Arctic would be preferred. But if this would eliminate the opportunity, either location is exciting and acceptable.

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
There is no preference on amount of time for participation. I have an obligation June 13 -20, 2020 where I would be unavailable.

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)
This might be the most difficult question so far because my interests are so wide and there are so many topics yet to explore. How would one know this is an interest if they do not know about the topic? Since my teaching assignment and favorite class is environmental science, terrestrial systems would be one interest I would rank highest as well as ecology and biotic systems. Cryospheric systems would be another top choice because of the deficit in my background experiences and how it could apply to my teaching assignments.

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 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 grew up hunting, camping, hiking, boating on lakes and rivers, whitewater kayaking, and had lifeguard training. Two summers ago, I spent six days completing a hut to hut hike on part of the King's Trail in Northern Sweden.

b. Provide a basic statement of your general health and physical condition.
Heavier than I need to be but very healthy and strong.

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.
At school, I use Windows on PCs and at home MacOS Sierra (because my older iMac cannot handle the newest OS). I am proficient in the use of these operating systems.

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.
DoDEA has invested in student access to the Google Suite to include doc, sheets, slides, hangout, gmail and use a communication platform called Schoology. Schoology allows teachers to share documents, links, upload assignments and videos and have students submit papers through Turnitin. These are used daily. Document cameras and Smartboard are used in the classroom. Personally, my cell phone apps are used to communicate with family and friends. This includes Kik, Messenger, Whatsapp, Instagram and Facetime. I enjoy new technology and learning how to use 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. Yes

Program Information ARMADA project research opportunity SEATOS (Sumatra Earthquake and Tsunami Offshore Survey) 2005, Indian Ocean

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?
Since my last research experience was many years ago, PolarTREC would allow me an experience to refresh and improve advice for students conducting original research and bring in a new knowledge where I can speak with authority. Students seem much more interested and curious when one can bring personal experience into the lesson.

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

Browsing teacher research experience opportunities to identify possible opportunities for hands on research.

12. References

Reference 1

Name Mr. Marc Villarreal

Title and affiliation Principal, Vilseck High School

Email Address marc.villarreal@dodea.edu

Phone Number +49-09662-83-2864/8505

Reference 2

Name Mr. Shawn Rodman

Title and affiliation Vice Principal, Vilseck High School

Email Address Shawn.rodman@dodea.edu

Phone Number +49-09662-83-2864/8505

Reference 3

Name Mrs. Mary Corrigan

Title and affiliation Science Teacher, Vilseck High School

Email Address Mary.corrigan@dodea.edu

Phone Number +49-09662-83-2864/8505

Blake Hoover

1. Contact Information

Name: Mr. Blake Hoover

Email: mowglie.hoov@gmail.com

Home Address:
212 N 1120 East
Orem, UT 84097 US

Home Phone: n/a

Cell Phone : (435) 671 - 2437

Institution Name: American Fork Junior High School

Institution Address:
20 North 1120 West
American Fork , UT 84003 US

Institution Phone: (801) 610 - 8750

Classroom/Office Extension: 405 - 143

Institution Fax: (801) 756 - 8407

Institution Website: afjh.alpineschools.org

Other relevant websites:

Supervisor's Name: Jake Anderson

Supervisor's Email Address: jakeanderson@alpinedistrict.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): American Fork Junior High School is a large junior high. We have almost 2,000 students. We are the only public Junior High in our city of about 29,000 citizens which is quickly growing. American Fork would be considered rural / urban. American Fork Junior is about “average” in the area of technology. All students have access to basic educational technology throughout the school and a push to have a computer for every student in every classroom is being implemented. We have all levels of economic diversity at AFJH many families are doing quite well, but we also have a sizeable community of economically disadvantaged students who worry more about their next meal than their grades. 23% of our students are on free or reduced lunch programs. There are many varieties of economic opportunities in American Fork, primarily technology, agriculture, and service oriented companies. There has been a big push for the collaboration of public schools and these industries to better promote and support one another. Utah’s suicide rate is nearly twice the national average. The state’s Department of Health revealed that suicide is now the leading cause of death among 10-17 year-olds in Utah. Current mitigation efforts focus on teachers, who are at the front lines with the kids.

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) Around 2000 students

f. School Ethnicity:
0.25% % - American Indian or Alaska Native
0.76% % - Asian
0.5% % - Black or African American
8.73% % - Hispanic or Latino
.96% % - Native Hawaiian or Other Pacific Islander
85.78% % - White

2.99% % - Multiracial

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

g. Percentage of students who receive free or reduced lunch: 23%

h. Average class or audience size 37

i. Total number of students/audiences you teach in a year about 560

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 start: August 20th Fall Break: October 17th – 21st Thanksgiving Break: November 27th – December 1st Winter Break: December 21st – January 5th Spring Break: April 4th – 12th Last day of school: May 29th

3. Teaching Experience and Education

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

Bachelor's Degree (Major): Technology and Engineering Education

Bachelor's Degree (Minor):

Masters Degree (Discipline): Technology: studied Multidisciplinary collaboration and its effect on the collaboration of innovation teams. Link to thesis article: https://scholarsarchive.byu.edu/cgi/viewcontent.cgi?article=7626&context=etd

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?: 4

d. List up to 10 relevant professional licenses, certifications, registrations, awards or honors that you have received in your profession::
- Professional Educator License for the State of Utah Level 2 - State educator endorsements: - General Career and Technical Education - Technology and Engineering - Multimedia - TV Broadcasting - Exploring Computer Science - American Fork Junior High School teacher of the month: December 2017 - Utah ACTE Technology and Engineering New Teacher of the Year 2018

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 [webform_submission:values:subjects]

Other Subjects Secondary: Technology and Engineering, Computer Science, Yearbook, College and Career Awareness, Digital Media.

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 first learned about scientific expeditions to the Antarctic when starting my graduate work at Brigham Young University in Utah. I was helping with the development of an educational Alternate Reality Gaming (ARG) experience called DUST that brought players through scientific questioning and analysis to solve a hidden message in an alien bacterial invasion of earth. Dr. Byron Adams was working with us to incorporate tardigrades and other microscopic life into the gaming experience and there introduced me to the research he had been performing in Antarctica. I was then reintroduced to Antarctic expeditions last year when our local science teacher, Kevin Dickerson, invited us to participate in helping our students analyze some of the data that had been collected at the Dry Valley LTER¬ as well as follow his experience. From these opportunities I have seen the potential drive that working with solving “real” problems, or performing “real science” affects students’ intrinsic motivation for learning. Students love it and I want to bring home those real problems so I can challenge them to perform real science to design technology and engineering solutions and find their passions.

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)

Teaching the technology and engineering portion of STEM, I help students see the outcome of what they are learning in their science and math classes by applying it. I do this through giving my students design briefs or challenges from real world situations and then working with them as they strive to find creative solutions. For example, when Kevin Dickerson was in Antarctica, I was able to have my all female Exploring Engineering course learn about Antarctic climate and materials science to create ways to keep warm in such harsh conditions. We were able to test their projects in our classroom freezer, but it was when Kevin took one of their designs, built, and tested it in the actual environment that the project became real. I want to integrate more engineering design challenges from these types of extreme environments into my classroom curriculum. I have been reading up on some of the expeditions and how they have had to learn and adapt to accomplish their designs. I know that when presented with extremes, extreme innovation must take place to make scientific research possible and I feel Antarctica is a perfect example to help

the students find application of their learning.

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

Engineering and technology is a developing and growing content area that is currently expanding. I would like to bring my experiences and challenges to present to my students as well as sharing them in my collaboration teams and at our annual state conferences so that other teachers can take from these ideas and apply them to their own classrooms. I also have a former professor who has been performing trainings and developing curriculum for elementary school teachers who are beginning to implement more STEM, and specifically engineering challenges, into their classrooms. I would like to help these teachers utilize the resources available and the challenges and experiences that I have to teach their students as well. I have an extensive video and film background and would love to make short films about the various studies being conducted on the Antarctic continent to be used by PolarTREC and the researchers as a form of publicity and public awareness.

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 enjoy using a lot of visuals and real-life scenarios to capture my students' attention and make their design challenges applicable to their future careers. I take the stance that I understand they will not all grow up to be engineers or scientists, but they will all be presented problems to be solved, or processes which need to be improved, and they need to know how to go about understanding the problem and designing solutions. We will often begin with paper and pen, drafting designs, and at times creating scale prototypes out of cardstock. Once a design has been proofed, the students then create digital templates on the computers that they transfer to CNC machinery or print into templates to manufacture the final product out of plastics, metal, wood, or a combination of the three. In the end the students have a physical product that they can test to prove their hypothesis and functionality of their design.

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

I am young, healthy, experienced in outdoor adventure, general construction, manufacturing methods, mechanics, and am an experienced videographer. I understand that working in a harsh environment requires hard work. Growing up as a farmhand has taught me the joy of manual labor and a strong work ethic. My

undergraduate work is from the College of Engineering, so I not only know theory but the application of engineering principles. Being a “shop” teacher I have a background in machinery and construction methodology on a small and large scale. I also have over four years experience as an audio-visual technician broadcasting and recording live events and video editing. I would love to make short films about the various studies being conducted on the Antarctic continent as well as help those there with their own film and photography. I can speak, read and write in the Spanish Language.

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 I was finishing up my undergraduate work, I had the opportunity to develop and then teach an elementary engineering curriculum at a summer school program in the Dominican Republic. I was paired to co-teach with Thomas Walsh, a skilled student who at the time spoke no Spanish. We worked very hard in the months preceding our trip to develop the needed content and then translate it into the Spanish language. Upon arrival we spent six weeks by each other’s side eating, sleeping, and working every day preparing, teaching, and revising our lessons to meet the needs of our students. All the while we were also filming a documentary to promote the school, experience and encourage others to join. In the end Tom had picked up quite a bit of Spanish and I had acquired a dear friend, examples, and experiences I now use in my teaching. Tom and I still work together as collaborative teachers on a PLC team at our school. We have been able to implement a collaborative learning environment across multiple disciplines including, science, math, English, and art that has greatly benefited the students that we teach. Documentary sample: https://www.youtube.com/watch?v=BLByIK1pLaY

6. Communicating the Experience and Science

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

This last Thursday in our College and Career Awareness course the students were presented with the task of becoming an epidemiologist (a person who studies diseases) and solving the case of the potluck poisoning. They were presented with a historical scenario, taking place in a small town in the state of Idaho, in which some 93 people after a community potluck showed up at the local emergency room with related symptoms. The students were called in to discover the cause of this wide spread outbreak. The first needed to perform some background research on bacterial and viral sicknesses, most from food born illnesses, which had similar symptoms to those present in the ER patients. They then analyzed the data gathered from patient interviews, food sample tests/ lab analysis, and some historical background on the event to discover the culprit behind it all. The students loved it. They were deep into the problem at hand and then would shout with excitement when they thought they had cracked the case. It is moments like this that I love being a teacher. Getting to see the lights come on in the student’s eyes and their newfound excitement for learning.

7. Scientific Interests and Research Area Preference

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

Please explain your preference
Antarctica, on average, is the coldest, driest, and windiest continent, and has the highest average elevation of all the continents. Extreme situations create the need for extreme innovations. I want to work with researchers have to adapt their equipment and technology to make their research and their daily living at such an extreme possible. I have been following the excursions of Mike Penn and am very interested in adapting and repairing the various weather stations and instrumentation found there as well as studying the adaptations of living organisms striving to survive.

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 ready and able to participate whenever and for as long as I can.

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 most interested in the innovation and adaptation of technologies to work around and through problems that are being presented to the researchers in Antarctica. I am also interested in the multidisciplinary effort of making this research a reality. How a group of people from various backgrounds (scientists, engineers, aviators, location and equipment experts) come together to make all these studies happen.

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 would really enjoy 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 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.
Growing up in Utah I have been blesses with wonderful outdoor environments to explore with extremes of heat and cold, snow covered mountains, and desert plains. I have been snow skiing and then snowboarding since the age of 3, hiking and backpacking as soon as I could walk. I am an Eagle Scout and going though scouting, have participated in, organized, and led several hiking, backpacking, and camping expedition every year. Canyoneering, repelling, rock climbing, snow shoeing, cross-country skiing, and spelunking are all activities that I do as often as time and opportunity does permit. I have taken wilderness first aid and wilderness safety courses.

b. Provide a basic statement of your general health and physical condition.
I am fit, ready, and able with no existing medical conditions.

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.
Currently I work more with Mac running the Mojave operating system. However, I am very familiar with general computer use on both Mac and PC. I not only know how to use these but it is part of what I teach every day.

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.
I am constantly working with the Adobe Creative Suite (Photoshop, Illustrator, Premier, InDesign) for personal design projects as well as instruction for student use. I also am familiar with the Microsoft software (Word, PowerPoint, Excel) as well as their Google equivalents (Docs, Slides, Sheets). I work a lot with Cannon DSLR cameras giving instruction on their use for both photo and video. I have a basic knowledge of web development. I feel as though I am constantly having to learn a new software to the point that I can teach and trouble shoot with others and have become very good at 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
Kevin Dickerson, Byron Adams

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

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
Local, state and national professional development conferences.

12. References

Reference 1

Name Thomas Walsh

Title and affiliation CTE Teacher, Collaborative Teacher

Email Address twalsh@alpinedistrict.org

Phone Number (385) 208 - 7744

Reference 2

Name Dr. Geoff Wright

Title and affiliation University Professor, Graduate Advisor

Email Address geoffwright@byu.edu

Phone Number (801) 422 - 7804

Reference 3

Name Jake Anderson

Title and affiliation AFJH Assistant Principal over Career and Technical Education

Email Address jakeanderson@alpinedistrict.org

Phone Number (801) 610 - 8750

Kathy Ho

1. Contact Information

Name: Ms. Kathy Ho

Email: kathy.amethyst@gmail.com

Home Address:
2113 Windrose Place
Mountain View, CA 94043 US

Home Phone: 650-996-6008

Cell Phone : 650-996-6008

Institution Name: Lucile Packard Children's Hospital School at Stanford

Institution Address:
725 Welch Road
Palo Alto, CA 94304 US

Institution Phone: 650-497-8231

Classroom/Office Extension:

Institution Fax: 650-497-8291

Institution Website: https://www.stanfordchildrens.org/en/patient-family-resources/hospital-school

Other relevant websites: http://totalkatastrophe.blogspot.com/ http://labsci.stanford.edu/ https://labsci.github.io/imagine/

Supervisor's Name: Kevin Danie

Supervisor's Email Address: kdanie@pausd.org

2. Demographic Information

a. Gender: Female

Race: Asian

c. Briefly describe your primary audience and surrounding community (e.g. K-12, public, rural/urban, technology access, economics): The Hospital School is a K-12 public school located within the Packard Children's Hospital at Stanford. We serve school-age hospital inpatients, plus siblings, outpatients, students living at the Ronald McDonald House while waiting for treatment, young mothers of neonatal ICU babies, and children of patients from the adult hospital. Although the hospital is located in the suburban setting of Palo Alto, California, approx. 2% come from the Bay Area and patients come to the hospital from all over the world. The length of stay ranges from a few days to several years.

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) 500

f. School Ethnicity:
1 % - American Indian or Alaska Native
10 % - Asian
5 % - Black or African American
35 % - Hispanic or Latino
2 % - Native Hawaiian or Other Pacific Islander
45 % - White
2 % - 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 25

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.

2020-21 School year: August 10 – June 4 Winter break: Dec 18 – Jan 6 Spring break: April 2 - 10

3. Teaching Experience and Education

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

Bachelor's Degree (Major): English/American Studies

Bachelor's Degree (Minor):

Masters Degree (Discipline): Education

PhD Degree (Discipline):

Other Degree:

b. How many years of education experience do you have?: 23

c. How many years have you been working at your current institution?: 23

d. List up to 10 relevant professional licenses, certifications, registrations, awards or honors that you have received in your profession::
2018 National Geographic Early Career Grantee 2017 Stanford Community Partnership Award Winner 2016 National Geographic Grosvenor Teacher Fellow 2016 Fulbright-Hayes Fellowship 2012 National Education Association Learning and Leadership Grant 2011 National Institutes of Health K-12 LAB Challenge Award Winner 2011 Toyota International Teacher Fellowship National Geographic Certified Educator Association for the Education of Children with Medical Needs (Past-President; Charter Member) Network of California Hospital School Educators (Organizer; Charter Member)

4. Professional Assignment

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

Other Primary Assignment Self-contained Hospital School classroom teacher (all grades/subjects)

b. What subjects do you teach? Check all Middle School English/Language Arts, Middle School Math, Middle School Science, Middle School Social Studies, Secondary Biology, Secondary Chemistry, Secondary Earth Science, Secondary Economics, Secondary English, Secondary World and U.S. History, Secondary General Science, Secondary Geography, Secondary Gov/Political Science, Secondary Math, Secondary Physical Science, Secondary Physics, Secondary 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 am so excited to gain new experiences and share this knowledge with my students. I work hard to bring science into the hospital classroom and have succeeded in getting my students curious about the environment and our world. I hope to find ways to motivate them into being as excited as I am about adventure and discovery. The PolarTREC expedition is especially interesting because it is not just an opportunity for travel, but a hands-on learning experience and an inspiration for students. I want them to see science in practice, show them why their actions are important, and excite them about the outside world. I feel strongly that it is our responsibility to teach the next generation to value the planet, and I want not only to inspire them to care, but to give them the tools to do so. A major focus of my teaching is climate change and environmental conservation. I'm both fascinated with and challenged by the difficulties in teaching students how they are connected to places that they may never see firsthand. After working with Polar researchers, I hope to return as a valuable resource not only to students but for my colleagues and 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)

I would love bring this experience into my classroom so that our most sheltered or isolated students – those who are medically fragile or hospitalized – can begin to connect with the polar regions. Through the LABScI Imagine Project, which I started through a grant from the National Geographic Society, I have been creating "virtual" field trips so that students who cannot be in nature can still experience nature. Without leaving the classroom, students would be able to visit the Arctic or Antarctic through photographs, video, and stories. For example, with the use of VR devices, they could experience the sights and sounds of a receding glacier, thereby seeing for themselves the impact of climate change on the natural environment. After discussing the causes of climate change, they could identify common practices in their own lives that add to (or alleviate) the problem. By studying native perspectives, they can learn about sustainable conservation and resource management, and can then determine best practice policies for the actions in their own lives. For students with cognitive deficits from medication or diagnoses, I hope

to include hands-on activities such as modeling erosion, mapping landforms, or art projects exploring color or shape.

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 fortunate to teach in a supportive school district. My own small school lends itself to a great deal of collaboration, and our school district encourages the sharing of lessons and ideas among local teachers. I've even Skyped with a classroom from a neighboring school while working on a field expedition in Costa Rica. More importantly, I plan to share what I learn not only with my own district colleagues, but with schools and teachers across the country. Over the past several years I have worked closely with Stanford University to create LABScI, a nationally recognized science program specifically designed for the hospital classroom environment. The program is currently used by several hospitals across the country, and I plan on sharing any resulting curriculum on our LABScI website (labsci.stanford.edu). Hospital teachers actively seek new and interesting topics for their students, and I know they would love to learn how to incorporate polar education into their curriculum. I have presented at multiple state and national teacher conferences, collaborating with hundreds of educators from around the country. I am also the main organizer for the Network of California Hospital School Educators, and work closely with this specialized group of teachers.

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

Working in a hospital school, I teach all different grades, courses, and levels of ability. Because of the unique nature of my classroom, I create individualized lesson plans for most students, and am constantly modifying lessons to meet special needs. Many require independent study and adapted curricula. Although I have credentials in English and math, I usually find myself developing integrated curricula using science or history or photography – any course a patient may be enrolled in. Rather than lecturing students or simply assigning book reading, I try to create innovative ways of delivering material. At times, I need to cater to special needs students – patients with impaired vision, limited physical ability, or who are perhaps too sick or weak to hold a book – so I use films, music, or books on tape. I also like to create interdisciplinary courses to involve students who are only interested in one field of study in order to help them broaden their perspective. I believe strongly in allowing students the freedom to ask questions and to suggest topics of interest that they

want to explore. In doing so, students become more engaged and interested, and become responsible for their own learning.

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

I am eager, easygoing, and enjoy sharing ideas with others. I have traveled extensively, and enjoy both physical and mental exploration. I know how to be uncomfortable without complaining, and don't take things for granted. I'm a quick study and am willing to get down and dirty, so I don't mind any job that's thrown my way. I'm also extremely organized and have good office skills. Most importantly, I am willing to do what it takes to get things done. As an eager learner, I'm constantly taking classes and seeking out professional development activities. When I started teaching, I was only credentialed in English. Most students needed help in math, so I took several community college classes and soon got my math credential. I'm now focusing on science, and have been lucky enough to partner with a Stanford professor to create a lab science program specifically for hospital schools. I'm so excited by this opportunity and sincerely hope I can take part to learn from and contribute to the experience. Most importantly, I'm not afraid of hard work but I'm not opposed to having fun while working hard.

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 enjoy collaboration and work well with others. I do this on a daily basis: it takes teamwork to run our school with only seven staff members in a small, two-room space. To me, the team experience is just as important as the group's goal. While I have had many experiences working with a team, one of the most memorable is a group volunteering trip to rural Nicaragua to help build a school. We started out as 12 strangers, but bonded quickly in order to live and work together. Being a part of that team meant all of us sharing in the work – the cooking, cleaning, and shopping needed for the house, as well as the effort and organization needed to finish the construction. Because of this, I helped develop the chore-sharing system that kept us all on track. I also planned the weekend outing that allowed us to experience the local sights and culture. Throughout the duration of the trip, I learned that being part of the team and the experiences shared with my new friends was just as meaningful and important as the end result – the two-room schoolhouse for the community of Pueblo Nueva.

6. Communicating the Experience and Science

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

Last weekend, I convinced three friends to join me in Colorado for a visit to Rocky Mountain National Park. It's peak season at RMNP, not just because of the color-changing Aspen trees, but because it's time for the elk rut. My friends were a bit apprehensive…I wanted to hear some testosterone-laden bull elk bugling? But they reluctantly agreed. After a lovely day driving through the mountains, we found ourselves in Moraine Park – a wide open meadow with the snowcapped peaks of the Rocky Mountains surrounding it. Dotting the landscape were herds of elk, mostly arranged in tight groups, grazing peacefully. The group closest to us seemed to be all females, until we heard that distinctive, unearthly, high-pitched whistle of a big bull. The males only bugle for two reasons – to fight, and to attract females. This one was herding his harem, all while keeping an eye out for lotharios who dared challenge him. A few solo bachelors wandered the field, but all kept their distance from the clearly bigger male. The entire spectacle was a feast for the eyes and ears, and we were all glad to have experienced it.

7. Scientific Interests and Research Area Preference

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

Please explain your preference
I think I would contribute to the expedition regardless of whether I went to the Arctic or Antarctic. I know either one would provide valuable knowledge and experience.

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
4-6 weeks - any duration or periods would be fine.

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 most interested in ecology, particularly the adaptations that are required given the changing conditions in the polar regions. I have always been interested in how organisms survive in extreme environments, and would love to supplement my current lessons with information garnered in the polar regions. Last year I created a unit focusing on desert organisms after visiting several Southwestern US National Parks, and my students (who are all hospitalized) took the lesson even further than I originally intended when they began discussing their own need for adaptations because of their medical/physical needs.

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 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.
Camping, hiking, river rafting, snorkeling, sea kayaking, skiing (downhill, cross-country, & snowboarding), ropes course.

b. Provide a basic statement of your general health and physical condition.
Excellent health, no allergies or limitations

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.
I work primarily with a Mac but also use a PC at work (for hospital charting); very knowledgeable w/ Mac and am comfortable with most other computers.

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.
Hardware: Mac for emails, word processing, internet PC for medical charting iPad for internet, drafting Canon EOS D5 SLR camera for personal Ricoh Theta and GoPro Fusion for 360° video Software: Google Chrome browser Google docs, Dropbox for document sharing Knowledge of: Excel PowerPoint Word Epic iMovie Keynote Limited but working knowledge of: Filemaker Photoshop Illustrator

e. List any additional skills or information that you wish to be considered.
Languages: Fluent Mandarin Chinese, Basic 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 2016 Earthwatch Teach Earth Fellowship, Playa Grande, Costa Rica – Costa Rican Sea Turtles 2018 National Geographic Early Career Grantee, US National Parks Southwest Region - Virtual Field Trip Project

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?
True knowledge comes when we step outside our comfort zone, and I know I can benefit from the PolarTREC experience. Sharing my experiences and seeking hands-on opportunities makes me interested and enthusiastic about learning and teaching. By showing students that I care enough to continue putting efforts into working for what I believe in, I hope to inspire students to do the same. I was so inspired by the biologists in Costa Rica, who worked hard to save an endangered species. I was able to Skype to several classrooms, and I could see how excited kids got when they could ask questions. I want to keep that spark alive. Having traveled to the Arctic, I now want to delve further by actually working with scientists. My National Geographic Grant led to the creation of the Imagine Project, which strives to connect hospitalized students with the environment, despite not being able to go out into nature. I hope to expand the project to expose students to the polar regions, and show them how they too are connected.

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
Jillian Worssam, Dave Walker, Tim Martin

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 Dr. Andrew Spakowitz

Title and affiliation Associate Professor, Stanford University Department of Chemical Engineering and Materials Science

Email Address ajspakow@stanford.edu

Phone Number 650- 736-8733

Reference 2

Name Dr. Anil Madhavapeddy

Title and affiliation Associate Professor, University of Cambridge (UK); Director of Studies, Computer Science, Pembroke College

Email Address anil@recoil.org

Phone Number +44 1223 763611

Reference 3

Name Susan Kinnebrew

Title and affiliation Director, Child and Family Life and Creative Arts, Lucile Packard Children’s Hospital at Stanford

Email Address skinnebrew@stanfordchildrens.org

Phone Number 650-497-8336

Carly Imhoff

1. Contact Information

Name: Ms. Carly Imhoff

Email: cimhoff@ashfordct.org

Home Address:
146 Beebe Farms Rd
Coventry, CT 06238 US

Home Phone: 2034510006

Cell Phone : 2034510006

Institution Name: Ashford School

Institution Address:
440 Westford Rd
Ashford, CT 06278 US

Institution Phone: 8604296419

Classroom/Office Extension: 321

Institution Fax: 860-487-4393

Institution Website: ashfordct.org

Other relevant websites: ashfordadventures.weebly.com

Supervisor's Name: Troy Hopkins

Supervisor's Email Address: thopkins@ashfordct.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 teach Science at a rural, low income, K-8 public school. We have Smartboards and computers in every classroom but many students do not have access to technology at home.

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) 400

f. School Ethnicity:
0 % - American Indian or Alaska Native
2 % - Asian
3 % - Black or African American
4 % - Hispanic or Latino
0 % - Native Hawaiian or Other Pacific Islander
88 % - White
3 % - Multiracial
If your school uses other categories to describe race/ethnicity, please describe:

g. Percentage of students who receive free or reduced lunch: 38

h. Average class or audience size About 15 per class.

i. Total number of students/audiences you teach in a year 400

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 week before labor day and end in mid June. We have almost two weeks off for Christmas and New Years. We also have one week off in April but this could change if we have snow days.

3. Teaching Experience and Education

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

Bachelor's Degree (Major): Human Ecology

Bachelor's Degree (Minor):

Masters Degree (Discipline): Community Organizing- Social Work

PhD Degree (Discipline):

Other Degree: I am currently working towards a Doctorate in Educational Leadership at the University of Connecticut. I expect to graduate in one more year.

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::
Fulbright Hays Fellow- 2019 Albert Einstein Distinguished Educator Finalist- 2019 NEA Global Learning Fellow- 2018 Fund for Teachers Fellow- 2017 JASON Teacher Argonaut- 2017 I also have a PreK-12 cross endorsement in Technology Education.

4. Professional Assignment

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

Other Primary Assignment

b. What subjects do you teach? Check all Middle School Science

Other Subjects I also teach Middle School Robotics and Elementary 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)

Personally, I feel that PolarTREC will give me the opportunity to be as enthusiastic and amazed by the natural world as my students are when we explore our nature trail, experiment with rocks and minerals, or learn about the amazing adaptations that allow animals to survive around the world. I know that I am an enthusiastic and passionate teacher and my students see my love of science as I teach. However, as an adult it can be hard to tap into the same wide-eyed wonder that children have for the expansive world that they have their lifetimes to discover. Professionally, I want to gain experiences that will make my teaching come alive for students. It is much more meaningful when learning is based in real world phenomena. I want to have a kit of Polar stories and artifacts that I can use as a basis for engaging science units. Students need to see how human actions impact the world as far away as Antarctica. Their generation will inherit a world in crisis due to climate change; I feel obligated to teach them about their relationship to the environment so that they have the tools to be responsible global citizens.

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)

It is hard to predict what new insight I will acquire from an opportunity as unique as PolarTREC. When I share this experience with my students I will use the inquiry process and my students and I will learn together. Through multimedia my students will get to go on a “virtual field trip” to the locations I will experience on PolarTREC. I have experience creating videos for my students that include phenomena from around the world and engaging interviews with scientists and engineers (these educational vlogs were featured weekly by the National Education Association for two months to highlight STEM learning. I recently learned that hundreds of educators were using my vlogs in their own classroom). This will be a launching point for scientific investigations and service learning projects. I will also create a StoryMap on ArcGIS. Throughout my PolarTREC experience I will collect data and media through Survey123 that will connect the information to geographic coordinates. Then my students will get to explore the map, look for patterns, and develop their own inquiry questions based on the information on the map. Many of their investigations may relate to climate change, animal adaptations, and how humans impact the

environment.

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

To share my fellowship with the community, I will develop district wide opportunities for teachers, students, and community members to learn about the Arctic/Antarctic. For example, I could have an Arctic science evening. Students could present the inquiry investigations and action projects they have been working on that were inspired by the fellowship. They could showcase this to teachers and community members. I will also share what I have learned on my fellowship through direct and targeted professional development. I will run workshops for my colleagues that will give them strategies for implementing current scientific research in their subject areas. What is great about seeing the world through a polar lens is that it shows how interconnected our planet is. Depending on the focus of my PolarTREC, I will be able to share with the community how Connecticut impacts the Arctic/Antarctic through influences such as climate change, microplastics, animal migrations, etc. Through PolarTREC I will have the honor of “translating” the work of polar scientists to my community. I believe that sharing with the community is the most empowering part of PolarTREC because a scientifically literate public is crucial to our ability to meet global sustainability goals.

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 a complex topic, I start by just sharing the basic information that students need to understand the phenomenon (normally through a mini lesson including multimedia and science demonstrations) and then I create carefully planned experiences so that my students can develop their own inquiry investigations to learn more. In my classroom I have my students act as citizen scientists to not only learn how the world works but to also contribute to global solutions by collecting data. I have a class set of iTouches (through a grant) with iNaturalist installed that the students use to gather data about the plants and animals in our town. This data contributes to a citizen scientists’ data set which can help in advocating for environmental protection. Last year I participated in a bioblitz in Malaysia (through the JASON Argonaut program) to gather data that is being used in an application to make Penang Hill Rainforest a UNESCO protected site. Each day of the bioblitz my students followed along through videos and lessons that I created. The students at my school did their own bioblitz on the nature trail. I have found

citizen science to engage students no matter how complex a topic.

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

Through reading PolarTREC blogs, I believe my strengths that will be most critical are 1. An enthusiasm for science regardless of rugged conditions and 2. A creative ability to translate what one learns in the field into engaging and meaningful learning opportunities. I practiced both these skills during a field course on climate change in Denali National Park. First, I was enthusiastic and kept an adventurous spirit. For example, I was so excited to explore and learn, that the rustic accommodations did not phase me. There was also a lot of hiking so that we could investigate carbon dioxide levels and record plant activity in remote areas but my enthusiasm for working with scientists kept me from getting tired. Second, I developed creative ways to translate my experience into new units and teaching strategies in my classroom. I changed my existing curriculum to make it more relevant to real world topics. For example, now my students use probes to record changes in our environment and we use geological evidence to examine climate changes over time. My experience in Denali improved my teaching and directly translated to more engaging learning for my students.

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 NEA Foundation Global Learning Fellow, I had the unique opportunity to be part of a team of teachers (44 teachers from 44 different states). For over a year we have worked together and supported each other as we made our school districts more globally competent. For example, I created and organized community conversations around the topic of global learning and over a hundred teachers, community members, and Board of Education members attended. Then I shared the materials I created with the other Global Learning Fellows and many of them used my format to run their own community conversations. We also divided up tasks when working on creating a global citizenship curriculum. We each wrote lessons for different grade levels and shared them with the group. By working together we were able to publish a book on global learning that will be released in October. I also helped the team by co-teaching and collaborating over Skype. This summer, our team travelled to South Africa and I collaborated on new ideas for global learning, helped my teammates problem solve, and developed student resources that translated the complex history of South Africa. Everyone was enthusiastic and made our work fun.

6. Communicating the Experience and Science

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

This is part of a post from a blog I submitted last year: After school I was emailing back and forth with another teacher, trying to figure out a way to make their school's Microsoft suite communicate with our school's Google accounts. We were finally reduced to using quotation marks when referring to "technology experts." And just like that, an inside joke had developed between myself and my colleague who teaches across the ocean. That is when I realized that the first person to benefit from the global learning program I created for my students was me . . . I would like to challenge all teachers to take the time to learn about another country or work with a teacher from another culture. And as you discover the diversity of perspectives that enable humans to tackle even the most challenging global issues, you may also discover that we have some challenges in common like bridging the divide between Skype and Google accounts.

7. Scientific Interests and Research Area Preference

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

Please explain your preference
I chose the Antarctic as my preferred research area because, after following many PolarTREC expeditions, I feel that Antarctica would place me in the best position to make connections to my classroom and to be able to share scientific discoveries that will grasp the imagination and interests of my community. In addition, past PolarTREC expeditions in the Antarctic seem to better fit my research interests which I will elaborate on in the next questions. Although I would prefer an Antarctic placement, I would be thrilled to go the Arctic 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
I would prefer a four week or less expedition. I am available at any 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)
As a teacher, the topics that interest me the most are the ones that I can best connect back to my classroom and larger community. For example, I integrate a lot of robotics, underwater ROVs, and drones into my classroom instruction and through robotics competitions (last year we went to VEX IQ Worlds!). So, any expedition that used robotics for research/data collection would be of great interest to me. Another interest is space (my students have built cube satellite experiments that have launched on a NASA sounding rocket and this year they had their experiment conducted on the International Space Station. We also had a radio contact with the ISS). With a placement like IceCube, I would learn as much as my students. Or, a placement with the Antarctic Automatic Weather Station would provide a whole new lens for my students' high altitude weather balloon experiments. I am also interested in how animals adapt to extreme weather (because of climate change more species will need to adapt to survive). Learning about polar animal adaptations (like the Weddell seals or species in the Dry Valleys) would provide me with phenomena that would inspire activism within my community.

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 enjoy camping and I hike almost every weekend in the Spring and Fall. I kayak most days in the Summer. In the Winter, I prefer to cross country ski with my dogs and when we have enough snow we also go dogsledding (they're huskies). I live in a rural area so I have easy access to outdoor experiences.

b. Provide a basic statement of your general health and physical condition.
Due to age (I'm 31) and luck, I am in good health. I don't have any medical conditions and I'm not on any medications. I am active, enjoying the above mentioned outdoor sports.

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.
I consider myself to be a digital native and therefore have used technology my whole life. I have lots of experience using computers (Macs and PCs), along with mobile devices, 3D printers, and various scientific instruments. I also have experience with some statistical software and with ArcGIS. I do a lot of vlogging so I am comfortable editing videos. I also teach robotics.

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 laptop all the time for research and writing (I am a doctoral student). I generally use the Google Suite (GoogleDocs, Slides, Sheets) but I can easily use Microsoft or Apple programs as well. I love using my DSLR camera, especially when I am traveling. Recently I have been doing a lot of GIS surveys with my students and I am also getting really into having my students use Flipgrid for international collaboration (but we also use Skype and Googlehangouts).

e. List any additional skills or information that you wish to be considered.
I doubt that this will be useful but. . . I'm a commercially licensed drone (unmanned aerial vehicle) pilot. I have experience traveling to and living in extremely remote areas so I would be comfortable in most PolarTREC situations.

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

12. References

Reference 1

Name Troy Hopkins

Title and affiliation Principal of Ashford School

Email Address thopkins@ashfordct.org

Phone Number 860-429-6419

Reference 2

Name Kate Craven

Title and affiliation Media Specialist, Ashford School

Email Address kcraven@ashfordct.org

Phone Number 860-429-6419

Reference 3

Name Dory Moore

Title and affiliation Colleague at Ashford School

Email Address dmoore@ashfordct.org

Phone Number 860-429-6419

Holly Jasperson

1. Contact Information

Name: Ms. Holly Jasperson

Email: hollyjasperson@katyisd.org

Home Address:
22400 Westheimer Parkway, Apt 706
Katy, TX 77450 US

Home Phone:

Cell Phone : 281-865-1805

Institution Name: Patricia E. Paetow High School

Institution Address:
23111 Stockdick School Road
Katy, TX 77493 US

Institution Phone: 281-234-5122

Classroom/Office Extension: Room 3333

Institution Fax:

Institution Website: http://www.katyisd.org/campus/phs/Pages/default.aspx

Other relevant websites:

Supervisor's Name: Stev'anne Horton

Supervisor's Email Address: StevanneDHorton@katyisd.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): Secondary 9-12, public, suburban, minimal technology 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) My students – 165 students, School population – 1450 students

f. School Ethnicity:
% - American Indian or Alaska Native
% - Asian
23 % - Black or African American
49 % - Hispanic or Latino
% - Native Hawaiian or Other Pacific Islander
20 % - 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: 52

h. Average class or audience size 30

i. Total number of students/audiences you teach in a year 165 students this 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.
8/6/2019-5/26/2019

3. Teaching Experience and Education

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

Bachelor's Degree (Major): B.S. Biochemistry

Bachelor's Degree (Minor): Math

Masters Degree (Discipline): M.S. Chemistry (Chemistry Education)

PhD Degree (Discipline):

Other Degree:

b. How many years of education experience do you have?: 11

c. How many years have you been working at your current institution?: 2 years at current school, 9 years at previous school

d. List up to 10 relevant professional licenses, certifications, registrations, awards or honors that you have received in your profession::
Composite Science 8-12 certification GT certification AP chemistry certification

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 Chemistry

Other Subjects AP chemistry 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)

I want to be able to participate in PolarTREC to share with my students and my school, real life research experiences. I want to be able to promote passion for science within the minority and economically disadvantaged populations. I have been trying to get approved to teach a senior seminar class for science, where students have the opportunity to intern with a science lab doing academic research with a mentor. My administration has asked that I prove that this would be a worthwhile and valuable learning opportunity. I think that participating in the PolarTREC experience would give relevant proof that research experience in a science related field would be invaluable for future science careers for our young scholars. Professionally, I want to participate in PolarTREC for the one in a lifetime opportunity it provides. I also want to be able to be a part of relevant research that is bettering our world and furthering our understanding of certain science fields. I am also looking at pursuing a PhD in a science based field and I am hoping that I can find a field of research that I want to continue working in.

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 for my students to be able to follow along with the research experience as I am participating. I would like to have them do some background research of the topics that I will be working with so that they can create and share questions that I can work on answering through the research that I am doing with PolarTREC. I also want to share the PolarTREC research experience with not only my school but also my school district, Katy ISD, which has 72 schools and 83,000 students, through multiple comprehensive field vlogs. I think vlogging is something that is relatable to the current generation of students that sit in our classrooms. My students are much more willing to watch a YouTube video about science than listen to me talk about it in class. I think that through vlogging the research excursion I would have the opportunity to reach out to many more individuals, promoting the amazing science that is happening around the world. Academic research is always looking for funding and I think that highlighting the PolarTREC research like this would lead to more research funding.

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

public. (200 words maximum)

Like I said previously I would like to be able to create vlogs of the trip and everything that goes with it, from the preparation and training to the actual field study and research. I think teachers at the secondary level that are teaching upper level science courses do not have hands on research experience, so when asked about it by students they do not have much to say. I want to be able to provide useful videos that highlight the ins and outs of field research, so that educators can promote research science as a field that students can and should go into for a career path. I also want to share my journey and present my research with PolarTREC at the CAST conference, which is the biggest science teacher conference in Texas that is attended by over 5,000 science educators from all over the United States. Secondary science teachers need to know that there are opportunities like PolarTREC that exist, and that are life changing to not only their own personal lives but to the lives of their students and the field of science.

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 favorite way to present any material is through hands-on learning. I believe that if the students have the opportunity to experience the science, they are going to remember the concepts. This is not always easy and sometimes I try things and they do not always work but I am always willing to try. A great thing about teaching forensic science is that there is so much new technology that is being developed and used to solve crimes. I have my students read newly published research articles when they come out to show them that they have an opportunity in their lifetime to make a mark in the field of science. So many people think that science is not a changing field and educators teach it the same way that it has always been taught. Just the other day there was an article about the size of the proton that came out and I had my AP chemistry students read it and research the experiments that were used to determine this. They were amazed that this was actual research that is happening in their lifetime considering that the proton has been around for a long time.

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

I am a super positive person and can find the good in any situation. High school students have so much negative going on in their lives. If I can be the one positive thing that they get to experience every day for 45 minutes, then that itself can be life changing. I have a great attention to detail and I am a perfectionist. I am willing

to work hard and complete any task that is asked of me. I am good at communicating with a team and I am willing to ask for help when needed. I am always questioning and wanting to know why and how things happen. I like to be challenged. I also like trouble shooting and coming up with ideas and ways to do things that have not been previously thought about. After undergrad I worked in a biochemistry lab for several years so I am familiar with following research protocols and the need to document everything. I am also willing to do the things that others do not always want to do, like repeating trials multiple times and cleaning up when everything is done for the day. I am athletic and strong and have no problem with working long hours doing manual labor.

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)

When working in the biochemistry lab at the University of Kentucky, I started out making solutions, where I learned to follow directions. I was then able to start assisting the graduate students in their research where I was able to come up with new ideas for the research we were working on. I finally got to complete my own experiments and ended up becoming the second author on a scientific article that was published. Currently as a secondary science teacher I am in charge of my forensic science team of two teachers. I am ready with an agenda for our team meetings so that we stay on task, along with helping to delegate the necessary tasks. I allow others a chance to speak their mind and contribute where they can. I think that everyone has a point of view and good ideas to share. I am also willing to work on setting up labs and cleaning up labs just like everyone else. I will also be the first one to volunteer to do the jobs that no one else wants to do because I think that is setting a good example as a leader of a team.

6. Communicating the Experience and Science

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

Lights, camera, broken glass? Today we walked into our mock crime scene and all we found was a tiny piece of broken glass and a dead body of course. But the broken glass is the key to solving the crime. We want to know what kind of glass it is, but we must not forget the danger that's involved in working with broken glass! Wearing our gloves to protect our hands and prevent contamination, we pick up the glass with forceps and store it in a hard sided container to transport it back to the lab…Meanwhile back at the lab…we find the density, using water displacement. The density test narrowed down the glass type; it could be bottle glass, lens glass or even headlight glass. Now to refractive index, wait what?! The piece of glass disappears in vegetable oil. Disappearing glass, that's magic, but it means we matched the refractive index of the glass to the vegetable oil. Now we know it is either headlight glass or camera lens glass, so let's look at the thickness. It's too thin to be headlight so it must be camera lens glass. Are we right? Stay tuned to tomorrow's blog to find out.

7. Scientific Interests and Research Area Preference

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

Please explain your preference
I think that either of the expeditions would be great research experience. I have never been to either places so I have no preference. I just want the opportunity to participate and change the field of science research in the minds of my students, my school, my district and any educator that I will be able to reach through the experience.

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 dates and for any length of 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 am interested in physical sciences that pertain to chemistry and physics. I think that there is so much to learn about these but they are under researched because they are (from the secondary science teacher perspective) old sciences and there is nothing new to learn about them. I believe that this is not true and any physics and chemistry concept when applied to the environment can yield interesting information that we have not discovered previously. There is a huge focus in today's world about saving the environment which is so important but what if the key to saving the environment comes down to researching the "old" sciences.

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 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 been camping since I was born. My family was poor growing up, so camping is all we did because it was cheap. I love to hike and do anything outdoors. I know basic first aid and have been CPR trained. I am fine being on a boat and do not get sea sick. I also own and know how to use a gun.

b. Provide a basic statement of your general health and physical condition.
I am in good overall health. I lift weights 4-5 times a week. I also run 3-4 times a week, and am currently training for a half marathon in a couple weeks and a marathon in January. I have no pre-existing conditions that would be an issue with participating in a PolarTREC expedition.

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 and am comfortable with doing anything that is asked of me in regard to completing a task using a computer. I am also willing to learn anything new that would be needed to participate in a PolarTREC expedition.

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 laptop on a daily basis, because that is what I use for a home computer. I use a desktop computer at school. I am familiar with the main Internet Browsers, Chrome, Internet Explorer, Firefox, etc. I use PowerPoint and Excel almost daily and am very comfortable with creating presentations and making spreadsheets. I am also familiar with basic photo editing software on a computer and on an iPhone. I have also edited videos before when making tutorial videos for my students.

e. List any additional skills or information that you wish to be considered.
I am a hard worker and can do most anything that is asked of me. I am also familiar with most lab equipment that is used in any chemistry or biochemistry lab.

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
PolarTREC teacher - Lesley 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
CAST science conference in Texas

12. References

Reference 1

Name Katie Poploski

Title and affiliation Science Department Chair Paetow High School

Email Address kaitlyncpoploski@katyisd.org

Phone Number 412-760-5542

Reference 2

Name Stev'anne Horton

Title and affiliation Science Instructional Coach Paetow High School

Email Address stevannedhorton@katyisd.org

Phone Number 713-471-2512

Reference 3

Name Tina Hovance

Title and affiliation Secondary Science Coordinator Katy ISD

Email Address christinazhovance@katyisd.org

Phone Number 281-396-7751

Donald Jenkins

1. Contact Information

Name: Donald Jenkins

Email: donzoey@aol.com

Home Address:
221 SW Judson Dr.
Oak Harbor, WA 98277 US

Home Phone: 360.679.4410

Cell Phone : 360.320.8627

Institution Name: North Whidbey Middle School

Institution Address:
67 NE Izett Street
Oak Harbor, WA 98277 US

Institution Phone: 360.279.5500

Classroom/Office Extension: 360.279.5528

Institution Fax: 360.279.5516

Institution Website: https://www.ohsd.net/Domain/10

Other relevant websites: https://www.ohsd.net/

Supervisor's Name: Bill Weinsheimer

Supervisor's Email Address: wweinsheimer@ohsd.net

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): I teach middle school in a K-12 public school district. Our town is about 23,000 so we have a combination of rural and urban students. Fifty percent of students are from military families and students have good access to technology in school and most resident are middle class.

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) About 150 students in my classes with about 800 in our school.

f. School Ethnicity:
1 % - American Indian or Alaska Native
7 % - Asian
5 % - Black or African American
18 % - Hispanic or Latino
1 % - Native Hawaiian or Other Pacific Islander
56 % - White
12 % - 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 27

i. Total number of students/audiences you teach in a year 147

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.
End: June 18, 2020 Begin: September 8, 2020 Christmas Break: December 18 -

January 4

3. Teaching Experience and Education

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

Bachelor's Degree (Major): Social Studies Education

Bachelor's Degree (Minor):

Masters Degree (Discipline): Secondary Education

PhD Degree (Discipline):

Other Degree:

b. How many years of education experience do you have?: 26

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

d. List up to 10 relevant professional licenses, certifications, registrations, awards or honors that you have received in your profession::
2019: Peru - Selected for NEA Global Learning Fellowship for year long professional development on integrating global education into classes which will culminate in a trip to Peru in 2020 2019: One of four teachers in nation to receive Civic Engagement Champions Award from the National Association of State Boards of Education (NASBE) 2019: Selected for Korea Research Trip with 20 other educators by Korean War Legacy Project 2018: Became a National Geographic Certified Educator 2017: Fulbright Scholar: Selected by German-American Fulbright Commission for 2 week program in Germany entitled, “Education in Germany – Good Practices and New Perspectives” 2015 and 2017: Selected to present at Google Apps Summit Events on Whidbey Island and Seattle area 2013: Selected for Gilder Lehrman Summer Seminar class called The American Environment in Historical Perspective 2008: Achieved National Board Certification in Social Studies/History 2005: Toyota Tapestry Grant Recipient - Assistant Project Leader for students to work with The Navy, University of Washington and Island County to restore salmon habitat 2004: Selected for Project Citizen Institute to implement civic engagement projects into the classroom Presidential Academy

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 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)

PolarTREC will challenge me to incorporate more scientific concepts into my classes and will give me techniques and tools to motivate and inspire students. I look forward to working with scientists and educators to develop creative lessons for students. I am exploring ways to infuse science into my curriculum with a focus on citizenship. PolarTREC is a unique opportunity for a social studies teacher because there are few opportunities to learn about and “do” science and bring that experience back to the classroom. This experience will give me ideas and scientific background knowledge to pass on to students and will provide my students with real life concrete examples in science, history, and the environment on a global scale which we can use and apply at the local and regional level. I also want to look for ways to keep social studies relevant. Social studies is under siege in education because of high stakes testing and many politicians and administrators don’t see the importance of social studies in comparison to other subjects. Social studies is in a unique position to bring the various disciplines together and by doing this students will learn all the disciplines in a deeper and more meaningful 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)

Antarctica will be used as a theme as we study Pacific Northwest History and Government. There are many connections and comparisons which will be made. For example, when students learn about the Bretz floods in the Pacific Northwest we will compare that to the floods when the Antarctic ice sheets melted over 100, 000 years ago. Other topics of comparison will include plate tectonics, climate, and glaciers. As we study the history of the Pacific Northwest, we will compare the explorers of our region with that of Antarctica and during our WWII unit we will look at the interesting story of the HMS William Scoresby. Current issues are also something we cover in my classes and I plan on having my students study how tourism is affecting Antarctica as well as the issues of whaling. As students learn about the economy and jobs of the Pacific Northwest I will be able to describe some of the STEM related careers in the polar regions. STEM connections and topics from the expedition will also be integrated in my world history classes when we discuss scientific achievements, The Scientific Revolution, and diseases such as the plague.

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

I have been a teacher in my district for over 20 years so I have built up many connections with teachers in other disciplines and grade levels. If selected I plan on taking a professional leave of absence so I can work with teachers at all levels in order to create lessons to integrate my experience into those classrooms. Planning will take place before and after my field experience. I will also be available to give presentations during my leave on my experience during PolarTREC. In our district we have a Math Teacher on Special Assignment whom I will work with to create math lessons which can be implemented with teachers across the district. At my school we have the teaming model so I will work with the language arts, science, and math teacher on my team to create cross-curricular lessons about Antarctica and those will be shared with other teams in our school. The education social media groups I participate in will be another avenue for collaboration and the lessons created will be shared on several lesson sharing websites I participate in. To reach a wider audience I plan on presenting at local community groups and educator conferences at the local, state and national level.

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 start by having students complete an anticipation guide on the topic and then we discuss it. This builds interest and informs me how much they know about the topic I then have students write down questions that they would like answered about the topic to encourage curiosity. My philosophy is that students should engage in a variety of activities to build a solid foundation of knowledge. I will use reading, writing, individual and group work, videos, games, discussion, and debate to help build content knowledge. I will scaffold activities beginning with easier assignments and progress to more difficult tasks to learn about the topic. I have frequent checks to see where students are at in their learning and will reteach on an individual or large group basis depending on level of understanding. I am a firm believer that students need to have this content knowledge before they can think at a higher level about the complex questions or issues surrounding a topic. I will then give students a choice to show what they have learned through a variety of options. This could be a presentation, an essay, making a podcast, or some other method that a student chooses.

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

I will bring 26 years of teaching experience and curriculum creation to PolarTREC. I have developed many original lessons and units for my classes over the years which are student centered, based on real world problems, and have integrated what I have learned in various professional development classes and educational tours. These lessons have been downloaded over ten thousand times on several lesson sharing websites. I have worked on teaching teams at my school in which we created cross curricular projects and have participated in several three week professional development opportunities so I know what it takes to work successfully on a team. I understand there are different personalities on these trips and have the ability to work with and get along with just about anybody. I am a calm person, don’t complain when things don’t go as planned, and have a good sense of humor which will help make our field research team successful. I am able to learn quickly, problem solve, take directions well, but at the same time I am not afraid to offer suggestions or give my opinion on how to do something or get a job done.

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 2007 I decided to try to earn my National Board Certification in Social Studies/History. This is a year long process which takes about 200 hours of reading,

writing, reflecting, and taking video of your classes. I joined a cohort of about 15 teachers from my district and the neighboring district. We had a mentor teacher who had gone through the process and achieved certification. We had elementary school teachers who taught Physical Education through high school Math and English teachers working on their certification in the cohort. We met twice a month on Saturday for four months to discuss our progress, offer support to each other, and peer review our written entries. Once we submitted our entries we had a long six month wait to see if we achieved certification. By working together in the cohort and with the help of our mentor, our group had a ninety percent passing rate. My general philosophy for being a good team member is to work hard, listen, give input when necessary, have a good sense of humor, and be willing to problem solve when things don’t go as planned.

6. Communicating the Experience and Science

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

Today the information was going to be released. Last Friday I received a phone call telling me that I had been selected as one of four Civic Engagement Champion in the country by NASBE. I don’t really like attention. I like to go about my business without fanfare, but if I had an opportunity to promote the importance of civic education then I would have to get over my own personal preferences. I started receiving congratulatory emails and the district posted it on the website. Some teacher friends jokingly gave me a hard time and I joked back saying NASBE probably only received two applications for the award. I received a request for a newspaper interview. After school I went for a mountain bike ride at the local state park and reflected that in a way this award was the culmination of 26 years of hard work, learning from others, and dedication in teaching students how to be active citizens the rest of their lives. I realized that being a teacher for 26 years has been a lot of fun and that I have been fortunate enough to work with a lot of great people when they were young.

7. Scientific Interests and Research Area Preference

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

Please explain your preference
I am unable to go next summer and that is when most Arctic trips happen. I believe Antarctica can be used as a theme in my classes throughout the year and that students in my district will be excited to learn about Antarctica. Antarctica will be a fantastic cross discipline and cross grade theme to use throughout our district.

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
Four weeks. I am not available June, July, or the first half of August 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)
Earth science topics interest me the most. This interest started when I was eleven and watching the video of Mt. St. Helens erupting and feeling the awe watching the event unfold. Growing up in the Midwest and never seeing a volcano made it even more interesting and exciting. When I was studying to become a social studies teacher I realized how much of a connection there was between earth science and social studies. When teaching I am constantly trying to show students how earth science has affected history. We talk about climate affecting migration patterns, the astronomical prowess of The Maya, and how people prepare for natural disasters such as volcanoes and earthquakes. We spend a whole unit at the beginning of my Pacific Northwest History class on geography and geology which provides a solid foundation for the rest of the semester. I have lived in Washington State for twenty years and still enjoy hiking on and up volcanoes and glaciers because they are at the same time beautiful and dangerous and it helps me to realize geologic time is now.

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 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

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 backpacking (including winter backpacking), snowshoeing, camping , hiking, mountain biking, and sea kayaking experience. I was close to summiting Mt. Rainier and Mt. Baker and have recently hiked Mt. Fuji and Mt. Adams.

b. Provide a basic statement of your general health and physical condition.
I am in excellent health and hike or mountain bike five to six 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 use PC and Chromebooks at school, Mac and Chromebooks at home. I received an endorsement in instructional technology on my teaching certificate and was the technology coordinator in my district for one year. I feel I am equally proficient at using all operating systems and would estimate my skill level at above average. I learn new skills and programs fairly quickly.

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 laptop and desktop computer daily, use word processing and Powerpoint on a regular basis, and use excel on a less regular basis. I use photo and movie software for personal and work projects frequently. For example, last year my classes used movie software to create videos for a class in India we were doing an environmental project with. I use digital cameras on a regular basis.

e. List any additional skills or information that you wish to be considered.
I am proficient using hand tools and power tools such as chainsaws and circular saws.

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

Summer Scholarships Facebook Group. State Boards of Education put out digital newsletters to teachers and districts. State and National Conferences for the various subjects such as NCSS and NSTA.

12. References

Reference 1

Name Bill Weinsheimer

Title and affiliation Principal, North Whidbey Middle School

Email Address wweinsheimer@ohsd.net

Phone Number 360.279.5510

Reference 2

Name Russ Peters

Title and affiliation Assistant Principal, North Whidbey Middle School

Email Address rpeters@ohsd.net

Phone Number 360.279.5511

Reference 3

Name Duane Sisto

Title and affiliation Assistant Principal, Oak Harbor Intermediate School

Email Address dsisto@ohsd.net

Phone Number 360.279.5307

Jennifer Johnson

1. Contact Information

Name: Ms. Jennifer Johnson

Email: jennheidrich@gmail.com

Home Address:
169 Old Lewiston Road
North Monmouth, ME 04265 US

Home Phone: 2078901453

Cell Phone : 2078901453

Institution Name: Edward Little High School

Institution Address:
77 Harris Street
Auburn, ME 04210 US

Institution Phone: 2077838528

Classroom/Office Extension:

Institution Fax:

Institution Website: http://elhs.auburnschl.edu

Other relevant websites: https://jennifermjohnso8.wixsite.com/website-1 - Classroom site www.instagram.com/mint_and_thistle - personal photography (Instagram) www.instragram.com/mrsjhikes - teacher Instagram

Supervisor's Name: Craig Latuscha

Supervisor's Email Address: clatuscha@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): Secondary, 9-12 grade, urban, low socio-economic demographic, high refugee and immigrant population

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) 1000 students, plus Instagram and Twitter, upwards of several thousands per year

f. School Ethnicity:
1 % - American Indian or Alaska Native
2 % - Asian
14 % - Black or African American
2 % - Hispanic or Latino
1 % - Native Hawaiian or Other Pacific Islander
80 % - 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 15

i. Total number of students/audiences you teach in a year 250

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: 8/24/2020 End date: 6/20/2021 Major breaks: Two weeks at the end of December/Beginning of January, one week mid-February, one week mid-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): Anthropology and Geography

Bachelor's Degree (Minor): Post-Bac classes (33 credits) - Biology, Chemistry, Environmental Science

Masters Degree (Discipline):

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?: 6

d. List up to 10 relevant professional licenses, certifications, registrations, awards or honors that you have received in your profession::
-2018-2019, nominated for Teacher of the Year -Running with the Bulls Award, 2017 -Presenter at the Maine Council for Social Studies, 2018 -Certified to teach Social Studies and Biology -Leader of the Truancy Committee at ELHS

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 Geography, Secondary Social Studies

Other Subjects Climate Policy, Anthropology, World History, Outdoor Education

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 deeply committed to sharing current, cutting-edge knowledge of the natural processes that are so rapidly changing in our world. I am a social studies teacher, but my first year teaching was spent teaching chemistry, and my undergraduate degrees are heavily science-based. (I learned how to teach on the fly, I was not formally trained. I feel it makes me a unique breed of educator.) I hope to continue my education in order to pass it on to the generations that will be shaping the world very soon. I have spent time doing archaeology work in the field, digging up cod fish vertebrae, working up the statistical analysis of them, and then running them through various tests, including an Accelerated Mass Spectrometer at a private college here in Maine. I firmly believe that the best teachers are the ones who actually do, which is what motivates me to seek out this experience. Professionally, it will enable me to be even more of an expert in the field. This will in turn ensure that I am able to help train other teachers in both the science and social studies on the most effective ways to help students grasp the changing world around us.

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)

Though I feel confident in my ability to communicate in written form and orally, my true medium is imagery. I am a professional photographer. My medium is imagery. I have been shooting on a Nikon since I was in my teens, first on a film camera, then gradually I moved into the DSLR world. I share my life stories, as well as stories of others, with my camera and my lens. I am an accomplished photographer, I am comfortable with animals (wild, domestic, you name it), landscapes, portraits, macro and micro photography. I live and breathe through my lens. This is my most powerful medium. I also am a huge proponent of auditory recordings. I believe that hearing the sounds of a place is nearly as important as seeing the sight of it. When I travel, I often bring back sound recordings for my students to listen to- the bustle of a London street, the sound of the sheep baa’ing in the highlands of Scotland, the sound of the Maori men and women performing Haka in New Zealand. The sounds of a place are easily as important as the imagery. I would share it in that way.

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

Again, I use images as my medium. I have envisioned several ways to share this experience, depending on the audience. First, I believe that the general public in my community should be able to access my recounting of this experience. Using imagery, audio, and blogging, I would like to curate a gallery-style opening to the public in one of our local art galleries. Galleries can be incredible ways to garner interest from all demographics in our particularly diverse community. This should also be digitized, and perhaps dovetailed with Google Maps or ArcGIS. In terms of sharing this experience with other educators and professional communities, I have already been offered time to share my own expertise in Professional Development days at our school. I also present at our annual Maine Council for Social Studies, which helps other teachers learn how to teach a particular topic. Last year, I presented on teaching hands-on ethnography. This would be an ideal place to share this experience. I also run a Twitter and an Instagram account which garners significant interest, and presents yet another avenue for sharing. I engage in conversations with many people across the United States on these platforms, particularly educators.The possibilities are endless.

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 teach in a staggered manner. Depending on the literacy level of my audience, I begin by working with very large concepts first. Often, this is presented as a visual timeline. Once that timeline has been established, I choose pieces of that timeline to explain in more and more detail. I pick out key events, processes, or people to highlight and show images of, audio of, or video of. It is important to speak to all audiences, and to cater to each different group of people. Sometimes, my audience is adults, and sometimes my audience is young adults or even children. I find that having an open discussion often helps as well. For example, I will show a particularly information-dense diagram or image, and ask in three rounds: What do you see here? What do you think? What do you wonder? And each person is invited to explore their own educational experience in this way. I find that images and audio work well here. When a teacher tackles a complex issue from a macro and micro standpoint, paying attention to each different type of learner, the lesson is much more easily absorbed by all.

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

I have my feet firmly in both worlds, being part researcher and part educator. I am quick to catch onto complex concepts, and not phased by intense physical activity or

peril. Hard science also does not deter me, I have worked extensively in labs and in the field. I love mountaineering, rock climbing, hiking, and have completed true field research in the field of archaeology and environmental science, and I have a passion for teaching all sorts of people about the world around us. I understand that the development of the body of research surrounding these issues is a slow, yet crucial, process that takes many individuals working towards common goals. I also understand that this is a team process, requiring the ability to work well with others under stressful conditions. I am an extremely hard worker, and I would probably require less training than some in order to be up to snuff and ready to roll into these expeditions. Anything I don’t know, I am confident I can pick up on quickly. I am humbled by those with more experience than I am; my willingness to learn and go out of my comfort zone is one of my biggest assets.

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 teach in an urban public high school with students of various needs, from fifteen year old students with a 3rd-grade reading level to Newcomers who have sought asylum from all over the world. Because of this incredible diversity, we have experienced a surge in racist incidents at our school. The Social Studies Department at my school decided they should assist other teachers in understanding how to have difficult conversations about race, as it was being reported that many teachers weren’t intervening because they simply didn’t know how. As a member of the team tasked with teaching other educators, I spearheaded our first phase. I developed a short course to help teachers self-reflect on their own practice, ensuring that while I was not offending, I was helping others to understand there is always room for more diversity and inclusion in a classroom. My course is in the process of being adopted throughout the school. This course was created using input and constructive criticism from my department members. I believe that constructive criticism, effective collaboration, and a shared vision are the foundation of excellent teamwork. Crucial to understand, I am part of a tiered solution, and if my part fails, the next can't succeed.

6. Communicating the Experience and Science

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

The end of the grazing season at our sheep farm is signaled by the fiery leaves on the trees, the slow turn of the grass from emerald green to dull brown, and the tell-tale shaggy coats that begin appearing on our sheep. It is this time of year that we must move our sheep from the fall grazing pastures to the winter paddocks. Moving dozens of sheep with just one woman and one dog is no small feat. It takes practice and stealth, and I must trust my dog to do his job. We set out early in the morning, before the sun is completely up. The frost shimmers on the blades of grass, and I can see my breath billowing out in front of me. We make our way through the woods, behind the sheep, so we don’t spook them. Once we have them in our sights, I sharply whistle… Off Thistle goes, stalking through the grass, moving the whole flock up the hill toward the barn. It takes us half an hour to move the whole flock, but we don’t lose one sheep along the way. Thistle, his body wiggling with delight, jumps into the back of my truck after we’ve shut the gate behind us. We head home for breakfast.

7. Scientific Interests and Research Area Preference

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

Please explain your preference
I am pleased to go wherever I am best suited and wherever space is available.

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 is acceptable

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 undergraduate degree is in Geography and Anthropology. I was accepted to a masters program in Climate Science, but unfortunately life got ahead of me and I became pregnant with my first son. I chose to go back to school to bulk up on hard science, such as Biology and Chemistry before going back for my masters once my children are older. My absolute favorite classes to take were Environmental Archaeology and Environmental Policy. As such, I am passionate about biology and chemistry, earth sciences, and climate change itself. I teach a course currently called “The End of the World: A History of Climate Policy in the USA” - in it, we focus specifically on the quaternary period. I am well-versed in biology and marine sciences. I am particularly fascinated with marine science, glaciology, and ocean currents. My work with cod vertebra off the coast of New Hampshire on the Isle of Shoals had me doing a combination of archaeological analysis, chemical analysis, and then reporting. I love data-driven research, and I also like hands-on work. I enjoy connecting the past to the present, which is why archaeology and biology & chemistry are so dear to my heart.

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 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
Archaeology and paleoecology

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 a significant amount of experience in the outdoors. I have been traditionally rock climbing for twelve years, I have experience in ice climbing and mountaineering. I have a (lapsed) certification in Wilderness First Aid. I hike weekly, including in the winter in the White Mountains. I have no formal firearms training, but I have been taught to shoot and am comfortable with a rifle. I also am an avid kayaker and fly fisherwoman.

b. Provide a basic statement of your general health and physical condition.
I hike and run weekly. I am a yoga teacher. I am physically fit enough to run several miles without stopping. I regularly weight lift and consider myself to be in good physical condition. I currently have no health issues that I am aware of.

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.
I'm happy to use either Mac or PC. I grew up using a PC, but now use Mac. Both are fine for me, I am quite comfortable with both.

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.
Laptop, Nikon D610 DSLR, Lightroom, Photoshop, iMovie, all basic Word, Excel, Powerpoint software, social media, videography equipment such as steadycams, various lenses for various cameras

e. List any additional skills or information that you wish to be considered.
- Thorough understanding of scientific research - Outdoor leadership skills - Professional photographer and image storyteller

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
Erin Towns

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 Nathaniel Theriault

Title and affiliation Assistant Principal, Scarborough High School, Former supervisor

Email Address

Phone Number 207-240-9058

Reference 2

Name Scott Annear

Title and affiliation Current principal, Edward Little High School

Email Address sannear@auburnschl.edu

Phone Number 207-713-5715

Reference 3

Name Matthew Edney

Title and affiliation Former professor of geography, Current professor at University of Southern Maine

Email Address

Phone Number 207-837-1931

2020-2021 PolarTREC Educator Application

Sarah Johnson

1. Contact Information

Name: Ms. Sarah Johnson

Email: sarah@wildroseeducation.com

Home Address:
PO Box 83
Carbondale, CO 81623 US

Home Phone: 417-689-0697

Cell Phone : 417-689-0697

Institution Name: Wild Rose Education

Institution Address:
520 S. Third Street, Suite 16
Carbondale, CO 81623 US

Institution Phone: 970-510-0697

Classroom/Office Extension:

Institution Fax:

Institution Website: www.wildroseeducation.com

Other relevant websites: www.wildroseeducation.com/about wildroseruminations.blogspot.com/ www.facebook.com/WildRoseEducation

Supervisor's Name: n/a - self employed, independent contractor

Supervisor's Email Address: sarah@wildroseeducation.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): Participants come from rural connected western Colorado. I work with middle school, high school, and college students, and educators primarily from public institutions. I also engage with community learners from this area. Most all participants are from middle class families and have dependable access to technology and internet.

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

Other Type of School Wild Rose Education is an innovative environmental education business providing place-based learner-centered educator workshops, youth leadership opportunities, and environmental education consulting. Clients include the public, private, and non-profit sectors. Wild Rose Education is lean and nimble, effective, sole proprietor, woman-owned, small business.

e. What is the population of your annual audience or school (estimates are fine) 2000 participants

f. School Ethnicity:
0 % - American Indian or Alaska Native
0 % - Asian
0 % - Black or African American
35 % - Hispanic or Latino
0 % - Native Hawaiian or Other Pacific Islander
60 % - 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: 40

h. Average class or audience size 20

i. Total number of students/audiences you teach in a year 2000 participants, 100 programs/classes

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.
Primary programming happens in early June, early August, and October-December; yet there is broad flexibility in the schedule. Vacation is happening in mid-April in 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): BS Biology

Bachelor's Degree (Minor): Geology

Masters Degree (Discipline): MAEd: Natural Science and Environmental Education

PhD Degree (Discipline):

Other Degree:

b. How many years of education experience do you have?: 18

c. How many years have you been working at your current institution?: 4.5

d. List up to 10 relevant professional licenses, certifications, registrations, awards or honors that you have received in your profession::
• Master Certified Environmental Educator (Colorado Alliance for Environmental Education) • Certified Interpretive Guide and Interpretive Trainer (National Association for Interpretation) • Land Ethic Leader (Aldo Leopold Foundation/Murie Center) • BEETLES Leadership Institute partner (Lawrence Hall of Science, University of California, Berkeley) • Leave No Trace Master Educator (NOLS/LNT) • Project WET (Water Education for Teachers) Facilitator and State-wide Host Institution Coordinator • Wilderness First Responder (WMI/NOLS) • InTeGrate Earth Education for Sustainable Societies Workshop Participant, 2019 • Colorado Alliance for Environmental Education Board of Directors, 2015-present; Vice President 2016-17, President 2018 • NAAEE National Environmental Issues Forums: River and Water Issues Team, 2015-present

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 (Describe Below)

Other Primary Assignment In-service teacher training community learners

b. What subjects do you teach? Check all Middle School Science, Middle School Social Studies, Secondary Earth Science, Secondary General Science, Secondary Geography

Other Subjects Environmental Education: primary focus is on rivers, water, climate change, and public lands. These are taught through the lenses of ecology, hydrology, geography, policy, civics, and community engagement.

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)

Doing field science in an ecosystem I have never experienced and learning and working alongside professionals excites me. Throughout the experience I hope to learn how science is happening in the Arctic, have opportunities to design learning experiences for teachers and students back home, establish long lasting professional relationships, and have an epic adventure while doing so. As a science education professional development trainer it would be incredible to expand my experience to include a field research experience to not only improve my field science techniques, but to also gain new inspiration for creating authentic learning experiences for teachers back home utilizing this experience and knowledge. Doing science with researchers will also inform and inspire me to design learning experiences for teachers to utilize with students that are steeped in the process of science, current issues, disciplinary core ideas, and cross cutting concepts. I'm also excited about being part of an adventurous scientific community of professionals who do excellent work and also have fun. Finally, I would be thrilled to share this experience and science research from the Arctic both professionally and personally with my professional community, local town community, friends, and as many others who might be interested.

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 can imagine a handful of ways I could possibly share this experience with the audiences I teach and facilitate. One could be sharing this experience with students in the Youth Water Leadership Program during the Healthy Rivers Youth Water Summit. It would be neat to have a live virtual presentation from researchers at the poles during the Summit that is about climate change and water. Also with the Youth Water Leadership Program I would like to coach students to investigate climate change issues related to the Arctic to then create a call-to-action presentation for policy makers. Another possibility is to reach out to local classes and offer to come to their schools on Antarctica Day, December 1st to bring Arctic science to their classrooms. I am also interested in the human geography component and would like to design a learning experience that utilizes the cultural stories of the Arctic, geography, and social justice. I would also like to write into the Youth Water

Leadership Program budget time and resources to offer a 2-3 day summer class for secondary students to explore climate change, rivers, water, and the Arctic using the science and resources gained from the PolarTREC experience.

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 professional development provider, I can imagine offering a 3-day summer course focused on the Arctic, through the Western Colorado University Teacher Institute. I can also propose a session for the Colorado Alliance for Environmental Education annual conference, the North American Association for Environmental Education (NAAEE) annual conference, the annual Colorado Science Teacher conference, and the Earth Educators Rendezvous. I also can author blog pieces for eePro (NAAEE), Water Education Colorado, Wild Rose Ruminations, and the InTeGrate Science Education Resource Center (SERC) Earth Education network. I would like to offer a couple community presentations at the library as well as at the local community college. I can also submit newspaper pieces to the local papers to communicate my experience and offer some tidbits of knowledge about the Arctic and climate change. And with my friends and family, it would be wonderful to host a couple slideshow nights to tell stories and share adventures.

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 am passionate about curiosity and wonder as teach as a guide on the side. I am interested in the science of teaching and learning and how to best teach how to do science. Utilizing the learning cycle, students bringing their previous knowledge into the lesson they create new authentic connections and expand on what they already know. Exploring real-world phenomenon and then discussing with peers is effective in creating student-centered learning. Having age-appropriate research tools allows students to dig into new content, learn how to find information, and construct new ideas and concepts. Creating time for students to then apply their new knowledge is important in building understanding. Finally, reflecting upon learning, thinking about what helped them learn, and asking new questions is essential. Yet, it doesn’t stop there. The ‘so what’ step is next. Using new knowledge and understanding of an issue allows students to create their own evidence-based opinions. This can lead to student designed calls-to-action communicated to policy makers. Engaging and exploring phenomenon, and then applying new knowledge in context creates purpose. If students believe they are learning with purpose and they are important

members of the community, they gain agency as change makers today and of the future

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

I have passion, energy, and motivation to be fully present and I love to learn. My creative innovative out the box thinking allows for new and engaging ways to create science education experiences. If selected, I would be all in and excited to become an ambassador for the program as well as a contributor to the team. With 17 years as a nonformal educator, I have a proven experience finding effective ways make complex technical content relevant and palatable for a variety of audiences. I have been interpreting the natural world for learners for all these years. I also have experience connecting scientists to educators and helping educators see themselves as scientists. This was the focus of my graduate school research. I am also very well connected with a broad reaching professional network with whom I could help make connections for PolarTREC and share my 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)

As a strong teammate and leader I am dependable and consistent. I am a listener, innovator, and communicator. I have strong follow through, drive, tenacity, and can be rather creative. I am always thinking a few steps ahead of the project at hand and am considering how to best connect the dots most effectively and efficiently while paying close attention to the details. I understand the necessity to be flexible and also balance and triage numerous tasks in a timely manner. Serving on a non-profit board, as a member of a project team, and part of numerous community committees, I am typically in a leadership capacity. I organize and call meetings, facilitate effective meetings, hold people accountable for action steps, ensure tasks happen as intended by the team, make decisions together with the team, strive for inclusivity, and work hard to respect people's time by being as efficient as possible. I am a cheerleader of sorts, making sure my team knows they are appreciated and their work is important to the team. Others regularly depend on and count on my leadership and ability to get things done.

6. Communicating the Experience and Science

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

September 24, East Maroon Creek, Maroon Bells Snowmass Wilderness, Central Colorado. Getting up before the sunrise, bundling up to embrace the crisp autumn air I gathered my data collection tools and set out to watch and count American Pikas. Hiking 4 miles through the bright yellow aspen groves and numerous avalanche debris piles I navigated off trail to a wide and steep rocky talus slope beneath Pyramid Peak, the official research site. Listening for pika squeaks, watching for them scurrying between the car tire size boulders, and looking for any signs of their scat or food caches, I waited. I never heard or saw any signs of pikas at this site during my research visit. Instead I began to notice the abundant varying shades of green lichens growing on the boulders just below the top layer of rocks in the talus field which had been transported down the slope during the epic avalanche cycle six months prior. I wonder if there is a relationship between the recent avalanche slides and the lack of pika activity. Did the deposit of new rocks on the talus slope disturb the pika habitat? Or was this site too far from the pikas’ food supply?

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 and available for 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
3-6 weeks would be great! I am not available during these time periods: April 17-19, 2020 May 24-June 20, 2020 July 27-August 7, 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)
Rivers, water, snowpack, ecology, human geography, climate change, and the science of teaching and learning have been my strongest recent interests. It is fascinating to understand how all these disciplines are connected, influence each other, and help us to understand the places where we live. We need to know how to dig deep into specialized narrow topics and then be able to apply these details to the larger perspective. Approaching these topics from an interconnected systems approach allows researchers and learners to take a wide view to gain broad understanding and not get too stuck in the minutia of specialization. I love learning about places and how they work from the rocks to the politics and everything in-between. It is when we understand places from holistic views we can begin to understand how culture influences landscapes and how landscapes influence culture. This ultimately allows us to strategically figure out how to best protect places and culture and the natural resources necessary for both to survive and sustain for generations to come.

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 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 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 am an avid outdoors person and have been since I was a small child. I have worked as a wilderness trip leader leading backpacking, canoe, and hiking trips. I have designed wilderness trip programs for organizations including risk management and travel logistics. I am currently a Master Leave No Trace Educator, Wilderness First Responder, and have been a licensed raft guide in the past. I enjoy car camping and day hiking as well as multi day wilderness adventures. I am typically the trip leader for winter ski hut trips with friends. I am a strong cross country skier and also downhill ski. I enjoy exploring the backcountry during any season.

b. Provide a basic statement of your general health and physical condition.
I have no health complaints. I am healthy without any diagnosis, without any prescription medications, and have good physical fitness. I can hike at elevation (above 8000ft) about 1.5 miles/hour.

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.
I am proficient in Mac and PC operating systems. I use a Mac daily, yet have years of previous experience on a PC. My skill level is an 8 out of 10 (10 = expert).

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.
I have daily access to a macbook pro, iphone 8, ipad (2012), Olympus waterproof digital camera, and Panasonic ZS100 digital camera. I am proficient in Chrome, Safari, Microsoft Office, Adobe InDesign, and Photoshop. I also use Adobe Spark to create images and videos for digital uses in email communication and social media.

e. List any additional skills or information that you wish to be considered.
I can build simple websites, work in databases, and run a successful small business.

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
Susy Ellison,

Former PolarTREC, TREC, or TEA teacher. Please provide their name
Susy Ellison, previous PolarTREC participant and current ambassador/supporter

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
Colorado Science Teacher Alliance list serve

12. References

Reference 1

Name Andre Wille

Title and affiliation recently retired science teacher, Aspen High School

Email Address awille100@gmail.com

Phone Number 970-309-3698

Reference 2

Name Jennifer Whitacre

Title and affiliation Teacher Institute Director, Western Colorado University

Email Address jawhitacre@western.edu

Phone Number 970-943-2120

Reference 3

Name Kellie Gorman

Title and affiliation Utilities Educator, Fort Collins Utilities

Email Address kellgorman@gmail.com

Phone Number 303-521-5866

Cassie Kautzer

1. Contact Information

Name: Ms. Cassie Kautzer

Email: ckautzer@sdale.org

Home Address:
4909 Avondale Ln.
Sprindale, AR 72762

Home Phone: 9206608530

Cell Phone : 9206608530

Institution Name: Hellstern Middle School

Institution Address:
7771 Har-Ber Avenue
Sprindale, AR 72762 US

Institution Phone: (479) 750-8725

Classroom/Office Extension: 0407

Institution Fax: (479) 306-4260

Institution Website: https://www.sdale.org/o/hellstern-middle-school

Other relevant websites:

Supervisor's Name: Dr. Allison Byford

Supervisor's Email Address: abyford@sdale.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): Hellstern Middle and Springdale School District is the largest public school district in the state of Arkansas. The primary audience at Hellstern is nearly 1,000 6th-7th grade students from variously diverse backgrounds in a semi-suburban community. Students have one-to-one technology access at Hellstern, and all across our district of around 25,000 students. Our school is both economically and racially diverse, as is our district. Our district also has over 70% total students receiving free/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) 1,000

f. School Ethnicity:
1 % - American Indian or Alaska Native
1 % - Asian
3 % - Black or African American
30 % - Hispanic or Latino
5 % - Native Hawaiian or Other Pacific Islander
59 % - 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: 47

h. Average class or audience size 28

i. Total number of students/audiences you teach in a year 175+ (175 daily, plus enrichment/extension courses 2 days per week to students beyond my regular daily classes)

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.

Annually - School Starts the first full week of August We have a full week off for Thanksgiving. We have two full weeks plus off for Christmas (approximately Dec 20th - Jan 6/7/8) We have spring break the third full week of March. School Ends that last full week of May right before/after Memorial 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): Bachelor's of Science - Elementary & Middle Level Education

Bachelor's Degree (Minor): Mathematics

Masters Degree (Discipline):

PhD Degree (Discipline):

Other Degree: National Board Certified Teacher - 2012; PAEMST Presidential Science Awardee - 2014

b. How many years of education experience do you have?: 11+

c. How many years have you been working at your current institution?: 4 full years - I am currently in my 5th year.

d. List up to 10 relevant professional licenses, certifications, registrations, awards or honors that you have received in your profession::
1. PAEMST Science Awardee – Presidential Award of Excellence in Math and Science Teaching – Arkansas Science – 2014 Winner (announced 2016) 2. Air Force Association STEM Educator of the Year – 2017 Chapter & State Awardee – Arkansas 3. National Board Certified Teacher – certified 2012 4. FIRST LEGO League Robotics Coach of Herobotics – 2017-18 1st place champions at the State Championship Tournament – represented AR & USA at the FIRST World Festival Championships in April 2018. 2018-19 1st place champions at NWA regional qualifier. I am in my 4th year as a coach, learning about the STEM foundations of the FLL program and the impacts it is having on my students. I have helped steadily increase diversity of the team, and am proud to have 50% female students on the team this year. 5. POETS RET partner – I am part of a team of science teachers partnered with POETS program through a NSF grant. I am an RET (Research Experience for Teachers) participant for the University of Arkansas – helping test POETS (Power Optimization of Electro-Thermal Systems) lessons and write curriculum for the pre-college components. We were Springdale, Arkansas’s 2017 winner for “Community Partnership of the Year” and won national grant monies for our 2017 & 2018 lessons. This partnership involves the University of Arkansas, University of Illinois, Howard University and

Stanford University. I've helped represent POETS and University of Arkansas at the NSTA (National Science Teacher's Association) national conferences for the last two years. 6. RET for Vanderbilt University, and Dr. Richard Lehrer, for six years, completing research and reporting on children's thinking about mathematics and spatial reasoning. I am now exploring opportunities to work with a protégé' of Dr. Lehrer on a math-science partnership to increase STEM skills in students. 7. eMINTS certified: eMINTS is "Enhancing Missouri's Instructional Network for Teaching" and was 100 hours of classroom pedagogy and technology training. I was certified in 2015. 8. CM certified. CM is "Constructing Meaning" for English Language Learners and strategies for helping all students grow in reading, writing, speaking, and listening in all content area classrooms. 9. Presenter: I have presented at I2 (a multi-state Innovation Institute) each of the last three years on Teacher-at-Sea and Robotics Programs & Coaching opportunities. I have also presented at NSTA National Share-a-thon with my POETS team and curricula; NSTA National Roundtable with Teacher at Sea, at Arkansas's Innovation Institute to share about Teacher Research Experiences and the NOAA Teacher at Sea Program Specifically, and had been accepted to present this year at the ISEA (International STEM Education Association) conference Oct 7 on Texas A&M's G-Camp and broadening science content knowledge for elementary and middle school teachers 10. Science Specific Content Professional Development: I have been honored to complete multiple in-depth professional development programs, and all of their requirements with: USPTO (US Patent & Trademark Office) National Summer Teacher Institute 2018, G-Camp with Texas A&M 2017, Nation WWII Museum's "Real World Science" STEM Seminar for teachers 2015, NOAA Teacher at Sea 2014, Honeywell Educator's Space Academy 2012, Mickelson Exxon Mobile's Math-Science Teacher's Academy 2010. It is my hope this list shows my dedication to my craft as a teacher, my classroom pedagogy, my yen to inspire my students, and true nature as a life-long learner.

4. Professional Assignment

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

Other Primary Assignment Middle School Science Educator - 150 students daily 6th Grade student Advisory - 25 students FLL Robotics Coach (Team Herobotics) - 10 students (2-3 nights per week) Middle School Intervention/Extension - 28 students (2 days per week)

b. What subjects do you teach? Check all Middle School Science

Other Subjects My teaching assignment is middle school science, but I am certified in Pre-K through 8th grade - for all subjects - so offer intervention and extension in multiple subject areas.

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 STUDENTS motivated me to apply to PolarTREC! Their love of science and STEM grew to my love of science and STEM. They are my ultimate inspiration. I always knew I was called to be a teacher, but never considered being a science teacher. My students changed that. I now teach science full time, and love every day! This led me to PolarTREC. I want to lead my students by example. I talk to them about being life-long learners and goal setters (this is my 3rd time applying), and I want to give them tangible examples of this in myself. I want students to think beyond their neighborhood. Many of my students are from low socioeconomic backgrounds. I want them to know that they are not stuck here – in the same life, town, jobs. I want them to know what possibilities the world has for them. Finally, I want to interest future scientists! I teach 6th grade, and find that many of my students haven’t had many experiences in science prior to my 6th grade class. If their future employers are looking for STEM strong applicants, I need to catch their interest and begin preparing them now.

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)

Aside from the elements completed by all PolarTREC teachers, I would share my lessons, both written by me and generally related to my PolarTREC experiences. I see myself creating Argument Driven Inquiry style research activities to allow students to explore and debate. Additionally, any hands-on exploration I can provide to students based on my experience would be a priority. Secondly, I place a huge emphasis on goal setting in my classroom. PolarTREC is a goal I will discuss with my students this year –and I will include whether or not I am chosen to work with a researcher. I want my students to understand the importance of goal setting, working towards goal, and never giving up. To reach other students, I am open to presenting, creating presentations, combining classes within my school, or teaching my students and having my students work to create presentations about my PolarTREC opportunity, experience, or content from/related to my experience. For it to mean the most to my students and others, I need to get them involved as much as possible, so am open to any creative ideas! I would also share my experiences on my Science Instagram and our school social media pages.

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

To share my experiences with other educators, the community, and the general public, I would contact my business and social networks. As examples, I would be in contact with my district publicist to help me mediate interviews and data sharing with local television, news, and newspaper media. I would work with my school and/or district EAST (Environmental and Spatial Technology) classrooms to create videos or access broader data sharing capabilities. Our district EAST classrooms are heavily connected in the community and with helping resolve community needs. In this way, they can help me network within the community and see if the project I am assigned to can help inform or support projects within our local community. I am also active on social media and network with many teachers from all over the country in this manner. In this way I connect with hundreds of highly qualified educators I’ve met at other high-engagement teacher learning opportunities. Finally, I would also be very interested in presenting at professional conferences, which I have experience with, – including Arkansas’s Innovation Institute, ISEA (International STEM Education Association) or NSTA Regional or National conferences about PolarTREC

and my corresponding work.

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 middle school teacher, I work through the 5E lesson planning process when teaching new and complex topics, concepts, or issues. The 5E model includes: Engaging students, students Exploring, Explaining, Extending or Elaborating, and Evaluating. I put the biggest emphasis on engaging students and finding ways for them to explore physically and mentally so they'll "buy in" to their learning and put effort into understanding. Then, students need to gain ideas, knowledge, and interest through exploration. Students demonstrate conceptual understanding when they provide evidence they can recognize, label, and generate examples of. To be able to do this, I believe they need their hands on materials and time to talk in groups about their ideas. After exploring, its my job to facilitate student structured talk and classroom discussions to help explain. I then question students (aiming for depth of knowledge) to elaborate or extend their thinking, while working to clear up misconceptions. Formal evaluation happens last, however, informal evaluation/assessment is happening throughout this process. I am also currently learning more about Argument Driven Inquiry and working to incorporate that style into my lesson planning to highly engage students in depth filled debates of science content.

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

I would bring many strengths to the PolarTREC program and field research team. I am open-minded, hardworking, and adventurous! I am a life-long learner and collaborator because I know we learn best from each other and that “two heads are better than one.” I will bring PASSION! I will bring passion and excitement for learning and increasing my science and STEM content knowledge and passion for life-long learning, and the desire to instill this in my students. And I bring my passion for educating my students to the very best of my abilities: working to inspire the next generation of STEM-literate professionals one real-world activity at a time. I will also bring DEDICATION to my PolarTREC experience. I am not afraid of the unknown, research, new tasks, or long hours. I honestly feel one of my strengths is being able to admit when I don’t have the content knowledge I need, but I have the HEART and dedication to learn, and that is why I believe so strongly in the exploration process for my students. Overall, I will bring 100% commitment to the PolarTREC program, field research team, my learning, and the inspiration and education of my students.

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)

Examples of my contributions include: I work with a Peer Learning Community (PLC) of science teachers at school, meeting multiple times a week to plan experiences for students, share supplies, disaggregate data, and share ideas. Annual test data has shown that when we collaborate and work as a team, our student growth and scores improve. Several years ago I was invited to join a STEM committee in Northwest Arkansas, sponsored by ASTA, to provide STEM professional development to K-12 teachers across the region. We’re planning for our second SciCONN event this winter. I am the team leader for my 6th grade cross-curricular team. We meet weekly to discuss student progress, goals, character, or concerns in all content areas. My role as team leader is to facilitate our discussions, help us adhere to NORMS, and document our progress. As a member, I dedicate this time to checking on individual students and assessing their learning needs in all areas. I also was a member of my district STEM Task Force. This team researched STEM activities and successful implementations across grade levels K-12 and put together collaborative reports of findings to share with district officials to aide in future decision making.

6. Communicating the Experience and Science

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

You never know where a 6th grade science class will lead you, and while I do have standards I'm required to teach, I truly believe some of the best lessons come from impromptu student questions and ideas. Last week students were putting together their science data binders when a small finger tapped me on the arm. "Excuse me, Miss K. May I ask you a question?" Ruth said with the sweetest smile. I was anticipating a vocabulary related question from this young lady as she continued her growth in learning proficient English. "Do you fart?" she blurted! … "Like, do teachers ever fart?" (I almost spit-laughed, but held it in!) "Well Ruth, um, everyone farts, actually." I recited, wondering why she was asking. "Well my book says that teachers never fart. And so, I wondered if YOU ever did." I couldn't help it any longer – I laughed! Loudly! She showed me her book and read aloud to me the diary entry about how 'teachers never fart.' This lead to a two-minute impromptu book-talk in front of the entire class and a ten minute discussion about bodily functions and which systems cause these reactions! Cross-curricular, engaging, learning at its best: when students WANT TO KNOW!

7. Scientific Interests and Research Area Preference

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

Please explain your preference
I would find Arctic or Antarctic research experiences very inspirational, so would be excited about and open to an expedition in either area. However, as my students are in school during Sept-Feb, I strongly believe an Antarctic expedition would have a greater IMPACT on my students. I would have time within the school year to discuss with them where I'm going, why, and engage them in pre-research along with me. Besides engaging with them during the trip, I'd then have these same students upon my return and would get to first hand see the impact and excitement.

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 willing to participate in any length expedition. I should be able to participate and almost any dates except late April, when Arkansas State Testing occurs.

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)

Overall, I would say I have a pretty vast general interest in Science because I just love to learn and have trouble narrowing my interests. Units I'm required to teach about are, however, of particular interest because I am always trying to gain content knowledge to best teach my students with. I teach a unit on Human Impacts and use this opportunity to talk about global and local climate change with particular attention to climate change seen in the Marshall Islands, because my city has the largest population of Marshallese in the US outside of Hawaii. I am also interested in Atmospheric Systems and Weather Data, as that is another new unit in Arkansas science curriculum. Engineering and Technology are of interest, as I want to grow STEM-literate students to be more college, career ready. Biology, biodiversity, and biological studies is another area of interest: energy in ecosystems, cell through body systems, and genetics. Finally, planetary science and space exploration is a particular interest of mine. I was able to attend a NASA Honeywell Educator Space Academy in 2012 and have since been inspired to learn more about the history and future of space exploration.

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 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 would really enjoy an expedition in this subject area

Other (please specify)

Other Areas of Scientific Interest

I truly would be interested in any areas of scientific study - and would be able to bring lessons in any area back to my students and/or my extension classes.

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)

NA

8. Background Information and Skills

a. Briefly describe your outdoor skills or experiences.
I am CPR and first aid certified and have also completed “Stop the Bleed” training for trauma related situations. I have moderate experience hiking and boating, and particularly enjoy hiking. I hiked through parts of Texas, New Mexico, and Colorado in summer 2017 with a Texas A&M Geology study program for teachers. I have some experience camping, but it has been quite a few years since I’ve been out. I have aspirations to hike Mt. Kilimanjaro in the next few years.

b. Provide a basic statement of your general health and physical condition.
I am in good physical condition and general health and had a positive report of health criteria at my last physical.

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 operating a PC. I have experience with Microsoft Word, Excel, and PowerPoint. At school, all of my students operate Google Chromebooks on a daily basis, so I have developed skills with Google Docs, Slides, Sheets, and Forms. I also use Promethean Active Software and Google Classroom daily with my students. I have also created and maintained my own website using Weebly.com and have kept blogs using Word Press. I have limited experience with many other applications and software and am a quick study for computer skills and technology apps.

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.
On a regular basis, I use: Windows based laptop for all school and home functional needs. Google Chrome is the internet browser we’re most often using for work, but I am also familiar with Firefox & Internet Explorer (which I still have to use for a few particular applications at school). Google Chromebooks, Google Classroom, and Google Apps & Extensions to provide student resources, activities, interactions, etc. Promethean Board and Promethean Active Software to present and share information with students while allowing them to interact. Apple Ipads & Ipad minis and associated apps & cameras for student projects. Smart Phone – daily personal use for news, social media, weather, logic puzzles, and other entertainment. Digital Cameras for pictures (though my current iPhone takes better quality photos than my old Canon digital camera). I have used Garage Band to mix music in the past, as well as iMovie, but it has been several years.

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

Please know, I understand that I will not be the candidate with the most depth of content knowledge for your research, however, I urge you to look at my accomplishments and know how hard I am willing to work to learn anything required or tasked of me! This opportunity and experience will help me INSPIRE my students… to set goals, to never give up, to be life-long learners, to be science literate… etc… and for that opportunity to inspire and engage my students, I will work harder than any teacher you've ever met!

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 NOAA Teacher at Sea - 2014 (Hydrographic Survey - Kodiak, Alaska)

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 work with NOAA TAS on a hydrographic survey was a very beneficial experience. Working alongside real scientists provided me with incite I did not previously have to share with my students. I continue to adapt and change my hydrography related lessons and use these with my students. The biggest impact, however, from NOAA has been my credibility. Researcher John Hattie found Teacher Credibility to be among the top 10 impacts on student learning. A research experience with PolarTREC would enhance my credibility (my trust, competence, dynamism, and immediacy) in the eyes of my students. I also believe PolarTREC would help increase my STEM content knowledge, and therefore, that of my students, in another area. PolarTREC Researchers have a multitude of research areas my students and I can learn from. While I do believe I should not be granted another Hydrographic research experience, I do believe each experience is different and engaging. In college, I never studied science beyond generalities because I never intended to teach it. I fell in love with teaching science because my students loved it. They love to learn when they get to explore! Now it is my job to seek out the very best opportunities for my learning to best help me prepare them for the future. Ideally, I would have them with me researching. Since that is not a viable option, however, I need to bring those world-wide, real science, learning experiences back to them! A few years ago I was honored to move into a science position full time, and now strive to learn as much as I can professionally to benefit both my pedagogy and my students' STEM education.

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)
As a life-long learner, I research for opportunities for teachers to get into the field and learn. Somehow, among this research 3-4 years ago, I came upon PolarTREC.

b. Please suggest other places we might advertise this opportunity for teachers
Social Media State science teacher list serves

12. References

Reference 1

Name Mrs. Maribel Childress

Title and affiliation Asst Superintendent for Curriculum, Instruction & Innovation

Email Address mchildress@sdale.org

Phone Number 479-957-7999

Reference 2

Name Dr. Todd Loftin

Title and affiliation Principal (Central Jr. High - Springdale; former Principal Hellstern Middle School - Springdale)

Email Address tloftin@sdale.org

Phone Number 479-466-8631

Reference 3

Name Dr. Jacob Hayward

Title and affiliation President - Arkansas Science Teacher's Association; Principal (Siloam Springs, AR Middle School); former Asst- Principal (Har-Ber High School, Springdale, AR)

Email Address haywardj@gosiloam.com

Phone Number 479-409-8161

Daniel Kenning

1. Contact Information

Name: Mr. Daniel Kenning

Email: dan.kenning@gmail.com

Home Address:
16 S 675 W
Hebron, IN 46341 US

Home Phone: 2192422937

Cell Phone : 2192422937

Institution Name: Wheeler High School

Institution Address:
587 W 300 N
Valparaiso, IN 46385 US

Institution Phone: 2197592561

Classroom/Office Extension: 2229

Institution Fax: 2197595602

Institution Website: http://wheeler.union.k12.in.us/

Other relevant websites:

Supervisor's Name: Dan Klimczak

Supervisor's Email Address: dklimczak@union.k12.in.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): Wheeler High School is located in a small rural/suburban community in the outer fringes of the greater Chicago metropolitan area. It can be described as a bedroom community, but also has a significant "blue collar" and rural population.

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) 520

f. School Ethnicity:
1 % - American Indian or Alaska Native
1 % - Asian
3 % - Black or African American
12 % - Hispanic or Latino
0 % - Native Hawaiian or Other Pacific Islander
80 % - White
3 % - Multiracial
If your school uses other categories to describe race/ethnicity, please describe:

g. Percentage of students who receive free or reduced lunch: 18

h. Average class or audience size 22

i. Total number of students/audiences you teach in a year 160 in grades 9-12 and 85 undergraduate 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 Dates: Begin: August 13 Fall Break – Oct 24-25 Christmas Break: Dec 20-Jan 5

Spring Break: March 20-30 End: May 31

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):

Masters Degree (Discipline): Secondary Education

PhD Degree (Discipline):

Other Degree:

b. How many years of education experience do you have?: 15

c. How many years have you been working at your current institution?: 14

d. List up to 10 relevant professional licenses, certifications, registrations, awards or honors that you have received in your profession::
- Keynote Speaker, MSEED Scholarship day at Valparaiso University, Spring 2014 - Assoc. of Teacher Educators - Indiana "Outstanding Cooperating Teacher Award", Fall 2013 - State of Indiana Senior High/Junior High/Middle School certification (grades 5-12) - Physics and Earth/Space Science endorsement (Rules 46-47) - Professional Educator’s License granted June 2009

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 Earth Science, Secondary Physics

Other Subjects College-level physics and astronomy labs at Valparaiso University

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)

When I first read about the PolarTREC program, I was completely overwhelmed by the possibilities! I have always been fascinated by a variety of professional development opportunities and have strived to attend various workshops, conferences, and field experiences related to my subject area. Unfortunately, a lack of available funding in our state/district usually prevents me from attending anything more than a one-day workshop. Should I be accepted, I can guarantee both personal and professional renewal that will be accompanied by an inspiration which will guide my curriculum and my interactions with my students for the foreseeable future. Truthfully, I was inspired to apply for the PolarTREC program by a family member who teaches middle school social studies. He has applied for several grants in his subject area. He has been able to travel the world (South Korea, Russia, Thailand, China, Philippines, and Mexico). I have seen him grow as a person and as an educator as he incorporates the love of his discipline into his profession. He has been able to simultaneously follow his passions and inspire his students. He came across the PolarTREC opportunity and forwarded a link to me. I hope to follow in his footsteps.

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 a physics and earth/space science teacher, I endeavor to do nothing less than bringing the world and the Universe to my students. I am very interested in bringing data measurement, collection, and analysis methods into my classroom, and it would be my hope that I could utilize data that I would collect during the expedition by bringing it directly to the classroom. I would hope that this could be done in a limited way during the expedition, depending on the type and scope of the project I am involved in. Additionally, once the data is processed and available, it could be used throughout the year in my classroom to both teach and reinforce previously learned STEM topics. This could be accomplished not only in my classroom, but in K-12 classrooms across our district as part of an outreach program bringing this data to teachers who may not have any formal STEM training, particularly those in the elementary grades. In this way, I would hope that I could recreate the scientific process and bring that data/experience directly to my district’s students when I

return.

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

At the beginning of the 2018-2019 school year, our school was able to provide each student with a Chrome book to use for educational purposes. This has greatly expanded the opportunities for digital learning and collaboration in our curriculum. It would be my hope that students from my district could learn about my expedition by using their Chrome books to ask me questions, send me messages, learn about my research, and incorporate my data into their studies. They can accomplish this throughout corporation's learning management system (Canvas). Additionally, I will incorporate photos, data, videos, and personal experiences into my curriculum after I return. Finally, I plan on posting regular updates to the corporation social media accounts that my principal administers. In this way, I hope to reach the maximum number of students and community members both during and after the expedition.

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 believe that real world data and research should be incorporated into the curriculum whenever possible. This includes not only quantitative data, but also historical research and accounts of past events (i.e. natural disasters). I am already incorporating meteorological data into my earth/space science classroom using an on-site weather station, and students frequently collaborate on activities using our online learning management system. Additionally, my curriculum incorporates many aspects of a blended learning environment. As such, students have significantly more freedom with respect to pacing and location than they otherwise would. I have found that a traditional step-by-step approach can not only leave struggling learners behind, but also can stifle the progress of gifted students. In order to maximize the potential and pique the curiosity of all learners, I am beginning to allow students/groups to choose the order that they would like to complete the lessons/activities. This results in students working on multiple tasks simultaneously in my classroom. I believe that this pedagogical approach has benefited the students. It accommodates students with different learning styles, provides extra help for struggling learners, and enables the gifted students the freedom to explore aspects above and beyond the standards of the course.

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

I genuinely believe that I have several characteristics that make me uniquely qualified for a PolarTREC expedition. In addition to my high school teaching job, I also teach 100-level physics and astronomy lab sessions at Valparaiso University. Consequently, I am well versed in numerical data analysis methods used in collegiate level physics/astronomy courses. I am familiar with the physical meaning of linear regressions and the statistical implications thereof. As such, it is my belief that I could assist in scientific research and data collection more effectively than the average PolarTREC candidate. Furthermore, I would describe myself as a jack-of-all trades. I work on my own car, built my own house, play several musical instruments, and regularly perform repairs on my own major appliances. I have been known to rescue TVs, toasters, and stereos from the dumpster and (usually) can fix them. On top of all these responsibilities, I have three boys of my own (age 9, 7, and 6) that keep me busy during what little free time I have. My kids have enabled me to see the fun, beauty, and wonder in all things, and I would hope that this attitude accompanies me on my expedition.

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 member of a committee that received a planning grant designed to rehabilitate a pond on our school's property. The grant monies have been used to design an educational center complete with restored with native plants and habitats. Additionally, during my years as an instructor at Valparaiso University, I have been part of a group that has written and modified several astronomy laboratory experiments for use in the course. At various times, I have acted as both the main writer and as the "guinea pig", whereby I would try out the experiment and proofread/edit as necessary. Finally, I am a member of various groups and committees within my school district. I am on our high school's technology committee, and through this we have implemented several building-wide initiatives. I have led two faculty seminars on the integration of technology into the curriculum. I am active in the local teachers' union, and I act as a building representative for this organization.

6. Communicating the Experience and Science

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

The day begin at 5:45 AM with my son Nolan running into my bedroom and screaming, “It is my birthday!” He was correct – although his party would not start for another 8 hours. I reluctantly got out of bed and made the kids oatmeal with raisins (aka “daddy oatmeal”) for breakfast. At about noon, the guests began to arrive. My parents, my mother-in-law, and about 15 other people eventually showed up. My wife had made 203 meatballs earlier in the week from scratch. We struggled to heat them up in two crock pots, but eventually succeeded. The guests ate until they were full. We sang “happy birthday” and enjoyed the cake, which was decorated with Matchbox cars. Later, Nolan opened many presents, and I was tasked with the excruciating task of opening the packages, removing the zip ties, assembling the countless parts, and inserting multiple batteries of various types into the newly acquired toys. As the guests left, Nolan was just beaming with glee. He normally fights with us regarding his bedtime of 8 PM, but he was more than willing to go to his room and rest after such an action-packed day.

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 participate in any available expedition. My corporation would be willing to allow me to embark on this adventure even if it meant being out of the classroom for several weeks.

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
There are no specific dates I would be unavailable at this time. July 9-18 2020 is currently unavailable due to a planned family event, but even that is "negotiable" if I am selected. I am flexible and could accommodate a 6 week absence, but I would prefer to be gone no more than 4 weeks. I feel that my students would lose out on valuable instruction time if I were to miss more than 4 weeks of class. My family is important to me, and it is another reason that it would be difficult to be gone for more than a month. In conclusion, I could make any amount of time work, but would prefer 4 weeks or less.

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 passion for a variety of disciplines, and this is evident in the way I plan my curriculum. I enjoy astronomy and have experience with telescopic observations at Valparaiso University. I completed several photographic and photometric projects while I was there. I was able to acquire two donated telescopes for my high school classroom. In addition, my classes at Valparaiso University utilize a 16” telescope on campus as part of their laboratory experience. I also enjoy studying meteorology and atmospheric sciences. A grant allowed me to purchase a professional weather station at our high school, and this weather station is part of a regional “MESOnet” of linked weather stations that is attempting to better predict lake effect snow events in the Great Lakes region. Finally, I enjoy regional and global studies of geology. I have been able to develop a “Geology of Northwest Indiana” unit in which my students learn about the past glacial features that are present in the landscape. I take the classes on a geomorphology field trip throughout our local region and allow the students to see evidence of the region’s glacial past in person.

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) I would really enjoy an expedition in this subject area

Other Areas of Scientific Interest

Neutrino/subatomic particle research or astronomical observation/data collection would be fascinating to study. Additionally, nearly any area of interest can apply to such a wide-ranging field of study as Earth/Space science. I would certainly be able

to incorporate any area of study into my students' curriculum in a meaningful way.

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 been on several back-country hiking excursions, including a 3-day trip to the bottom of the Grand Canyon. As a result, I am familiar with living out of a backpack and camping in a rustic setting. I would be comfortable setting up gear such as tents or other temporary living quarters, and would be comfortable living outdoors for several days. I am CPR certified, with the most recent training completed in Fall 2017. I have owned and operated a boat in the past, and I am familiar with basic watercraft safety procedures and outboard motor maintenance/repair. I would be able to drive a snowmobile, ATV, off-road vehicle, or a small watercraft.

b. Provide a basic statement of your general health and physical condition.
I am in good health, with no special medical issues or concerns. I do not require any special dietary needs or medications, and I would have no problem lifting heavy objects or walking long distances.

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.
I consider myself well versed with computers and the technology of my trade. I own an Android smart phone, and utilize a Windows laptop and a Chromebook provided to me by my school district. My grades, curriculum, assignments, lesson plans, and important personal information/photographs are all stored digitally. I utilize Google Drive and the Google suite of products (Docs, Sheets, etc.) for many online storage and office-based tasks as well.

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.
I am proficient with common office/educational software such as Microsoft Word, PowerPoint, and Excel. I am also proficient in learning management systems such as Blackboard and Canvas, and have been using these in my classroom for several years. Beyond that, I can complete linear regressions and statistical data analyses using Microsoft Excel and other related educational products. I have used CCD cameras to image astronomical objects, and can perform basic data reduction and image processing during astronomical photography and photometry. Finally, I utilize "probeware" such as accelerometers and digital force sensors throughout my physics curriculum. I use the Google suite of products for personal use, including document/photo storage and organization. Additionally, I regularly post on Facebook and keep in touch with family and friends using this platform.

e. List any additional skills or information that you wish to be considered.
I am a lifelong learner, and am able to learn new procedures rather quickly. I can perform repairs on many items, ranging from electrical circuitry and appliances to small engines and automobiles. I change my own oil and brake pads, and usually can diagnose and repair many issues on my own devices. I can frame a house, and can install/repair household electrical wiring, plumbing, and flooring.

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
Thomas Kenning

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
National Science Teachers' Association (NSTA) Conferences

12. References

Reference 1

Name Dan Klimczak

Title and affiliation Principal, Wheeler High School

Email Address dklimczak@union.k12.in.us

Phone Number 2197592561

Reference 2

Name Kevin Goebbert

Title and affiliation Professor of Meteorology/Faculty Senate Chair, Valparaiso University

Email Address kevin.goebbert@valpo.edu

Phone Number 405-615-2841

Reference 3

Name Todd Hillwig

Title and affiliation Professor of Physics and Astronomy, Valparaiso University

Email Address todd.hillwig@valpo.edu

Phone Number 219-464-5370

Thomas Kenning

1. Contact Information

Name: Mr. Thomas Kenning

Email: tkenning@gmail.com

Home Address:
1254 36th Ave N
St Petersburg, FL 33704 US

Home Phone:

Cell Phone : 219-510-2458

Institution Name: Plato Academy St. Petersburg

Institution Address:
3901 Park St N
St. Petersburg, FL 33709 US

Institution Phone: 727-205-6360

Classroom/Office Extension:

Institution Fax:

Institution Website: https://platoacademy.net/stpetersburg/

Other relevant websites: https://openendedsocialstudies.org/

Supervisor's Name: Michelle West

Supervisor's Email Address: principalstpetersburg@platoacademy.net

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): Plato Academy St. Petersburg is a K-8 public charter school serving an urban population of students, approximately forty percent of whom are classified as low income. Despite this, students generally achieve above average on standardized tests as compared to neighboring schools. They also enjoy one-to-one access to laptop computers, as well as various other technological tools - including document cams, Nearpod, and robotics - that encourage STEM integration and creative applications of computer technology.

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 approximately 130 sixth through eighth graders every year in a K-8 school with a total population of approximately 500. In addition, I run a not-for-profit education website called Openendedsocialstudies.org which reaches a combination of student

f. School Ethnicity:
0 % - American Indian or Alaska Native
5 % - Asian
5 % - Black or African American
15 % - Hispanic or Latino
0 % - Native Hawaiian or Other Pacific Islander
65 % - White
10 % - 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.

The school year runs from approximately August 14 to Memorial Day. There is a week break at Thanksgiving, two weeks straddling Christmas and the new year, and another week near the end of March. School administration is enthusiastically supportive of educator field experiences and nontraditional professional development.

3. Teaching Experience and Education

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

Bachelor's Degree (Major): Secondary Education, Social Sciences (Indiana University)

Bachelor's Degree (Minor):

Masters Degree (Discipline): American History, History of Science (American University)

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?: 7

d. List up to 10 relevant professional licenses, certifications, registrations, awards or honors that you have received in your profession::
1. Florida Educator’s Certificate. • Secondary Level, Social Sciences. • ESOL Endorsement. 2. National Geographic Certified Educator 3. 2019 Ecology Project International Fellow • participated in field research, conducting transect surveys on coral populations in Baja California, Mexico in April 2019. 4. 2017, 2018 Peace Studies Institute Fellow • traveled to Moscow with a group of academics to discuss and explore the current relationship between Russia and the United States. 5. 2016 Florida VFW Teacher of the Year 6. 2016 Fund for Teachers Fellow • conducted one month of fully-funded independent research and development for original lesson plans in Peru and Bolivia. 7. 2015 Fulbright-Hays Seminar participant, conducting research and study in People’s Republic of China • collaborated with other educators on an interdisciplinary curriculum covering Chinese history, current events, and culture. 8. 2013 Field Researcher, Nuclear Institute, American University • Conducted interviews and collected documentary evidence related to the historical memory and legacy of the atomic bombings of Hiroshima and Nagasaki, Japan. 9. Founder and content creator, Openendedsocialstudies.org • a nonprofit website aiming to bring free high-quality, thought-provoking lessons to secondary social studies classrooms the world over. 10. Author of Abandoned Washington, DC, a 2018 book of essays and photography on urban exploration, history, and sustainable urban development •

utilized in secondary and university classrooms and has been an Amazon bestseller in multiple categories.

4. Professional Assignment

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

Other Primary Assignment Developer of social science-related online content

b. What subjects do you teach? Check all 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)

Ecology and conservation are topics of vital import to all life on Earth – but through neglect, they are brushed into the cracks left between social studies and science classrooms, marginalized by the strict division of disciplines in our secondary schools. This dynamic works in favor of those who dismiss sound environmental policy as a drag on the economy. This does not need to be the status quo, but change requires educators who are willing to break down the barriers between civics and science class. If we as a species have any hope of halting the alarming environmental trends unwinding around us, students need to see themselves equally as citizens of a country and as inhabitants of a larger ecosystem – as a part of a unified political and natural world, without any clear distinctions between the two, with agency to act in both. To that end, I seek a rigorous field experience with PolarTREC. I have set before myself a task - return to my social studies classroom with firsthand knowledge that will translate into lessons bridging the gaps between science, action, and policy, so that for my students, the notion of civic duty extends seamlessly to stewardship of our environment.

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 regularly incorporate field experiences into my teaching in dynamic ways. I have had the privilege of participating in several teacher fellowships in the past, and I've always returned to the classroom with unique lessons that bring to vivid life what I've seen and documented – in the form of geotagged photo essays, YouTube videos that I have filmed and edited, or original articles informed by my experience. These unlock the raucous potential of digital media; gone are the days when a textbook included a few impersonal photos and diagrams. My students (and the tens of thousands of others around the world who regularly access this content on my not-for-profit website) are treated to personal, probing, idiosyncratic lessons that have helped them better understand anything from the dynamics of a camel caravan crossing the hard desert climate of the Sahara to the unique environmental conditions of the steep Andes, harnessed by the thriving Inca Empire. I am always experimenting with new approaches and technologies to bring these experiences back home in the most evocative ways possible, but I have learned that no matter

how flashy the presentation is, there must be a thought-provoking line of inquiry running through any lesson.

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

In 2015, I launched Openendedsocialstudies.org, a nonprofit website presenting original, dynamic classroom materials focusing on parts of the world and concepts neglected by traditional social studies textbooks. This is the humble lever with which I hope to effect the world - multiplying my reach as a teacher far beyond one classroom. My lessons aim to foster critical and social thinking, greater geographic literacy, and a sense of wonder about the world and our place in it. Traffic to the site increases steadily - reaching tens of thousands of visitors in the last year alone - garnering positive feedback and press from educational media and practicing teachers. It is in the capacity of this ongoing project that I now apply to PolarTREC. I seek to develop dynamic, engaging, media-rich lessons drawing upon science, geography, and social studies, teaching students about the interdependent relationship between human activity and the environment, as well as the rich diversity of the natural world - specifically focused on the changing polar regions of the planet. The resulting curriculum, reflecting the sum of my research, observations, and collaboration with PolarTREC specialists, will be employed and refined in my own classroom, even as it is featured at Openendedsocialstudies.org.

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 recently completed work on my second book, a volume on the decommissioned coastal defenses that have guarded Florida’s long coastline through the centuries. I have strategically used these experiences to educate the students in my classroom, too. I’m shooting vlogs from the field, dropping geotags which allow students to reckon with distances and scales. Google Earth helps to illustrate how the configuration of sand above and below the water might channel an enemy ship toward the big defensive guns of a fort. One example is Fort Dade on Egmont Key, which once guarded the mouth of Tampa Bay, near where I teach. This sandy island is eroding as rising sea levels and intense hurricanes like 2017’s Irma have swept the fort itself out to sea. Students have tracked this change over time, as well as efforts at conservation and restoration, by examining archived satellite images and historical photos and maps. They are learning about the history of their state, its geography, its tumultuous relationship with the ever-present ocean and gulf, as well

as the dynamic nature of its coastline over time, even as the rate of change on that coastline accelerates in the age of global climate change.

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

I would be an asset to any field research team, as I have demonstrated on projects ranging from underwater transect surveys to data collection on a project related to the atomic bomb. I am a patient observer, good with precise details, nuance, and discernment – without losing sight of the bigger picture. I possess a natural and contagious curiosity. I am self-motivated and independent enough to follow through on the most challenging or mundane tasks. I am also humble enough to subsume my ego to the demands of the project, as well as to the broader dynamics of the team of which I am only one part. If I had to highlight a single quality above the rest, however, it would be my ability to communicate all of the above with an infectious passion. I take pride in my ability to take nearly any subject in which I have become conversant and explain its scientific or social import in a way that resonates with an audience. I get out of bed each day for the feeling that comes from helping other to realize that they care they deeply about a topic of which they had never heard just fifty minutes earlier.

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)

Based on the success and popularity of a blog I created – covering urban exploration in Washington, DC – I was recruited to consult for a major video game publisher. They wished to create a game set in a sci-fi version of DC which had been abandoned and quarantined for more than a year. I was to lead a team of developers – writers, sound designers, graphics designers with incredibly particular specialties – through the city's abandoned places, helping them to spot the granular details that would make their digital DC feel authentic. To prepare for this unprecedented assignment, I spoke extensively with the game's creative directors. This helped me comprehend their unique vision and to anticipate how I could best support it. As a social studies teacher, I don't normally work in the world of speculative fiction, but by taking the time to understand the specific role and vision of each team member, I developed a guided tour of the city tailored to the needs of each interested party. The game we worked on together portrays a rich, vivid version of the capital. When I watch the game's trailer, I can point proudly to the details informed by my collaboration with the team.

6. Communicating the Experience and Science

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

It’s my third week teaching at this school, and my students have quietly decided – scandalously! – “Kenning doesn’t own a car.” I catch the vapors of this rumor during third period – they waft from the bicycle parked once again in the corner of my classroom, intoxicating to students otherwise numbed by another day of middle school. “I own a car – but I choose to ride my bike.” Comments like “Are you poor? Gas only costs, like, two dollars!” ripple through the class. Despite the fact that Hurricane Dorian, raging over a human-warmed ocean, has just narrowly missed our Florida town – instead unleashing its fury on the Bahamas – my students find it hard to understand why I would choose such an “inferior” mode of transport when I have at hand the convenience of a car. They’re products of our education system, itself so carefully calibrated not to upset the apple cart. “Dollars are one way to measure the cost of a gallon of gas. Twenty pounds of carbon is another, maybe more meaningful measure…” I’m speaking a new language, not being smug… I’ll end up postponing standards-aligned coursework that had been due tomorrow, because now we’re getting into some real social studies…

7. Scientific Interests and Research Area Preference

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

Please explain your preference
I am eager and willing to participate in whatever expedition that PolarTREC sees as the best fit for the interests I've described.

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 availability is generally flexible and open. My school administration is supportive and will work with me to ensure my ability to participate in an expedition of any duration.

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 particularly interested in how the polar areas previously on the extreme edge of – or beyond – human habitation are changing our understanding of past and future as a result of the transformations wrought by climate change. It seems that every month, new scientific papers are upending what we thought about how polar ice, the tundra, and other remote areas are responding to the trauma of climate change. These surprises in turn influence our understanding of our distant human past – and the patterns of human movement and settlement for the future. How are these thawing environments reshaping our understanding of the distant, prehistoric past, as dire wolf heads are unearthed in Siberia; as subarctic species colonize the tundra in the wake of receding permafrost; as vast swathes of sea ice clear, allowing waves to lap the shores of Antarctica for the first time in millennia? I am also interested in how these changes are shaping our human future, as nations position themselves to control new trade routes in the Arctic Ocean, as new resources are unlocked from beneath glaciers in Greenland and Antarctica – will this lead to a scramble, or a newfound restraint on the part of our 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 would really enjoy 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 am somewhat interested 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
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 - I am eager and willing to work with anyone.

8. Background Information and Skills

a. Briefly describe your outdoor skills or experiences.
I am an experienced backcountry hiker, filtering water from rivers and rehydrating food for multiple weeks at a time in environments such as the Grand Canyon, the Canadian wilderness, or the Andes Mountains. I have competence in basic first aid, can confidently start a fire, and undertake precautions to secure a campsite from bears or other wildlife. I have undertaken canoe and rafting trips of similar duration and rigor. I am comfortable with primitive camping, as well as sleeping in the open. I do not have a great deal of personal experience with firearms, but am comfortable in their presence.

b. Provide a basic statement of your general health and physical condition.
I am in exceptional physical health. I cycle eighty miles a week, frequently run and hike, have a healthy BMI, take no medications, and suffer from no allergies or known health issues.

c. Briefly describe the computer type and operating system (Mac/PC) with which you are most familiar and your skill level.
I can work comfortably with both a Mac or a PC, but work most commonly with the latter. I am more skilled than the average user and can competently troubleshoot and modify the settings on a computer for desired results. I have built my own PC, and can comfortably carry out mechanical repairs.

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.
I am proficient with all technologies mentioned as examples. I maintain several blogs using WordPress and have basic HTML skills. I can develop and maintain Excel spreadsheets. I can also create a coherent, compelling PowerPoint presentation. I have published several books of my own photography and comfortably use any digital camera, as well as the software required to obtain optimal results from the images generated. I have filmed and edited several short educational YouTube videos on topics related to my travels.

e. List any additional skills or information that you wish to be considered.
I have basic proficiency with most tools and do not mind working hard. I maintain my yard, a garden, and regularly execute various home improvement projects.

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 Yes - Ecology Project International, 2019, Baja California.

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'm a social studies teacher, and the conventional wisdom is that a PolarTREC-facilitated experience is primarily for science teachers. I applied because I feel that both disciplines are better – they make more sense, they're more relevant to students – when the lines are blurred. The two subjects are compliments, not as naturally siloed as a textbook with the title History or one with the title Science would have you believe. The scientific method is at work in disciplines like history, anthropology, and economics, for one. We should be asking questions with a scientific mindset – testing and looking critically at the evidence – in all sorts of disciplines. Policymakers and our citizenry need to be scientifically literate. Science should inform our civic life – it should help us make more sustainable choices about how we allocate resources for the future. One question that often gets lost in science classes is, "So what?" To the average student, the average non-scientist, science can seem like a collection of trivia, odd facts. The answer to the "So what?" question is often where we make the leap into social studies – and where too many science classes stop. The most relevant example of this that I can think of is climate change. Our species is at a crossroads. There is a moral imperative to take action on climate change – to do it on a large scale and pretty rapidly. And it is only going to be policies informed by science that get us there. Why aren't we teaching young people to look at the world not with one lens or the other, but with both? To see the continuity and overlap between disciplines – that is where real creative thinking transpires.

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 have been generally familiar with the PolarTREC program for several years, but really learned about it and was encouraged to apply by PolarTREC researcher Jennie DeMarco.

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 Michelle West

Title and affiliation Principal, Plato Academy St. Petersburg

Email Address principalstpetersburg@platoacademy.net

Phone Number 727-205-6360

Reference 2

Name Adam Beard

Title and affiliation Principal, Plato Academy Clearwater

Email Address principalclearwater@platoacademy.net

Phone Number 727-455-1694

Reference 3

Name Lisa Macki

Title and affiliation Field Experience Coordinator, Ecology Project International

Email Address lisa@ecologyproject.org

Phone Number 406-218-2586

Anna Khawam

1. Contact Information

Name: Ms. Anna Khawam

Email: aigras@aol.com

Home Address:
1929 S. State St, UNIT 4
Chicago, IL 60616 US

Home Phone: 7734908049

Cell Phone : 7734908049

Institution Name: John C. Haines Elementary

Institution Address:
247 W. 23rd Place
Chicago, IL 60616 US

Institution Phone: 7735349200

Classroom/Office Extension: 7735349200

Institution Fax: 7735349209

Institution Website: haines.cps.edu

Other relevant websites: www.cps.edu

Supervisor's Name: Catherine Moy Davis

Supervisor's Email Address: camoy@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 a 6th and 7th grade science classroom at a K-8 school in Chicago's Chinatown community. We are a Tile 1 low income community but have some of the best students around!

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

f. School Ethnicity:
% - American Indian or Alaska Native
90% % - Asian
9% % - Black or African American
1^ % - 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: 99%

h. Average class or audience size 30 kids

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.
In this year, we started September 3rd 2019 and will end June 24th 2020. Christmas break will start on December 23rd 3019 to January 6th 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): 1st degree is BA in History. 2nd degree is a BS in Education with Bilingual Bicultural Education emphasis

Bachelor's Degree (Minor):

Masters Degree (Discipline):

PhD Degree (Discipline):

Other Degree:

b. How many years of education experience do you have?: 20

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::
1. Museum of Science and Industry Distinguished Teachers Award 2. Foundations of NGSS Certificate 3. Science Teacher Leader For Museum of Science and Industry 4. Chicago Public School Advisory Team Member for Science Curriculums 5. Advisory Team Member for Scholastic Science World Magazine 6. AAAS Project 2061 Certificate - Biology

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 am hoping to bring back to my students the behind the scenes of the research at PolarTREC so they can experience what it's like to go on a scientific expedition. I am hoping to document my journey through audio/visual components so that they can use their senses to submerge themselves in the expedition. I would like to foster an interest in scientific careers they can explore, as well. As a student, I once dreamt about going on an scientific expedition but never had the opportunity to even explore scientific careers while being a little girl in Poland. My country did not have the resources to teach us about expeditions. I would love to bring that to my students, because I never had the chance to learn about anything like that. The way the world is changing is important, and we need to tell stories - not just read from textbooks, about what is going on in parts of the world we don't truly know or experience. I am hoping that by going and documenting my journey, I can touch the hear and minds of my students and future students of my school to care more about the environment and care more about considering a career in science and education.

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 wish to integrate my experience into my curriculum. So aside from all of the above, I will create session plans based on my experience and create activities which will reflect some of the things I experienced. I would like to create problem based learning session plans and projects to see how they could contribute to solving problems and using critical thinking for some of the issues surrounding the ecosystem and nature. I would also love to document my experience through two unique concepts: A podcast I record while on the expedition that will take the listener through my journey - with all the things I see, smell, hear, and experience. This podcast will serve a student and general public audience and will be released when possible on my trip. My students and fellow teachers can follow along on my journey as I experience the expedition. Another idea I had was to create a vlog on Youtube of my journey of the expedition that will feature beautiful scenery and personal stories. I think a vlog will be so much fun and connect to my students who love watching Youtube and their favorite Youtubers go on trips to different places. Youtube can be a wonderful aspect of the expedition.

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 Science Leader, I would share my experience to not only my school but fellow teachers in the Chicago Public School system as part of the Science Leadership initiative which requires school partners to share valuable experiences, data, and resources with one another. I would also use my science leadership position to share my journey and teaching points to my fellow school teachers at Haines in professional development meetings. And for the general public (and anyone of course), I can share my podcast and vlog to them as a resource and a fun way to experience an expedition from someone who is not technically a scientist. I would also like to host a science family night at my school so I can present my journey in a lecture/movie type way to the community, other grade levels, and parents - who can then foster discussions with their children, students, or even family members about science and ecology. My podcast would be a great way to reach the general community. I would create podcast flyers and post them in local libraries, online teacher boards, and even social media platforms like Pinterest! Social media is a great way to reach the general community and some of my best resources come

from Pinterest

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 always start my sessions with "Science Talks" which pertain to different phenomenas and during those science talks, students talk and listen to one another about their own background knowledge and ideas they have the topic. During the discussions, students pose questions to each other and to me. Then we research the phenomenas and try to answer questions they may have. Or we investigate through hands on experience based learning. This way, students discover new ideas in science and clear any misconceptions they may have. When a complex concept or issue is presented, I break down the topic by mini topics and investigate one topic at a time with students. You can't overwhelm students by presenting multiple concepts or very complex topics all at once.

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

I believe that I would be a new sense of wonder and exploration to your expedition from the view point of an everyday citizen, teacher, and mother. Our own stories make us unique. Our strengths lie in our brand story and mine is a little girl from Poland who dreamed she would explore the world. She then sought opportunity in the United States a created a life for herself even though it was a long and hard journey. As a teacher, I've been from school to school with many challenges and many different demographics. I taught on the West Side, having to shelter my students when gangs shot each other right out our front doors. In my current school, I am bridging the Chinese community and African American community together through shared values, principles, and by story telling. I am a story teller - that is my strength. And your PolarTREC program will have a creative and heart centered person on their team who can bridge the gap between the scientific community and the everyday public.

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 work as a member of a team by facilitating communications and making sure everyone is heard. As a Science Leader with the Museum of Science of Industry, I lead my team at my school in discussions on how we can do better, get better, and teach better. I lead, but I make sure to include everyone in the discussion and make

sure they feel like they are making a contribution to the whole team effort. My experience is that you have to really impower others, that is where true team effort lies.

6. Communicating the Experience and Science

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

The day started off with hope and inspiration... I opened my curtains to reveal the morning light as I got ready for a day with my daughter. It was going to be an average day by all means. A doctors appointment here, a doctors appointment there. Just average for us - but not for most people. You see, my daughter has a disability, and I must be the one to drive her to appointments. So on this average day, we set out to go to our average appointments. As we drove however, the average day turned into one full of magic! A rainbow appeared to us as we drove to her appointment. It lasted for a full 20 minutes...I have never watched a rainbow that long. But the rainbow appearing isn't the magical part of the day! The magic was in the message the rainbow Brought us. Before our second appointment that day, we stopped in to see a spiritual counselor my daughter often visits. He is a psychic medium and she had many questions to ask him about things in her life. I didn't think much of his profession. To be honest, I don't really believe in psychic mediums. But something told me to talk to him, so I did. I sat down at his table and he looked down at his piece of paper and started drawing something. I leaned over slightly, just to try to see what it could have been he was drawing. He drew lines in quick successions. The more lines. Then some more. "You saw a rainbow today, didn't you?" he looked up from his paper and looked at me. I nodded yes. How could he know that? "It's a message from your parents...they say, you need to tell your students about how rainbows work. They need to learn about having different perspectives on life...to look deeper, to look differently at things. Your daughter too...she needs to see the rainbows" he said to me and smiled. Readers, this one rainbow turned into a lesson. I didn't consider that the rainbow I saw could be used to teach a lesson, but it did. I had a different perspective on this man and his profession now. If I didn't think differently...if I didn't give things a chance, maybe I wouldn't learn something. You must give chances...you must look at things in different prisms and perspectives. Just like a rainbow, there will be many lanes to drive down, many colors to choose from. You must consider the possibility of a different route, a different color, and different lane in your life. If you see a rainbow, admire it's beauty...but also think about how you can look at things differently. Perhaps you too will see a message in the many prisms.

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 experience the Arctic because I would like to see what type of wildlife is there and to see this wonderful part of the world. I'd love to challenge myself to learn more about the environment 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 am NOT available to participate during the school year but open to any time during my breaks for however long it takes.

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 the ecology of the Arctic - what species of all animals and plants are found there. I love learning about wildlife and how climate change is affecting their environment.

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 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 can do basic camping

b. Provide a basic statement of your general health and physical condition.
I am generally healthy, I have high blood pressure but it is controlled with medication. I wear contact lenses and glasses to see.

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

d. Briefly describe technological devices and software you use on a regular basis and how you utilize these tools personally and professionally.
Iphone for personal uses Projector for education purposes Smartboard for education purposes Chromebooks for education purposes

e. List any additional skills or information that you wish to be considered.
I can speak Polish and Russion fluently

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
Science representative at CPS Network Level

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 Catherine Moy

Title and affiliation Principal at Haines

Email Address camoy@cps.edu

Phone Number 7735349200

Reference 2

Name Scott Scherquist

Title and affiliation Assistant Principal at Haines

Email Address sscherquist@cps.edu

Phone Number 7735349200

Reference 3

Name Kyle Kauffman

Title and affiliation Senior Manager, Institute for Quality Science Teaching - Museum of Science and Industry

Email Address Kyle.Kauffman@msichicago.org

Phone Number 7739473721

2020-2021 PolarTREC Educator Application