



TEACHERS AND RESEARCHERS
EXPLORING AND COLLABORATING



Welcome! PolarTREC Meet and Greet

Program & Project Overview for 2017-2018



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Agenda for Webinar

1. Overview of PolarTREC Program (5 min)
2. Program Requirements for Teachers & Researchers (5 min)
3. Program Evaluation (5 min)
4. Introduction to the 2017-2018 PolarTREC Introductions (40 min)
5. Questions & Answers (5 min)



TEACHERS AND RESEARCHERS
EXPLORING AND COLLABORATING

PolarTREC Staff



Janet Warburton
PolarTREC PI &
Project Manager



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Programs



Zeb Polly
Systems Administrator



Joed Polly
Video Production

...with help from the entire staff at ARCUS

What is ARCUS?

ARCUS (Arctic Research Consortium of the United States) is a non-profit corporation consisting of institutions operated for educational, professional, or scientific purposes. ARCUS provides leadership in advancing knowledge and understanding of the Polar Regions through a variety of programs and outreach endeavors.

ARCUS is based in Fairbanks, Alaska and works with primarily arctic scientists around the world to facilitate interdisciplinary collaboration, outreach and education within and outside the science community.

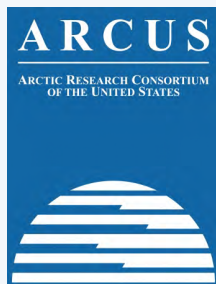


25 Years of Connecting Arctic Research
www.arcus.org

Support and Funding



We are funded by the National Science Foundation Office of Polar Programs for the 2017-18 season.



We are administered by the Arctic Research Consortium of the United States, a non-profit member consortium based in Fairbanks, Alaska. www.arcus.org



Arctic logistics support (including teacher travel, clothing, and equipment provided by CPS).



Antarctic logistics support (including teacher travel, clothing, and equipment provided by Antarctic Support Contractor ASC)

...With other support and funding provided for specific projects on a situational basis.

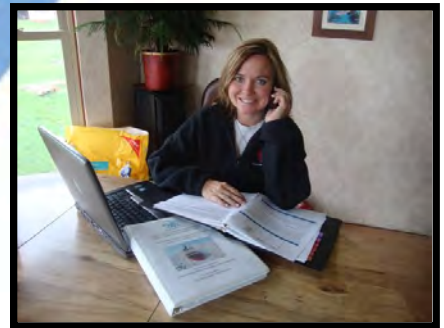
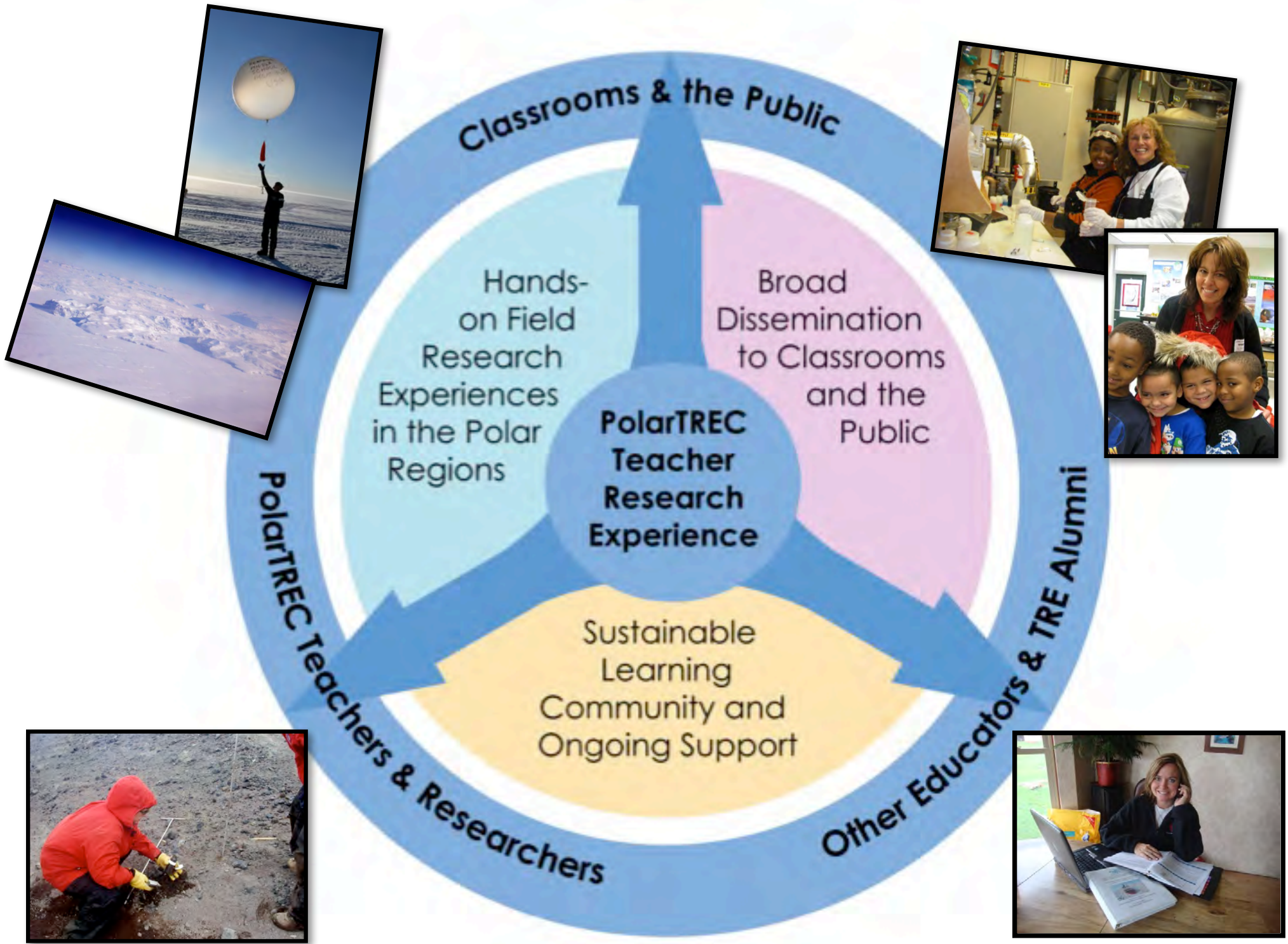
Teachers and Researchers Exploring and Collaborating

Our vision is to create and sustain a successful approach to professional development in the polar regions, fostering enthusiasm and awareness to inspire the next generation of scientists and a STEM-literate public.

We will do this by:

- ✓ Improving teachers' STEM content knowledge of the Polar Regions and transfer to the classroom
- ✓ Increasing teachers' knowledge and use of STEM practices with their students in the classroom
- ✓ Increasing students' understanding and engagement in the polar regions and interest
- ✓ Developing long-term professional relationships between the education and research communities







PolarTREC Teacher Participation Timeline

- **Apply, Selection & Match**
- **PolarTREC Orientation**
- **Partner Teacher & Cohort Collaboration**
- **Education and Outreach Planning**
- **Pre-Field Visits with Research Team**
- **Pre-Expedition Logistics & Evaluation**
 - Content Pre-Test & Instructional Survey
 - Pre-Field Team Logistics Call
 - Cohort Outreach/Logistics Webinar
- **Field Research Experience**
 - Daily Online Journaling
 - Host PolarConnect Events
 - Q&A Interactions with Students
- **Post-Expedition Follow-up & Evaluation**
 - Evaluation Requirements
 - Post-Field Team Logistics Call
 - Seasonal Webinar with Cohort
 - Administer Student Pre-Survey
 - Cohort Partnership Activities
- **Post-Expedition Education and Outreach**
 - Publish STEM Experience Report
 - Researcher Visit to Classroom
 - Design Original Lesson
 - Refine Existing Lessons
 - Attend Professional Meetings
 - Collate Teacher Portfolio
 - Submit Learning Resources
- **Summative Follow-up & Evaluation**
 - Administer Student Post-Survey
 - Content Post-Test & Instructional Survey
 - Seasonal Webinars
 - Year End Webinar with Cohort
- **PolarTREC Sustainability Activities**
 - Co-Lead Teacher Trainings
 - Partner Teacher for New Cohort
 - Reviewer on Selection Committee
 - Leadership in PolarTREC Network
 - Liaise in Partner STEM Initiatives
 - Compete for State/Regional Awards

- 1 week in Alaska for Orientation - February 2017
- 3-4 webinars related to the program
- 1-2 pre-field logistics phone calls
- 3-6 weeks in the field, plus associated travel
- Personal time for technology training and practice
- Personal time for learning/reading on science
- Outreach activities before/after the expedition
- PolarTREC program requirements and evaluation

Expectations: Pre, During, Post Expedition

Teacher Commitments

Teacher Orientation

Researcher Commitments

Requirements

Teachers Role in the Team

ARCUS support for researchers

Expectations: Pre, During, Post Expedition

- Technology Training
- E&O Planning
- Polar Science Overviews
- Safety & Logistics
- Cohort Team Building
- Hands-on Practice
- Science Field Trips

Teacher Commitments

Teacher Orientation

Researcher Commitments

Requirements

Teachers Role in the Team

ARCUS support for researchers

| Monday, 6 February 2014 | | |
|---|-----------|---|
| 14:00 | Breakfast | Complimentary Continental Breakfast in East Lothian Restaurant (at hotel level) |
| 8:00 am | 8:00 am | 8:00 am |
| 9:30 am | 9:30 am | 9:30 am |
| PROGRAM REQUIREMENTS – TAKING THE EXPERIENCE TO THE CLASSROOM & BEYOND | | |
| 10:30 am | 10:30 am | 10:30 am |
| 11:30 am | 11:30 am | 11:30 am |
| 12:30 pm | 12:30 pm | 12:30 pm |
| TECHNOLOGY TRAINING – INTRODUCTION | | |
| 1:00 pm | 1:00 pm | 1:00 pm |





Expectations: Pre, During, Post Expedition

PolarTREC Teacher Participation Timeline

- **Apply, Selection & Match**
- **Meet & Greet/Expectations Webinar**
- **PolarTREC Team Networking**
- **Assist in E&O Planning**
- **Pre-Expedition**
 - Pre-Field Team Logistics Call
 - Coordination with Logistics Personnel
 - Pre-Field Site Visits
- **Field Research Experience**
 - Vetting science content in journals
 - Host PolarConnect Events
 - Assist Q&A Interactions with Students
- **Post-Expedition**
 - Evaluation Requirements
 - Post-Field Team Logistics Call
 - Seasonal Webinar with Cohort
 - Post-Field Site Visit
 - Vetting science content of STEM Report
 - Vetting science content in lessons
 - Attend Professional Meetings
- **Summative Follow-up & Evaluation**
 - Year End Webinar with Cohort
 - Yearly Alumni Survey
- **PolarTREC Sustainability Activities**
 - Write journal paper/article
 - Reviewer on Selection Committee
 - Leadership in PolarTREC Network
 - Apply to host more teachers

- Reading applications & interviews to select a teacher for your team
- 2-3 webinars related to the program
- Pre-post field logistics phone calls
- Fielding prep questions from teacher
- Commitment to working with teacher in the field
- Vetting science content of products
- Outreach activities before/after the expedition
- PolarTREC evaluation components

Teacher Commitments

Teacher Orientation

Researcher Commitments

Requirements

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Expectations: Pre, During, Post Expedition

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2012 PolarTREC Program Requirements With Additional Recommendations for a Successful Research Experience

PolarTREC is meant to build ongoing, collaborative relationships between educators and polar researchers. The PolarTREC program is designed to facilitate this relationship and provide support for the relationship to grow and become independently sustainable.

One component of successful relationships is collaboration and understanding of each partner. We strive to have teachers and researchers working together as much as possible before, during, and after the polar field experience. Therefore, teachers and researchers selected for PolarTREC are expected to participate in a number of specific program requirements throughout the experience.

ARCUS uses the PolarTREC program requirements in a number of ways, including tracking participation in the program, evaluating the impact of the program, and collecting data on program participants. Information is used to report to the National Science Foundation, apply for further funding, provide data and information to researchers, publish papers and articles and much more. **Your timely completion of program requirements and the PolarTREC Evaluation is integral to the continued funding and support for the PolarTREC program.** You must contact the PolarTREC Project Managers if you have questions or concerns related to the completion of the program requirements.

Upon successful completion of the program requirements, teachers and researchers will be recognized with a certificate of PolarTREC Participation and Program Completion. In addition, teachers will be rewarded one day of substitute reimbursement for a day of a professional development activity of their choice. Please let us know if there are other ways we can recognize your successful participation in the program (letters of support, references, college credit, etc.).

The following list briefly outlines the PolarTREC program requirements for both teachers and researchers. The list also includes recommendations for a successful research experience. While these are not program requirements, they come from years of program management and advice from past teachers and researchers on how to make the experience successful.

If you have any questions or concerns regarding these requirements, please contact Janet Warburton or Sarah Crowley, PolarTREC Project Managers, at info@polar trec.com or 907-474-1600.

IMPORTANT INFORMATION FOR TEACHERS: Starting in January 2011 most program requirements will be tracked online using your profile page on the PolarTREC website. PolarTREC teachers are responsible for tracking and uploading their own program requirements as they complete them.

Instructions for updating or uploading program requirements:

- 1) Log in to the PolarTREC website. Press the "Edit" tab.
- 2) Check off program requirements that have been completed.
- 3) Upload related documents (if applicable)
- 4) Make sure to press "Save" at the bottom of the page!

After you update or upload a program requirement an automatic e-mail will be sent to the PolarTREC Project Managers who are tracking your progress.

| Program Requirements | Teachers | | Researchers | |
|---|---|--|---|--|
| | Other Recommendations | Program Requirements | Other Recommendations | Program Requirements |
| DURING THE EXPEDITION | | | | |
| <ul style="list-style-type: none"> Participate as an active member of the field research team During the field experience, post daily journal entries and photos online Respond to "Ask the team" Questions online. Seek assistance from research team as needed | <ul style="list-style-type: none"> Balance your role of teacher, research team member and specialist Communicate, be safe, remain flexible, have humor and have fun! Contact PolarTREC Project Managers if any problems arise Use multimedia tools for interviews, sounds created podcasts or videos as another tool for documenting your experience. Connect to classrooms through interactive communication channels such as PolarConnect live events when possible. | <ul style="list-style-type: none"> Provide mentoring, training and support for the teacher while serving as a member of your team. Provide information and/or assist teachers in answering questions from the public that are posted on the Virtual Base Camp. | <ul style="list-style-type: none"> Contact PolarTREC Project Managers if any problems arise Recognize that teachers are required to communicate their experience from the field to the public as actual research. Help them balance these duties Collaborate with the PolarTREC teacher as they post daily online field journal entries and connect to classrooms from the field and connect with classrooms from the field Help the teacher connect to classrooms through interactive communication channels such as PolarConnect, when possible | <ul style="list-style-type: none"> Participate in the Post-Field Debriefing Call Follow up with PolarTREC and logistics providers to ensure that local responsibilities related to the experience research experience have been resolved Check in with your teacher, ensure they make if home okay, communication and collaboration |
| IMMEDIATELY FOLLOWING THE EXPEDITION | | | | |
| <ul style="list-style-type: none"> Remember to take adequate time to adjust to returning to the classroom Make sure your administrator sends an invoice to ARCUS for substitute reimbursement Return any borrowed gear or equipment to the logistics provider | | | | |

- Detailed program requirements and recommendations for before, during, and after the expedition
- Teachers have “deliverables”; need the support/communication with the research teams
- Just like evaluation, important to our tracking, reporting, and continuation of the program



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Expectations: Pre, During, Post Expedition

Teacher Commitments

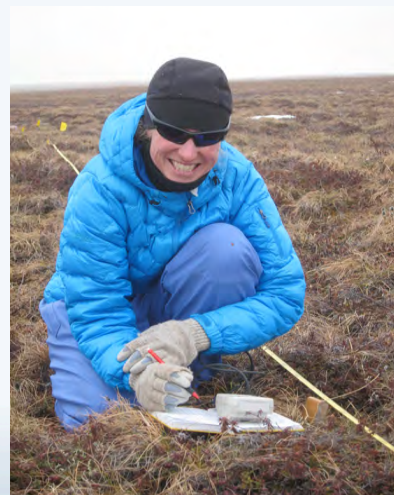
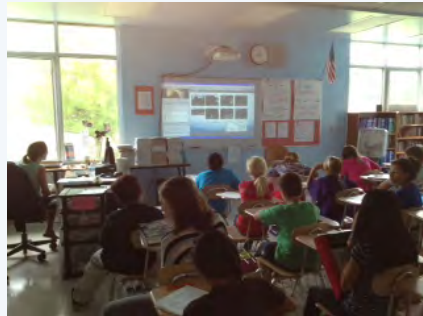
Teacher Orientation

Researcher Commitments

Requirements

Teachers Role in the Team

ARCUS support for researchers





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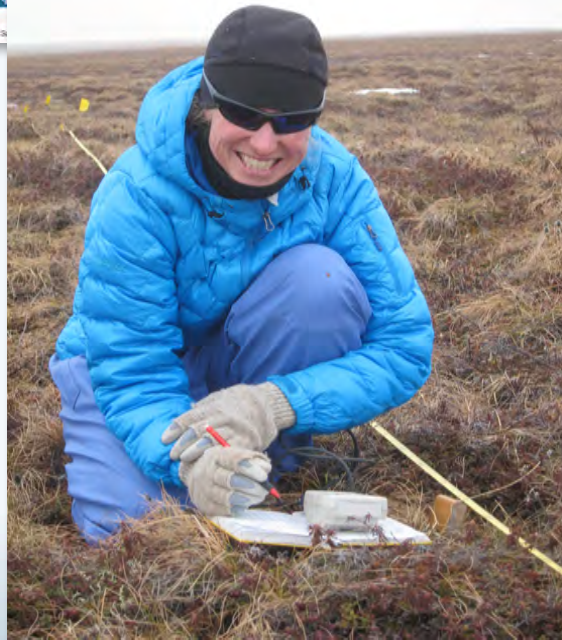
Teachers Role in the Team

What Are They Doing?

Since the first expeditions to the poles, scientists have compiled a long list of polar taxa that have unusually large body sizes. This phenomenon is known as polar gigantism, and biologists have proposed many hypotheses to explain it. The most broadly-accepted idea is the 'oxygen hypothesis,' which states that polar gigantism stems from a combination of high oxygen availability in the ocean and low metabolic rates because of the extreme cold temperatures. In combination, these two factors are thought to allow animals to be giants by making it comparatively easy to get enough oxygen from the environment to support large bodies. The links between body size, environmental oxygen availability, and performance have been used to argue that as marine and aquatic environments warm, giants will be among the first to disappear. We are looking at these tradeoffs and the validity of the size-vulnerability hypothesis using Antarctic pycnogonids (sea spiders), which contain spectacular examples of polar gigantism.

Where Are They?

The team is based in McMurdo Station, Antarctica. McMurdo Station is on Ross Island, a volcanic island (with the will take



28 January 2016 Weddell Seal Eyes

This journal is brought to you by...

I'm hold three amazing flags in front of Scott Base. Photo credit: Alex Eilers

- Michelle Wright and her 2nd grade class at Riverwood Elementary School
- Bilderback Home school
- Mefford's movie stars at Bon Lin Elementary School

I spy with my little - I mean - BIG eyes!

Public Relations Officer

Pre-Field Momentum

In-Field Journaling/Q&A

Capturing the Science

Outreach Campaigns

PolarConnect

Leading by Example

Field Assistant/ Graduate Student

Learning Science

Translating Science

Hands-on in All Aspects

Balancing the Two

Pre-Field Communication

Mid-Field Check-in

www.polar trec.com



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Expectations: Pre, During, Post Expedition



Teacher Commitments

Teacher Orientation

Researcher Commitments

Requirements

Teachers Role in the Team

ARCUS support for researchers

- E&O planning strategies
- Pre-Post Field Site Visit Funding
- Seamless integration of teacher logistics
- Prep and Follow-up Mgmt
- Dedicated outreach staffing
- Additional professional networking



Travel Support

- We have a limited amount of funding to support pre- or post- field collaborations between teachers and researchers
- Please consider:
 - Teacher Visit to Lab or Researcher's Inst.
 - Researcher Visit to School or Classroom
 - Data Workshop or Preparatory Meeting
 - Team Conference Presentation

Logistics Support



Arctic logistics support (including teacher travel, clothing, and equipment provided by CPS).

**Point of Contact for Teachers:
Robbie Score**



Individualized

Coordinated

Flexible

Begins Early



Antarctic logistics support (including teacher travel, clothing, and equipment provided by Antarctic Support Contractor ASC)

**Point of Contact for Teachers: Elaine
Hood**



Thorough Follow-up

...With other support and funding provided for specific projects on a situational basis.



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2017-2018 Projects & Participants

Why PolarTREC??
(1min)

**Teachers and Researchers:
Introduction (1 min)**

Name, School, City, State

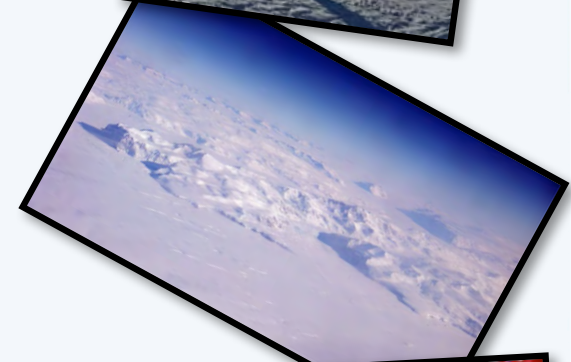
Why did you apply to PolarTREC this year??

Researchers add:

Project Information (1 min)

Project Title & Location

Primary goal of the research project





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Closing Thoughts & Next Steps

How to Succeed

Communicate

Expectations, instruction, outreach plans, problems/praise to ARCUS

Be Flexible

Plans change moment to moment, be prepared

Research comes first

Be an excellent research assistant, be a sponge, not all field work is sexy!

Make safe sacrifices to meet goals

Sleep, fun, comfort, status/authority

Bring your unique skills to the team

Readiness to lend a hand, humor, special skill/strength, positive attitude

NSF Hopes for PolarTREC

- Support the integration of research and education
- Convey research experience to K-12 classrooms
- Develop inquiry-based activities for students
- Share with PIs the experience of K-12 educators, develop long-term relationships
- Professional development for your career
- Improve outreach, education, broader impacts



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Thank You for Participating in PolarTREC!

For Questions & More Information:

info@polartrec.com

907-474-1600

www.polartrec.com

@polartrec

#polartrec