

# Welcome to a Special Event!

**Taking PolarTREC to the Classroom and Beyond**  
*Reflecting on the Experience*







**16 April 2019**

# Agenda

- Update on the program and products
- Reflecting on the Experience
  - Teachers Reflection
  - Researchers Reflection
- ARCUS Resources for Staying Connected & Your Needs
- Additional Announcements & Adjourn

# PolarTREC Participants

	Year	Total Teachers	Arctic	Antarctic
NSF IPY Award 	2007-08	<b>20</b>	11	9
	2008-09	<b>15</b>	10	5
	2009-10	<b>19</b>	14	5
NSF OPP 	2010-11	<b>15</b>	11	4
	2011-12	<b>14</b>	8	6
	2012-13	<b>17</b>	12	5
	2013-14	<b>18</b>	12	6
NSF OPP + 	2014-15	<b>18</b>	11	7
	2016-17	<b>15</b>	8	7
	2017-18	<b>11</b>	8	3
NSF OPP 	2018-19	<b>12</b>	7	3 (2)
	2019-20	<b>12</b>	7	5
		<b>186*</b>	119*	65

**\*Total includes 9 NSF Einstein Fellows**

# STEM Experience Reports

These reports succinctly summarize teachers' professional benefits of the field experience, a description of field activities, and a classroom implementation plan. Reports are designed to target an audience of funders, researchers, and future participants. Researchers associated with PolarTREC expeditions will be able to utilize the reports to communicate their science and as a tool to share their broader impacts activities.

## STEM Experience Report - Michael Penn



Never, in my 27 year career as a teacher, have I had so many students so interested and enthusiastic in so

## Learning Resources

**PolarTREC Learning Resources** is a collection of articles, lessons, activities, interactive media, and more for educators, families, students, or anyone interested in teaching or learning more about the science of the Arctic and Antarctica.

A majority of the resources have been contributed by educators that have participated in the PolarTREC program. In particular, lesson plans written by the PolarTREC alumni have been vetted and tested. Many of these resources have been aggregated into "Collections". The collections are a chance to find all types of resources that all pertain to a specific discipline or location.

We encourage you to explore the many resources using the search interface below.

Please email [info@polartrec.com](mailto:info@polartrec.com) if you have any questions, suggestions, comments, or issues with the resources.

Displaying 1 - 50 of 1521

Search

Items per page

50



Apply

Reset

Date	Title	Resource Type	Author	Region
10 April 2019	PolarConnect Event with Kim Young and the Winter Respiration in the Arctic Team	Event	Judy Fahnestock	Arctic
26 March 2019	2019 Meet and Greet Webinar	Event	Judy Fahnestock	
13 March 2019	Investigating Penguin Populations of Antarctica	Lesson	Bridget Ward	Antarctic

### Filter by Type

- Article (332)
- Web Link (303)
- Event (235)
- Lesson (217)
- Video (210)
- Activity (58)
- Presentation (58)
- Report (39)
- Audio (27)
- Fast and Fun Fact (18)
- Polar Profile (16)

### Filter by topic:

- Polar Science (308)
- Earth Science (258)
- Life Science (252)
- Physical Science (144)
- Polar Careers (128)
- Environmental Studies (121)
- Archaeology and Anthropology (46)
- Engineering (28)

[View Full Report](#)

# The 2018-19 Cohort



Teachers & Researchers  
Exploring & Collaborating

[www.polar-trec.com](http://www.polar-trec.com)

Follow Expeditions • Teaching Resources • Live Connections

Take your students on a polar science adventure with PolarTREC! Your classroom could be virtually transported to an icebreaker in the Amundsen Sea, a remote field camp in Alaska, or an archipelago of islands in the High Arctic. Experience the excitement of the polar regions by reading journals, looking at pictures, watching videos, and interacting with teachers and researchers working in the polar regions by asking questions online and joining PolarConnect live events from the field.

Join the 2018-2019 PolarTREC teachers on their ARCTIC expeditions!



PolarTREC is funded by the National Science Foundation Division of Polar Programs and managed by the Arctic Research Consortium of the United States. For more information, visit us online or e-mail [info@polar-trec.com](mailto:info@polar-trec.com).



T: Teacher, School, State  
R: Researcher, Institution, State  
D: Expedition Dates  
L: Expedition Location

### Phenology and Vegetation Change in the Warming Arctic

T: Melissa Tavel, Bedford Intermediate, OK  
R: Steve Oberbauer, Algori Internl, University, FL  
D: 15 June 2018 to 15 July 2018  
L: Toolik Field Station, Alaska



### Jellyfish in the Bering Sea

T: Joanna Chiesla, Wexlin H. Krepf Middle School, NJ  
R: Mary Beth Decker, Yale University  
D: 24 June 2018 to 4 July 2018  
L: R/V Shalika, Bering Sea



### Ferrocatal and Community

T: Allison Woodard, Oregon Museum of Science and Industry, OR  
R: Santosh Panda, University of AK, Fairbanks, AK  
D: 10 August 2018 to 20 August 2018  
L: Villages of Telida and Nikita, Interior Alaska



### Water Respiration in the Arctic

T: Kim Young, Weston High School, MA  
R: Jennifer Watts, Woods Hole Research Center, MA  
D: 15 August 2018 to 15 September 2018  
L: Various locations in Alaska



### Sheds, Snow and Nitrogen in the Arctic

T: Lena Anderson, Agua Caliente Elem., AZ  
R: Doris Brethorn, University of Alaska Fairbanks, AK  
D: 15 July 2018 to 15 August 2018  
L: Toolik Field Station, Alaska



### Migration and Carry-Over Effects in Arctic Seabirds

T: Wendy Pflanz, Jordan-Matthews HS, NC  
R: Alexis Will, National Institute of Polar Research, Japan; Univ. of Alaska, Fairbanks  
D: 16 July 2018 to 5 August 2018  
L: Savoonga, Alaska



### Sliding Glaciers

T: Lauren Neirake Adams, Rutgers, NJ  
R: Neal Iversen, Iowa State University, IA  
D: 10 August 2018 to 28 August 2018  
L: Vatsoi, Canton of Switzerland  
\* not identified with a star



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### Chemical Ecology of Shallow-water Marine Communities

T: Keith Smith, Freedom High School, NC  
R: Chuck Amies, University of Alabama at Birmingham, AL  
D: 16 May 2018 to 21 June 2018  
L: Palmer Station

T: Teacher, School, State  
R: Researcher, Institution, State  
D: Expedition Dates  
L: Expedition Location



### Weddell Seals: Growing Up on Ice

T: Heather Livonag, Springfield Central High School, MA  
R: Heather Livonag, California Polytechnic State University, CA  
D: 1 October 2018 to 28 October 2018  
L: McMurdo Station



### Antarctic Automatic Weather Stations 2018

T: Mike Penn, Shaler Area School District, PA  
R: Carol Costanza, Antarctic Meteorological Research Center, WI  
D: Winter 2018  
L: McMurdo Station



### IceCube and the Askaryan Radio Array 2018

T: Malakke Hall, Science Education Solutions, NM  
R: Jim MacKenzie, University of Wisconsin, River Falls, WI  
D: 1 December 2018 to 30 December 2018  
L: South Pole Station



### Dry Valleys Ecosystem Study

T: Kevin Dicksen, American Fork Junior High School, UT  
R: Byron Adams, Brigham Young University, UT  
D: 27 December 2018 to 7 February 2019  
L: McMurdo Station & Dry Valleys



PolarTREC is funded by the National Science Foundation Division of Polar Programs and managed by the Arctic Research Consortium of the United States. For more information, visit us online or e-mail [info@polar-trec.com](mailto:info@polar-trec.com).

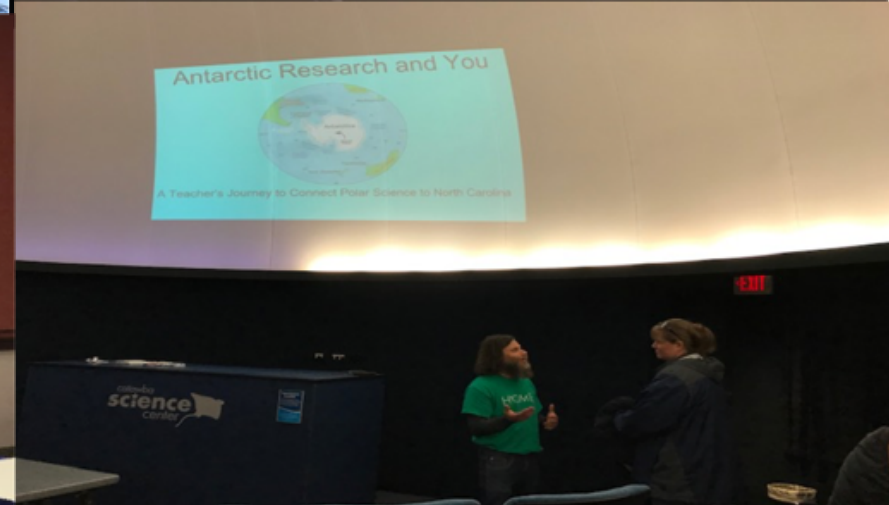


# Reflections & Reports

A chance to hear from YOU!

- Implementation in the classroom
- Updates on outreach and lesson plans
- Highlights of challenges, surprises and successes
- Future plans to collaborate with the cohort and research teams

# Chemical Ecology of Shallow Water Marine Environments Palmer Station, Antarctica



# Phenology and Vegetation Change In the Warming Arctic-Utqiagvik, AK and Toolik Field Station, AK







# Jellyfish in the Bering Sea 2018

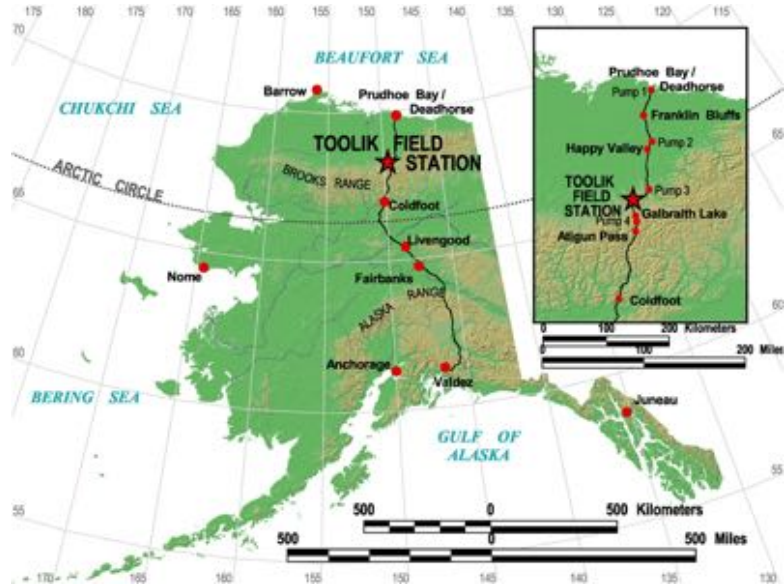
Joanna Chierici  
Mary Beth Decker  
Hongsheng Bi



Examples of the jellies we found



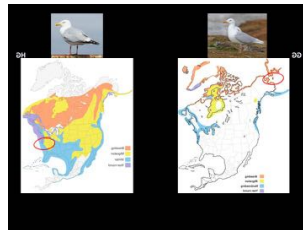
Outreach in Alaska and in New Jersey



# Shrubs Snow and Nitrogen in the Arctic:

Dr. Bret-Harte and Svea Anderson





# Migration and Carry-Over Effects of Arctic Seabirds

Wendi Pillars and Dr. Alexis Will

**SEABIRD**  
majesty

*"aithuia" in Greek*

**GREAT OCEAN VOYAGERS**

**"ICEBERG" - of "OTHERNESS"**

**"PELAGIC"**  
• roam far out to sea  
• spend most of their lives above, on, or in the sea.

**BEAUTY on the MARGINS of UNDERSTANDING**

**the ONLY ANIMALS which can exist ON the SEAS**

**IN the SEAS**

**IN the AIR**

**ON LAND**

*"living skin of our ocean shores"*

**CHARACTERISTIC DRAB PLUMAGE**  
"countershading"

**SEABIRDS HAVE DECLINED BY 2/3 IN PAST 60 YEARS**

**SEABIRDS RELATIVE TO BODIES SIZE THAN OTHER BIRDS**  
waterproofing insulation

**MORE FEATHERS**

**"OBTAIN ALL (NEARLY) ALL AT FOOD AT SEA"**

**SOME CAN FLY 5 million miles in a lifetime**

**"PELAGIC"**  
• roam far out to sea  
• spend most of their lives above, on, or in the sea.

**CHARACTERISTIC DRAB PLUMAGE**  
"countershading"

**SEABIRDS Globally, ~500 of possibly 10,000 species at birds (American Museum of Natural History)**

**grace power ingenuity cleverness efficiency majesty**

WENDI PILLARS @WENDIPILLARS




**Polar Opposites**  
Why the Antarctic and Arctic Should Be Part of Your Social Sciences

wakeaudubon • Following  
NC Nature Research Center (NRC)

wakeaudubon Last week's guest speaker Wendi Pillars (@wendipillars) took us on a fantastic journey of the mind to the Arctic world of St. Lawrence Island. She showed us around with snapshots and stories of the Siberian Yupiks, the island's inhabitants. The Yupiks' subsistence culture depends on a close, respectful relationship with the sea and local wildlife, a relationship that's being devastated by climate change. Wendi shared images of native seabirds and discussed how climate change is altering their migration and hindering their survival. Thanks for reminding us that global warming affects people, their lives, and their culture in an indelible way. #WASmeeting #siberianyupik #stlawrenceisland #savonnga #restedauklet wakeaudubon #climatechange

12 likes  
8 HOURS AGO  
Add a comment...

# Permafrost and Community Nikolai, Alaska



## Melting Foundations

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Program Type: Demo	Audience Type: All ages
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Description: Visitors learn about an engineering solution Alaskans use to keep their warm houses from thawing the permafrost below. A facilitator places two warm model houses on ice; one starts to sink, while the other does not.





Topics: Permafrost, Engineering, Climate change

Process Skills Focus: Inquiry, Observing

LEARNING OBJECTIVES

- Warm house foundations thaw permafrost, so some Alaskans keep it frozen by building their houses on stilts.
- When permafrost thaws, it seriously impacts people living in the Arctic.
- Climate change is speeding up permafrost thaw.

TIME REQUIRED

Advance Prep	Set Up	Activity	Clean Up
			
5 minutes	5 minutes	10 minutes	5 minutes

SITE REQUIREMENTS

- None, but this activity works well in the "Permafrost Lab" area of the exhibit.
- This demo works well on the same table as "Metabolizing Microbes." Do this demo first, then use the other to transition into a discussion of how thawing permafrost affects each of us by impacting our global climate.

Oregon Museum of Science and Industry 54



# Polar Science in the Swiss Alps



Sliding Glaciers- August 2018



Outreach Events

- Museum Open House
- Skype a Scientist
- School Events
- Technology Night
- Earth Science Week Activity for GSA



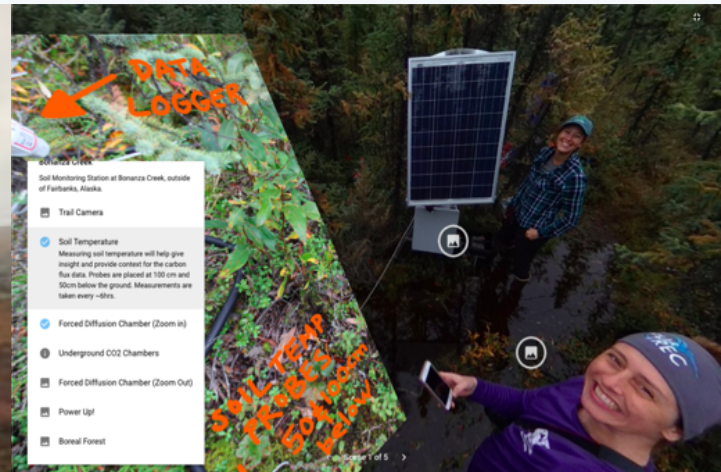
3D Printing Lesson Plan



Structure from Motion



# Winter Respiration in the Arctic Fairbanks (and onward), Alaska



# 2018 Automatic Weather Stations Project

McMurdo and South Pole, Antarctica



# GETTING TO THE BOTTOM of *Soil Ecoystems* McMurdo Dry Valleys **ANTARCTICA**



Underwater  
outreach



**30** O.R. Events  
and still counting!



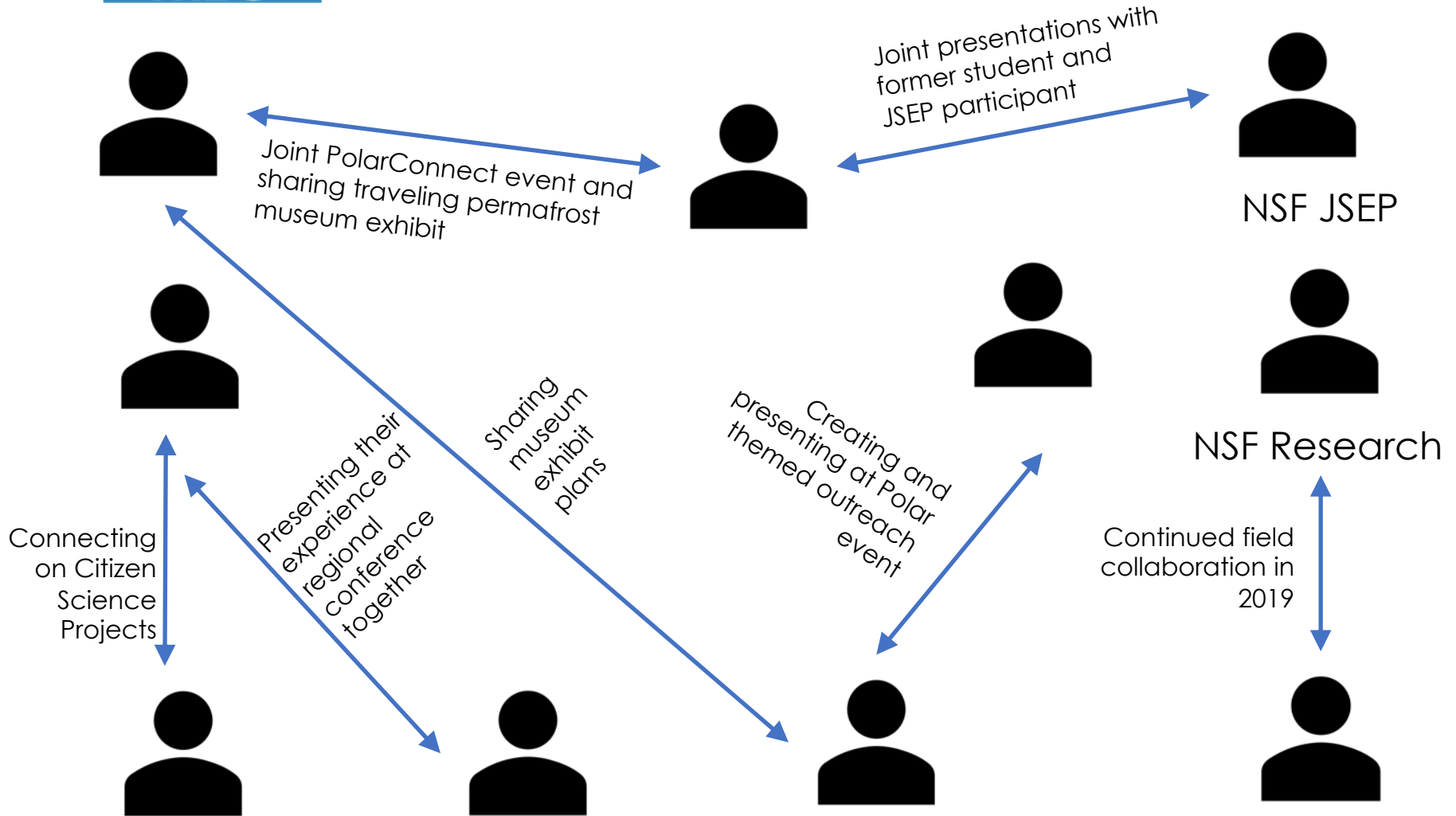
HOME OF THE  
WORMHERDERS







# How are 2018-2019 PolarTREC participants continuing collaboration after their expedition?



On-going support by program managers, school administrations, and PolarTREC alumni partner teachers.

## Resources & Reminders

- Finish any program requirements (vet lessons & Stem reports with researchers)
- Researchers can view profile of teacher and see progress and share
- Funding to those that finish requirements
- PolarTREC emails will be changed on website (for teachers)