

Welcome to a Special Event!

Taking PolarTREC to the Classroom and Beyond
Reflecting on the Experience






30 March 2017

Agenda

- Update on the program and products
- Reflecting on the Experience
 - Teacher's Reflection
 - Researcher's Reflection
- ARCUS Resources for Staying Connected & Your Needs
- Additional Announcements & Adjourn

PolarTREC Participants

	Year	Total Teachers	Arctic	Antarctic
NSF IPY Award  	2007-2008	20	11	9
	2008-2009	15	10	5
	2009-2010	19	14	5
NSF OPP Award 	2010-2011	15	11	4
	2011-2012	14	8	6
	2012-2013	17	12	5
	2013-2014	18	12	6
	2014-2015	18	11	7
	2016-2017	15	8	7
		151*	97*	54

* Totals include 9 NSF Einstein Fellows

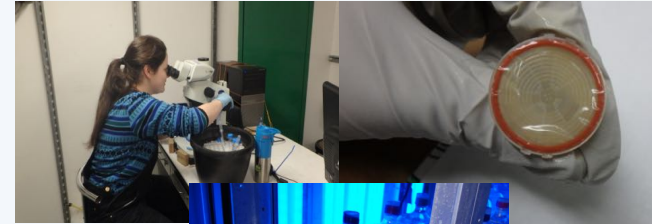
New Products

- Classroom and Community Lesson Plans
www.polartrec.com/resources/search
- Project Pages
www.polartrec.com/projects
- Expedition Reports
www.polartrec.com/resources/expedition-reports
- Product Pages
www.polartrec.com/products
- ARCUS Internet Media Archive
www.media.arcus.org
- Portfolio Pages – Click on Photo or in Members List
- PolarTREC Channel on YouTube

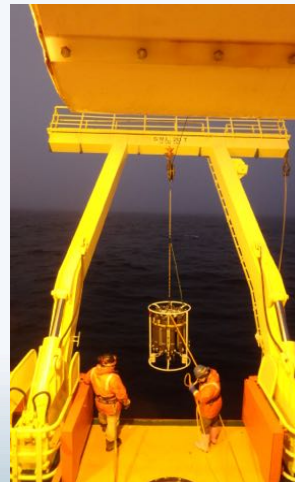
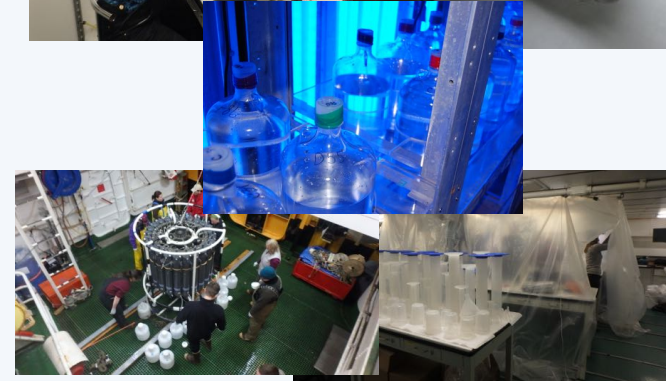
Reflections & Reports

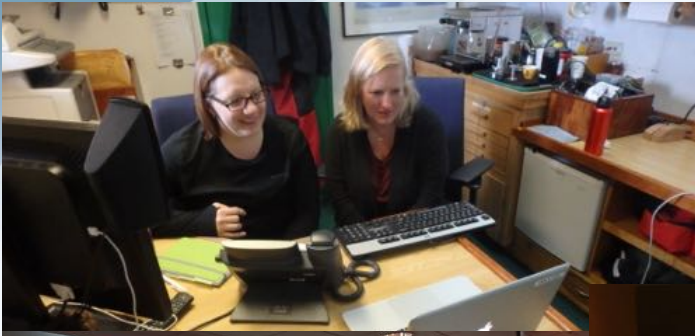
A chance to hear from your cohort of researchers and teachers.

- 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



Southern Ocean Diatoms





I-178 Crevasse Structures in the McMurdo Shear Zone

POLARTREC IN THE FIELD

- The shear zone is caused by the movement of both the McMurdo and Ross Ice Shelves against each other.
- The shelves move at different rates, causing extensional crevassing between the two
- Modeling their development is important for the understanding of where they might be and exactly how they form

POLARTREC IN THE CLASSROOM

SHEAR ZONE DEVELOPMENT

- Modifying an existing lesson on glacial flow using oobleck.
- “Large” sections of oobleck are allowed to flow at different rates (determined by placing toothpicks in the oobleck and calculating) and then encouraged to interact.
- Behavior is observed and mapped



I-178 Crevasse Structures in the McMurdo Shear Zone

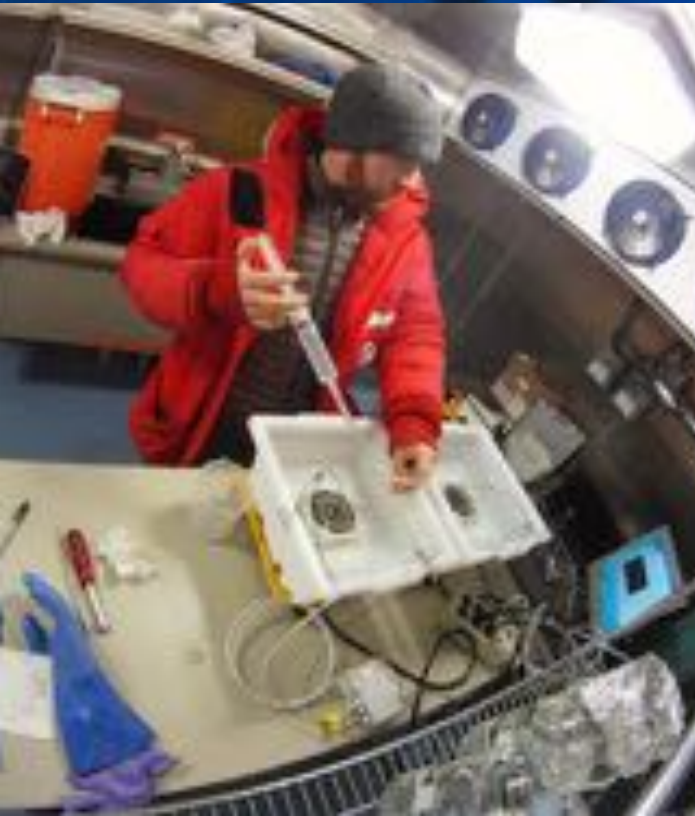
POLARTREC IN THE FIELD

- Robots were designed to help in the exploration of the shear zone in areas that were deemed too hazardous for human exploration.
- Yeti and Scotty are products of an evolution of robot design
- Both needed to operate in harsh conditions (both physically and climatologically), be semi-autonomous, and be capable of towing heavy objects at a constant speed.

POLARTREC IN THE CLASSROOM

• ROBOT DESIGN

- Students have been working to develop a working autonomous robot that is capable of meeting the requirements of the actual Yeti and Scotty
- Skype with Josh and Jim to evaluate the designs and give feedback





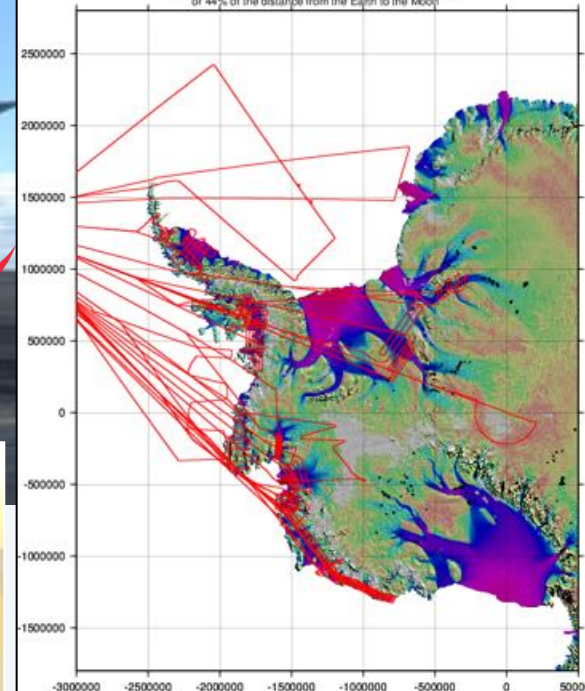


NASA's Operation IceBridge – Antarctica

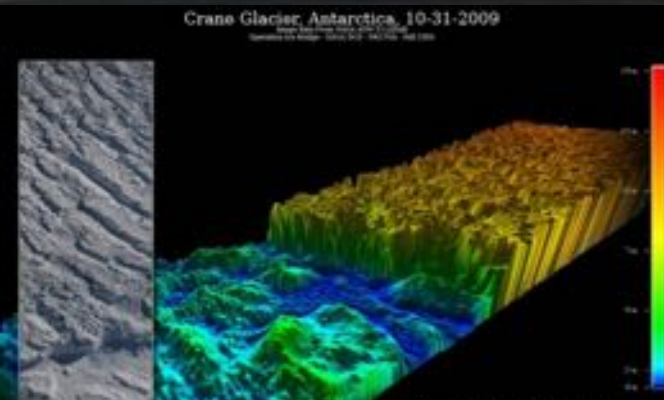
Maggie Kane



2016 OIB DC-8 Antarctic Flights
20 science flights, 91457 nm, and 247.5 hrs flown
Distance flown equivalent to 4.23 times around the Earth,
or 44% of the distance from the Earth to the Moon.

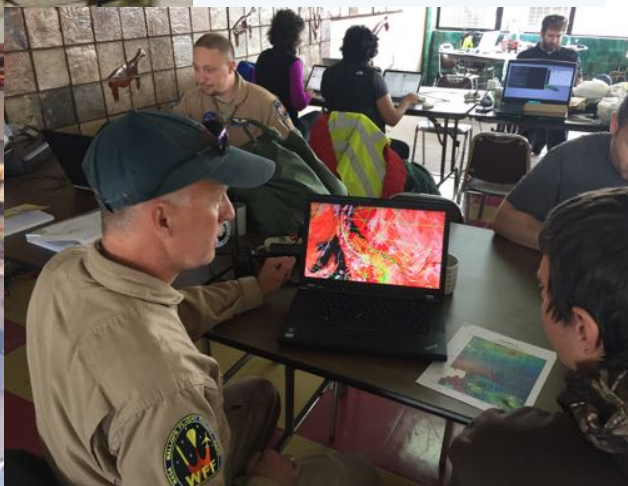
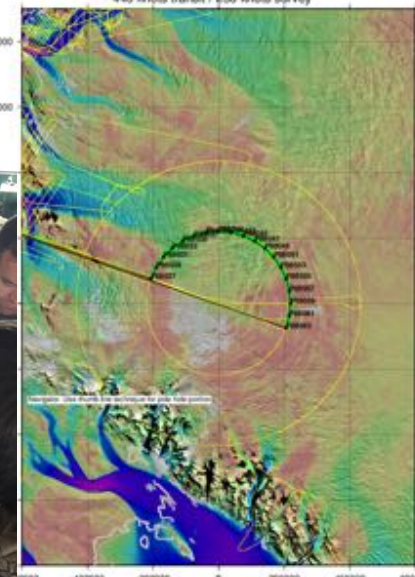


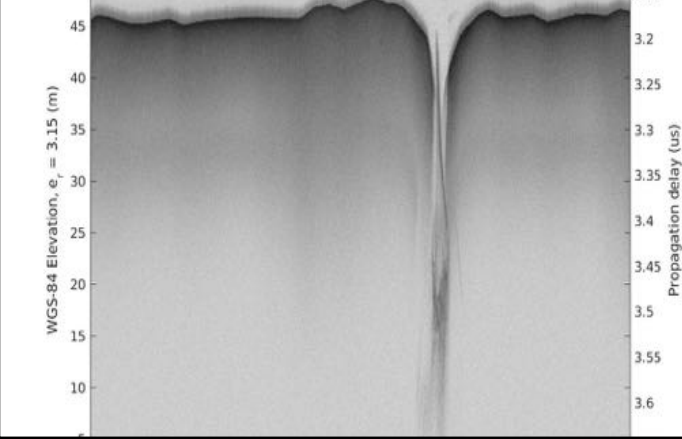
Crane Glacier, Antarctica, 10-31-2009



Hamilton Line East

11.6 hrs total / 1.5 hrs survey
440 knots transit / 250 knots survey





Questions: 10th grade

- Δ What is the best solution to climate change & why?
- Δ Is climate change human caused?
- Δ What are ongoing effects of climate change?
- Δ What are some of the issues with the solutions proposed?
- Δ What Renewable resources are viable alternatives?
- Δ Who contributes to climate change more (GOP vs. Total)?
- Δ Do you agree with the Paris agreement?



A typical day at the South Pole
...only -20F (windchill -40)



(Some of) the team at the
Geographic South Pole

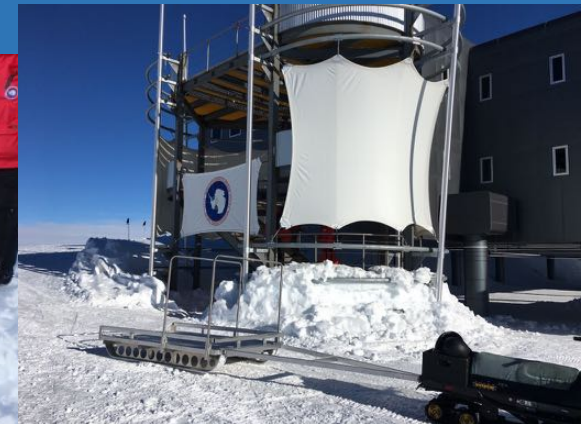
ICECUBE – SOUTH POLE



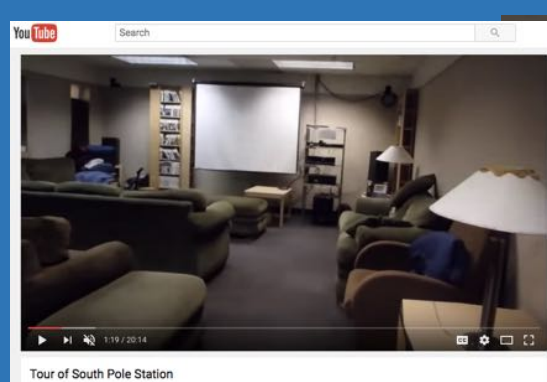
Handstands at the
Ceremonial South Pole



Digging for ARA



Amundsen-Scott
South Pole Station



162,450 views!

Radio Hotline with Dennis Price
(1 hour)

OUTREACH

In the works:

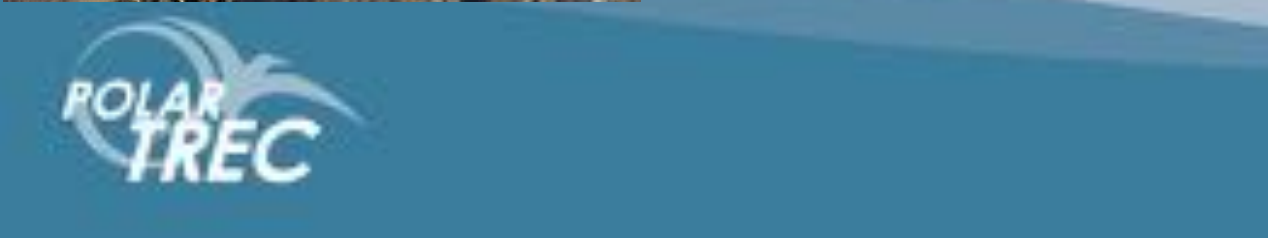
- STEM Careers Presentation (April 1)
- Antarctica Community Night (April 5)
- IceCube Collaboration Conference (May 5-6)
- Superintendent's Seminar (June 26)
- Poster Presentation at KSTF Summer Meeting (July 26)
- Festival of Minds Presentation (August 20)

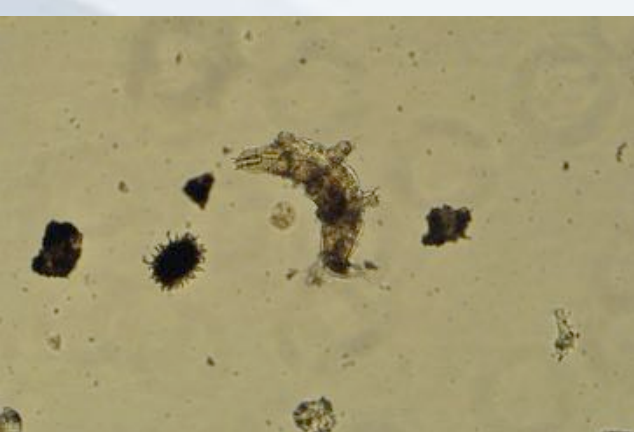
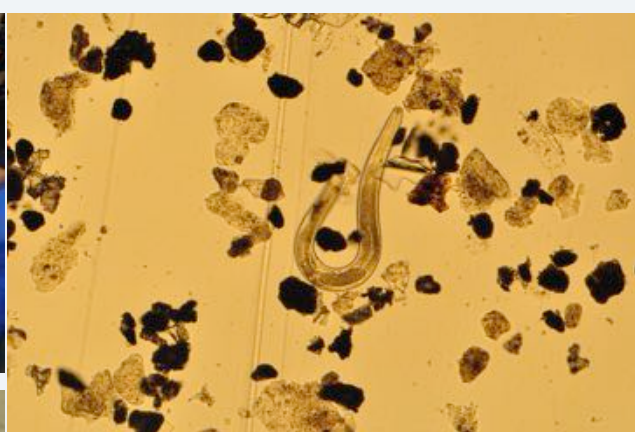


500 postcards mailed!



Fly your Flag at the South Pole Contest
over 200 entries







Catching Cosmic Rain



Jongil Jung

Dr. James Madsen
University of Wisconsin
River Falls

Samantha Pedek
UW-RF

Dr. Paul Evenson
University of Delaware

Eric Thuma
Stoney Creek HS

Dylan Frikken
UW-RF



What did we do?

- We packed and shipped the neutron monitors to Jang Bogo Station (I moved a bunch of lead!)

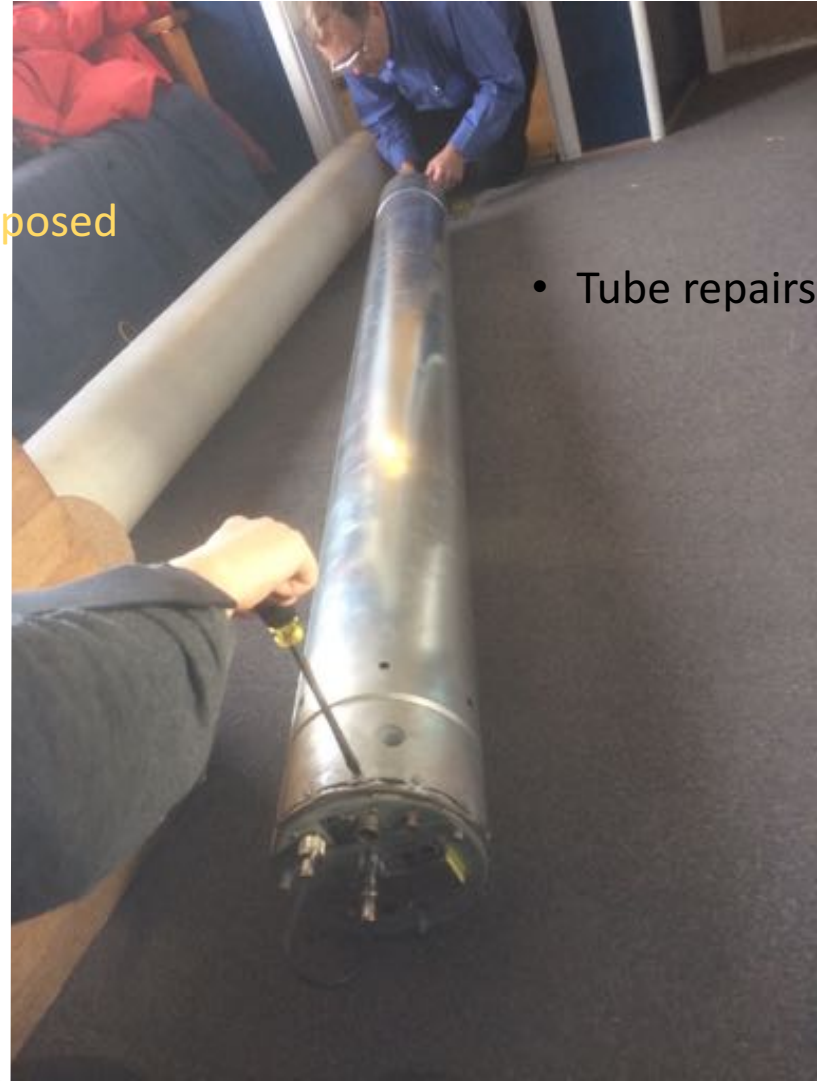
The neutron Monitors help Study cosmic radiation primarily from the Sun.



- The Neutron monitors exposed



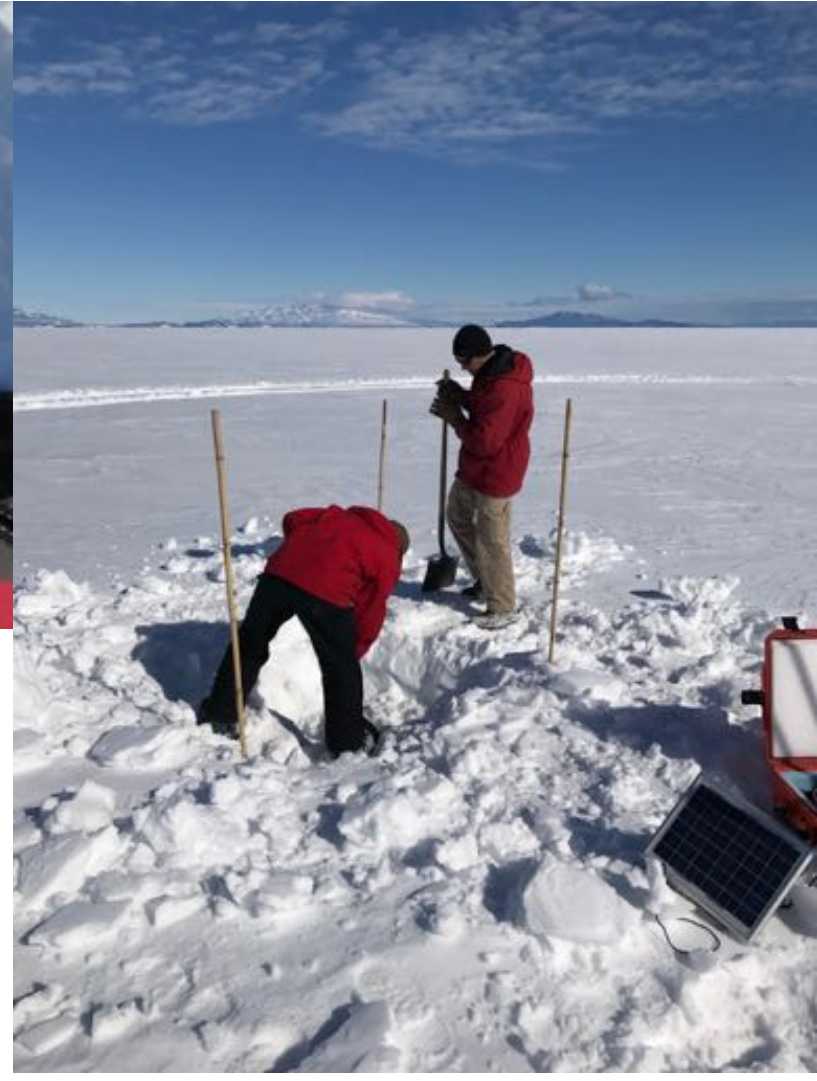
- Time to get the lead out



- Tube repairs



I also got a chance to help dig a few seismometers out of the McMurdo Ice Sheet. They are used to study the stability of the sheet.



Now what?

Since then I have been presenting to different groups in my district. (Middle/High School Science Teachers, the School Board, Science honor Society), Teachers Organizations (DMAPT, AAPT) and at other venues ...



Preparing for a talk with students and high school teachers at Michigan State University.



Preparing for a talk with teachers sponsored by the NASA Office of Education

A Few Reminders

- Finish program requirements (lessons, etc...)
- Evaluation in spring w/ students
- Alumni Survey
- Expedition pages
- Social networking tools – connect w/ new cohort
- Travel Requests
- Other?
- Future PolarTREC Proposal

Upcoming 2017-18 cohort...

www.polartrec.com

POLAR TREC
Teachers & Researchers Exploring & Collaborating

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 2017-2018 PolarTREC teachers on their ARCTIC expeditions!

Operation IceBridge 2017*
T: Adeella Perez, Stoneman Douglas HS, FL
E: John Woods, NASA's Goddard Space Flight Center, MD
D: April 2017
L: Kangerluavag, Thule AFB, Greenland

Dynamic Observations of the Microstructural Evolution of Ice
T: Steve Krasche, Liberty Pines Academy, FL
E: Ian Baker, Dartmouth College, NH
D: June 2017
L: Summit Station, Greenland

Research Opportunities in the Arctic for Minors
T: Ruth Rodriguez, Clint BD Early College Academy, TX
E: Vahesla Lougheed, U. of Texas at El Paso, TX
D: July - August 2017
L: Barrow, Alaska

Arctic Ground Squirrel Studies 2017
T: Jennifer Bakacsi, International School of Basel, Switzerland
E: Cary Williams, Northern Arizona University, AZ
D: April - May 2017
L: Toolik Field Station, Alaska

Upwelling and Ecology in the Beaufort Sea**
E: Lisa Seft, Springs School, NY
E: Carin Ashjan, Woods Hole Oceanographic Institution, MA
D: August - September 2017
L: R/V Sikuliaq, Beaufort Sea

Jellyfish in the Bering Sea
T: Lee Teevan, Booker T. Washington High School, VA
E: Mary Beth Decker, Yale University, CT
D: July - August 2017
L: R/V Sikuliaq, Eastern Bering Sea

CO2 and pH Studies of the Arctic Ocean
T: Dave Jones, Big Sky High School, MT
E: Mike DeGrandpre, University of Montana, MT
D: August - September 2017
L: CCGS Louis S. St-Laurent, Beaufort Sea

Arctic Glacial Lakes
T: Rebecca Harris, Escalante High School, UT
E: Ellie Broadman, Northern Arizona University, AZ
D: July - August 2017
L: Lake Peters, Alaska

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

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IceCube and the Askaryan Radio Array
T: Lesley Anderson, High Tech High Chula Vista, CA
E: Jim Maden, University of Wisconsin, WI
D: January 2018
L: South Pole Station

Seasonal Sea Ice Production in the Ross Sea
T: Jenni Boul, Nicolet Union High School, WI
E: Hongliu Xie, University of Texas at San Antonio, TX
D: November 2017
L: McMurdo Station

Antarctic Automatic Weather Stations
E: George Hademenos, Richardson High School, TX
E: Carol Costanza, University of Wisconsin, WI
D: November 2017
L: McMurdo Station

Follow all the 2017-2018 Expeditions!

On the PolarTREC website:

- Read Expedition Journals
- Ask questions and leave comments
- Participate in PolarConnect Events
- Join the Polar Education E-mail List

On social media:

- Follow the hashtag #PolarTREC on Facebook and Instagram
- Check out the Twitter feed with @PolarTREC

PolarTREC is funded by the National Science Foundation Office of Polar Programs and managed by the Arctic Research Consortium of the United States. For more information, visit us online or e-mail info@polartrec.com.
* Expedition supported by NASA/Operation IceBridge.
** Expedition supported by researcher funding.

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

Ideas, Needs, and Questions



Thank You!

An archive of this event will be available.

