

Welcome to *PolarConnect*



Arctic Ground Squirrel Studies 2017

With PolarTREC Teacher Jennifer Baldacci
& Researcher Dr. Cory Williams

27 April 2017

Getting to Know Adobe Connect

Slides will be shown here

Exit presentation

Mute your speakers

Raise your hand

List of all participants

Follow the chat

Find out more about the presentation

Chat here



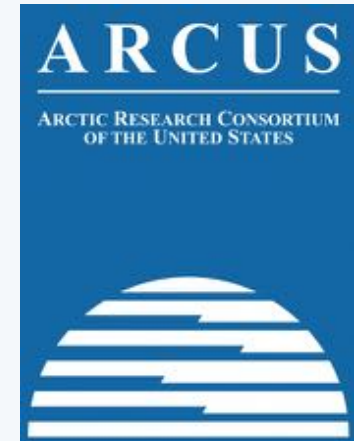
Participant Introductions

**In the Chat box, please introduce yourself
by typing in your:**

- ✓ Name
- ✓ School or Institution
- ✓ The number of students and adults participating with you in the same location

What is PolarTREC?

- Since 2004, the Arctic Research Consortium of the United States (ARCUS), a non-profit organization, has been administering the PolarTREC Program.
- PolarTREC is professional development for K-12 teachers. They are paired with researchers for 2-6 week research experiences in the polar regions.
- Over 150 teachers from around the United States have joined scientists in the Arctic and Antarctica to learn about science, the polar regions, and to share what they have learned with their students and communities.



25 Years of Connecting Arctic Research
www.arcus.org

Questions

During the Presentation:

- Type your question in the text chat box

At the End of the Presentation:

- Raise your hand with the “hand button”.
- PolarTREC staff will call on you and activate your microphone.
- Speak loud and clear, directly into the computer microphone or the phone to ask your question.

Arctic Ground Squirrel Research at Toolik Field Station



Principal Investigator – Cory Williams
PolarTREC teacher – Jennifer Baldacci

Cory Williams

- Researcher at Northern Arizona University
- Moving to University of Alaska, Fairbanks, in August
- Research focuses primarily on systems characterized by high seasonal and/or inter-annual variability
- My goal is to understand the mechanisms that underlie variation in daily and seasonal timing, and to explore the ecological and evolutionary drivers of this variation.

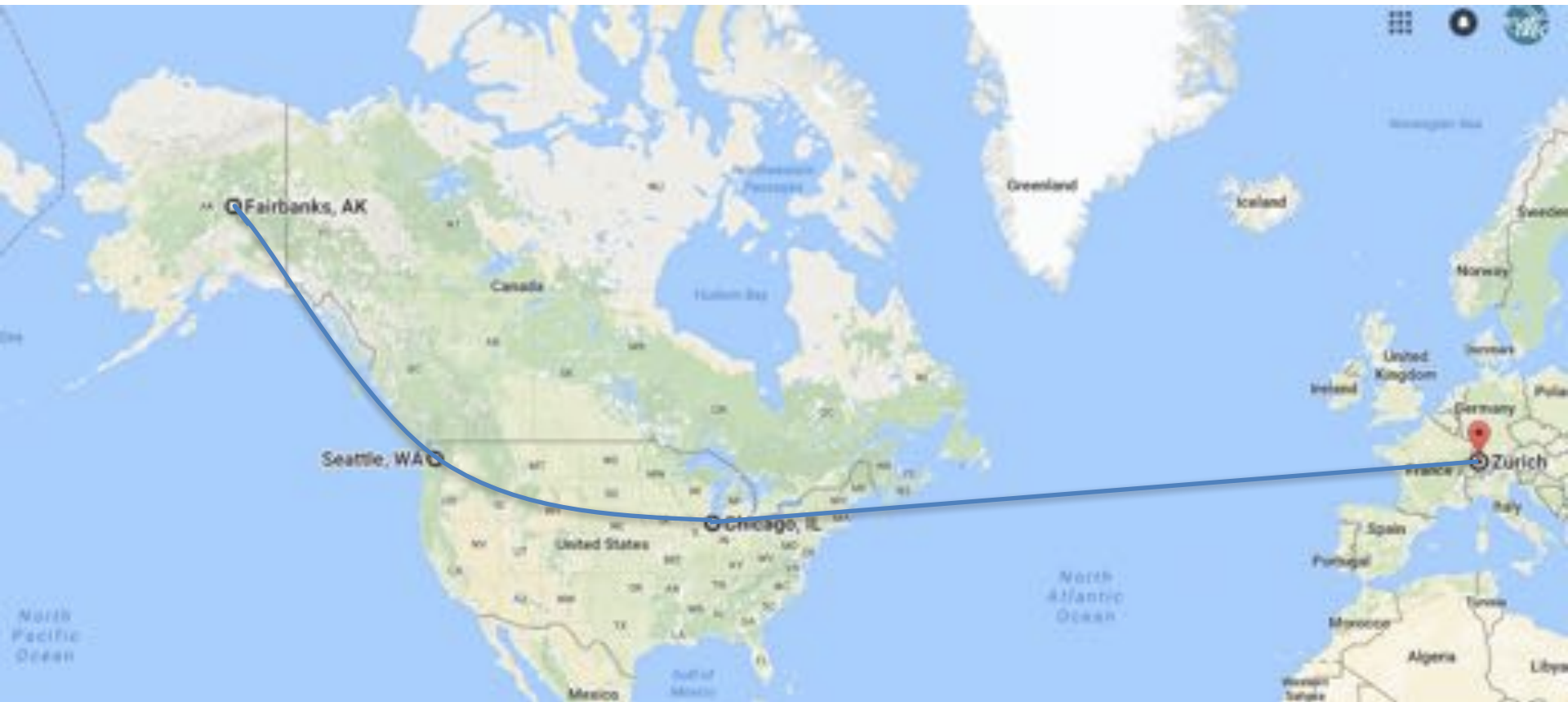


Cory releasing the most aerodynamic of squirrels



Cory with a skunk in Arizona

My journey from Zurich, Switzerland to Fairbanks, Alaska



Where is Toolik Field Station and how did I get here?

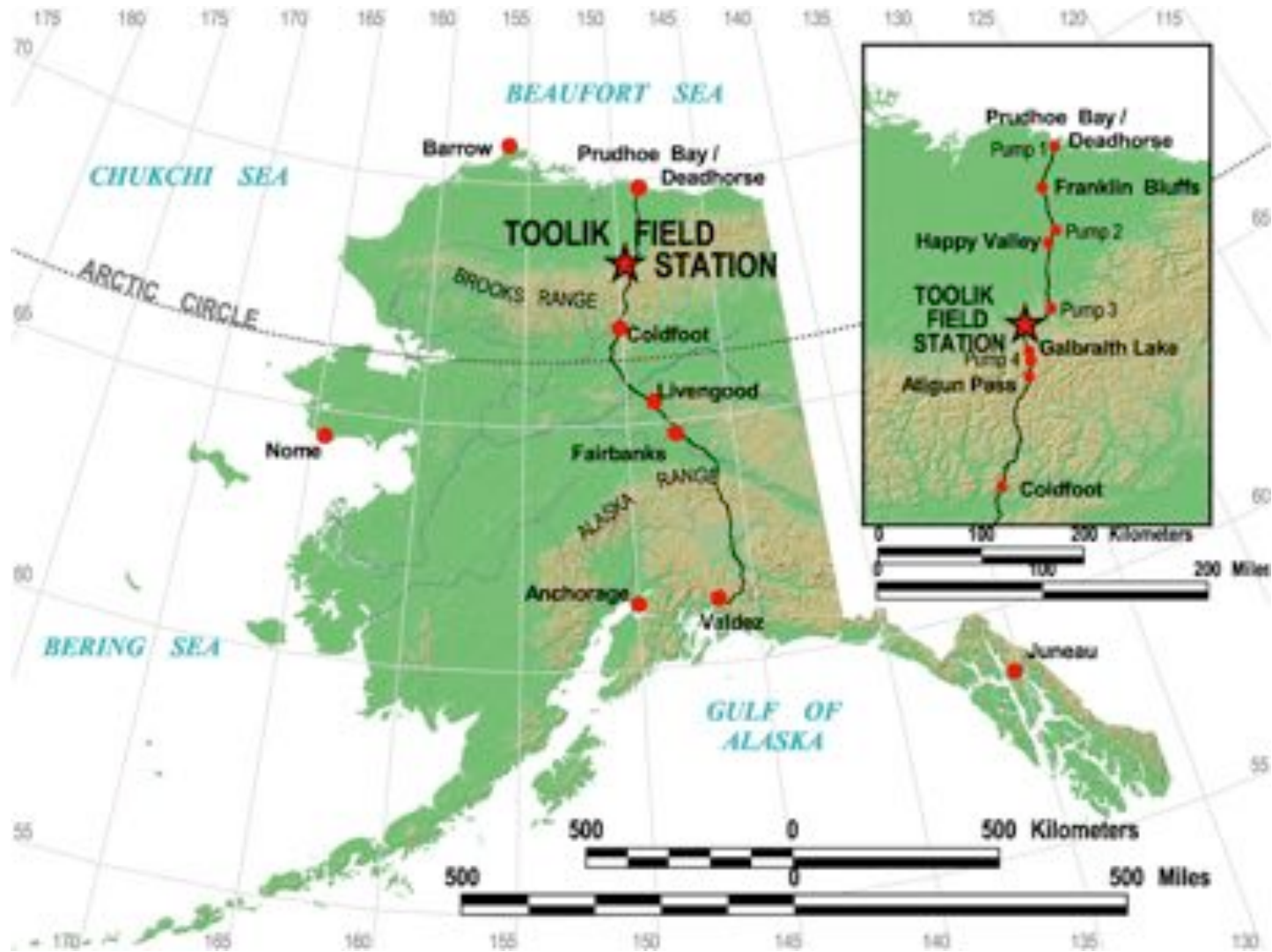


Image by Toolik Field Station

<http://toolik.alaska.edu/gis/maps/maps.php?category=general>

Ground Squirrel Study

- **Long-term study** to learn how flexible ground squirrels are in their behaviors, including the timing of waking from hibernation and mating
- The main focus of this trip is to continue collecting long-term data on **annual timing and hibernation physiology** to assess how these animals are being affected by long term climate change
- We need to collect these long-term datasets to understand the **impacts of climate change**



Arctic ground squirrel at Atigun field site

Study animal - Arctic Ground squirrels

- Scientific name *Uroditellus parryii*
- Northernmost squirrels
- Mainly vegetarians but will eat meat that they find
- Prey to many predators in the Arctic, like foxes, eagles and wolverines
- Live in underground burrow system
- Hibernate below ground 7-9 months each year
- Mate in spring, after hibernation
- Gestation 25 days (avg), Litter size 5-10 pups
- Pups weaned by July before hibernation



Arctic ground squirrel at Atigun field site

Field Sites

East Atigun

- 12mi/20km from field station
- Accessed by truck and then hike in
- More heavily populated by squirrels



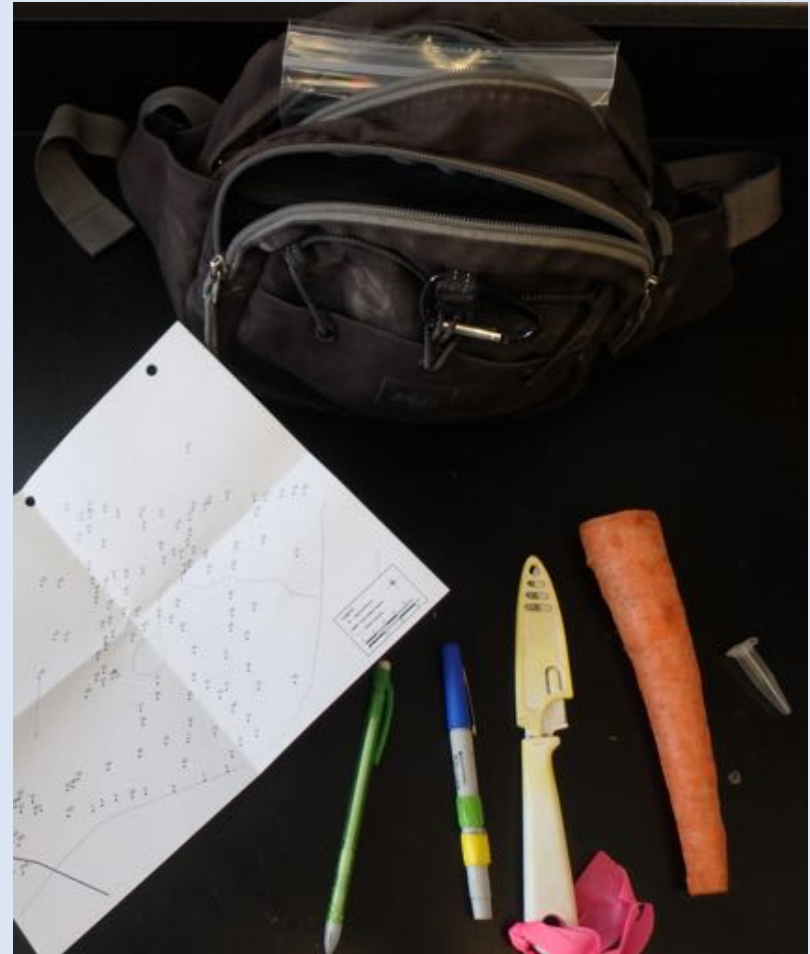
Toolik Lake

- Just across the lake from the field station
- More snow at this time
- Accessed by snow machine



Field Equipment

- Traps
- Carrots and knife
- Flagging tape
- Tape to mark trap with location and time
- Plastic tubes
- Map of the field site
- Walkie-talkie
- List of which animals have been caught before



My field pack and supplies for squirrel trapping

Data loggers

The variety of sensors tells us how animals alter their physiology and behavior in response to environmental variation

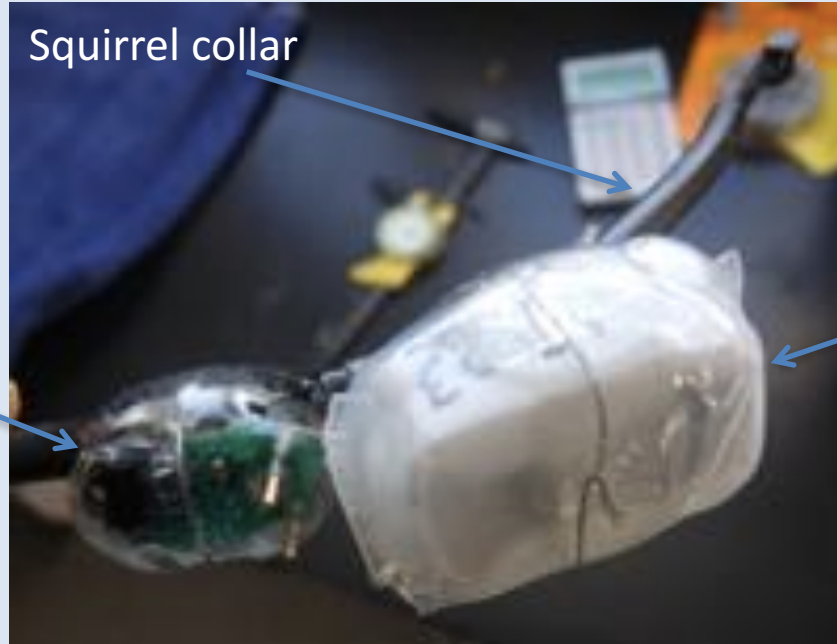
Light and outdoor temperature loggers

- Placed on the collar
- Detect light and dark (above vs below ground)
- Can last 23 months
- Weight - 1g

Accelerometers

- Placed on the collar
- Measure movement in space and time
- Lasts 2 months, rechargeable
- Weight - 5g

Squirrel collar



Pit tags

- Used for identification
- Read with a scanner
- Placed under the skin

Body temperature loggers

- Implanted into the squirrel
- The battery can last 18 months
- Store on board technology
- Weight - 1-2g



How to trap a squirrel

1. See the squirrel
2. Walk to the squirrel
3. Open the trap and set the hook
4. Place delicious carrot in a nice trail leading to and inside the trap
5. Walk away and wait patiently
6. Check the traps about every 30 minutes, more often if windy or bad weather, to protect the squirrel from the elements
7. Once you have the squirrel:
 - Place trap on the snow if possible, to easily see and collect fecal sample
 - Place trap in a dark plastic bag to protect the squirrel from the sun and wind and help them feel more relaxed
8. Take your squirrels back to the lab



Helen Chmura releasing a ground squirrel at Atigun field site

Data collection

1. Get the squirrel into the jar for anesthesia
2. Once asleep, remove the squirrel and check identification (ear tags and pit tag) if present
3. Record everything as you go
4. Take weight and length measurements
5. If ear tags and/or pit tag is not present, assign a color/number/tag
6. Collect fleas if present
7. Cheek swab
8. Ear tissue sample
9. Collect blood sample
10. Collar with light logger and/or accelerometer (female)
11. Implant temperature logger (female)
12. Allow squirrel to wake up from anesthesia, place back in trap overnight with food
13. Centrifuge the blood sample and remove plasma and white blood cells
14. Centrifuge the cheek swab DNA
15. Enter data into database on the computer



ear tag #		wire color		Sex: F (M)		Age: Juv Year (Adu) ?		Year: 2017		Devices:	
R: L-237P		R: L-237P									
AVID-833*963*778 Pit Tag # V08CNP45LAL01H2M date TB logger # deployed min Collar											
Date Time Trap Site BM (g) Length (cm) Zygo. Arch (mm) Repro & Molt Marks (color) Devices (date)											
9/14/17	14:27	1160	1140	574	28	41			EarTag	PitTag	Logger
									Wire	PitTag	Logger
									EarTag	PitTag	Logger
									EarTag	PitTag	Logger



Video

How to ear tag and collar
an Arctic ground squirrel



GoPro Photos







Join PolarTREC!

www.polartrec.com/about/join

Everyone can participate in different ways:

- **Follow Expeditions**
- **Participate in PolarConnect Events**
- **Join the Polar Education Email List**
- **Check out the great resources**
- **Become a PolarTREC Teacher or Researcher**
- **Become a member of ARCUS**

Thank You!

An archive of the event will be available shortly.

<http://www.polar-trec.com/polar-connect/archive>



25 Years of Connecting Arctic Research
www.arcus.org