AUTHENTIC RESEARCH EXPERIENCE FOR TEACHERS AT LONG-TERM ECOLOGICAL RESEARCH SITES

Kari O'Connell[1], Ivan Arismendi[1], Martha Downs[2], Gretchen Hofmann[2], Kristin Hunter-Thomson[3], Joe LaManna[4], Amanda Morrison[5], Scott Simon[2]

[1]Oregon State University, [2]University of California Santa Barbara, [3]Dataspire Education & Evaluation, LLC, [4]Marquette University, [5]Arctic Long-Term Ecological Research site

THE PROGRAM

The goal of the Authentic Research Experience for Teachers at Long Term Ecological Research sites (ARETs@LTERs) project is to engage high school teachers who work with students from marginalized groups in the practice, process, and communication of data-intensive STEM.

Teachers work in partnership with scientists to explore how emerging stressors such as drought, marine heatwaves, and global warming impact communities and biodiversity across ecosystems.

ANDREWS FOREST

Jack DeGroot helps PhD Candidate Tatiana Latorre-Beltran set up a Malaise trap for capturing adult flying insects at the Andrews Forest LTER site. Credit: Lina DiGregorio

In 2023, three teachers worked on two projects: *Forest understory biodiversity and climate change* with Dr. Joe LaManna and *Biodiversity and Riverscapes* with Dr. Ivan Arismendi.

Ryan Herlands teaches NGSS Biology and College Now Biology at a rural/suburban high school less than 1 hour from the Andrews LTER site.

Jack DeGroot teaches Environmental Science and Conceptual Physics at a high school in Milwaukee, WI with > 90% of students from groups underrepresented in STEM).

Matt Retterath teaches IB Biology and General Biology at an IB magnet high school in the northern suburbs of Minneapolis with over 71% minority enrollment.

Ryan Herlands (left) and Matt Retterath and Mercedes Allen (right) collecting emerging aquatic insects with a Surber trap from headwater streams at the Andrews LTER Site. Credit: Lina DiGregorio

ARCTIC

Teachers separate plants by species and then by parts, which will be dried and weighed, as part of Dr. Adrian Rocha's research. Credit: Amanda Morrison.

In 2023, four teachers worked primarily on arctic plant ecology projects: *Reorganization and resynchronization of biogeochemical cycles after an unprecedented tundra fire* with Dr. Adrian Rocha and *Measuring carbon in tundra vegetation* with Dr. Syndonia Bret-Harte.

Zia Wineriter and **Kelly Cunningham** are high school science teachers in Cottage Grove, OR, a Title I school near the Andrews LTER site. Zia will be applying their experience in this project as a first year teacher.

Dan Barnett is a middle/high school science and math teacher in Shishmaref, Alaska.

Greg Clark is a middle school science teacher turned Assistant Principal in Fairbanks, Alaska.

Dr. Laura Gough and teachers head out to the arctic tundra where they will estimate plant diversity. Credit: Amanda Morison
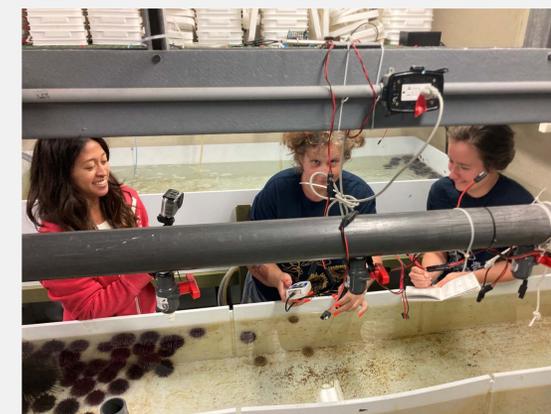
SANTA BARBARA COASTAL

Emily Chittick (left) and Traci Kennedy (right) are working with Dr. Gretchen Hofmann for their RET experience. Credit: Scott Simon

In 2023, two teachers worked on studying the potential effects of Marine Heat Waves and climate change on the purple sea urchin (*Strongylocentrotus purpuratus*) in the Kelp Forest understory with Dr. Gretchen Hofmann and PhD candidate Erin De Leon Sanchez.

Emily Chittick teaches Chemistry and Environmental Studies. Riverside Urban High school in Milwaukee, WI is an urban, traditional public high school with a racially and socioeconomically diverse student body.

Traci Kennedy teaches Environmental Studies and Earth Sciences at Audubon HS in an urban setting in Milwaukee. Students typically come from a low socioeconomic status background.
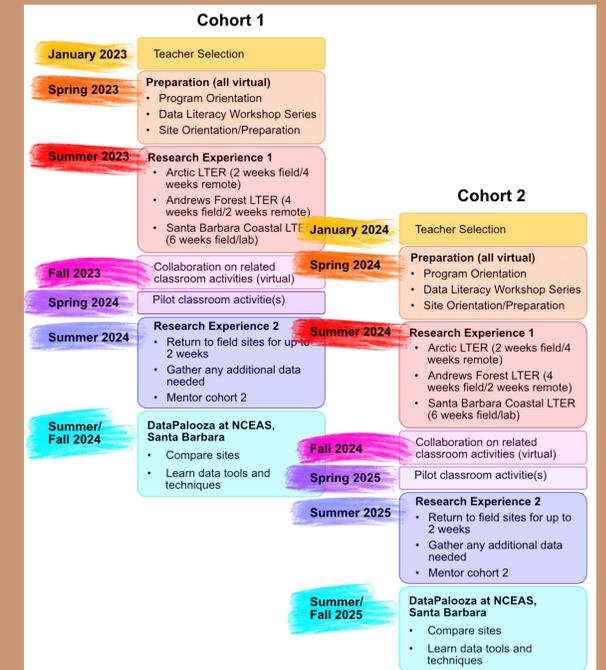

PhD candidate Erin De Leon Sanchez guides Milwaukee teachers in sea urchin righting trials. Credit: Scott Simon

Teachers begin their journey by participating in the Data Literacy using LTER Data workshop series. They then spend up to four weeks embedded in field and lab research during the first summer, followed by virtual collaboration with other teachers to develop and pilot authentic data science learning activities with their students, followed by two weeks of field research in the second summer. A capstone in-person experience at the National Center for Ecological Analysis and Synthesis (NCEAS) Center will help teachers build data skills and develop a cross LTER site data product.

WHAT'S NEXT

We will use insights from our end of program evaluation (to be completed mid-August) to help us plan and recruit for teachers for cohort 2.