



Science in the Snow: Participation of K-12 Schools in the CoCoRAHS-Albedo Network



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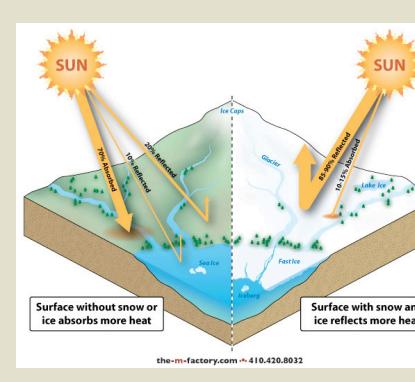
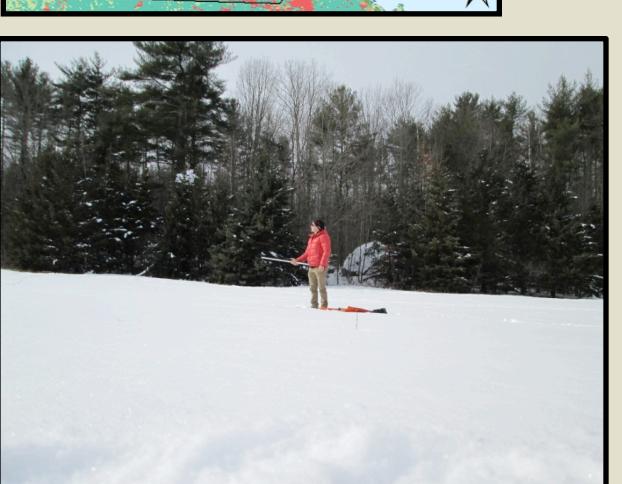
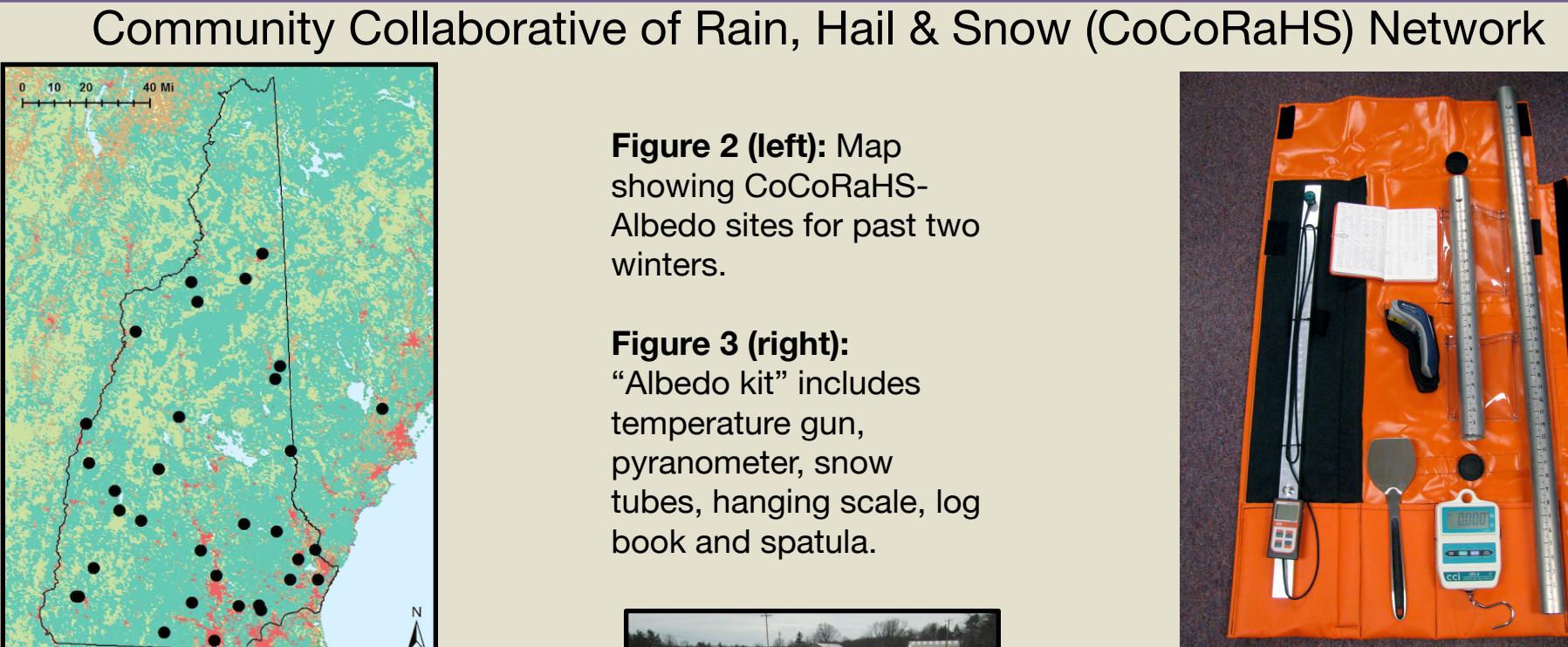
Scientific Research Objectives

- Measure fluctuations in surface albedo over time and across New Hampshire using a network of citizen-scientists.
- Evaluate the physical properties that drive changes to albedo and develop predictive albedo relationships with the interest of modeling regional climate effects.

Summary

For the past three winters (2012-2015) K-12 schools in New Hampshire and Maine have participated in the CoCoRAHS-Albedo network. Teachers and students are equipped with an albedo kit and trained on how to properly collect data and maintain the equipment. A relevant ~20 minute presentation is given to student classes which provides scientific background on albedo, climate, feedbacks and rationale for data collection. Teachers are instructed how to minimize measurement errors and how to upload data to the CoCoRAHS-Albedo website. Following a winter of measurements, teachers are informed how to obtain data for personal use in the classroom.

Data Collection



What is Albedo?

- Albedo is the ratio of reflected energy to total incoming solar energy expressed as a unit-less number between 0 and 1.
- Varies based upon land surface type and surface properties.

Participating Schools

- Hampstead Middle School
- Belmont Regional High School
- St. Thomas Aquinas Exeter High School

- Pinkerton Academy
- Bishop Guertin Academy
- Keene High School
- Windham High School (ME)

Training Visits

- During the fall/early winter participating classes received a ~45 minute presentation to prepare the students (and teacher) for the upcoming winter measurements.
- Half the presentation is devoted to scientific background about albedo and climate as well as several NGSS topics including sea ice cover and feedbacks.
- During the second half of the presentation, students and teachers were taken outside for a hands-on training with the albedo equipment and instructed how to take proper measurements as well as take care of the albedo kits.



Spring Wrap-Up

A spring “wrap up” lesson plan was developed to accomplish the following:

- Using data collected by the students from the past winter, demonstrate the factors that influence snow albedo change over time.
- Make simple graphs using data to show decay of albedo over time.
- By way of simple xy correlations, identify which measured parameters are correlated with albedo decline and which with albedo increase.

Outreach Highlights

- Participating students and teachers are involved with current, impactful scientific research.
- Researchers obtain valuable scientific data which are otherwise impossible to collect.
- Researcher/teacher collaboration has resulted in article publication in *The Science Teacher*. (Elizabeth Burakowski and Eric Hanson- “Sampling in the Snow”)

Acknowledgements: Support for this project was provided by NH EPSCoR with funding from the National Science Foundation’s Research Infrastructure Improvement Award # EPS-1011245. Special thanks to Elizabeth Burakowski, Steve Hale, Mary Stompone and Tianna Begonis for outreach help and other assistance. Thank you to all students, teachers and volunteers in the CoCoRAHS-Albedo network.