

Alpine Science Institute/Expedition Science - Summer 2025

This summer we learned we received a \$1 million dollar grant from the Advanced Technological Education program (NSF sub grant) - to continue supporting students in paid GIS internships for the next three years!!

Additionally- this summer, 38 unique students participated in course work, internships, and research funded by our existing Advanced Technological Education award, Wyoming EPSCoR, Wyoming Innovation Partnership, and NASA Space Grant Consortium. (And, significant off-season support was provided by WY INBRE, and the LOR foundation).

These students were supported directly by the following faculty: Jacki Klancher, Mara Gans, Darran Wells, Mike Bostick, Stacy Wells, Eric Bennett, Todd Wurth, Charles Palmer, Crystal Reynolds, & Todd Guenther AND, substantial additional administrative support was provided by Kathryn Primrose, Kathryn DeWitt, Jenni Poor, Amber Stitt, Jennifer Kellner, Heather Holbert, Carol Woolery, Rory Tendore, Dr. Bill Finney and others. (And we wouldn't be able to make any of this happen without Shea and Courtney stewarding our facilities and classrooms).

A summary of the projects students were involved in is below:

Northern Arapaho Tribal Historic Preservation Office GIS Internship

- 1 student, 19 hrs a week; Supported by Northern Arapaho THPO
- Paraphrasing from the head of the Northern Arapaho THPO office: This student supported the GIS department with data entry and digitizing site forms, including homesite information for the tribe. They consistently demonstrated reliability, a strong work ethic, and the ability to work independently. Their willingness to learn and positive contribution to the team were noted, and they were encouraged to apply for future positions.

Wind River Tribal Buffalo Institute Internship

- 1 student, 35 hrs a week; Supported by WRTBI
- A summer intern with the Wind River Tribal Buffalo Institute developed a database of native plants and animals, supported educational tours, and built a geospatial database and web map to track buffalo herd movements using cameras, field observations, and signs. This tool is contributing to ongoing graduate research (by a former CWC student) on herd dynamics. The Institute was highly impressed with her work and has invited her to continue this fall.

You can read more about this internship here:

<https://windriverbuffalo.org/internship-showcases-buffalos-wide-impact/>

HIKES Expedition/Shoshone National Forest Wilderness Monitoring Internship

- 13 students, 1-week expedition, led by Mara Gans and Stacy Wells
- This summer, 13 students participated in the HIKES expedition in the southern Wind River Mountains. Students learned backpacking, Leave No Trace practices, GPS field data collection, and GIS tools such as Survey123 and Field Maps. They monitored 60 campsites, providing critical data to the Shoshone National Forest, which cannot always access these remote sites. Now in its fifth year, this partnership has helped launch multiple CWC students into land management careers.

ICCE Expedition/ Glacier Rephoto and Temperature Monitoring Project

- 11 students, 2-week expedition; led by Darran & Willow Wells and Mara Gans
- This summer, 11 students participated in a mountaineering course to Gannett Peak. Along the way, they successfully summited the high point of Wyoming, repeated historic glacier photo points to document ecosystem change, and tested the practicality of carrying portable temperature sensors in remote environments. Two sensor types were used: a proprietary Italian device (MeteoTracker) and a custom sensor built by CWC software development students with support from INBRE & Charles Palmer. During the trip, students also assisted search and rescue efforts by locating a missing individual, gaining hands-on experience with wilderness safety and providing a vital community service.



Photos: Climbing up Gannett Peak on Summit Day, Carrying portable temperature sensing devices while backpacking to Gannett, and Wayne Steeds takes in the view on the way down from Gannett Peak.

WIP Supported Data Analysis Workshop

- 9 Students; led by Mike Bostick and Mara Gans
- Following the Gannett Peak expedition, nine students participated in a week-long geospatial data science workshop. They conducted statistical analyses comparing proprietary temperature sensors with custom-built devices from CWC's software

development program, created visualizations of temperature change and ice loss in the Wind River Mountains, and gained hands-on experience with both ESRI GIS software and the open-source R platform. The workshop was a major success and highlighted exciting opportunities for future collaboration between CWC's Software Development, Math, and GIS programs.

Student work, photos, maps, & reports from the previous two courses can be found here:

Miles Gibson & Summeri Bass: [Glacier Change in the Wind River Range: Then and Now](#)

Willow Wells: [Repeat Photography In the Footsteps of Mark Meier](#)

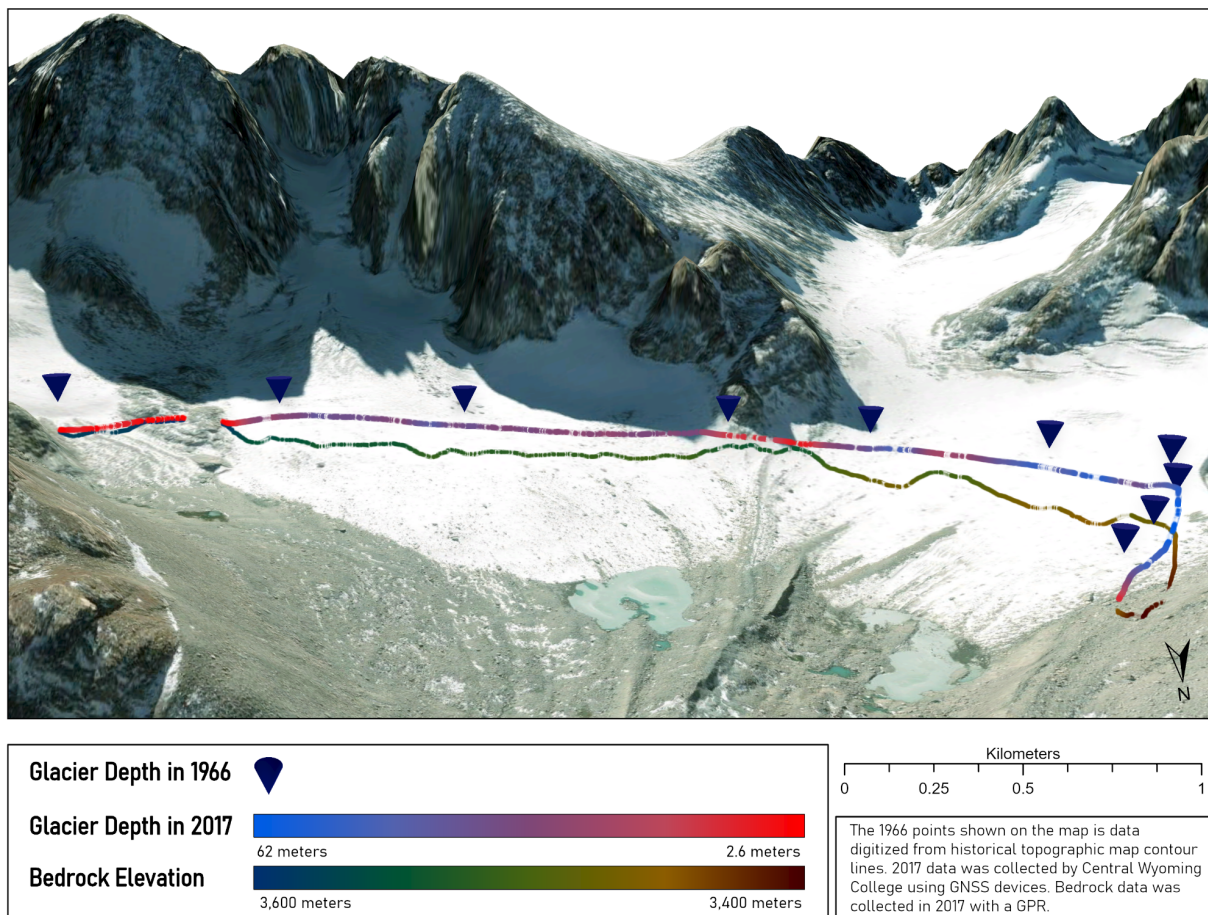
Neta Ricker: [Assessing Agreement Between Climate Measuring Devices](#)

Kole Cox: [Temperature Data Collection on Gannett Expedition](#)

Abby McWilliams- [Temperature Data from Devices Built by CWC Students](#)

Ella Sokolowski- [Practicality of Recording Temperature Remotely](#)

Beau Stanish- [Wind River Glaciers from 1951-2025](#)



Cartography and analysis by: Summeri Bass

Visualization of glacier change in the Wind River Mountains created by Summeri Bass.



1951



2024

Change in the Helen Glacier, Image comparison completed by Willow Wells.

Independent Temperature Monitoring Research-

- 7 students; Supported by Jacki Klancher & Mara Gans
- This summer, seven students carried and tested mobile temperature sensing devices on independent expeditions. These included bikepacking the northern portion of the Great Divide Trail in Canada, traversing the 100-mile off-trail Wind River High Route, hiking an 100-mile section of the Continental Divide Trail in the Wind River Range, and completing two additional backpacking trips in the Winds. Students collected and mapped data, and shared feedback on the devices' performance. The goal of this project is to test whether mobile sensors could serve as a community science tool for monitoring weather in areas where federal laws prohibit permanent weather stations—an important step toward filling data gaps in remote, climate-sensitive environments.

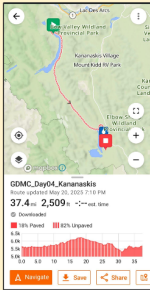
Malaika Klancher- Blair: [Trekking with MeteoTrackers: Assessing Technological Readiness for Community Science Applications](#)

This research was conducted along the Great Divide Mountain Bike Route. We rode from Banff, AB, Canada, to Whitefish, Montana.

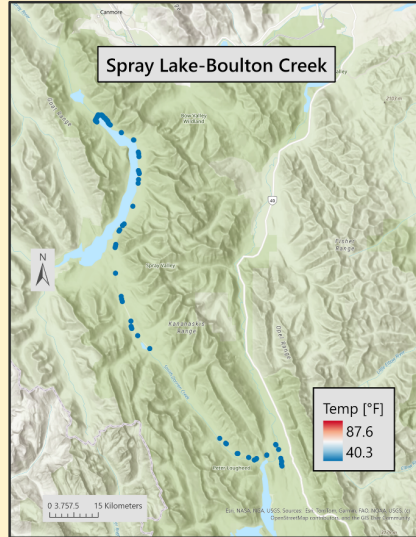
Temperature Collection

Haley Callison - Summer 2025

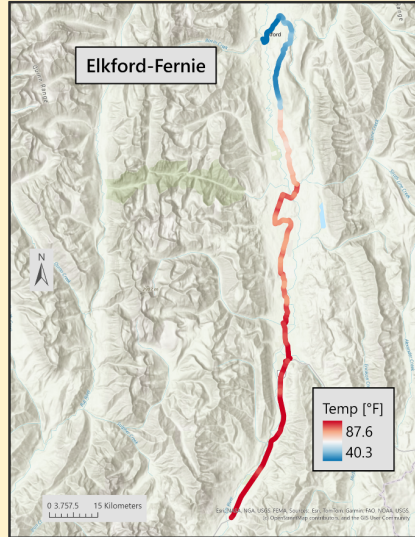
This research is crucial in understanding which methods are effective in collecting accurate weather data in remote locations.



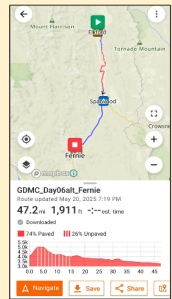
During this trip, I collected temperature data using a Meteo Tracker device attached to my bike. I was looking to see how accurate the readings were compared with local weather.



I was able to record on 2 days. The temperatures ranged from 40.3-87.6 degrees Fahrenheit. The device was recording the entire time I rode, from around 7:30am to 5pm each day.



We rode an average of 42.7 miles and gained 1,134-3,240 feet of elevation each day. I rode with the Meteo Tracker device attached to my handlebars to collect data. After the trip, I downloaded the data into ArcGIS to create a map.



During this process, I learned that using new forms of technology can allow us to record weather data in remote areas, even when there is no cell reception or WiFi. The main issue that I ran into was having the settings in my Meteo Tracker configured wrong, which made it so that I only got the full data on one day. Overall, it was a really fun process.



Image displays the MeteoTracker in use, attached to a hiking pole, further demonstrating their diverse applicability. **Photo source:** Jacki Klancher, 2025.

Archival Historic Glacier Photo Research-

- 1 student; Supported by Jacki Klancher
- Another CWC student conducted archival research on historic expeditions into the Wind River Mountains, locating and documenting photographs of glaciers. These historic images will guide future repeat photography projects, allowing researchers to track long-term glacier change and better understand the impacts of climate change in Wyoming's high alpine environments.

Wiggins Fork Archeological Research

- 2 students; supported by Crystal Reynolds (and previous support from Todd Guenther)
- This summer, two CWC students prepared research for presentation at the International Mountain Conference in Innsbruck, Austria. They presented it there this September!! Building on past CWC archaeological field schools, they used GIS to study the relationship between the Wind River Range and surrounding plains. One paper examined how environmental factors shaped Native American hunting practices and the creation of buffalo jumps, highlighting mountain–prairie interconnectedness. The other used GIS least-cost pathway analysis to explore the spatial organization of a buffalo jump site and its cultural and geographical linkages across Wyoming.

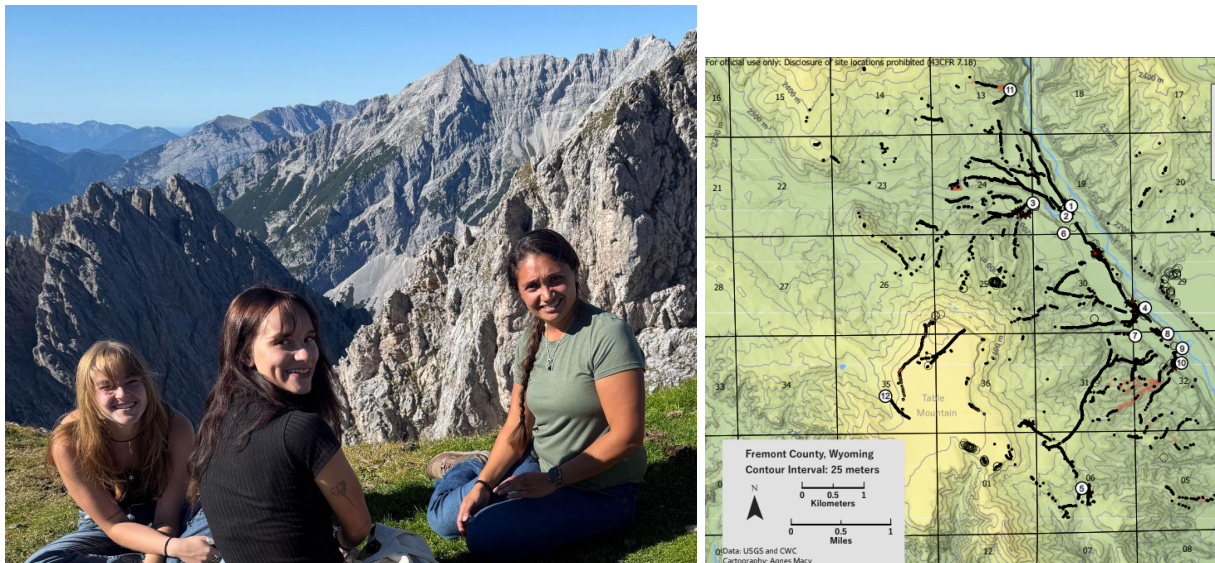


Photo: CWC Alumni and Adjunct Faculty Crystal Reynolds with CWC recent alumni Maeryn Antoniewicz and Cadence Truchot on a field day in Austria at the 2025 International Mountain Conference in Innsbruck, Austria. Map on right is a part of research these students presented.

National Atmospheric Deposition Program- Atmospheric Monitoring (w/ Shoshone National Forest)

- 1 student; Supported by Jacki Klancher
- A CWC student partnered with the Shoshone National Forest to conduct weekly fieldwork at South Pass as part of the National Atmospheric Deposition Program (NADP). The NADP is a nationwide network that monitors air quality and tracks pollutants such as nitrogen, sulfur, and mercury that impact ecosystems, water quality, and human health. This project gives students hands-on experience in nationally significant atmospheric monitoring while contributing valuable data for science and land management.

Monitoring water quality and fish populations- (w/ Shoshone National Forest)

- 1 student; Supported by Jacki Klancher
- A CWC student partnered with the Shoshone National Forest to conduct regular field work to monitor riparian area habitat quality and to monitor fish populations.

In addition to the Internships & research described above, we used summer funding to support students enrolled in the following hands-on GIS & natural resources courses.

Land Management on Western Reservations: 3 students; taught by Eric Bennett

Applications in Unmanned Aerial Vehicles: 3 students; taught by Todd Wurth

Certified Interpretive Guide: 5 students; Taught by Jessica Moore

Additionally- A trailer for a new PBS/CWC Partnership documentary is currently out!

<https://www.pbs.org/video/bikes-bridging-the-great-divide-teaser-7ud1ft/>

This film tells the story of the CWC 2020 BIKES expedition. Jacki Klancher, and alumna of the program (and documentary star) Aidan Hereford are currently touring the US on road bikes showing the film and raising awareness for community college education.



Agriculture and Livestock Judging -Keith Duren and Amanda Winchester

The Agriculture faculty have been extremely busy this term, once again offering a wide variety of Agriculture classes.. While it is clear that Mr. Duren frequently forgets to take pictures of his field trips, the students are afforded ample opportunity for hands-on learning. In the following pictures, students in the AGRI 3200 Forage Crops class are learning about various forage harvesting equipment at Brown Company (one of our many industry partners).