

From the White Mountains to Yosemite: New Vegetation Monitoring Transects Established on Mt. Dana

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Cal Poly field crew in the Yosemite backcountry (left). Cut-leaf daisy near the peak of Mt. Dana (right).

In late summer, a garden of petite wildflowers blooms beneath the boots of peak-baggers and view-seekers on the highest peaks in California. Growing amongst the rocks and ice, these plants have special adaptations that have allowed them to persevere for decades, or even centuries, in the harsh alpine environment. With temperatures warming more quickly in alpine environments compared to lowland areas, alpine plant species may be a bellwether for the ecological effects of climate change. Researchers want to know -- how have California's alpine plant communities changed over time and more importantly, how will they change in the future?



Dr. Dena Grossenbacher, Rachel Friesen and Brooke Wallasch on the top of Campito Mountain (left). Townsend's daisy near Sheep Mountain.

One organization striving to answer these questions is the Global Observation Research Initiative in Alpine Environments, or GLORIA. This summer, the Great Basin chapter of GLORIA assembled an enthusiastic group of botanists, students and volunteers at the Crooked Creek Research Station to complete alpine plant surveys on Campito and Sheep Mountain. Among the volunteers were Dr. Dena Grossenbacher, master's student Rachel Friesen, and undergraduate biology student Brooke Wallasch from Cal Poly, San Luis Obispo. Over the course of a week, Grossenbacher, Friesen and Wallasch familiarized themselves with the GLORIA downslope survey protocol. While surrounded by a lively crew of plant-enthusiasts and the beautiful backdrop of White Mountain Peak. In addition to admiring charismatic alpine species like Townsend's daisy (*Townsendia condensata*), these Cal Poly affiliates prepared for their own field season where they planned to use what they learned and install downslope transects on a new peak: Mount Dana, the second highest peak in Yosemite National Park.



Placement of the 12 downslope transects on the southwest slope of Mt. Dana.

Soon after the GLORIA Great Basin downslope surveys, Friesen and Wallasch were joined by three more Cal Poly San Luis Obispo undergraduates: Eda McColl, Ben Sherman and Maddie Windsor in Yosemite to establish new monitoring plots on the southwest slope of Mt. Dana. Using high-accuracy GPS units, they established 12 belt transects following elevation contours that crossed verdant subalpine seeps, talus gardens, and alpine fell-fields. Only a 20-minute hike from Tioga Road, these new monitoring plots are more accessible than the previous vegetation plots, and encompass a ~1000 ft elevation gradient from treeline to ridgeline that will be informative in terms of the effects of climate change on alpine plant communities. During the field season, Friesen and her crew were assisted by GLORIA Great Basin botanists who aided in the survey efforts. This project aims to inform adaptive management strategies within Yosemite National Park to preserve alpine plant communities threatened by climate change.



Jan Nachlinger and Dr. Dena Grossenbacher (left) and Kaleb Goff (right) using "bidens" to survey the downslope transects on Mt. Dana

The connections made during the enriching week of botany, networking, and fun during the GLORIA surveys had impacts far beyond the White Mountains! Our team is grateful for the funding provided by the Bristlecone CNPS chapter which helped support our work on Mt. Dana, as well as efforts to resurvey historic vegetation plots throughout Yosemite's alpine this past summer.