

California Climate Watch

A monthly newsletter monitoring California climate

Monitoring the Globe in California

By Laura Edwards
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Imagine standing on top of the world. Picture the lichens, small spring flowers, rocks and the wind that permeates through your parka. What better place to monitor climate change than here? Real mountain peak environments all around the world are home to thousands of species of flora, and can be observed through the work of the Austrian-based Global Observation Research Initiative in Alpine Environments, or GLORIA.

This international collaboration to establish sites for the purpose of observing mountain biodiversity began in the mid-1990s. The European Union (EU) funded the early work, to determine a replicable method and establishing some sites on the European continent. The first sites were in EU countries, including Austria, Switzerland and Italy. The Multi-Summit approach was developed. This approach creates target regions where, ideally, four mountain tops are chosen for long-term monitoring.

California is joining the only other North American fully active target region in the Montana Rocky Mountains to contribute to the global observing network. Two areas in the White-Inyo Mountains are already underway, as well as another location in the Sierra Nevada at Dunderberg Peak, west of Mono Lake. The Lake Tahoe Basin is in design stages, with site selection occurring this summer. In the United States, Consortium for Integrated Climate



Figure 1. Taking inventory in a 1x1 meter grid. Photo courtesy of Connie Millar.

Research in Western Mountains (CIRMOUNT) is leading the effort.

GLORIA is intended to be a long-term monitoring network, watching for changes in the biodiversity and vegetation patterns on mountain summits around the world.

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MayQuick Look:

Average

Temperature:

63.1

Average Maximum Temperature:

75.8

Average Minimum Temperature:

50.4

Precipitation:

116% of average

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Monthly Weather Summary

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The first few weeks in May were warm and dry, leading to above average temperatures statewide for the month. High pressure dominated the state for most of the month. The average statewide temperature was 63.1°, more than 2° above the 30-year average. Both the average maximum and average minimum for the month were about 2° above average, at 75.8 and 50.4°, respectively. Precipitation was just above normal statewide, at 116% of average. The seven climate divisions ranged from 16% of average

in the Southeast Desert Basins to 196% of average in the Central Coast division.

The first couple weeks of May were quiet weather-wise, with virtually no records being broken as onshore flow came to the Southland to cool temperatures, and then high pressure built in going into the second week. By the 10th, high pressure settled in bringing warmer temperatures across the Golden State. Some record high temperatures were broken on the 14th, continuing

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GLORIA (continued from page 1)

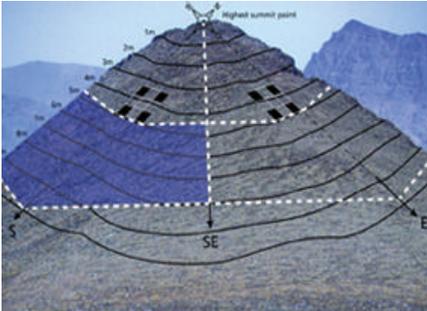


Figure 2. GLORIA Summit sampling design.

This ecosystem above the tree line is a good place to start looking for climate change effects on the natural environment as humans have not had, and likely will not have, many direct effects. As a result of the observations made in these undisturbed settings, improved knowledge about the effects of climate changes can help create better natural resource management and policy. In addition, these areas can be found on all continents, in different climates. The design of the GLORIA network requires minimal site visits, which makes it easier to sustain long-term monitoring.

Each GLORIA site consists of four sampling sites five meters down from the summit, and another four sites at 10 meters down. (See figure 2.) At each circumference, the four sites are in the cardinal directions (N, S, E and W). At each of these 8 sampling sites, a 3m x 3m grid is made, and the corners of those grids (each 1m x 1m size) are thoroughly inventoried for species identification. Small temperature sensors with data loggers are also embedded to monitor the climate, and can store data for up to 3 years. This standardized method is able to be repeated on future visits, and is used at all summits worldwide.

Difficulties arise when slopes are very steep, and quick weather changes occur. But the benefits of this minimum impact observation method and long-term commitments by researchers and public land managers are great. Not to mention the views that extend beyond your imagination once you reach the top.

This international effort to monitor vegetation distribution and changes is the first of its kind. In addition to the individual research groups that take on the challenges of mountain top observations, a central database has been established in Vienna, Austria, to collect the taxa, photography, and temperature data.

With more than 30 locations on several continents, GLORIA is gaining recognition and followers. CIRMOUNT is planning a number of more target regions in North America, so look for these scientists and volunteers on a mountain peak near you.

References:

1. The GLORIA Field Manual-Multi-Summit Approach. Online at GLORIA website: <http://www.gloria.ac.at/>
2. CIRMOUNT's GLORIA webpage: <http://www.fs.fed.us/psw/cirmount/wkgrps/gloria/>

For more information, visit:

GLORIA website: <http://www.gloria.ac.at/>

CIRMOUNT website: <http://www.fs.fed.us/psw/cirmount/>

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"...high pressure settled in bringing warmer temperatures across the Golden State."

through the 18th. Stations reporting record highs on the 14th included: Oakland downtown 89 (old record 85), Lancaster 97 (96), and San Francisco airport 87 (85). On the 15th, high temperatures reached 97 at Stockton, 75 at Eureka and 87 at Alturas and Mt. Shasta.

On the 16th, the Pacific Northwest was experiencing a heat wave, with numerous records broken all across Washington, Oregon and northern California. Southern California did not miss out on the excitement, however, with Palmdale, Lancaster and Sandberg all reporting new record highs on that date. Hotter locations in the Central Valley reached the century mark, with the southeast desert stations reaching well above 100°.

Beginning Friday the 19th, cooler, wetter weather returned to the state as a Pacific low pressure system moved south along the coast. Record single-day rainfall totals were scattered over the next 3-4 days, including .96" at Paso Robles and 1.29" at Cal Poly on the 21st, and a whopping Trace of precipitation at Lancaster. Less impressive rainfall records were reported in the northern areas of the state, including .87" at Modesto and .39" at San Jose on the 21st.

May ended cool over most of the central and southern portions of the state with some record lows reported in Bakersfield, Redding and Ramona on the 28th-29th.