

Elevation, substrate, and climate effects on alpine and sub-alpine plant distribution in California and Nevada's high mountains: Preliminary data from the California and Nevada GLORIA project

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Documenting plant response to global climate change in sensitive zones, such as the alpine, is a major goal for global change biology. Basic information on alpine plant distribution by elevation and substrate provides a basis for anticipating which species may decline in a warming climate. The Global Observation Research Initiative in Alpine Environments (GLORIA) is a worldwide effort to document vegetation changes over time in alpine settings using permanent multi-summit plots. The California/Nevada group currently monitors seven permanent GLORIA target regions, composed of 29 summits in alpine and subalpine zones. Summits range in elevations from 2918m to 4325m on substrates including dolomite, granite, quartzite, and volcanics. High-resolution plant occurrence and cover data from the upper 10 meters of each summit are presented. Plants from our target regions can be divided into three groups: summit specialists found only on the highest peaks, alpine species found predominantly within the alpine zone, and broadly distributed species found in the alpine zone and below. Rock substrate and microsite soil development have a strong influence on plant communities and species richness. We present the first set of five-year resurvey and temperature data from 18 summits. We have documented some annual variation in species presence/absence at almost all sites, but no dramatic changes in total diversity. Consistent with the expectation of rising global temperatures, our soil temperature loggers have documented temperature increases at most of our sites. These data are a baseline for assessing bioclimatic shifts and future plant composition in California and Nevada's alpine zone.