

# Capturing the Flowers of the Sierra Nevada Mountains: The Contribution of the Fresno State Herbarium (FSC) to the California Phenology Network

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The California Phenology Thematic Collections Network (CAP TCN) is a collaborative project involving 22 herbaria, with the goal of capturing images, transcribing label data, and georeferencing locality descriptions for nearly a million plant specimens. A major additional component of the project is developing new Symbiota-based tools and workflows to enable precise scoring of the phenological status of herbarium specimens, and applying these methods to the imaged specimens from the California Floristic Province biodiversity hotspot. The FSC Herbarium at California State University, Fresno is contributing approximately 40,000 specimens to the CAP TCN. The collection dates from the 1890s to today, with a special concentration on coniferous forests and meadows at elevations above 2500 meters in the Sierra Nevada mountains, surveyed from the 1920s-1960s by the Fresno State Biology professor Dr. Charles H. Quibell. In addition to the high elevation ecosystems represented in this herbarium, the FSC has substantial collections from other severely threatened Central California habitats, including vernal pools and alkali sinks, riparian corridors along the Kings and San Joaquin Rivers, and foothill chaparral and native grasslands. Fresno County is the most agriculturally productive county in the United States, and the location of the 5th largest city in California (Fresno), with a total county population of almost a million people and a growth rate of approximately 0.8% per year. As the human population increases in the Fresno area, and climate change elevates temperatures while decreasing water availability, native habitats all over the county are facing ever-intensifying pressure from urbanization, agriculture, fire, drought, and invasive species. The digitization of the FSC specimens will enhance understanding of historical Central California ecosystems, especially those high elevation habitats particularly threatened by climate change, to establish baseline 20th century data at each elevation for species presence and phenology. Researchers in a variety of different disciplines will be able to use this data to study the ecology and evolution of different taxonomic and functional groups of Central California plant species, and help to develop better plans for conservation and habitat restoration.

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