

Michelle Goman (Geography, Environment, and Planning Department)

Sabbatical Year Activities Academic Year 2022-2023

Sabbatical Activities

Old Focus

My sabbatical year of Fall 2022 to Spring 2023 turned out a bit differently than originally envisioned. My plan was to return to Oaxaca in June of 2022 to collect sediment cores as part of my NSF grant and then work on those cores during the sabbatical year. In the spring of 2022, I discovered that the Mexican government had issued a new permitting requirement for fieldwork in Mexico. I scrambled to get the extensive permit packet together and submitted to the relevant agencies via the US Embassy in Mexico City. Unfortunately, the permit did not come through in time for June of 2022. I therefore resubmitted for a permit request for January-March of 2023. This was successfully obtained by end of summer 2022. Visa requirements were finalized in December of 2022. I worked with the Continental Scientific Drilling (CSD) Facility to have field equipment shipped to Mexico for the first week in January. Unfortunately, the equipment, despite considerable effort from CSD personnel, was stuck in Mexico City or MIA in a customs quagmire. The recourse was to have the equipment, when possible, shipped back to CSD and to start again. Unfortunately, the window for fieldwork and liaising with collaborators from CSD and from UNAM and to remain within the designated permit time granted from the Mexican government was not feasible. I would need to re-apply for a permit and resume the lengthy process again. This nearly yearlong process had been incredibly frustrating, time consuming and stressful. I ultimately decided to withdraw from the project.

New focus

I have been using the sabbatical time to develop a new research agenda, specifically focusing on paleoecological and geoarchaeological records from California.

This research has three regional foci.

1. San Francisco Dune Fields

A. The ecology of paleo wetlands in San Francisco Dune Fields

Building on some earlier small projects in San Francisco and research completed during my sabbatical I am developing a late Holocene paleoecological history of dunal wetlands. Prior to European colonization a large part of the region now encompassed by the city of San Francisco, was covered by large sand dunes, but little is known of the ecology of these systems. Geoarchaeological examination of excavations for new buildings in the city are revealing discrete wetland soils within these dune fields. I have been examining these records for pollen and macro-botanical remains. Particularly, interesting is that nearly all the samples examined have charcoal present possibly suggesting purposefully set fires by the Ohlone for vegetation management. I presented on this work at the *Geological Society of*

America annual meeting. I am currently working on a manuscript which I intend to submit to the *Holocene*.

B. San Francisco dune field stabilization and destabilization

In order to better understand the ecology of the San Francisco dune fields prior to their removal, due to historic urbanization, I have been undertaking an historical analysis of early traveler and settler accounts of the region. I have been developing a database of ecological and geological references to the region since early European contact in the 18th Century. This work is ongoing but initial data suggests that the dune system was very different from that described a hundred years later and which may reflect destabilization due to human impact.

C. Climate History

While the wetland records from the San Francisco dune fields are relatively short lived, they do appear to reflect a climate record. Examination of the ages of the records and comparison with extant climate records for the region, indicates that the paleo wetlands persisted during periods of wetter conditions. I presented on this work at the 30th PACLIM workshop.

2. Paleocology of Vandenberg Air Force Base

I examined a sediment core collected from Vandenberg Air Force Base (Santa Barbara County) for fossil pollen. The record is unusual as it has a very high rate of sedimentation and excellent pollen preservation for a short period about 8000 years ago. The pollen record is very interesting as it appears to reflect a period of dry then wet conditions, which coincide with the globally recognized climate perturbations that occurred at 8.2ka and which are associated with the catastrophic drainage of proglacial Lake Agassiz. Relatively few paleoecological records from this time frame exist for coastal California. I am currently running other sedimentary analyses on the core, once these are complete the intention is to submit a manuscript to *Quaternary International*. This work is in collaboration with a SSU CRM alumni.

3. Saddleback Ranch Paleocology

In collaboration with Mark Selverston of SSU Anthropological Studies Center. I analyzed soil samples for pollen from archaeological trench units from Saddleback Ranch, Yuba County. Samples were also processed for a variety of sedimentary signatures, these were undertaken by a CRM graduate student, who I trained. The palynological and sedimentary analyses indicated potential human modification of soils, which will help in the overall understanding of the site development.

Service

A major outlay of my time during part of the sabbatical was organizing the 30th Pacific Climate Workshop (PACLIM) at Asilomar, Pacific Grove in late February of 2023. I organized the conference in collaboration with Scott Mensing (University of Nevada, Reno). After a four-year break, due to COVID, this meeting felt like a family reunion and spirits were high throughout the conference. We had a total of 70 registrants, with a mix between senior researchers, mid-career and graduate students, and participants from federal agencies, universities and non-profit organizations.

I continued to review manuscripts for journals, undertook tenure review assessment (non SSU) and also served as a Technical Advisory Committee Member for the Southern Laguna de Santa Rosa Sediment Source Assessment project.

I continued my participation in the SSU naturalist training program during my sabbatical by leading two teaching hikes to interns.

Stevenson Hall Reoccupation

Late Fall 2022 marked the reoccupation of the remodeled Stevenson Hall. I had to pack up the teaching lab equipment, which was housed in 10 Carson and also pack and move my research lab equipment from 5 Carson.

I unpacked the equipment and organized the new Physical Geography Teaching lab space.

As my research involves samples from overseas, I am required to maintain a USDA soil compliance permit. I developed soil handling protocols for my new research lab in Stevenson 2041 and applied for a new permit. The lab was evaluated and a permit was issued early in 2023. I was then able to move my soil samples to the new lab and storage facility.

Products

Goman, M., Pastron, A., Russell, M., Tjoa, E., and Zimmer, P.D., 2023. *Wetlands in the San Francisco Dune Fields: Paleoecological Evidence for Late Holocene Wet Phases*. 30th Pacific Climate Workshop, Asilomar, CA. February 26th to March 1st.

Goman, M., Zimmer, P.D., and Russell, M., 2022. *Buried by water and sand: Glimpses into the Holocene landscape and paleoecology of prehistoric San Francisco*. Geological Society of America Annual Meeting, Denver, Colorado. Abstracts with Programs, Volume 54, number 5, <https://doi.org/10.1130/abs/2022AM-378053>

Goman, M. (2022) *CA-YUB-2057 Soil and Pollen Analyses Report* Submitted to The Anthropological Studies Center, SSU, California.