Subsurface carbon dynamics in diverse coastal wetland settings at the Elkhorn Slough National Estuarine Research Reserve

SUSAN PIT[1], ADINA PAYTAN[1], PEI-CHUAN CHUANG[2], NATALIE HERMOSILLO[1], VALERIA GALINDO-EGUIARTE[1] AND LUNA OSLEGER[1]

[1]University of California, Santa Cruz
[2]National Central University
Presenting Author: supit@ucsc.edu

Wetland restoration has globally been heralded as a climate change mitigation strategy for its ability to store carbon, but we lack holistic, quantitative data to provide a more nuanced view. Understanding wetland carbon cycling is essential for effective management, and related implementation of adaptation and mitigation strategies.

To address this gap, we collected 50cm sediment cores in 3 different locations in the Elkhorn Slough National Estuarine Research Reserve (ESNERR) wetland in Monterey Bay, California: one restored, one tidally restricted and disturbed, and one pristine. Data from these sediment cores will be combined with ancillary surface water quality data (i.e. water level, temperature, conductivity). In addition, at each site eddy covariance towers record gas fluxes (i.e. methane and carbon dioxide emissions), meteorological data, and radiative fluxes.

Sediment cores were collected at each of the three locations in both vegetated and mudflat areas at both high tide and low tide. We collected pore water and dissolved gas samples from these cores and analyzed them for several common carbon species, hydrogen sulfide, iron(II), nutrients, trace metals, water isotopes, and dissolved methane concentrations and isotopes.

Data from all of these sources will be combined into a comprehensive dataset to describe each wetland site. This dataset will be used to compare subsurface carbon dynamics between the sites across different stages of restoration, between vegetated areas and mudflat areas, and across tidal cycles. We would like to acknowledge the ESNERR team for their help and guidance in this study.