

ONLINE SEMINAR SERIES
September 9, 2020—11:00 a.m.



Emily Miller

Research Technician, MBARI

Herbaria macroalgae as a proxy for historical upwelling trends in Central California

Planning for future ocean conditions requires historical data to establish more informed ecological baselines. To date, this process is largely limited to instrument records and observations that begin around 1950. Here, we show how marine macroalgae specimens from herbaria repositories may document long-term ecosystem processes and extend historical information records into the nineteenth century. We tested the effect of drying and pressing six macroalgae species on the amino acid, heavy metal, and bulk stable isotope values over one year using modern and archived paper. We found historical paper composition did not consistently affect values. Certain species, however, had higher variability in particular metrics, while others were more consistent. Multiple herbaria provided *Gelidium* (*Rhodophyta*) samples collected in southern Monterey Bay from 1878 to 2018. We examined environmental relationships and found $\delta^{15}\text{N}$ correlated with the Bakun upwelling index, the productivity regime of this ecosystem, from 1946 to 2018. Then, we hindcasted the Bakun index using its derived relationship with *Gelidium* $\delta^{15}\text{N}$ from 1878 to 1945. This hindcast provided new information, observing an upwelling decrease mid-century leading up to the well-known sardine fishery crash. Our case study suggests marine macroalgae from herbaria are an underutilized resource of the marine environment that precedes modern scientific data streams.

Registration for this seminar is required and space is limited. [Please RSVP here.](#)