AGU 100 FALL MEETING
Washington, D.C. | 10–14 Dec 2018

PP33C-1737: Refining the Calibration of Oxygen Isotope Ratios in *Nacella* Limpet Shells, Tierra del Fuego, Argentina

Wednesday, 12 December 2018
13:40 - 18:00
Walter E Washington Convention Center - Hall A-C (Poster Hall)

Nacella deaurata (Gmelin, 1791) and *N. magellanica* (Gmelin, 1791) are common intertidal species of patelloid limpets found in the Magellanic biogeographic province of Tierra del Fuego, Argentina. These species are also prominent constituents of Holocene archaeological shell middens in the area and are therefore potentially valuable as paleoclimate archives of coastal sea surface temperature (SST). An earlier calibration study examined oxygen isotope ($\delta^{18}O$) time series of one individual from each species (Colonese et al., 2012). A range of estimated SST from shell $\delta^{18}O$ values was based on maximum, minimum, and average $\delta^{18}O$-water values. They compared estimated SST with the range of measured SST at the collection site. Here, we present a refined calibration of both *Nacella* species. Five modern *N. deaurata* and *N. magellanica* specimens were collected alive on a nearly monthly basis from October 2015 to October 2016 in the Beagle Channel (54°52′49.62″S 67°16′26.49″W). Two archaeological shell middens containing both species occur at this location dating to the Vandal Minimum. Water temperature and $\delta^{18}O$ data were also measured for each collection date to calculate expected $\delta^{18}O$-shell values. We sampled the last increment of growth along the growing edge of the posterior margin of 32 individuals for isotopic analysis. Shell-edge $\delta^{18}O$ values have a predictable offset from expected values of +1.28±0.38‰ for *N. deaurata*, and +1.32±0.32‰ (VPDB) for *N. magellanica*, similar to other patelloid limpet species. Once corrected for this predictable offset, estimated SST agreed well with measured values. Our next step will sequentially micromill specimens harvested in October 2016 and compare estimated monthly SST to observed measurements. Our refined calibration of *Nacella* limpets will allow seasonal-scale SST reconstruction using archaeological specimens. Such high-resolution archives will provide much needed seasonality data at high southerly latitudes, as well as insights into human-climate interactions.

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