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GSA Connects 2021 in Portland, Oregon

Paper No. 93-1

Presentation Time: 9:00 AM-1:00 PM

PAST SEA ICE STATE IN MCMURDO SOUND, ANTARCTICA FROM CARBON ISOTOPES AND GROWTH STRIATIONS IN THE ANTARCTIC SCALLOP *ADAMUSSIUM COLBECKI*

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Sea ice cover fluctuations are major factors driving climate change and are a substantial component in the global climate feedback loop. Antarctica currently lacks notable proxy records of sea ice state; bivalves archive environmental conditions and can be studied to track changes in sea ice cover through time. *Adamussium colbecki* is a large sea scallop with a circum-Antarctic distribution with an abundant fossil record throughout the Holocene. Our group's prior work showed that carbon isotopes ($\delta^{13}\text{C}_s$) in modern scallop shells record seasonal variation in sea ice state over time when paired with growth markers called striae. We also found that sea ice cover is recorded by low $\delta^{13}\text{C}_s$ values in narrow striae while ice-free conditions are recorded by high $\delta^{13}\text{C}_s$ values in wide striae. Here we apply this paleoclimate proxy by analyzing *A. colbecki* subfossil shells from terraces along Explorers Cove (EC) and Bay of Sails (BOS), western McMurdo Sound, Antarctica. Today, these sites have different sea ice states: persistent (multiannual) sea ice at EC and annual sea ice (that melts out every year) at BOS. Three adult fossil shells collected at EC and three fossil shells (including one juvenile) collected at BOS will be serially sampled for $\delta^{13}\text{C}_s$ from the growing shell margin to the umbo. Imaging of striae will allow $\delta^{13}\text{C}_s$ values to be paired with summer (wide striae) and winter (narrow striae) scallop growth. Seawater temperature proxy records suggest warmer conditions 2000–5000 ybp, so we expect variable $\delta^{13}\text{C}_s$ values recording annual sea ice in shells from both sites.

Session No. 93--Booth# 100

[D20. Recent Advances in Paleontology III \(Posters\)](#)

Monday, 11 October 2021: 9:00 AM-1:00 PM

[Exhibit Hall A \(Oregon Convention Center\)](#)

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