GSA Annual Meeting in Seattle, Washington, USA - 2017

Paper No. 272-41
Presentation Time: 9:00 AM-6:30 PM

RELATIVELY FAST GROWTH AND MODERATE LONGEVITY FOR THE ANTARCTIC SCALLOP, *ADAMUSSIUM COLBECKI*, LIVING IN THE COLDEST WATERS ON EARTH

CRONIN, Kelly[1], WALKER, Sally E.[1], MANN, Roger[2], CHUTE, A.S.[3], LONG, Mathew[2] and BOWSER, Samuel S.[4], (1)Department of Geology, University of Georgia, Athens, GA 30602, (2)Virginia Institute of Marine Science, College of William and Mary, Gloucester Point, VA 23062, (3)Fisheries Service, National Oceanic and Atmospheric Association, Woods Hole, MA 02453, (4)Wadsworth Center, New York State Department of Health, Albany, NY 12201, kec75599@uga.edu

Polar bivalves are often long-lived and slow growing. However, growth and lifespan estimates are contested for the Antarctic scallop *Adamussium colbecki* living in the coldest waters on Earth. Either they are extremely long-lived (40–100+ yrs) with very slow growth (von Bertalanffy growth parameter K = 0.09) or they are only ~two decades old and grow faster (K = 0.12). Discrepancies may arise from varying ageing strategies or using either top or bottom valves. If growth rates and lifespan can be resolved, this ecosystem engineer will be an excellent paleoenvironmental proxy because of its circum-Antarctic distribution and generic fossil record to the Oligocene.

We estimated growth and lifespan for *A. colbecki* from two sites that differ by sea ice cover in western McMurdo Sound, Antarctica: Explorers Cove (EC) and Bay of Sails (BOS). EC has multi-annual sea ice, which may affect nutrient availability, and sea ice melts out yearly at BOS. Both have similar austral summer temperatures (-1.97 ^{o}C). We predict that EC scallops would have longer lifespans and slower growth than BOS scallops, but if temperature affects growth then BOS and EC should be similar. Adult *A. colbecki* (72 – 92 mm) were collected at ~ 18 m water depth, 14 top and bottom valves of which were randomly selected from each site. Using a scallop fisheries method, distinct yearly annuli were counted for longevity estimates. Growth increments from umbo to each successive annulus were measured and used in Ford Walford plots, the slope from which yields K values for each valve that were also pooled by site and valve type. Data were compared using ANOVA and 95% CIs.

Results indicate that *A. colbecki* lives at least two decades at EC and BOS (13–19 yrs) and is not a century old as previously reported for EC. It also grows relatively fast for a polar bivalve (pooled Ks: 0.15–0.20) unlike previous reports from EC (Ks = 0.09–0.12); there is also much individual variation (K range: 0.11–0.23). Our estimates align with *A. colbecki* living in seasonally warmer Antarctic regions (Terra Nova Bay: 0.11 > K > 0.19; Antarctic Peninsula K = 0.24). Importantly, age and K estimates were not statistically different by site or valve type suggesting that persistent sea ice may not affect their growth.

Session No. 272--Booth# 266

D17. Paleontology, Paleoecology/Taphonomy (Posters)
Tuesday, 24 October 2017: 9:00 AM-6:30 PM

Halls 4EF (Washington State Convention Center)

Geological Society of America *Abstracts with Programs.* Vol. 49, No. 6
doi: 10.1130/abs/2017AM-306175