EVAN LAU, CAITLIN FRAME, EDWARD NOLAN, ZACHARY DILLARD, MARCUS KINKER, DANIEL LUKICH, NICOLE MIHALIK, KATELYN YAUCH, and SAMANTHA WAYCHOFF, Department of Natural Sciences and Mathematics, West Liberty University, West Liberty, WV, 26074, Environmental Science, University of Basel, Basel, Switzerland. **Ecology of ammonium oxidizing and nitrite oxidizing microorganisms in namibian coastal upwelling zone at different depths.**

The upwelling of nutrient-rich South Atlantic waters (as part of the Benguela current) along the Namibian coast sustains some of the highest rates of primary production in oceans, which involves important steps in the Nitrogen cycle. However, the ecology of nitrifying microbes in this ecosystem is not well-studied. Using deep multiplex sequencing of (~450bp) 16S rRNA amplicons, complemented by salinity, temperature, dissolved oxygen, Photosynthetically Active Radiation (PAR), fluorescence and N2O isotope concentration measurements, we profiled the microbiota at 10m, 25m, 100m, 130m, and 250m depths. We assessed the diversity and abundance of Ammonia oxidizing Archaea (AOA), Ammonia oxidizing Bacteria (AOB), and nitrite oxidizing Bacteria (NOB), which oxidize ammonium (NH4+) or ammonia (NH3) to nitrite (NO2−), and nitrite to nitrate (NO3−). Our data indicate that the AOA or anammox (anaerobic oxidation of ammonium by Archaeal ammonia oxidizing microbes) are the dominant nitrifying microbes at 25m and below, where dissolved oxygen levels in the upwelling seawater becomes depleted. Their abundances and diversity far exceed that of other nitrifying bacteria. This study supports previous reports on the abundance of anammox cells, and biomarker lipids that indicate that anammox bacteria are responsible for significant losses of fixed nitrogen in this ecosystem, as well as other oxygen-depleted upwelling seawaters.