
Woods Hole Oceanographic Institution
Biology Department Seminar



Tuesday, December 5, 2023 – 12:00 Noon

Microbially-Driven Shifts in Marine Nutrient Cycling in Response to Ocean Deoxygenation and Climate Change

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The oceans are currently losing dissolved oxygen (O₂) as a result of climate change and human activity, which may have dramatic effects on biodiversity and global climate feedbacks. As O₂ is depleted to near-anoxia in pelagic marine environments, microorganisms shift from aerobic respiration to anaerobic nitrogen-based metabolisms. Most conceptual and numerical models assume this shift will lead to nitrogen loss, but it can also lead to nitrogen retention depending on which microbial metabolism(s) engage. The controls regulating the relative activity and variability of these metabolisms remain uncertain, however, and this confounds our efforts to predict how the marine nitrogen cycle responds to deoxygenation and impacts other marine biogeochemical cycles. I conduct experiments with live marine microbial communities to measure how different nitrogen-based microbial metabolisms are regulated in the transition from oxic to anoxic conditions. I use a combination of stable nitrogen isotopes (¹⁵N) and bioinformatics technologies to increase our knowledge of how competing microbial metabolisms are regulated under variable environmental conditions and unstable resource availability. My work has implications for our biogeochemical models that predict ocean deoxygenation and related climate feedbacks.

HYBRID! In person: Redfield Auditorium **Zoom:** <https://whoi-edu.zoom.us/j/92270689921> Meeting ID: 922 7068 9921 **By phone:** Find your local number: <https://whoi-edu.zoom.us/u/acKR1TbYcS>