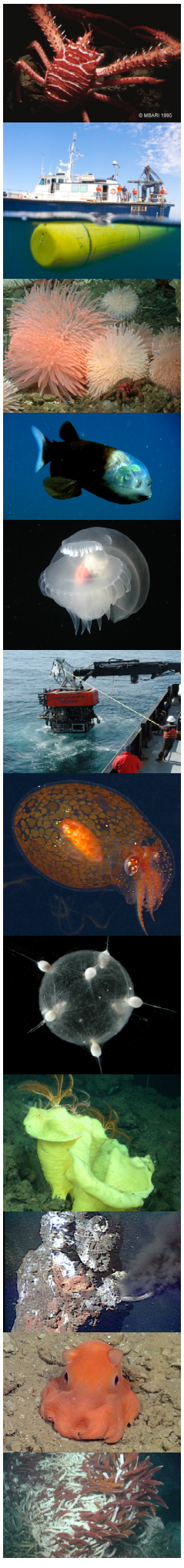

Making do under low dissolved oxygen: Microbial ecology and biogeochemistry in low-oxygen marine ecosystems

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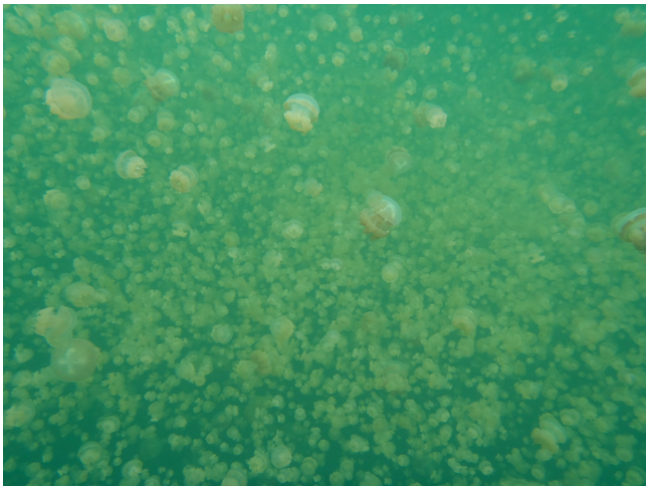

January 17, 2018

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Ocean deoxygenation and oxygen minimum zone (OMZ) expansion have profound implications for marine ecology and biogeochemistry. However, a missing link in our understanding of ocean deoxygenation is accurate measurement and modeling of those processes and organisms that are ultimately responsible for consuming dissolved oxygen (DO) in the ocean. Aerobic microorganisms catalyze the respiration of organic carbon and the oxidation of ammonia and nitrite, therefore they regulate the consumption of DO and organic matter, regeneration and cycling of nutrients, and the availability of substrates and nutrients to other organisms. As DO is consumed, anaerobic forms of metabolism are subsequently favored. But how, precisely, does this proceed through space and time? How predictable are microbial community responses to low DO, both biogeochemically and ecologically? Which organisms and processes 'win' the competition for oxygen and other resources? How does oxygen shape microbial communities relative to other environmental variables (temperature, nutrients, and carbon), and in the context of other ecological processes (dispersal and drift)? In this talk, I will address these challenges through new biogeochemical results and quantitative analyses of microbial communities in the largest low-oxygen region of the ocean—the eastern tropical North Pacific (ETNP)—as well as in "marine lakes"—including Jellyfish Lake, Palau.

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