

HKB Distinguished Seminar series cum International Workshop on *Deep Sea Biology*



Climate Change and Biodiversity in the Deep Sea: An Energetic Approach



**13 April 2022 (Wednesday)
9:30 – 10:30 am (GMT +8, HK Time)**

Prof. Craig McClain

Professor and Executive Director,
Louisiana Universities Marine Consortium, USA
Expertise: Deep Sea Biodiversity and Ecology

Abstract: The great anthropogenic alterations occurring to carbon availability in the oceans necessitate an understating of the energy requirements of species and how these may impact biodiversity. The deep oceans are characterized naturally by extremely low availability of chemical energy and be particularly vulnerable to further reductions carbon flux from surface waters. Because energetic requirements of organisms impact nearly every aspect of their ecology and evolution, species are adapted to specific levels of carbon availability and possess a metabolic niche. Here we test this in deep-sea mollusks in the Atlantic Ocean specifically examining how energetic demand, axes of the metabolic niche, and geographic range size vary over geographic gradients chemical energy availability. We find that higher energetic species, and ecologies associated with high energy demand, are located in areas with high chemical energy availability. In addition, we find that range size and location of deep-sea species is determined by geographic patterns in chemical energy availability. Our findings indicate that deep-sea species are adapted to specific energy regimes, the metabolic niche can potentially link scales from individuals to ecosystems, and link adaptation to patterns in biogeography and biodiversity.

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