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SEMINAR

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Hosted by Professor Peter Ng

From corals to concrete: Urban marine ecology and the design of new shorelines

Peter Todd

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Many years of studying ecosystems in Singapore's cityscape, and especially their resilience to multiple stressors, led to the conceptual development of 'urban marine ecology'. Key characteristics of this nascent discipline include resource exploitation, pollution, and coastal infrastructure (ocean sprawl). These are all well represented in Singapore and extensively researched by my lab. The replacement of natural shores with artificial coastal defences is particularly damaging. These hard engineered structures simplify, linearize, and homogenize the coast, leading to reduced biodiversity, ecological functioning, and ecosystem services. The challenge is to design new shorelines that can protect back-shore assets while also providing ecological uplift. I will present our 'meandering shoreline' approach that replicates bays, headlands, reefs, and estuaries. This large-scale ecological engineering has relevance beyond urban areas as increasingly extensive tracts of coast are facing risk from climate-change driven sea level rise and frequency and intensity of storms.

Associate Professor Peter Todd is an experimental marine ecologist who focusses on organism-environment interactions in nearshore waters, especially those close to urban centers. His research is highly interdisciplinary, synthesizing elements of biology, geography, and engineering to answer ecological questions. Results contribute towards both fundamental knowledge as well as informing conservation and sustainability priorities. In both curiosity-driven and translational work, he emphasize the design, build, implementation, and analysis of high-quality novel experiments.

He has been working on impacted tropical coastal ecosystems for over 20 years, with a focus on urban marine ecology and the ecological engineering of artificial coastal defences in Singapore for the last 15 years.