

School for the Environment

Dissertation Defense

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Isaac Rosenthal

Floating Forests: A Citizen-Science Approach to Giant Kelp Research and Education

Giant kelp (*Macrocystis pyrifera*) forests are critical marine ecosystems with great economic and ecological value. These key natural resources are threatened by climate change, and kelp forests are disappearing worldwide. Beyond climate change, *Macrocystis* is also strongly impacted by local drivers such as coastal urbanization, and is most vulnerable to those that impact water quality. However, given the natural variability of kelp forests, these changes are difficult to study at large scales. In addition, much of the public is unaware of the importance of this issue, or worse, has dangerous misunderstandings about the drivers and impacts acting on these floating forests. In my dissertation I take a variety of approaches to 1) Test a causal model of how urbanization and climate change interact to drive kelp biomass in California, 2) Validate a citizen science approach for scaling up kelp mapping efforts using freely available Landsat data, and 3) Develop and evaluate an undergraduate-level activity that uses our citizen science project as a focal point for increasing awareness of climate change impacts, as well as improving students' general scientific literacy.