ABSTRACT
Species dynamics and interactions in nature often fail to conform to classical ecological models because of a failure to account for species interactions and the influence of environmental forcing. In my thesis, I use modern quantitative tools to help unravel these complex ecological dynamics and consider their implications for natural resource management in three separate cases. In the first case, I use a nonlinear approach to show how environmental context greatly alters the strength and direction of species interactions in a California kelp forest. Next, I investigate a human-wildlife conflict between California sea otters and the southern California red sea urchin fishery at a productive fishing ground. By reconstructing the past dynamics of the sea urchin fishery, I describe how otter and fishery pressures determine the past and likely future of the sea urchin resource. In the final part of the thesis, I investigate broad spatial and temporal patterns in the distributions of two valuable, interacting species in the eastern Bering Sea in relation to environmental variability. In combination, the projects in my thesis reveal how long term spatial and time series data can be leveraged through powerful quantitative methods to better understand and manage dynamic species distributions and interactions.

BIO
Owen is a spatial and fisheries ecologist interested in how relationships within and among species inform how we should manage marine ecosystems and resources. He uses a combination of computer modeling and empirical approaches to investigate how interactions between species, like competition and predation, combine with human pressures to determine the structure and function of marine ecological communities across a range of spatial and temporal scales. Owen received his BS and MS in Earth Systems from Stanford University. Before returning to graduate school, he worked as a research associate at the Environmental Defense Fund, designing tools to facilitate the effective implementation and evaluation of spatial management measures in fisheries.