

"Intraspecific niche partitioning in bottlenose dolphins across fluctuating environments".

How animals respond and adapt to changes in climate and extreme climate events is one of the most urgent problems in conservation biology. For long-lived, slow reproducing species, it can take years to detect significant fitness effects before and after environmental change. Longitudinal studies therefore represent crucial opportunities to investigate climate impacts on basic biological phenomena such as ranging, phenology, life history, and fitness. My research program leverages data from long-term studies on the behavior and demography of toothed whales, using a combination of observational data, genetics, and simulations to investigate how individuals respond to environmental disturbances and fluctuating population dynamics. Much of my research takes place in the Shark Bay Marine Park in Western Australia, where some of the largest seagrass beds on earth support a large resident population of Indo-Pacific bottlenose dolphins (*Tursiops aduncus*). High baseline biodiversity has created opportunities for intraspecific niche partitioning, with individual dolphins adopting distinct social and foraging profiles within a complex fission-fusion society. However, recent marine heatwaves have caused large-scale seagrass die-offs with cascading trophic effects. Declines in dolphin vital rates have persisted for several years with consequences for genetic and behavioral diversity. Here I will evaluate the contributions of shifts in habitat use, predation pressure, mating opportunities, and loss of social support to individual reproductive success and population resiliency. Lastly, I will discuss how long-term studies of populations in protected habitats can inform our understanding and management of populations in highly industrialized areas like those of the common bottlenose dolphins found off the coast of Texas.