Intertidal habitats present a dynamic and challenging environment for organisms trapped between tides. Temperature, salinity, pH, and oxygen often suffer wide fluctuations over the course of a few hours, and as a result, many organisms have evolved remarkable levels of physiological tolerance to many of these factors. Our with the intertidal copepod *Tigriopus californicus* explores multiple levels of adaptation, including the physiological response to daily abiotic stressors, as well as how different isolated populations have evolved divergent mechanisms of tolerance. We also examine the consequences of rapid mitochondrial DNA (mtDNA) evolution in this species. Copepod populations isolated in tidepools that are only a few kilometers apart have diverged by more than 10% in mtDNA sequence, and this has resulted in widespread patterns of genetic incompatibilities in hybrid individuals when populations are crossed in the lab. We take advantage of this system to address questions related to the functional coevolution between nuclear and mitochondrial genomes, and how these intergenomic incompatibilities might promote reproductive isolation.

If you would like to visit with Dr. Felipe Barreto, please contact Michi Tobler at tobler@ksu.edu.