

NON-TECHNICAL ABSTRACT:

The future high CO₂, high temperature ocean holds numerous uncertainties for marine ecosystems. Rocky intertidal species, like those found along coastal California, have already been identified as potentially some of the most vulnerable groups of organisms to climate change; however, we currently lack the research that establishes the species' relative sensitivity to climate change developed from climate model projections. A recent report issued by the National Research Council (Ocean Acidification: A National Strategy to Meet the Challenges of a Changing Ocean) recommends a number of "next-steps" in scientific research critical to understanding the impact elevated CO₂ and temperature of future on marine ecosystems. This CSUPERB proposal directly begins to address these recommendations by 1) providing currently lacking information on the vulnerability of California's coastal marine populations to conditions of CO₂-driven acidification specifically and global climate change more generally; 2) examining the mechanisms underlying the physiological capacity of marine organisms to tolerate the unprecedented rate of climate change; 3) investigating the synergistic effects of ocean acidification and warming on early life history stages of marine invertebrates and 4) having a strong training component (1 graduate student and 4 undergraduates), establishing a new lab in global climate change research and engaging young scientists into this rapidly expanding field of research.