**Research Opportunity Award (ROA)***-* Requesting $25,000 for 1 Scientist & 1 UG

This ROA proposal will establish a link between the University of California at Santa Barbara (UCSB) and a local community college, Santa Barbara City College (SBCC) to provide research opportunities for SBCC science faculty and community college undergraduates. The research focuses on habitat use patterns of and trophic resources for kelp forest fishes in response to disturbance and therefore fits within three core themes of the Santa Barbara Coastal Long Term Ecological Research project (SBC LTER). Our ROA candidate, Dr. Michelle Paddack, is an assistant professor in Biological Sciences at SBCC, a local community college that awards associate and certificate degrees, is a Hispanic-Serving Institution and in 2013 received the Aspen Prize for Community College Excellence. Dr. Paddack joined the faculty of SBCC in 2009 as a full-time instructor, which has limited her ability to maintain her scientific research career. This ROA will help her to get a research program off the ground again and to establish a new connection with SBC LTER. The proposed collaboration will: a) expand the response of SBC LTER to current warm-water conditions due in part to El Niño, b) provide science faculty at a community college the opportunity to re-engage in scientific research, and c) open up an opportunity for community college students to receive training and experience in scientific research.We are requesting ROA funds to support scientific diver update and training for Dr. Paddack and 1 SBCC student, summer field research, and meeting travel to present results. The support will also cover a modest stipend for the student and for Dr. Paddack.

**The Project and Benefits.**

Unusually warm conditions since 2013 have begun to cause declines in kelp canopy biomass at sites off Santa Barbara. A previous SBC LTER study (Koenigs et al 2015) showed that canopy fishes depend heavily on kelp mesograzers, e.g. isopods and amphipods, for food. This project will investigate how these fishes have responded to canopy losses by examining their diet and behavior at sites varying in canopy biomass. Giant kelp (*Macrocystis pyrifera*) is a marine foundation species that creates forests on rocky reefs in temperate regions around the world. Declines in the abundance of kelp can cause loss of biodiversity and simplification of kelp forest food webs and kelp can impact population size of kelp forest fishes via habitat and food availability for recruits and adults. Observations of such impacts are not consistent however, and kelp clearance experiments and comparative studies have sometimes revealed surprisingly little correlation between kelp abundance and fish communities. We hypothesize that kelp forest fishes respond to declines in kelp canopy by shifting their feeding activity toward the benthos and their diets away from kelp mesograzers toward epibenthic invertebrates. To test this hypothesis we will quantify feeding activity and analyze gut contents of three focal kelp-associated species, kelp surfperch (*Brachyistius frenatus*), kelp rockfish (*Sebastes atrovirens*), and Señorita (*Oxyjulis californica*). The ROA candidates will work with SBC researchers to compare these data to past results on diet for these species at sites where kelp canopy was abundant and between sites varying in canopy biomass. Canopy declines have been most severe at mainland reefs, and we can use sites at the offshore Channel Islands to represent kelp forests with more intact canopies. The results of this project will shed light on the resilience of kelp forest food webs to future climate change.

**Student Participation.**

Undergraduate laboratory and field teaching is an important focus at Santa Barbara City College, but research opportunities are rare. The participation of undergraduates will be central to this 1-year project. Students will have the opportunity to interact with scientists and graduate students from UCSB, and will present their work at the annual SBC LTER all scientist meeting and at the annual Western Society of Naturalists meeting. This experience will be a life changing opportunity to study in world-renowned kelp forest ecosystems, and to obtain scientific training in subtidal marine research. This project will also help students to develop professional relationships leading to opportunities for higher education and career development.

*Reference:* Koenigs, C., Miller, R. J., & Page, H. M. (2015). Top predators rely on carbon derived from giant kelp *Macrocystis pyrifera*. Mar Ecol Prog Ser, 537:1-8.