

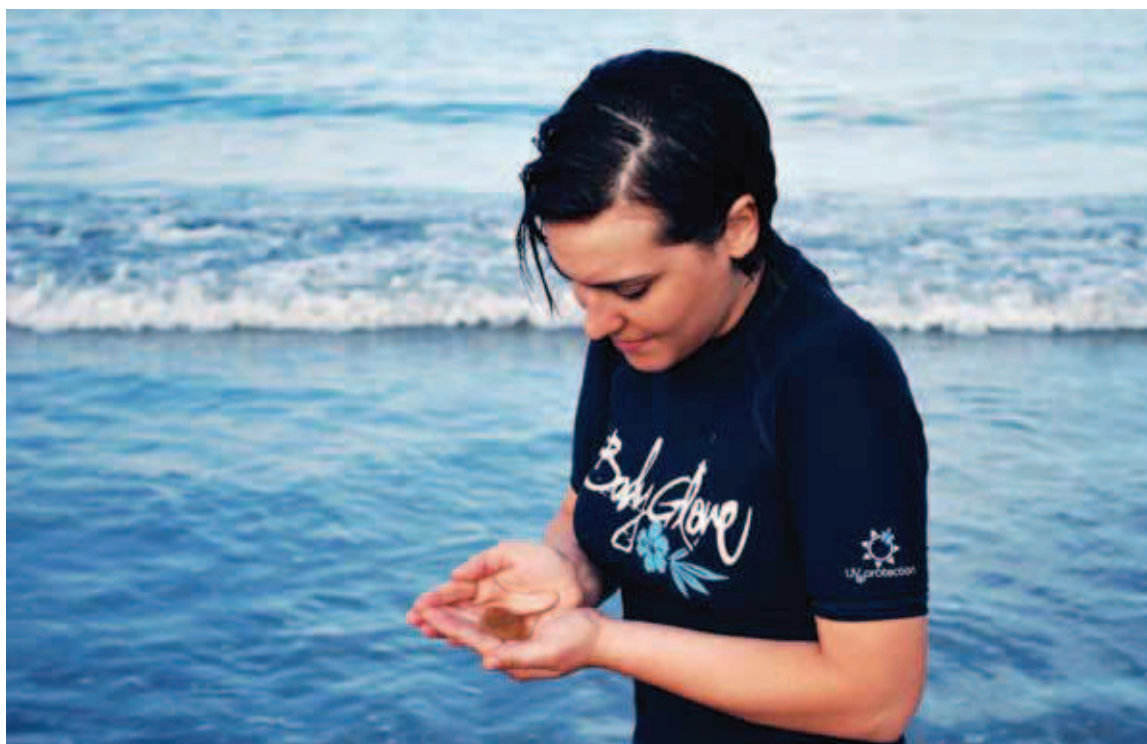
# The Steven Berkeley Marine Conservation Fellowship Winners

This annual fellowship was created to honor the memory of Steven Berkeley, who passed away from cancer in June 2007. Throughout his career, Berkeley was a passionate advocate of conserving fish populations and improving fisheries management by integrating basic research results and scrutinizing fundamental assumptions about fish stocks. On the East Coast, he examined stock composition and by catch issues in large pelagic fishes and developed management plans as a staff member of the South Atlantic Fishery Management Council. After moving to the West Coast, he served on the Science and Statistical Committee for both the North Pacific and Pacific councils. His research on maternal effects in rockfishes has been widely recognized in demonstrating the need to protect older females in long-lived species, particularly through management measures such as marine protected areas.

*The 2011 recipient of the Berkeley Fellowship is Valentina Di Santo from Boston University. Honorable mention awards go to Lewis Barnett, University of California–Davis, and Pablo Granados-Dieseldorff from Texas A&M University.*

## Valentina Di Santo

Valentina Di Santo is a Ph.D. student in Dr. Phillip Lobel's laboratory at Boston University where she investigates the effect of synergistic climate change stressors on fish physiology. In recent years, differences in response of fish populations to environment variability have been recognized as an important component of adaptation. However, there is still a knowledge gap in the understanding of physiological and behavioral responses in fish challenged by interacting climate change factors (for instance, fast warming and increasing ocean acidification). Because each of these single stressors reduces whole-organism performance and survival, thereby causing changes in biogeographical ranges, Valentina is studying their combined effect on fish physiology. For her dissertation work, Valentina is examining the effect of temperature and CO<sub>2</sub> concentrations on two latitudinally separated populations of little skate (*Leucoraja erinacea*) physiology at different life stages by employing a whole-organism approach combined with biochemical methods and behavioral techniques. Without the understanding of physiological and behavioral responses of fish to climate change, it is difficult to meaningfully predict future biogeographical shifts and population dynamics. Therefore, results deriving from her research will enable prediction of physiological and behavioral adjustments and tailoring of specific conservation strategies for elasmobranchs living in a changing, rather than stable, environment.



## Lewis Barnett

Lewis Barnett is a doctoral student at University of California–Davis, working with advisors Marissa Baskett and Louis Botsford on spatial population models that allow him to ask questions about the effects of climate variability and species interactions on size/age structure, population persistence, and fishery yield. These models are motivated by the biology and ecology of rockfishes (*Sebastes* sp.) and the trophic webs of the temperate reefs they inhabit. Although implementation of marine reserves is often proposed to protect temperate reef ecosystems from climate change effects, approaches for accomplishing this objective have been primarily qualitative. One obvious shortfall in the progression toward a quantitative understanding is the absence of temporal environmental variation in marine reserve models. This is why Lewis plans to research how climate change–dependent variability in recruitment affects population persistence, thereby providing insights into how reserve network design can be modified to mitigate climate change threats and meet management and conservation targets. To accomplish these objectives, he is developing dynamic, spatially explicit, age-structured models with density dependence, incorporating environmental and maternal effects on larval survival. He will compare size distributions resulting from model simulations with age-structured predator–prey interactions to size distributions from monitoring data collected in regions of California with existing marine reserve networks. It is hoped that these comparisons will provide explanations for some of the observed patterns and reveal what may be wrong with our current theory of conservation and management of subtidal ecosystems.



## Pablo Granados-Dieseldorff

Pablo Granados-Dieseldorff is currently a doctoral candidate in geography at Texas A&M University studying under Dr. William D. Heyman's supervision in the Marine & Coastal Geography Group and the Applied Biodiversity Science NSF-IGERT Doctoral Program. His doctoral dissertation is investigating the biogeography and management of mutton snapper (*Lutjanus analis*) in southern Belize. The mutton snapper fishery is highly valuable and regionally shared throughout the Caribbean. The unregulated harvest from their highly predictable spawning aggregations has been of special concern to fisheries managers who seek to reverse stock declines and prevent additional fishery collapses. The Belize Barrier Reef, in the Western Caribbean, hosts mutton snapper spawning aggregations that occur in waters accessed by fishers from Belize, Honduras, and Granados-Dieseldorff's native country, Guatemala. The dissertation aims to (1) characterize the geography of fishing of mutton snapper and the associated snapper–species fishery complex in southern Belize using a fishery–systems–science framework; (2) evaluate the stock status of mutton snapper using a stakeholder-centered approach; (3) identify and predict high-quality juvenile habitat using a geographic information system–based habitat suitability spatial model; (4) explore dispersal ability and degree of spatial stock mixing when mutton snapper aggregate to spawn using geochemical tracers in fish otoliths and tissue; and (5) simulate long-term impacts of spatial management on the population dynamics of mutton snapper project will lead to specific conservation recommendations for his study fishery and region and contribute methodologically to data-sparse fisheries conservation and management more broadly.