Thursday, December 2, 2010

Workshop

From discovery to conservation of marine biodiversity

16:00 - 18:00 Parallel Workshop related to plenary session 2

Oral presentation

Linking marine biodiversity, ecosystem functioning and ecosystem services: from experiments to global analyses

John J. Stachowicz

Department of Evolution and Ecology, University of California Davis, 1 Shields Ave, Davis CA 95616, USA

contact-e-mail: jjstachowicz@ucdavis.edu

Marine ecosystems are experiencing accelerating losses of populations and species, renewing interest in understanding what the functional consequences of diversity loss might be. The past decade has seen an explosion in empirical and theoretical research in this area. One major strength of research conducted to date is the breadth of coastal marine ecosystems for which we now have some data on the consequences of diversity loss, including estuaries, kelp forests, seagrass beds, salt marshes, mudflats, tide pools and many other ecosystems that provide important services to humans. Individual studies have clearly demonstrated causal links between higher biodiversity and a variety of ecosystem functions including primary productivity, invasion resistance, and greater stability in the face of environmental fluctuations such as climate change. This occurs through a variety of mechanisms most of which relate to fundamental differences in species' adaptations that allow them to use resources or respond to changing environmental conditions in different ways. Effects of biodiversity are consistent across levels of biological organization: genetic diversity within key predator or plant species can have effects on ecosystem processes as well. However, linking diversity to ecosystem services at broader scales remains a challenge that will require approaches that go beyond local-scale experiments. Meta-analytical approaches are increasing our confidence in the consistency of the effects of diversity on ecosystem functions, and helping to better assess the conditions under which diversity does and does not have important effects on ecosystem functions. Broad-scale correlational analyses have allowed us to infer some connections between species diversity and ecosystem services such as the productivity and resiliency of fisheries. Although considerable work remains to translate basic ecological understanding of the consequences of diversity loss into management practices, considerable evidence suggests that losses of biodiversity will impair ecosystem services, at some cost to society.