

UC SANTA BARBARA

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National Ecology Center at UCSB Awarded \$2 Million Packard Grant

The recent U.S. Commission for Ocean Policy Report calls for a national ocean policy that balances use with sustainability, and moves toward ecosystem-based management founded on sound scientific information.

However, significant gaps in knowledge critical to implementing such a program must be bridged to achieve that goal.

As yet, there is neither a scientific consensus on the basic elements or processes involved in managing complex ecosystems, nor an adequate scientific understanding of coastal-marine ecosystems.

As a first step in developing a science strategy to address this urgent need, the National Center for Ecological Analyses and Synthesis (NCEAS) at UC Santa Barbara has designed a program to synthesize and evaluate existing ecosystem-based management data, and develop new tools to address gaps in knowledge that are critical for sustainable coastal management.

The pioneering program was supported by The David and Lucile Packard Foundation, which has awarded the center at UCSB \$2 million over three years for related activities.

The grant will support working groups of researchers from around the world, postdoctoral fellowships, graduate student research, and a novel graduate seminar.

An international advisory committee of prominent scientists will be created to provide advice on the program.

"We expect the NCEAS activities will lead to the development of a coherent body of knowledge that will change the conceptual foundations for managing coastal-marine and terrestrial ecosystems, and help develop the necessary capacity among individuals and institutions to catalyze this change," said Sandy Andelman, deputy director of NCEAS and co-leader of the Packard program with Jim Reichman, director of NCEAS.

Many scientists believe that single-species management, as called for by the federal Endangered Species Act, alone is not sufficient because conflicts over the protection of individual species often arise.

For example, on the Channel Islands near Santa Barbara both the island fox and the golden eagle, a predator of the fox, are threatened with extinction and must be protected.

"As more and more species are threatened with extinction, they are running into conflict," said Andelman.

"We are proposing an integrated approach to managing whole ecosystems, rather than piece by piece."

Previous attempts to implement ecosystem-based management have been hindered because they failed to incorporate scientific understanding effectively into the decision-making process, and neglected to include all the stakeholders whose support is essential to implementing a plan, said Andelman.

The NCEAS program will go beyond publishing academic papers to devise specific strategies to make the scientific knowledge developed directly useful for practitioners and policymakers.

Understanding natural systems with their complex interactions involves integrating immense amounts of data as diverse as climatological records, geographic distributions of individuals, changes in biodiversity over space and time, patterns and processes of ecosystem functioning, and much more.

"There is a real need to synthesize knowledge from a broad range of disciplines, including ecology, economics, fisheries management, oceanography, aquatic

ecology, and to agree on a definition for ecosystem based management that entails some level of understanding of the scale, complexity, and dynamic nature of both ecological and human systems," said Andelman.

Over the last decade there has been a wide range of efforts to implement ecosystem management throughout the world, including in the Everglades, the Greater Yellowstone ecosystem, the Interior Columbia Basin, the Serengeti-Mara ecosystem, and the Great Barrier Reef.

The NCEAS researchers will analyze and synthesize studies conducted on these and other ecosystems to identify lessons learned from these activities and their applicability to coastal-marine systems.

"Goals and approaches for ecosystem-based management vary, depending on geographic location, social values, institutional settings, economic constraints, and other factors," said Andelman.

"Nonetheless, it is clear that ecosystem-based management entails some level of understanding of the scale, complexity, and dynamic nature of both ecological and human systems."

The National Science Foundation established the National Center for Ecological Analyses and Synthesis in 1995.

Recognizing the potential value of existing complex data sets and the need for new approaches to assembling, accessing, and synthesizing this information, the ecological community rallied around the idea of a creating a synthesis center---a unique facility to promote access to ecological information, analytical tools, and collaborations among ecological scientists.

In addition to 25 scientists in residence at NCEAS for between one to three years, more than 700 scientists, graduate students, and postdoctoral fellows visit NCEAS each year to work together and use its high performance computing capabilities, bringing their own data.

NCEAS continues to be supported by the NSF, with additional funding from the University of California, UC Santa Barbara, and private foundations

"We know that the NCEAS model works very well for advancing basic science," said Andelman.

"This is an opportunity to see if it can translate information into practical management and policy tools."

The David and Lucile Packard Foundation works "to ensure opportunities for all children to reach their potential, to protect reproductive rights and stabilize world population, to conserve and restore the earth's natural systems, and to encourage the creative pursuit of science."

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