

UC SANTA BARBARA

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## **Andrew Mellon Foundation Makes \$700,000 Grant for Ecology Data Networks to National Center at UCSB**

Understanding natural systems with their complex interactions relies on integrating immense amounts of data as diverse as climatological records, spatial distributions of individuals, changes in biodiversity over space and time, patterns and processes of ecosystem functioning, and much more, according to Jim Reichman, director of the National Center for Ecological Analysis and Synthesis (NCEAS) at the University of California, Santa Barbara.

Research at the NCEAS, which is based on the notion of using existing data to address ecological questions, has revealed the need for more generic access to the extremely valuable resources that reside in laboratories, agencies, museums, libraries, research stations, and personal computers--all in different forms, formats, and storage systems.

Nearly all this data is unavailable, even to those who need it most.

"Only a tiny fraction---perhaps five percent or less---of what scientists have learned and measured in the natural environment has ever been published or produced in a form available to the research community," Reichman noted, comparing the situation to that of an art museum with only two percent of its collections on display.

Recognizing the potential value of existing complex data sets and the need for new approaches to assembling, accessing, and synthesizing this information, the NCEAS has developed a powerful new Internet computing system with software capable of making accessible the world's immense store of ecological knowledge.

The core element of the project, called the Network for Biocomplexity, is a data management system for scientists and research groups that allows both local information management and, at the researchers' discretion, access by a broader range of users.

"The ability to extract useful information from these huge electronic repositories of data is fundamental to solving many of our most vexing environmental problems," said Reichman, professor of ecology, evolution and marine biology.

With the support of a \$700,000 grant from the Andrew W. Mellon Foundation, the NCEAS is working with leading scientists to identify ecological data systems to incorporate into the network, introduce its capabilities to potential users, and involve scientists both in using the tools and sharing their research data.

Benefits of data sharing include potential access to a huge array of electronic repositories of ecological information that will spawn new collaborations and allow for more comprehensive analyses of the world's natural ecosystems.

"Ultimately, scientists everywhere will be able to conduct larger-scale studies involving urgent issues that have been intractable because the information couldn't be accessed effectively," he said.

"What they discover will be of inestimable value not only to other scientists and students but also to urban planners, resource managers, policy makers, and the public."

The National Science Foundation established the National Center for Ecological Analyses and Synthesis in 1995 to promote access to ecological information, analytical tools, and collaborations among ecological scientists.

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

The center has begun working with the researchers to assist in making their data available to the larger scientific community.

Plans are also underway to approach publishers of scientific journals and scientific societies that sponsor meetings and conferences where research results are presented to encourage scientists to participate in this ambitious initiative.

"Our hope is that these combined means get thousands of scientists to begin to consider the notion of sharing their research data using the new tools now available," said Reichman.

Recent research topics at the center have included analysis of large scale processes, complex population dynamics, interactions within and between ecological communities, analysis of broad biogeographical patterns, development of new analytical and statistical methods, projects related to resource management and conservation, and ecological informatics.

In addition, several projects have revolved around areas outside the core of ecology such as evolution and ecological economics.

The center also supports outreach activities and provides K-12 educational programs.

NCEAS continues to be supported by the NSF, with additional funding from the University of California and UCSB.

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The University of California, Santa Barbara is a leading research institution that also provides a comprehensive liberal arts learning experience. Our academic community of faculty, students, and staff is characterized by a culture of interdisciplinary collaboration that is responsive to the needs of our multicultural and global society. All of this takes place within a living and learning environment like no other, as we draw inspiration from the beauty and resources of our extraordinary location at the edge of the Pacific Ocean.