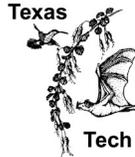


A KNOWLEDGE NETWORK FOR ECOLOGY

A FRAMEWORK FOR DISCOVERING AND USING ECOLOGICAL DATA

Complexity is an inherent property of living systems that arises from direct and indirect interactions among the earth's physical, chemical, and biological components. The ecological components of these living systems are in crisis, and are undergoing potentially irreversible changes in the face of rapid human population growth and economic development. Catalyzed by these societal concerns, and facilitated by technology advances, scientists focused on complex ecological systems have generated an explosion of ecological and environmental data. When integrated with data from other critical disciplines (e.g., meteorology), these data have the potential to greatly enhance understanding of central ecological principles. However, broad-scale and synthetic research is stymied because these data are largely inaccessible due to their spatial dispersion, extreme structural and semantic heterogeneity, and complexity.



Knowledge Networking—We propose to integrate the distributed and heterogeneous information sources required for the develop-

ment and testing of theory in ecology into a standards-based, open architecture Knowledge Network. The network will extend recent advances in metadata representation to provide conceptually sophisticated access to integrated data drawn from autonomous data repositories. We will create new tools for discovering, retrieving, interpreting, integrating, and analyzing data from these diverse sources. In addition, the Knowledge Network will include advanced tools to explore complex data sets by formulating and evaluating multiple hypotheses. This prototype network will be useful to a variety of disciplines and will provide a basis for the growth of multidisciplinary research groups addressing a multitude of questions in ecology.

GETTING IN ON THE ACTION

The Knowledge Network—

As part of the Knowledge Network, we are developing Desktop Client Software that will provide a user interface with the data repositories composing the Knowledge Network. It will contain tools for creating and editing standardized metadata, as well as managing and analyzing data. In addition, the software will allow the user to make data available to the Knowledge Network and to query other data repositories within the Knowledge Network. We are seeking participants who are interested in sharing ecological data and wish to collaborate in this venture. For further information, contact Stephen B. Cox.

Collaborative Research—We are seeking participants who have access to site-specific data that pertain to the relationship between aspects of biodiversity (e.g., species diversity, richness, evenness, and dominance) and ecosystem function, particularly productivity. We wish to collaborate in the use of these data to analyze scale-dependence in the relationship at each particular site and to arrive at a broader understanding of the relationship by combining data from all sites into a hierarchical framework. Collaborators are expected to share data and participate in a working group to be held at NCEAS,

during which time synthetic analyses will be the focus of activity. If you have

such data and are interested in collaborating, contact Stephen B. Cox.

Graduate Education—We are soliciting faculty and students to organize and participate in a web-based, multi-institution graduate seminar course. Course goals are fourfold: (1) to train graduate students in techniques to acquire, manage, and synthesize multi-scale data, (2) to explore mechanisms and patterns relating to ecosystem structure and function, (3) to acquaint students with the use and potential of the Knowledge Network, and (4) to prepare students to participate in a working group at NCEAS to synthesize course results across institutions. In Fall of 2001, and again in 2002, faculty at 5-10 participating institutions will conduct concurrent graduate seminars focusing on the relationship between species richness and productivity as a mechanism to explore the capabilities of the Knowledge Network. The results of this distinctive training effort will be the generation of a cohort of investigators well-versed in ecological knowledge networking tools and approaches. For more information, contact Elizabeth A. Sandlin.

<http://www.nceas.ucsb.edu/kdi>

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This project is funded by the Knowledge and Distributed Intelligence (KDI) Program of the National Science Foundation through a grant to the National Center for Ecological Analysis and Synthesis (NCEAS) at the University of California, Santa Barbara, the Long-Term Ecological Research (LTER) Network Office at the University of New Mexico, the San Diego Supercomputer Center at University of California, San Diego, and the Department of Biological Sciences at Texas Tech University.

