



DEPARTMENT OF ENVIRONMENTAL SCIENCES

CLARK HALL . UNIVERSITY OF VIRGINIA . CHARLOTTESVILLE, VIRGINIA . 22903
(804) 924-7761

MEMORANDUM

To: LTER Coordinating Committee

From: PIs of the Virginia Coast LTER Program
Raymond D. Dueser, Correspondent

Date: August 25, 1987

Subj: LTER Inter-site Synthesis Project

We propose that the Coordinating Committee examine the wisdom and feasibility of undertaking an aggressive inter-site modeling/synthesis project over the next 2-3 years.

We foresee a project which would revolve around a team of post-doctoral fellows with specific expertise in the modeling of ecological systems. The group would be home-based at one of the LTER sites, and would receive input from an Advisory Group comprised of quantitatively and experimentally oriented Principal Investigators from several sites. The group would be directly involved in developing intercomparable models of vegetation dynamics at a number of LTER sites.

The global objective of this group would be to develop a set of modules describing the vegetation dynamics of different life forms of plants and the interaction of these life forms with the environment to create landscape pattern. The "Patch Dynamics and Stability Project" outlined in the memorandum from Nel Caine and Fred Swanson (7/29/87) is an excellent example of the direction this work could take. The understanding of spatial patterns in relation to ecological processes has been a central theme in ecosystem research and provides a compelling central focus for a consolidated modeling effort.

The project would have three postdoctoral associates based at a central site who would spend up to one-half their time on "assignment" at other LTER sites (by invitation), conferring with on-site investigators and formulating individual models. The Advisory Group and interested investigators from each site would participate in formulating the best strategies for attacking the vegetation modeling problems specific to that site. The Advisory Group also would serve to reduce duplication of effort between sites. An additional advantage of the proposed modeling group would be its ability to turn substantial modeling talent in the direction of sites that need such input.

This modeling team would in the course of its existence be expected to develop several modular models of the dynamics of the vegetation applicable across the spectrum of LTER sites. In terms of its contribution to advancing ecological modeling, the project would benefit from the great breadth of ecosystems represented in the LTER network. Also, "moving" the same model from, for example, one grassland site to another would be an excellent test of the model formulation. Understanding the dynamics of ecosystems dominated by one life form (e.g., forests and grasslands) has been a theme in ecosystem studies for the past three decades. Understanding the interaction of several life-forms to create pattern is a central problem in landscape ecology. In the global context, understanding how biome boundaries might shift under a regime of large-scale, secular environmental change is a central problem.

In spite of the exciting implications of the research products of the proposed modeling group, the development of a multiple-life form and environmentally interactive model is a focused central objective. The objective is not to build a complex "master-model" that can be all things to all plant communities. Rather, the objective is to develop a dynamic version of the classical concept of plant life form that can simulate spatial and temporal vegetation pattern. The modeling effort would be documented as a book with chapters describing the individual models, the performance and testing of these models, the theoretical implications of simulating the dynamics of vegetation in diverse ecosystems, and the performance of the multiple-life form model.

We propose, therefore, that an inter-site modeling project be included in the LTER/CC proposal. The Coordinating Committee would underwrite the salaries of the three postdocs during the time they are working at the central location. The focal site would provide funding during the time they are working with a particular LTER site. Such "cost-sharing" would serve to insure that focal-site modeling problems were addressed, and would serve to advance the cause of inter-site synthesis in a manner calculated to have substantial impact on the field of ecology. Travel costs would be shared, and there would be a certain amount of support needed for computer time, publication costs and other similar considerations at the base site.