Incorporating Social Elements into the Long Term Ecological Research Program: Institutional Lessons from the LTER Network

Tischa A. Muñoz-Erickson

Introduction

Incorporating the social sciences in the LTERs has become a priority for the LTER Network and was a central aspect in the funding planning workshops held at the recent All Scientists Meeting in Estes Park, Colorado.

Numerous LTER sites, concerned over increasing human influences within and around their sites, are also taking the initial steps in engaging social scientists into their long-term research programs. This poster was initially motivated by an interest from the Luquillo LTER (LUQ) to incorporate human sciences into their site but seeing guidance as to how to begin this process.

The objective of this poster is to draw on lessons from LTERs conducting social science research and assess the institutional challenges and opportunities for other LTERs interested in engaging social sciences in their research program.

Research Objectives and Methods

I conducted a qualitative review that expands on the lessons of four LTER sites presented in a recent issue of Society and Natural Resources (Grappin and Groves 2006), including the Central-Arizona Phoenix (CAP), Baltimore Ecosystem Study (BES), Coweeta (CWT), and the Northern Temperate Lakes (NTL) program. The purpose was to document the roles played by social scientists within this framework and the value they added to the research.

The results of this poster aim at recommendations for integrating social sciences into the long-term research goals of LTERs, using the LUQ-LTER as an example.

Results

Key institutional characteristics of LTERs engaging in integrative research that are relevant to the LUQ-LTER:

- Social sciences are institutionalized in the leadership of the LTERs - all four LTERs reviewed have social scientists Co-PIs.
- Two of the LTERs have an explicit conceptual model to guide their socio-ecological research. The other two have an implicit model reflected in their proposal objectives and research questions.
- All sites include a range of social sciences in their research team. Although economics is prominent in all LTERs, sociology, anthropology, geography, and political sciences are also represented.
- While analyses of human actions (e.g. resource use) are a central focus of environmental-social science research, analysis of human perceptions and attitudes, institutional changes, and cultural interactions, are also key factors addressed in the LTERs.
- Characterization of the socio-ecological system is an important activity for creating context and future integrative analysis. The LTERs use a combination of data collection methods for this purpose, such as social surveys (e.g. Phoenix Area Social Survey), U.S. Census data (e.g. NTL), and GIS data (e.g. BES social differentiation index, CWT land-use mapping).
- All have published synergistic articles with integrated ecological and social data. There does not appear to be an impediment for the LTERs to publish interdisciplinary studies, however, this requires in-depth study into the publishing process.

Table 1. A recent issue in Society and Natural Resources brought together results and experiences of LTERs that engage in integrative research with the social sciences. The four LTERs featured in this review have incorporated social dimensions to their current research program, the Coweeta LTER (CWT) and the Northern Temperate Lakes LTER (NTL), and two that were created with the explicit purpose of conducting integrative research in human-dominated systems, the Central Arizona-PHOENIX LTER (CAP), and the Baltimore Ecosystem Study LTER (BES)(Grappin and Groves 2006). This table reviews some of these overlaps and differences but also sets institutional factors for comparison among the LTERs with information obtained from site documents and websites.

Relevance to other LTERs

Institutional factors and research activities of the LTERs highlighted in this poster provide guidance to other sites beginning to incorporate social science, such as the Luquillo LTER (LUQ-LTER) in Puerto Rico.

Traditionally focused on understanding factors driving long-term change in tropical forest ecosystems, the LUQ-LTER is experiencing increasing in human influences, with urban encroachment and recreation use having local and regional impacts on forest cover and quality of ecosystem services, such as water (Figure 1 and 2) (ITES and IITF, 2006).

While each LTER is unique, their experiences offer a starting point for the LUQ-LTER, specifically the socio-ecological and research context of the CWT is most similar to the LUQ-LTER (i.e. research evolution from forest to watershed management to land-use trends in urban/rural interface). Nonetheless, the urban ecology research by the BES and CAP can provide hypotheses and key insights into urban processes useful to the LUQ-LTER in the future.

A recommendation from this study is to conduct an internal assessment of LUQ-LTER scientists as to what challenges and opportunities they see with engaging social sciences into their guiding research framework. Other suggestions include:

- Developing a conceptual model of the socio-ecological system. Consult a general model as developed by Redman et al. 2004, or a site-specific model of another LTER (see Figures 3 and 4 as an example). Conceptual models have been proposed as a useful tool for LTER scientists to communicate across disciplines (Janssens et al. 2003)
- Characterize the socio-ecological system through historical and present descriptive data. This will help establish baseline socio-ecological conditions and facilitate the monitoring long-term changes. Consulting methods and data used by other LTERs could promote cross-site research collaboration in the future.
- Developing integrative research hypotheses with a priori participation of social scientists. Inviting social scientists in the early stages of research development ensures their long-term involvement in the LTER (Social Science Committee Meeting LTER All Scientists Meeting, 2006).
- Studying changes in human values and perceptions is just as important as human behaviors and actions, but these are not necessarily addressed the same way as they pose different challenges (i.e. difficult to predict).

Literature Cited

Figure 3. The LUQ-LTER traditionally focused on community and ecosystem responses to climate change and disturbance and now expanded to address regional processes and their effects on regional and local climate, tree species composition, stream ecology, and ecosystem services. At the moment, no social factors are explicitly included in the model. The LUQ-LTER could consult other models that explicitly include social factors, such as the CAP-LTER in Figure 4.

Figure 4. The CAP-LTER was originally conceived as an urban LTER, thus social factors were explicitly incorporated in its conceptual model. This model expanded the ecological focus to include understanding of social patterns and processes and changes in human perceptions and attitudes.

Please see list attached to poster.

Acknowledgements

Thanks to Dr. Kelli Larson and Elizabeth Larson of the CAP-LTER for reviewing this poster. I would also like to thank the LUQ-LTER team, especially Nick Brokaw, Fred Scatena, and Jorge Ortiz-Zayas, for their input in this research. This study was supported with funding by the IGERT (Integrative Graduate Education and Research Training) in Urban Ecology Fellowship.