

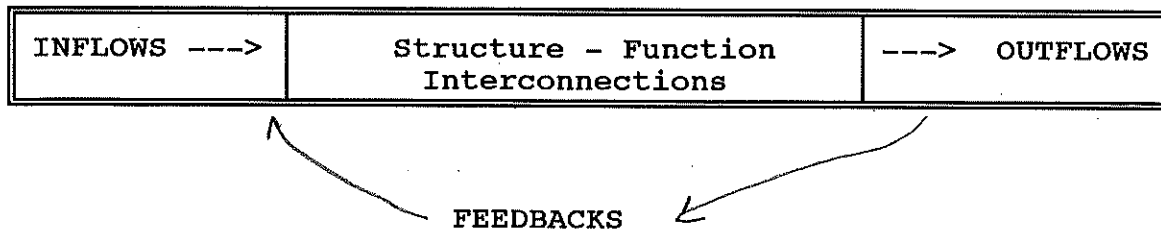
Human Dynamics Workshop  
Co-Chaired by Chuluun Togtohyn and Elizabeth Blood

The purpose of the workshop was to start a dialog on the human dimension in ecological studies and LTER research.

The workshop participants acknowledged the need to explicitly deal with human systems as an integral component of ecological systems. Discussion followed on current perceptions of the role of humans in ecological studies. Humans are generally viewed as externalities (e.g. drivers) or recipients of residuals (e.g. human impacts from ecological contaminants or residues). Few studies have viewed humans as an integral part of the system under study. As an example, incorporating humans as a data layer within a GIS or level within a model complete with structure, function and linkages interconnected with other ecological systems.

The need to explicitly incorporate humans into ecological studies was discussed. Current critical environmental issues require that we understand how humans modify and affect ecological systems and how they are inter-related with ecological systems. Ecological systems do not exist which are not affected by human activities. We acknowledged that there is a large information gap that would need to be filled before we could adequately address these environmental issues with sound ecological perspectives. A number of stumbling blocks were identified. These stumbling blocks include: language barriers; interaction of ecologists with "human ecologists", ecological economists, sociologists and political scientists; lack of knowledge; and ecological biases. There was concern about "value laden" terminology in translating human concepts to ecological concepts. The group decided that perhaps new or value-neutral terms would be more appropriate and minimize "mis-information". It was clear that a "systems" approach would be essential to integrating differing discipline concepts into a functional interaction.

To overcome potential barriers, the group suggested the "systems" perspective would allow for understanding concepts without constraints due to language. Social, economic and ecological systems could be viewed from a structural, functional and integrated system view with appropriate inflows, outflows and feedbacks.



Using this simple system diagram, one could portray economic systems, social systems or ecological systems. Inflows could be dollars, energy, matter, information, humans, etc. and outflows wastes, energy, matter, or dollars. The structure could be social entities (e.g. regulators, judicial system, community), economic entities (consumers, manufacturers), or ecological entities (populations, communities, individuals) with the interconnections as flows of energy, matter, dollars, or information.

In ecological population dynamics, a dynamic equilibrium is reached as a function of production and consumption of energy and matter. With human systems, the dynamic equilibrium is defined by values such as "quality of life", and the balance of consumption of natural resources and production of human populations and their structures. With this approach, dynamics of the human system would follow the classical thermodynamic approach and use ecological population quantifications and mathematical formulations for describing human systems and their dynamics. As an example,

$$NR = aNR - bH$$

$$H = cH - dH = (c-d)H$$

where,

NR = natural resources

H = human population

a = recovery rate of NR

b = consumption rate per capita

c = birth rate

d = death rate

The workshop group decided that additional efforts should be made to follow-up this meeting and gain some insights to the status of these issues within the LTER network. We will survey the LTER network to assess the current status of the human perspective and the role of human dimensions in the current LTER research. The survey will identify people, projects, activities and interests of scientists

within the network to address these issues. We will develop a list of interested parties associated with the LTER network which have expertise in "human ecology" or human related sciences. We will identify some critical articles and references on "human ecology" and human sciences that could provide valuable insights to the LTER network. If there is sufficient interest, we would like to develop a EMAIL forum for information exchange and to foster future intersite activities.