The Ecological Footprint Workshop: Creating an Ecological and Social Sciences Interface


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Abstract

The dynamics of ecological and social systems are interdependent. Understanding the feedbacks between these systems is a current challenge spanning many disciplines, including ecology, economics, geography, sociology, engineering, and others. We are developing an interdisciplinary workshop to investigate a mechanism by which ecological and social processes are coupled. In addition to conducting interdisciplinary research, an important goal of this workshop is to develop a methodology for identifying the most interesting questions existing beyond a single academic domain and approaches to answering them. We have begun by identifying a tentative research topic, the ecological footprint, which serves as a common set of ideas that can bring together a team of people from various backgrounds. We will achieve a breadth of expertise through a committed involvement of team members with differing knowledge bases. The core group will be complemented with short-term invited guests having specific expertise beyond the collective team background. Initially, we are scheduling weekly meetings throughout the spring semester. During these meetings we will review work completed, identify problems, and assign tasks. However, the workshop will have an adaptive structure to take advantage of our changing needs and experiences. The success of the workshop will be assessed in relation to meeting our stated goal, with respect to a manuscript submitted to an appropriate scientific journal by June 2000.

Some Limitations of the Footprint / Opportunities to Improve

- Traditional footprints are not explicitly linked; they often assume all lands are equal (e.g. Arizona’s Sonoran desert is equivalent to California’s Napa Valley) and suggest that the distribution of people and/or resources does not matter (the cost of an apple grown in Washington is the same whether you live in Seattle, WA or Tulsa, TX).
- Traditional footprints fail to distinguish between sustainable and unsustainable land uses and are therefore hypothetical.
- All categories of land use are viewed equivalently (e.g., roads are equated with agriculture from a land consumption perspective).
- Traditional footprints use a linear summation of individual behaviors that may not yield an accurate account of external impacts and (via versa). There is no social discounting.
- Traditional footprints lack indices of temporal change.
- Traditional footprints inadequately account for trade and cooperation for resources between different regions.
- Traditional footprints do not allow for trade-offs among the three central dimensions of ecological economics evaluation (i.e., efficiency, equity and sustainability).
- Traditional footprints lump all ecosystem services together. As it is currently computed, the footprint is dominated by carbon footprint and the footprint of the manufacturing of products.
- For more information see Luck et al. (1997).

The Ecological Footprint

An ecological footprint is a representation of social dependence on ecosystem services. The footprint measures human impact on nature.

Ecological footprint calculations are based on keeping track of the resources humans consume and the wastes generated, and that the rate of these flows can be measured as the earth area needed to produce or assimilate these materials. The ecological footprint shows the land area required to sustainably produce the resources consumed and assimilate the material released by an individual or society.

For example, the per capita ecological footprint of each U.S. citizen was estimated to be approximately 12 hectares (Wackernagel et al. 1997). Ecological footprint calculations are based on keeping track of the resources humans consume and the wastes generated, and that the rate of these flows can be measured as the earth area needed to produce or assimilate these materials.

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To study the socioecosystem, a conceptual model is needed to identify questions and approaches while also providing a common framework for researchers of differing backgrounds.

THE SOCIOECOSYSTEM

Human Material Consumption and Release
Land Cover Changes
Technological Developments
Long Range Transportation
Social Interactions

Social and Ecological Interactions Include:
- Human Material Release – Atmospheric Carbon, Nutrients
- Human Caused Species Range Changes
- Ecological Disturbances – Fire, Flooding, Disease

The Socioecosystem is a Prominent Earth System.

To Study This System, an Interdisciplinary Approach Must Be Undertaken.

The Ecological Footprint Workshop

Goals, Approach, and Possible Research Questions of the Ecological Footprint Workshop

GOALS
- Scientific progress will be the measure of workshop success

APPROACH
- For the socioecosystem we will use the multi-tiered interdisciplinary team approach to incorporate researchers with differing backgrounds. A single, comprehensive theoretical model, the ecological footprint, will be a common framework for all members of the core group. Our first meeting will consist primarily of concept and question identification. Then, a single research question will be developed by the interdisciplinary team and research strategies will be identified. The following meetings will include discussion of research, reports from work completed, group problem-solving, and meeting with outside members.

POSSIBLE RESEARCH QUESTIONS
- For more information or if you are interested in participating, please contact Darrell Jenerette (jenerette@asu.edu)

Invited Guests
- Short-term participation with specialized knowledge

Interdisciplinary Team Creation

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