Land Change Cooperative Extension Specialist
Draft Description September 29, 2010

Justification:

California's forests and rangelands have undergone extensive transformation over the past two centuries. Timber removal, agricultural intensification, and stream channelization are only a few examples of the changing landscape. Much of the state has shifted from a wildland matrix, with urban patches, to an urban or agricultural matrix, with wildland resource patches. Just as each parcel of land is influenced by local environmental and ecological processes, management, and its social, economic, cultural, and political setting, over large scales it is the multifaceted feedbacks between natural and human drivers that shape the complex spatial configuration of land use in California.

Any understanding of California's future needs to consider this interplay of factors, which is increasingly described as "land change science:" an interdisciplinary field of research that spans the social, spatial and biophysical sciences and seeks to understand the dynamics of land cover and land use as a coupled human–environment system. It addresses theory, concepts, models, and applications relevant to linked environmental and societal challenges across scales. California -- diverse, dynamic and growing -- is at the extreme end of biophysical and social complexity, and thus faces the immediate consequences of land use change. We have an urgent need for academic research and outreach excellence in this important area, to help California plan for future growth and land use change so that people can live in liveable communities while maintaining connected and functioning natural and agricultural communities.

Fragmentation of the landscape means that biodiversity will change, resources such as water shift spatially and are used (or lost) differently (channeling versus meandering in streams), and ecological mechanisms affecting management strategies change. These approaches need to be scaling-based. We can no longer just focus on farm field-size perspectives. Global climate change will affect a constrained biota in small patches differently than in a large matrix where organisms can move in response to climate shifts. Invasive species can migrate along corridors created in a disturbed landscape, and can use the increasing edges as invasion points to spread into agricultural or wildland areas. Greater emphasis is needed to understand the micro- to state-wide impacts of our changing environment, and understanding the shifting spatial structure and fragmentation of wildland and agricultural lands is a critical step. New conceptual approaches to measuring, understanding, and managing of natural resources are needed.

Position Description: Land Change Specialist

The incumbent is expected to develop a strong program of applied research and education in the emerging area of Land Change Science, which embraces aspects of global environmental change, resource economics, land management, planning and policy, geospatial sciences, and sustainability research. Several areas of investigation might include:

(1) understanding the causes, contexts, consequences, and future trajectories of coupled human-environmental systems;
(2) examining the complexity of coupled human-environmental systems, for example emergent spatial or temporal properties, uncertainty and heterogeneity, and feedback mechanisms that can produce nonlinear system behaviors;
(3) earth observation and monitoring, including the use of innovative geospatial tools and hyperspectral, optical and active remote sensing technologies across multiple scales;
(4) modeling: including spatially explicit, econometric, ecological, cellular automata, and agent-based models as well as novel statistical approaches; and
(5) synthesis issues involving linkages across themes and with other disciplines.

Strong skills in landscape ecology, GIS, remote sensing, modeling, and resource management are required, as is a degree in resource management.

The incumbent will be expected to develop strong collaborative links with other academics in ANR including AES faculty, specialists, and advisors. Interaction through outreach with a varied clientele outside of ANR is important. Because land use and fragmentation are critical issues in sustaining natural ecosystems (e.g. biodiversity, climate change, working landscapes) the position must go beyond considering just a single landuse patch type, but consider local-to regional scale patterns and processes that consider not only multiple types of natural ecosystems, but how they, and managed ecosystems, are arranged and interact across a working landscape. Helping clientele build and use better tool kits for quantitatively evaluating changes in the Californian landscape is an appropriate role for the specialist.

Submit a CV, statement of research interests and addresses of three references to:

Chair, Specialist Search Committee
Address TBA

Applications must be received by…