

# Managed Ecosystems

**Goal:** Colorado State University will enhance its focus and depth in undergraduate education, graduate education, research, and outreach in the long-range adaptation of agriculture in the 21st century in response to changes in demography, water availability, water and agricultural policies, environmental and land use policies, demand for recreation, and national and international markets. Colorado State University will be recognized regionally, nationally, and internationally for modern crop, range, and livestock systems in semi-arid environments. This will include disciplinary and interdisciplinary work in crop and soil sciences, economics, animal sciences, pest sciences, landscape design and policy, range science, wildlife biology and ecology, forest science, and water sciences.

**Purpose:** The state of Colorado can be viewed as an ecosystem with its basic parts consisting of soil, air, water, plant life, animal life, and human inhabitants. The system components are highly interrelated and each is affected by the other, e.g., the dependence of humans on soil, water, plants and animals for food and the effects of humans on land use and water availability and quality through actions and policy. The Colorado ecosystem is shared by agricultural producers, a rapidly growing urban population, and wildlife. As competition grows for finite water, land, and air resources, and as agricultural and natural resource policies and international markets change, opportunities to maximize the economic value of agriculture in Colorado will change continuously. The complex relationships of ecosystem variables must be well understood to predict these opportunities. Colorado State offers BS degrees in Soil and Crop Science (58 majors in fall 2008) and in Horticulture (66 majors in fall 2008), including pest management courses in the Department of Bioagricultural Sciences and Pest Management, and MS and PhD degrees in Soil and Crop Science and Horticulture. These college degrees prepare professionals to understand and manage economically important plants that depend on our soil and water resources. Twentieth century agriculture focused on monocultural production of commodity foods, however, 21st century agriculture will focus on a broader array of food products of higher value, differentiated in the marketplace and produced with much higher cost land and water resources in more crowded environments. Professional agriculturalists and agribusiness people will require much more education in overall ecosystem management. Colorado State University is in a strong position to assist with the economic development of Colorado's agricultural industries within the context of increasing population, higher competition for land and water, and changing policy environment by educating agricultural and resource industry professionals, researching technical and economic issues related to improved resource utilization, and enhancing international competitiveness by being actively involved with agricultural industries and governmental agencies to assure that the latest knowledge is incorporated in management and regulatory decisions which are important to sustain the agricultural industry with rapidly evolving competition for resources.

## Strategic Actions:

- Enhance the effort of the integrated research, graduate education, and outreach program in long-range managed ecosystem dynamics, led by a faculty steering committee, incorporating disciplines in the Colleges of Agricultural Sciences, Natural Resources, Engineering, and Natural Sciences.
- Pursue the possibilities of an external program review and implement recommendations as appropriate.
- Explore connection of the IRM and Managed Ecosystems strategic initiative.
- Align research facilities for integrated plans and fill gaps in expertise through collaboration or new positions.
- Develop an Environmental Chemistry program in collaboration with BSPM and Chemistry departments.
- Continue to expand the newly created interdisciplinary program in Organic Agriculture Production and build the collaboration among the supporting departments and add an animal component to the program.

## Critical Resource Growth Needs:

- Assure adequate faculty staffing in rangeland, wildlife sciences and regional and community development economics to support a comprehensive approach to the area. Pursue collaboration with University of Wyoming for range science.
- Develop additional, multi-disciplinary grant programs to provide research and travel support.
- Critical need to hire a full-time Coordinator for the Organic Agriculture Production interdisciplinary program.
- Secure adequate lab/office space for new hires and potential future hires.

## Personnel:

Administrative Advisor: Gary Peterson

Steering Committee Lieutenant(s): [Frank Peairs](#) and [Reagan Waskom](#)

Steering Committee Members: Neil Hansen, Eugene Kelly, Mary Stromberger, Kraig Peel, Bill Wailes, Dana Hoag, Patrick Martin, Bruce Bosley, Luis Garcia, Lou Swanson, Del Benson, Mark Paschke