



ECOSYSTEM SERVICES RESEARCH PROGRAM

ECOSYSTEM SERVICES RESEARCH IN COMMUNITIES: SOUTHWEST PROJECT

Issue:

EPA's Ecosystem Services Research Program (ESRP) in the Office of Research and Development has undertaken a comprehensive research effort to study ecosystem services and the benefits they provide to human well-being. The benefits include water supply and protection of water quality, flood protection, wildlife habitat support, and food and fiber.

The landscape of the Southwestern United States, particularly that of California, Nevada, and Arizona, is highly diverse with significant portions of desert, shrub and grasslands, forest, agriculture, and urban development. This area is facing unprecedented pressures from population growth and climate change. Based on U.S. Census data, over the past 90 years the population in the southwestern United States has increased 1,500

percent. Changes in climate are projected to increase in the frequency and intensity of drought. The sustainability of basic ecosystems services vital to human health and well-being may be becoming compromised.

Scientific Objective:

The Southwest Ecosystem Services Project (SwESP) is one of five community-based research projects in ESRP. Earth, life, and social scientists are collaborating with other federal agencies, communities, tribes and organizations to develop and implement the methods, models and tools to map, and assess the expected changes in quality and magnitude of ecosystem services under a variety of alternative future scenarios. Specific research areas are:

- Identify, locate, and inventory ecosystem services and establish the value of these services,



including the costs to society resulting from the loss of these services.

- Using available data, map the current condition of ecosystem services (e.g., provisioning of water, food, habitat, and cultural services, supporting nutrient

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cycling, and regulating soil erosion).

- Quantify the response of ecosystem services to current and projected conditions and drivers (e.g., climate change, human development).
- Determine the linkages and trade-offs among bundles of ecosystem services in response to climate change and human development.
- Model response of ecosystem services based on alternative scenarios of land use, climate change, water availability, and human development.
- Determine how changes in ecosystem services affect human well-being.
- Develop decision support systems to help decision makers in the Southwest apply the information and methods developed by this project.

Application and Impact:

Research will be conducted through several integrated, multi-

disciplinary, multi-agency partnerships:

The interagency project, Assessment of Goods and Valuation of Ecosystem Services (AGAVES), will conduct an ecosystem services assessment of the San Pedro River Basin and adjacent watersheds in southeastern Arizona.

The Santa Cruz Watershed Ecosystem Portfolio Model Project, an interagency effort, will develop a decision-support tool that will integrate natural science and economic information in order to conduct a cost-benefit analysis of climate change and urban growth impacts on the U.S. and Mexico Border.

The Native American Ecosystem Services Tribal Pilot Study by EPA and others will determine how an ecosystem services assessment can be linked with traditional knowledge to improve natural resource management and to identify decision support options.

The Southwest Wetlands Ecosystem Services Study

(SWESS), a component of the nationwide wetland research project by EPA's Ecosystem Services Research Program, will investigate the services of southwestern coastal and inland wetlands and compare them with wetlands of North America.

Ultimately, these efforts will be integrated with other community-based ecosystems services projects by EPA to create a transferable suite of methods and tools for evaluating ecosystem services. Using these tools, decision makers can implement proactive policy and management decisions to conserve and enhance ecosystem services vital to human health and well-being and support sustainable planning for current and future generations.

CONTACT

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