



# science in ACTION

BUILDING A SCIENTIFIC FOUNDATION FOR SOUND ENVIRONMENTAL DECISIONS

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## ECOLOGICAL RESEARCH PROGRAM

### RESEARCH TO VALUE ECOSYSTEM SERVICES

*Identifying, Quantifying, and Assessing Nature's Benefits*

#### Ecosystem Services

Clean air and water, flood protection, fertile soil for crop production, and pollination are among the many benefits we receive from nature.

These important ecosystem services ensure human health and our well being, but they are limited and often taken for granted as being free.

For more than 30 years, the U.S. Environmental Protection Agency has studied the impacts of human activities on the environment. However, the contributions of nature's services have not been fully considered by policy makers and planners, largely because of the lack of scientific and socioeconomic knowledge to do so. There is growing recognition globally that the full range of benefits derived from ecosystem services needs to be considered if we are to continue to benefit from them.

Scientists at EPA are studying ecosystem services to gain a better understanding of how to enhance, protect, and restore the services of nature. Their discoveries are providing the information needed by national, regional, and local decision makers to make clear how our choices affect the type, quality, and magnitude of the services we receive from ecosystems.

#### Ecological Research Program

The Ecological Research Program (ERP) in EPA's Office of Research and Development (ORD) provides research to support one of the Agency's highest needs to protect the environment and human health. Researchers in the research program are identifying, mapping, and modeling ecosystem services that affect directly and indirectly our quality of life, now and in the

future. ERP research is leading to a decision support system that will provide critical ecological information on these services. Through partnerships with economists, social scientists, and others, this research contributes to our understanding of the monetary, cultural, and health implications of using ecosystem services. It enables us to make decisions that better represent the full value of these services, if altered.

ERP has unique ecological research capabilities, based on more than a decade of research on monitoring, diagnostic/modeling, and restoration of ecosystems. This expertise and knowledge is being applied and refocused to take on the new ecosystem services research challenge. The results of this research will provide the scientific foundation for others who shape policy and

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## ECOLOGICAL RESEARCH PROGRAM

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management actions that protect public health and the environment.

ERP research will span a five-year period starting in 2008, guided by a research strategy and multi-year plan. The program's research supports EPA's efforts to incorporate the valuing of ecosystem services into its environmental management decisions. This valuation approach is outlined in EPA's Ecological Benefits Assessment Strategic Plan.

### What research is being conducted?

ERP has identified three research approaches: 1) national scale pollutant research (nitrogen); 2) specific ecosystem type research (wetlands); and 3) ecosystem services research in selected communities. All three approaches offer unique research and valuation challenges.

**Nitrogen Research** – This research will improve understanding of how nitrogen, a regulated pollutant, affects the collection of services derived from an ecosystem in both positive and negative ways. For example,

excess nitrogen from fertilizer, septic tanks, animal feedlots, automobiles, power plants, and runoff from pavement causes changes in ecosystem services. The results of this research will assist national air and water policy makers in evaluating the most cost effective means of improving human health, and ecosystem services protection.

**Wetlands Research** – Wetlands are protected under our nation's "no net loss" policies. The primary objective in this research area is to document the range and quantity of wetland services provided by a wide range of varying types of wetlands and determine how their position on the landscape alters the provision of ecosystem services. This information can be used to protect and manage wetlands under alternative use options.

**Community-Based Research** – Four locations in the United States have been identified for study to develop decision tools for regional and local managers to examine the effect of alternative management strategies on the collection of ecosystem services. This research

will provide local decision makers with the information they need to decide how to use their environment while maintaining the services most highly valued by their communities. The research projects are planned for Tampa Bay in Florida, the Upper Midwest, the Willamette River Basin in Oregon, and portions of the North and South Carolina coast lines. The research will provide critical information about the interrelationship of ecosystems and the impacts of different existing or proposed uses on the services they provide. The scientific discoveries made will be useful as other communities and regions deal with similar issues of managing nature's finite ecosystem services and resources.

### REFERENCES:

EPA's Ecological Benefits Assessment Strategic Plan.  
[http://yosemite.epa.gov/ee/epa/ermfile.nsf/vwAN/EE-0485-01.pdf/\\$File/EE-0485-01.pdf](http://yosemite.epa.gov/ee/epa/ermfile.nsf/vwAN/EE-0485-01.pdf/$File/EE-0485-01.pdf)

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