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ECOSYSTEM SERVICES RESEARCH PROGRAM

RESEARCH PROJECT FOCUSES ON ECOSYSTEM SERVICES IN WILLAMETTE RIVER BASIN

Issue:

EPA's Ecosystem Services Research Program (ESRP) in the Office of Research and Development (ORD) is focused on the study of ecosystem services and the benefits to human well-being provided by ecological systems.

The Willamette Ecosystems Services Project (WESP) emphasizes the development of a robust decision support framework and set of tools for assessing bundles of ecosystem services under current and potential future conditions consistent with identified client and stakeholder needs in the Willamette River Basin (WRB). The WRB, located in Oregon between the Coast Range and the Cascade Range, has highly productive agricultural and forest areas, and a growing urban population. There is considerable local interest in sustainable economic growth.

Science Objective:

The research in the Willamette River Basin will strive to quantify the area's ecosystem services and understand the effects man-made stressors have on those services. WESP is an intensive, interdisciplinary project that focuses on characterizing multiple ecosystem services through quantitative models and incorporating these models into a decision support framework relevant to clients and stakeholders in the Willamette basin. WESP builds on prior or current ecosystem services research for assessing current conditions and trends and developing datasets necessary for models. It applies, develops and refines models that target specific services (e.g. water quality and quantity), working with clients and stakeholders to articulate alternative scenarios, and incorporating these into the WESP decision platform. WESP focuses on five key services of interest to EPA in the basin:

1) biological greenhouse gas regulation, 2) water quality and quantity regulation, 3) wildlife populations and habitat, 4) fish populations and habitat, and 5) air quality regulation. Quantifying these services will help local decision makers understand the ecological costs and benefits of existing and proposed land management and growth policies under current and potential future conditions. To achieve these ends, WESP will:

- Map ecosystem services in the river basin based on current conditions and available data

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- Develop data and models to quantify the response of ecosystem services to current and projected conditions

- Develop a decision support system that stakeholders can use to assess future effects of factors that have the significant potential to alter ecosystem services within the WRB, including climate change, land use/land cover management and modification, carbon management, and growth and development policies.

Application and Impact:

The Willamette River basin is facing a number of challenges related to ecosystem management. With an anticipated doubling of the population over the next several decades, understanding the impacts of alternative growth management strategies on ecosystem services in the Willamette is vital to ensuring continued provision of ecosystem services. Similarly, the large base of agricultural and forest lands provides numerous opportunities for the development of new management strategies that consider "bundles" of services for provision of carbon sequestration, water quality/quantity and habitat. An emerging ecosystem service marketplace in the WRB provides a strong need for scientifically defensible quantification of a variety of ecosystem services.

To address these needs, EPA scientists are developing ecosystem services maps, models, and decision support tools to help decision makers in the Willamette River Basin apply the information and methods developed by this project. Using these tools, decision makers can implement proactive policy and management decisions over time and at multiple scales. These decisions will help to ensure human well-being by conserving and enhancing ecosystem services.

There are a number of consumers of WESP ecosystem service outputs. A direct client will be the U.S. EPA Region 10 office in Seattle, Washington, which has regulatory authority in the Willamette River Basin. WESP is also working collaboratively with a number of other ongoing efforts engaging clients and stakeholders needing to understand the consequences of management alternatives on ecosystem service bundles – public and private forest managers, local jurisdictions planning for growth, watershed groups involved in ecosystem restoration, partnership involved in creating a Willamette ecosystem service marketplace, among others WESP research is integrated with other community-based ecosystems research being conducted in the Willamette in order to create a transferable suite of methods and tools for evaluating ecosystem services. This research will be applicable across other EPA regions and national program offices.

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