Abstracts

Wednesday, April 30

Session I1: Implementing EPA's Healthy Watersheds Program

3:30 – 5:00 pm | Room 263

Using Integrated Assessments to Identify Healthy Watersheds at the State Scale

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Abstract
The goal of EPA's Healthy Watersheds Program is to protect healthy aquatic ecosystems and the natural landscapes, hydrologic and geomorphic processes, and natural disturbance regimes that support them. EPA is providing technical assistance to states to identify healthy watersheds by conducting integrated assessments of watershed health. Integrated assessments bring together disparate datasets to examine the connectivity, dynamics, and interrelationships between landscape characteristics, hydrologic and geomorphic processes, physical habitat, water chemistry, and biology. Natural land cover and landscape statistical models are used to estimate relative watershed health across a state. Additionally, watershed vulnerability to future changes in climate, land use, and water use is assessed to inform healthy watershed protection efforts. Participating states use the assessment results to strategically target resources towards protection and restoration. A comparative analysis and lessons learned from applying the Healthy Watersheds Program assessment framework in California, Wisconsin, and Alabama will be presented.

Application of EPA's Healthy Watersheds Initiative Concepts Enhances Protection of California's Streams and Watersheds

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Abstract
California's freshwater resources face tremendous pressures from population growth and uncertain water availability that are expected to increase over the coming decades. To make effective resource allocation decisions, agencies need objective tools to help prioritize protection and remediation. Ecological condition indicators have great potential to fill this role.

California has made steady progress over the last decade to integrate biological condition indicators into its water resource assessment and management. However, the potential of biological condition indicators to transform water resource management would be greatly enhanced by the ability to interpret patterns of biological condition in the context of non-biological watershed features and processes. California's Healthy Streams Partnership recently collaborated with the US EPA's Healthy Watersheds Initiative (HWI) to adapt the HWI's watershed assessment approach for integrating diverse measures of watershed condition (*e.g.*, hydrology, geomorphology, water quality, landscape) in California streams. The California effort built on previous work by the HWI and its partners, but adapted the framework to take advantage of other related statewide efforts. The California implementation of HWI had two key modifications, a focus on parameters related to fundamental ecological processes (not strictly condition based) and the differentiation of structural indicators (*e.g.*, landscape condition, hydrologic condition) from ecological condition indicators (biological condition, habitat condition, water quality). This allows a broad scale assessment of potential function, restoration opportunity, and vulnerability. California's adaptation also explicitly incorporated indicators of the relative confidence of the different measures of watershed

condition and excluded portions of the state that did not meet minimum criteria for applicability of biological indicators. The resulting framework provides California's water resource managers with a tool for predicting general watershed health throughout the state. These predictions can serve as the basis for monitoring resource allocation, prioritization of watersheds for restoration and protection (*e.g.*, 305(b)/303(d) integrated report Category 1 waters), more informed permitting and enforcement decisions and more effective communication among resource agencies and stakeholders. The approach allows users to selectively emphasize different components of watershed health depending on the application of the data and components of the framework can be updated/upgraded as our knowledge and data accuracy improves.

Wisconsin's Healthy Watersheds Initiative: Ranking Watersheds to Inform Management Actions

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Abstract
Wisconsin is conducting a Healthy Watersheds Initiative (HWI) in conjunction with EPA's national effort. The goal of the HWI is to assess a range of statewide, watershed-level datasets to rank each watershed in the state on scales of "health" and "vulnerability." These rankings can then be used to prioritize and target appropriate funding and management practices to specific watersheds. While other EPA programs focus on restoring impaired waters, the Healthy Watersheds Initiative uses the watershed approach for proactive protection and restoration, to avoid additional water quality impairments in the future. Wisconsin is one of the early states to adopt such a framework. This talk will describe the intent of the project, the data sets used for ranking, project results, and lessons learned. It will also discuss potential uses of the watershed rankings by state agencies, watershed organizations, and other partners.

Alabama's Healthy Watersheds Initiative and Biological Condition Gradient: Two Tools for Prioritizing Restoration and Protection Efforts

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Abstract
Alabama completed both a Healthy Watersheds Initiative (HWI) integrated assessment and a Biological Condition Gradient (BCG) calibration in 2013. Each was based on the collaborative efforts of state and regional experts to define conditions of ecological endpoints. The purpose of the HWI was to generate technical information and tools for freshwater aquatic resource protection in Alabama and the Mobile Bay Basin for use by state agencies, local governments, citizen groups, and other organizations. The HWI identified watershed health indicators that reflect a holistic view of watershed health, as well as watershed vulnerability indicators to characterize the vulnerability of watersheds to future degradation. A Healthy Watersheds Database with indicator values for the entire state of Alabama and the Mobile Bay was developed. With these data, a Healthy Watersheds Index and a Watershed Vulnerability Index for assessing relative levels of health and vulnerability were developed at three separate tiers: 1) statewide; 2) the entire Mobile Bay basin; and 3) the Mobile Bay and Mobile-Tensaw sub-watersheds in Baldwin and Mobile counties. An important component of the HWI was to evaluate connectivity throughout the Mobile Bay Basin to highlight key areas for protecting Bay health.

The BCG is a scientific framework for characterizing biological response to anthropogenic stress. The AL BCG was developed primarily through expert consensus, focusing on the biological expectations for the fish and benthic macroinvertebrate assemblages in the higher gradient streams of north Alabama. While Alabama's macroinvertebrate and fish multi-metric indices are calibrated to least-impaired reference conditions statewide, the AL BCG provides a framework for understanding current conditions relative to natural, undisturbed conditions. Together, the HWI and the BCG provide tools for prioritizing and targeting specific watersheds for protection and restoration, as well as a method for setting achievable restoration goals.