

Watershed Index Online – National Data and Tools for Watershed Prioritization

Project Status Summary: April 2014

In recent years, use of geospatial data in evaluating watershed characteristics across large areas such as states, regions or the nation has increased dramatically as a mainstream component of water quality program tracking, evaluation, prioritization and strategic planning. National policies involving nutrients strategies, agricultural management practice funding, and numerous other activities recommend or apply watershed indicator analysis and comparison techniques to help guide effective action. The TMDL program's national Vision Implementation effort

calls for watershed prioritization as a part of states' biennial Integrated Reporting of water body condition. These and many more programs need key watershed-based indicators and the analytical tools to use them.

Watershed Index Online (WSIO) - A joint product of EPA Region 4 and EPA/HQ Recovery Potential Screening to provide online watershed prioritization support

- **Data:** Over 300 key watershed indicators compiled on all HUC12 watersheds nationally
- **Tools:** Recovery Potential Screening Tool – drives online analysis, custom version for each state
- **Analyses:** High-interest prioritizing topics pre-compiled
- **Program Links:** Assistance finding other major tools and watershed data sources

Watershed data and comparative assessment techniques have been applied on local and statewide scales for several years, but the opportunity to compile and make available uniform watershed parameter and indicator information nationwide has yet to be fulfilled. Many good quality national datasets exist, but most don't have the next step of interpreting watershed parameters of the greatest relevance. For example, a national dataset showing the presence of agriculture has some value in recognizing possible watershed condition and stressors, but a watershed's percent agriculture on steep slopes within a set distance of streams would be much more useful in watershed assessment. These kinds of metrics are being calculated again and again for single states or river basins throughout the country, although the data and tools are available now to process them as nationally consistent attributes on a useful watershed scale. The timing has never been better to fill this need more efficiently at the national scale, especially as the CWA Section 319 Nonpoint Source Program Guidance and the TMDL Program Vision have both recently increased the emphasis on states' systematic comparison and prioritizing of watersheds. EPA can support states nationally with data, tools, and technical methods as they carry out watershed prioritization.

Watershed Index Online (WSIO) is now being developed jointly by EPA Region 4 and EPA Headquarters Watershed Branch's Recovery Potential Screening (RPS) Project to substantially increase watershed prioritizing capacity, tools and data available to states and others. WSIO is consolidating and making widely available a library of many of the most popular watershed indicators along with easily accessed tools for using them. This site will offer national-scale watershed indicator data and tools at a single online location dedicated to helping users evaluate, compare, and prioritize among watersheds, in support of the several program activities above (TMDL vision, watershed prioritization, Recovery Potential Screening, Healthy Watersheds and others). As this online site is being developed collaboratively by EPA Offices responsible for these programs, it will focus on meeting program needs while it integrates and builds on some of the most widely used watershed geospatial assessment tools and indicator data that can be efficiently served through existing EPA web geospatial architecture. In particular, Watershed Index Online will offer indicator data and tools at the HUC12 scale, which increasingly has been the watershed scale of choice for assessment, management and planning in recent years.

The primary components of WSIO, and progress highlights to date, include:

- **Watershed Attributes Library:** This will contain HUC12-specific values for many ecological, stressor, and social indicators calculated consistently and nationwide. A major source of the library is the Region 4's Watershed Index (WSI) datasets compiled for the conterminous US, but many other indicator sources will also be used. As a library of attributes (i.e., tabulated indicator values per watershed) geo-referenced only to the HUC12 national GIS dataset, this library maximizes attribute information while minimizing the geographic data. Thus it will utilize a fraction of the storage and response time that would be required to host all of the source GIS datasets from which all these indicators were measured. Attributes may be individually user-selected for user-defined project areas such as states, major river basins, or HUC8s and downloaded or used online. ***Progress Highlights: Over 300 Ecological, Stressor, and Social Indicators have already been measured and compiled on the 83,015 HUC12 watersheds in the lower 48 states. Most are of demonstrated interest for state prioritizing based on previous projects and workshops. Data table design and download support are under development.***
- **Analytical Tools:** The initial user interface is an online adaptation of the Recovery Potential Screening (RPS) Tool, which has been in use as a custom-coded excel file for several years helping states compare and prioritize watersheds for restoration investments. The RPS tool enables users to define a project area, select indicators and weight them, perform a variety of different RPS screening scenarios and save results as rank-ordered priority lists, thematic maps, and bubble plots. RPS assessments can be conducted with this tool online or locally after tool and data downloads, but the interface will support other forms of data download and analysis as well. ***Progress Highlights: The RPS Tool is already used in several states, and state-specific custom RPS Tools will be available for each of the others (beginning with lower 48 by summer 2014). Meanwhile, the tool is being adapted for online use by the end of 2014.***
- **Pre-compiled Screening Assessments:** Although a primary purpose of the site is to support a variety of user-customized and controlled watershed analyses, a small number of high-interest screening assessments will be developed as warranted. These would apply RPS and potentially other watershed-based methods and would generate example results and demonstration products for users without the time to customize their own analyses. ***Progress Highlights: The May 2014 States Workshop will present insights into candidate high-interest prioritizing topics; meanwhile nutrients RPS projects in five states and collaboration with the healthy watersheds program on protection potential may lead to two demonstration assessments this year.***
- **Programmatic Links:** Although Watershed Index Online may eventually have a broader user audience, its initial design is to support watershed analysis, comparison and prioritization relative to Clean Water Act programs mentioned above. We plan to offer portal links to the appropriate programmatic websites that utilize watershed indicators and tools, and plan over time to increase the use of new analytical tools and data through such program-focused collaboration. ***Progress Highlights: A significant update and enhancement of the Recovery Potential Screening Website during fall 2014 will expand the site's function as a prioritization assistance portal that provides links to relevant programs and other tools.***

The practical benefit of expanding RPS tools and WSI data to become Watershed Index Online, with user selection of indicators and data from consistent national datasets, is the immediately improved capacity of any of the lower 48 states to prioritize watersheds. This will ensure that states have tools and data to implement an important, first goal of the TMDL Vision as well as many other applications of watershed comparison and prioritization. Please contact Doug Norton (OW, norton.douglas@epa.gov), Amy Newbold or Gary Davis (Region 4, newbold.amy@epa.gov or davis.garys@epa.gov), or Dave Catlin (OEI, catlin.dave@epa.gov) for additional information.