Watershed Tools for Tribes

In recent years, use of geospatial (GIS) data in evaluating and comparing watershed characteristics has increased dramatically. The EPA's CWA Section 319 Nonpoint Source Program and the TMDL Program Vision have both increased the emphasis on systematic comparison and prioritizing of watersheds, to help programs plan well and be more successful as a result. Tribes need watershed-based information and analytical tools for a variety of water quality program decisions and plans. EPA is supporting watershed data and tools development.

What watershed information and tools would help tribes?
The Recovery Potential Screening (RPS) Tool series is available publically for download at http://gispub.epa.gov/wsio/states/states.html. Although originally created to help states compare and prioritize watersheds for restoration and protection program planning, data included in each tool makes it possible to identify, assess and compare only those watersheds with tribal lands or adjacent to tribal lands. RPS Tools can be used on your desktop in Excel. The Watershed Index Online at http://gispub.epa.gov/wsio/ is an internet source of more watershed data and a modified version of the RPS Tool that allows for screening user-defined geographic areas.

What is Recovery Potential Screening?
Recovery Potential Screening (RPS) is a systematic, comparative method for identifying differences among watersheds that may influence their relative likelihood to be successfully restored or protected. It was developed by the EPA Office of Water as a flexible, user-driven tool to help compare impaired waters more quickly and efficiently and set priorities for investing limited restoration resources. The RPS screening approach involves identifying a group of watersheds to be compared and a specific purpose for comparison, selecting appropriate indicators in three categories (Ecological, Stressor, Social), calculating index values for the watersheds, and applying the results as part of strategic planning and prioritization.   See the Recovery Potential Website for more information, but note that the Tools section is currently undergoing update and does not have the recent tool versions downloadable at the URL above.

What is the Recovery Potential Screening Tool?
The RPS Tool is a custom-coded Excel spreadsheet that performs all RPS calculations and generates RPS outputs. It was developed several years ago to help users calculate Ecological, Stressor, Social, and Recovery Potential Integrated index scores for comparing up to thousands of watersheds systematically in a desktop environment using widely familiar software. The RPS Tool series includes individual tools for each of the lower 48 states with indicator data (on HUC12 watersheds, each approximately 35 sq mi in area) already embedded. Complete usage directions are included on all the Tool's worksheets. Many of the indicators are landscape characteristics derived from common GIS datasets, but other attributes derived from field monitoring and geo-referenced to water bodies or watersheds, such as selected impairment-specific 303(d) and TMDL data, are also included.

What kinds of skills and equipment does an RPS Tool user need?
Anyone with basic familiarity with Microsoft Excel (versions 2003 or later) and a personal computer can learn how to use the RPS Tool quickly at their own desktop. Directions for each step and worksheet are contained within the Tool file, and a user manual with more detailed directions is under development.

What kind of outputs can an RPS Tool generate?
The RPS Tool generates the results from each screening run in tabular, graphic, and map format. Results from a RPS Tool include a table of index scores and rank orders (Ecological, Stressor, Social, and Integrated), a bubble plot display, and a HUC12 map display. Users can customize the bubble plot display and the map (e.g., use a color gradient on the HUC12 bubbles or the mapped HUC12s to represent value differences for one key indicator of interest), and different iterations of the map and bubble plot can be saved as JPG files for future use while iteratively changing settings and exploring options with screening results.
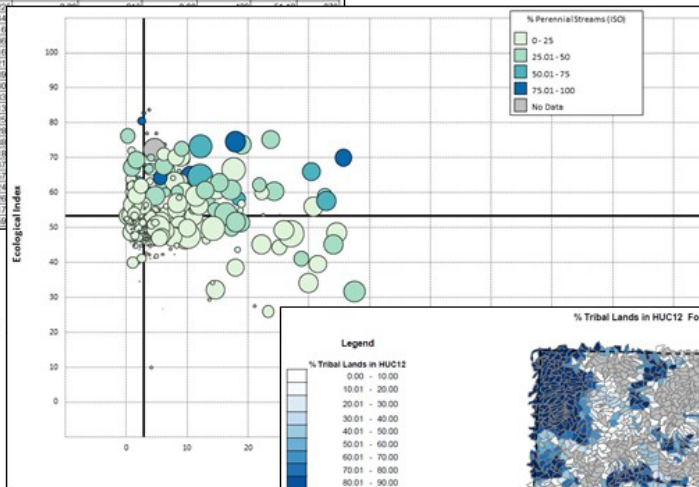
What should I do to use an RPS Tool to analyze tribal watersheds?
Please follow the general instructions on the back of this page. For more information or assistance, please contact norton.douglas@epa.gov.
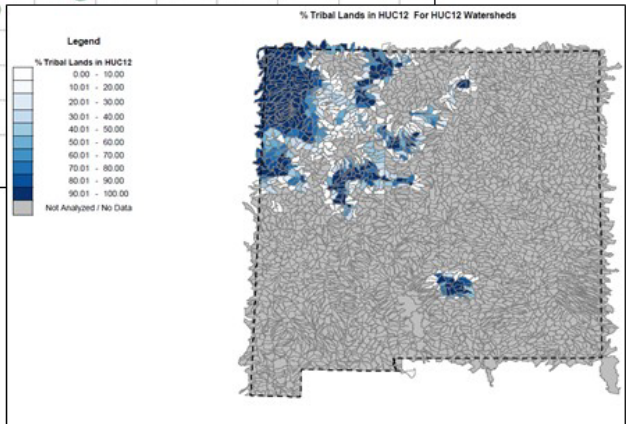
1. *Download the RPS tool* for the state or states within which the tribe's lands occur, at the public website http://gispub.epa.gov/wsio/states/states.html. Contact EPA for help working with multi-state data.

2. *Open the Tool in Excel*. First, save the RPS Tool by a different name so you always have the original copy unchanged. Scroll to the right along the list of worksheet tabs (bottom of the screen), and go to the tab marked HUC12_DATA. Copy this data sheet to a new, blank Excel file so you may examine it and rearrange it without affecting the Tool, which will malfunction if you rearrange its data worksheet.

3. *Identify the tribal and tribal-adjacent watersheds*. In the new Excel file, delete the top six rows, leaving the indicator names as the new top row. Then find the indicator column named "% Tribal Lands in HUC12". In Excel, use DATA/SORT/ to rearrange the whole data table in order from highest to lowest value in the "% Tribal Lands" column. Then, select and copy all of the HUC12 IDs (leftmost column) that have any tribal lands. Paste them into the RPS Tool's worksheet called SUBSETS and name the column TRIBAL HUCS. Repeat with the column "HUC12 Adjacent to Tribal HUC12s", and copy these into a second column on the SUBSETS worksheet.

4. *Set yourself up to do a tribal watersheds screening*. In the RPS Tool, select and copy the whole list of tribal HUC12 IDs from the SUBSETS worksheet and paste the list into the left-most column of the SETUP worksheet (left end of the tabs). You are now ready to compare these watersheds to one another based on indicators you will select from the dropdown menus for Ecological, Stressor, and Social indicators. Select at least one in each of the three categories, but ideally not more than 10 in each. Click on the button "RUN SCREENING". You can choose countless combinations of indicators to compare your watersheds for different purposes.

5. *View your results*. After seeing the pop-up "Project Successfully Created" you can find the results of your watershed comparison in three different formats: tabular rank-ordered indexes, a bubble plot graphic, and a map graphic. Examples of each appear below (data for demonstration only).

Recovery Potential Screening Tool outputs from a demonstration analysis of tribal watersheds that compares their relative condition and restorability.

A: Ecological, Stressor, and Social Index values calculated and rank-ordered for all New Mexico watersheds with any tribal land.

B: Bubble plot of the same watersheds (bubble symbols); position and size are determined by index score per watershed, and bubble color shows % perennial streams.

C: HUC12 watersheds in New Mexico with varying % tribal lands shown by color shades (darker blue is higher).