

Developing a National Set of Statewide Healthy Watersheds Preliminary Assessments

A national Healthy Watersheds Preliminary Assessment will provide a “first cut” watershed health assessment across the lower 48 states, with statewide summaries intended to help states and others engage in healthy watersheds protection planning and prioritizing.

Background

EPA’s [Healthy Watersheds Program](#) (HWP) works with states to generate assessments of watershed health and vulnerability, supporting efforts to identify and protect watersheds that are in good condition. To date, HWP has supported the completion of in-depth statewide assessments for California, Wisconsin, Alabama and Tennessee, and a basin-level assessment for the Clinch-Powell Rivers, as well as local-scale projects. A new HWP project will soon apply the experience gained in these detailed assessments more widely in a preliminary assessment of healthy watersheds across the nation.

In-depth assessments are valuable to the states that have them already, but many states do not. Developing a national preliminary assessment will help advance healthy watersheds protection across the nation much earlier than detailed assessments on a few states alone. A consistent, base-level characterization of watershed health and vulnerability for the nation is needed because:

- As a national-scale program, HWP’s vision is that healthy watersheds are identified, protected, and tracked in all 50 states, territories and tribal nations. HWP naturally generates expectations for national coverage and products.
- Two major EPA restoration/protection programs – the TMDL and 319 programs – have recently issued guidance that promotes prioritization by states as part of their Integrated Reporting and non-point source pollution strategies, respectively.

For these reasons, HWP has initiated a preliminary healthy watersheds assessment to identify and map the nation’s healthy watersheds and assist states and other users in watershed protection planning.

Approach

Consistent with HWP Methods. In-depth HWP assessment involves scoring watersheds at the catchment scale according to multi-metric indices of **Watershed Health** (landscape condition, habitat condition, hydrologic condition, geomorphic condition, biological condition, and water quality) and **Watershed Vulnerability** (projected climate change, land use change, and future water use). To the extent possible the preliminary assessment will follow the same assessment approach, at a small watershed scale (HUC12 watersheds averaging 35 square miles each) and using data that are nationally available and yet closely comparable to all of the Health and Vulnerability indices and sub-indices. Indicator data will come mainly from the [Watershed Index \(WSI\)](#), a partnership between EPA Region 4 and the [Recovery Potential Screening \(RPS\)](#) project that has compiled 500+ environmental indicators, measured at the HUC12 level for all lower 48 states.

Ecoregion-based scoring. HUC12 scoring in the Health and Vulnerability indices will be quantified per whole (i.e., often multi-state) ecoregion rather than per state only, as HUCs within ecoregions share ecological commonalities and thus are more comparable across the myriad water body traits and ecosystem functions represented in the Health and Vulnerability indices.

Formatted for state-specific results. The preliminary assessment will compile statewide and ecoregion-wide assessment results, as well as results for each ecoregion portion within state boundaries. Users may gain insights about a watershed’s condition as compared to its whole ecoregion, its in-state portion of the ecoregion and its whole state. This will encourage states to weigh the benefits that may come from neighboring healthy watersheds as well as set priorities among their own watersheds. Figure 1 demonstrates how ecoregional vs. statewide results can provide surprising insights about watersheds.

DRAFT ANALYSIS - FOR CONCEPTUAL DEMONSTRATION PURPOSES ONLY

Ridge and Valley Ecoregion (67)

HUC12s: 1,297
HUC12s in WV: 191
% of 67 in WV: 15%
% of WV in 67: 24%
of 67's top 10% HUCs in WV: 53
% of 67's top 10% in WV: 41%

Central Appalachians Ecoregion (69)

HUC12s: 654
HUC12s in WV: 287
% of 69 in WV: 44%
% of WV in 69: 37%
of 69's top 10% HUCs in WV: 40
% of 69's top 10% in WV: 61%

Western Allegheny Plateau Ecoregion (70)

HUC12s: 1,022
HUC12s in WV: 301
% of 70 in WV: 29%
% of WV in 70: 38%
of 70's top 10% HUCs in WV: 63
% of 70's top 10% in WV: 62%

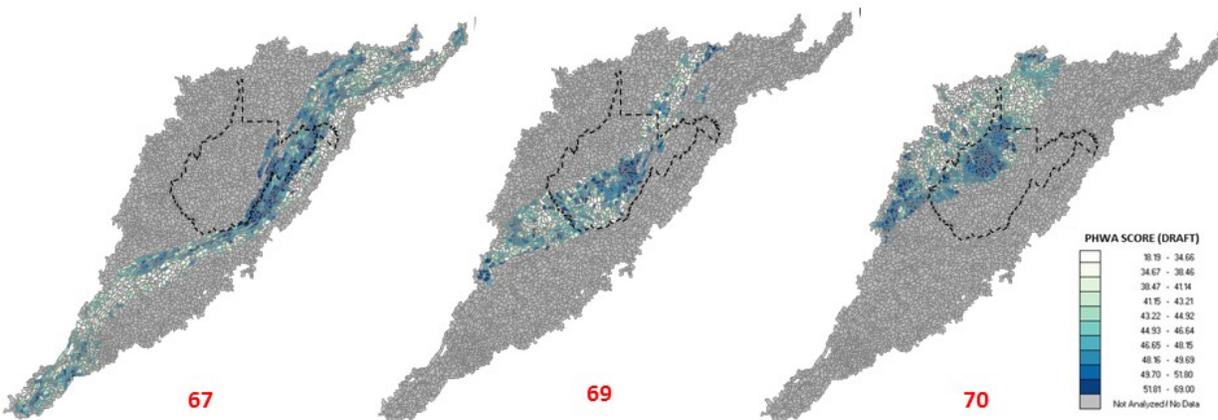


Figure 1: Draft simulation of a Preliminary Healthy Watersheds Assessment for West Virginia, a state with three main Level 3 Omernik Ecoregions (ER67, ER69, ER70). Scoring used 6 ecological and 5 stressor indicators to calculate a preliminary watershed condition index and compare watersheds for prioritization. This assessment output color-codes HUC12 watersheds in deciles relative to scores across each whole ecoregion. The example prioritization threshold of top 10% in each ecoregion (darkest blue watersheds) that also occur instate identifies 53 HUC12s in ER67, 40 in ER69, and 63 in ER70. This analysis reveals the State has a disproportionately high percentage of the top-scoring HUCs from all three ecoregions (41% of ER67, 61% of ER69, and 62% of ER70). Calculating the same top 10% index statewide only without ecoregions (not shown) heavily favored ER67 HUCs while identifying few to none from ER69 or ER70.

Final Products and Timeline:

Although the assessment is national in scope, its products will be compiled by state and by ecoregion; there are no plans to compare watersheds nationally. The National Healthy Watersheds Preliminary Assessment products for the lower 48 states will be based on HUC12s and include the best approximation of the HWP Health and Vulnerability indices that can be constructed from consistent national data sources. Rather than a static reporting framework providing a single final score, the assessment products will be set up to encourage adding data and refining assessment results over time. [The Statewide Recovery Potential Screening Tools](#) are being modified to calculate the basic Healthy Watersheds indices while still providing hundreds of additional watershed variables. This will allow users to further manipulate the data and customize indicator selection to address a variety of specific watershed protection options. Assessment development is ongoing, with incremental products involving the lower 48 states compiled throughout 2016. Non-CONUS states, territories and tribes can also contact EPA for support.

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