Using the RPS Tool and Enhanced Watershed Protection and Restoration Efforts

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NWQMC Tampa
Integrated Water Resources Management

Water Data & Goals
Data
Criteria
Monitoring
Standards
Natural Resource Information

CWA Program: Bridging the Gap

Implementation
Remediation
Non-point Source
Permitting
Natural Resource Management

Establishing Plans and Actions to Restore and Protect Water Resources
New Approach

- New opportunity from EPA
- States select water quality focus
- More flexible approach
- Emphasis on results for restoration and protection
- Coordinate program efforts and increase returns

Improve collaboration and integration across all activities and programs to better realize water quality goals.
6 Key Elements of New Approach

- Prioritization
- Integration
- Engagement
- Alternatives
- Assessment
- Protection
Recovery Potential Screening (RPS)

EPA Tool to help States compare restorability across all watersheds

• Origins in Impaired Waters program
• Broader audiences now (fisheries, healthy watersheds)
• Systematic but very flexible approach
• Science-based, indicator-driven (GIS and field data sources)
CT Water Quality Concerns

- General Watershed Health
- Stormwater
- Nutrients
- Bacteria
- Saltwater Estuaries
### Recovery Potential Screening - Basic Concept

<table>
<thead>
<tr>
<th>Ecological Category</th>
<th>Stressor Category</th>
<th>Social Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicator 1</td>
<td>Indicator 1</td>
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<tr>
<td>Indicator 5…</td>
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<td>Indicator 5…</td>
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</table>

Ecological Index + Social Index + \((100 - \text{Stressor})\)

\[
\text{RPI} = \frac{\text{Ecological Index} + \text{Social Index} + (100 - \text{Stressor})}{3}
\]
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Setup Screen View

The HUC12s and indicators you select here will provide the basis for calculations that are automatically applied to other worksheets. This is the only sheet where you should ever modify your screening by adding or removing HUC12s and indicators, or change indicator weights.

The steps for scenario setup are summarized below:

1. In the **Select Watersheds** section, enter the 12-digit IDs of the HUC12s to include in the screening. For a statewide screening, click the **Add All Watersheds** button. A list of HUC IDs can also be copied and pasted from a separate file. Use the **Paste Special/Values** option from the Excel menu to ensure proper calculation and preserve the formatting of this worksheet. Or, select HUCs individually from the drop-down menu or type them in manually, one per row.

2. Using the drop-down menus, select the ecological, stressor, and social indicators to include in the screening. Indicator descriptions can be reviewed in the **indicator_info** worksheet. Generally between three and ten indicators should be selected for each of these three categories.

3. Assign indicator weights. Weights determine the relative influence of each indicator on recovery potential index scores. Indicators with higher weights can have a greater contribution to recovery potential scores relative to indicators with lower weights. By default, indicators are assigned an equal weight of 1. Weights must be greater than or equal to zero.

4. After selecting HUC12s and indicators, click the **Run Screening** button to calculate recovery potential scores and ranks for each HUC12. Scores can be viewed in the **Summary_Scores** worksheet and a bubble plot of Ecological, Stressor, and Social index scores can be viewed in the **Bubble_Plot** worksheet.

5. You may see a pop-up message if (a) not all of your HUC12s have data for one of your selected indicators; or (b) all of your HUC12s have the same value for one of your indicators. In either case you may decide to continue as is, or change your indicator selection. In the case of (a), HUC12s with no data for a given indicator calculate RPS indices only on the remaining indicators.

6. Save the file at this point and after making any subsequent changes in other worksheets to retain a record of the inputs and results of the screening. If beginning a new screening run, rename the file before clearing worksheet contents.

**IMPORTANT NOTE:** Never click the **Reset** button until after you have saved and renamed the file and you now wish to clear worksheet contents and restart a new RPS screening scenario. This button will not clear the HUC12_Data or **indicator_info** worksheets.

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### Select Watersheds

- **Add All Watersheds**
- **010802050102** (Pequiscott Brook-Connecticut River)
- **010802050105** (Muddy Brook)
- **010862020201** (Stony Brook)
- **010804020201** (South Farmington River-Blackstone River)
- **010802050101** (Pequiscott River)

### Select Ecological Indicators

- **Select the Ecological Indicators of interest below:**
  - % Open Water (2006) in Watershed
  - % Natural Cover, N-index2 (2006) in Watershed
  - % Open Water (2006) in Watershed
  - % Barren Land (2006) in Watershed
  - % Forest (2006) in Watershed

### Select Stressor Indicators

- **Select the Stressor Indicators of interest below:**
  - Impervious Cover (2006) IC = 5%, PCT of Watershed
  - Number of game WS
  - % Agriculture (2006) in Watershed
  - % Watershed Streamlength 303d-Listed
  - % Pasture/Hay (2006) in Watershed
  - % Urban (2006) in Watershed

### Select Social Indicators

- **Select the Social Indicators of interest below:**
  - % Watershed Streamlength Assessed
  - Watershed NPDES Permit Count
  - % Watershed Waterbody Area with TMDLs
  - Watershed Waterbody Assessed

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**INSTRUCTIONS**

- **Setup**
- **Notes**
- **Summary_Scores**
- **Bubble_Plot**
- **Bubble_Plot_Options**
- **HUC12_Map**
- **Indicator.Values**
- **Normalized_Indicator.Values**
- **Values Only_Summary**
Overview of Prioritization Tool

Enhance Prioritization Tool
- Acquire CT Specific Indicators
- Develop Indicators

Develop Scenarios for Tool
- Select Indicators & Weights
- Compare impacts of adjusting indicators

Extract results Further Analysis
- Sort and Filter Watersheds
- Rank and Select Common Watersheds

Publish DRAFT list of Watersheds for Comments
- Include priorities outside Tool results
- Engage Public with Complete DRAFT list
Example Indicators

**Ecological Category**
- # dams with fishways
- % of watershed as protected open space
- Miles of free flowing stream
- # of sampling stations with sensitive aquatic insects
- % Natural Diversity Data Base areas

**Stressor Category**
- Number of road crossings
- % of agriculture land in the watershed
- # of potential release remediation sites
- % Impervious Cover >12% in a watershed
- # of toxic discharge permits
- Phosphorus yield
- Nitrogen yield

**Social Category**
- Stream miles of trout stocking
- % watershed in a municipal stormwater permit area
- # of known recreation areas
- # impaired segments with TMDLs
- % drinking water source area
- % Environmental Justice Areas

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CT Water Quality Scenarios

General Watershed Health
- Restoration
- Protection

Stormwater
- Restoration
- Protection

Nutrients
- Restoration
- Protection

Bacteria Impairments Current and Future
(not tool based)

Estuaries and Embayments (not tool based)

Six RPS Tool Scenarios Generating Six Lists of Watersheds
Screening Runs

Connecticut Department of Energy and Environmental Protection
### Output Rankings of RPS Tool

<table>
<thead>
<tr>
<th>Watershed ID</th>
<th>Watershed Name</th>
<th>Ecological Index</th>
<th>Ecological Rank</th>
<th>Stressor Index</th>
<th>Stressor Rank</th>
<th>Social Index</th>
<th>Social Rank</th>
<th>RPI Score</th>
<th>RPI Rank</th>
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<td>45</td>
</tr>
</tbody>
</table>

**Note:**
- This worksheet contains each watershed's auto-calculated index values and rank orders for the Ecological, Stressor, Social, and Recovery Potential Integrated (RPI) index scores.
- Ecological, Stressor, and Social Index values have a maximum value of 100. They are each calculated by summing weight-adjusted, normalized indicator values, dividing by the total weight, and multiplying by 100. The index is expressed as: \[ \text{Index} = \frac{\sum \text{Normalized Indicator Values}}{\text{Total Weight}} \times 100 \].
- Among the index values, a higher score implies higher recovery potential in the case of the ecological, social, and RPI indices. A higher stressor index score implies lower recovery potential. In the case of rank orders, a smaller number implies higher recovery potential.
- Raw indicator values specific to the current RPS screening run can be viewed in the Indicator Values worksheet. Refer to the Normalized Indicator Values worksheet for weight-adjusted, normalized indicator values. The Bubble Plot worksheet contains an auto-generated graphical display based on the ecological, stressor and social index scores from this screening run.
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Enhance Prioritization Tool
- Acquire CT Specific Indicators
- Develop Indicators

Develop Scenarios for Tool
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Extract results Further Analysis
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Connecticut Department of Energy and Environmental Protection
Screening Results Analysis

Method of Using Protection Rankings from Recovery Potential Screening Tool

Similar Approach used for Restoration Ranking

- All Watersheds in CT
  - 184 Watersheds
  - Stressor Score Sort
    - Top 125 Watersheds
  - Social Score Sort
    - Top 75 Watersheds
  - Eco Score Sort
    - Top 40 Watersheds
  - Re-sort by Recovery Index
    - Top 40 Watersheds

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Sorting RPS Tool Protection Results

- Nutrient Top 20 Watersheds: Watershed A, Watershed B
- General Watershed Health Top 20 Watersheds: Watershed B, Watershed C

Only Watershed B added to Priority List
Additional Evaluation

- Partners
- Refined Data
- Existing Monitoring Data
- Other Scenarios
Preliminary Focus Watersheds

CT DEEP Preliminary Areas for Action Plan Development

Major Basin
- Connecticut
- Housatonic
- Hudson
- Pawcatuck

Proposed Watersheds
- Protection
- Restoration
- Proposed Priority Embayments
- FW Proposed Bacteria Priority

DRAFT
Enhanced Public Outreach

• Online GIS Interactive Web “Storyboard”

Connecticut's Enhanced Watershed Protection and Restoration Strategy

Protect What's Good: Watersheds Selected for Protection

This draft list of Connecticut watersheds focuses on areas that currently have healthy water quality and natural resources. The objective for these areas is to maintain and protect the higher water quality that is currently found in the watershed. This group of watersheds tend to feature low development conditions and low impairment scores percentages.

Why Establish Plans for Connecticut's Waterbodies?

Protection

- Current Conditions
- Future Conditions

- Necessary Pollution Reduction
- Pollutant Load
- Water Quality Goal

Zoom in to view examples of social/ecological indicators and watersheds selected for protection.
Enhanced Watershed Analysis

Prioritized HUC12 Watersheds with Local Basins
Next Steps

- Engage the public
- Respond to public comments on List
- Revise List for submittal to EPA
Questions?

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