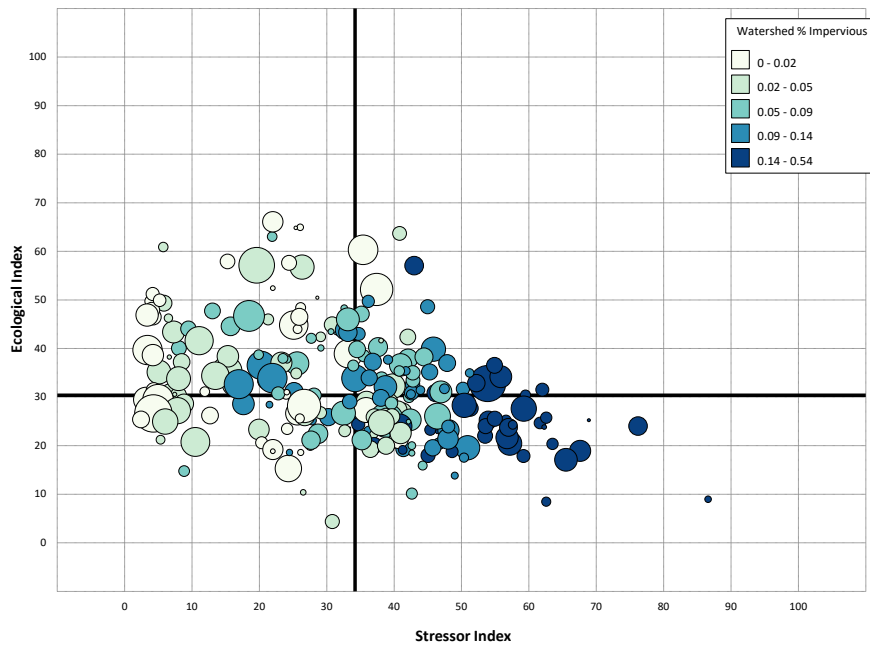


# USER GUIDE FOR THE EXCEL RECOVERY POTENTIAL SCREENING (RPS) TOOL



October 2023

## Table of Contents

1. Introduction & Background.....	4
1.1. RPS Overview .....	4
1.2. Excel RPS Tool .....	4
1.3. File Versions .....	4
1.4. User Guide Organization.....	5
2. Enabling Macros.....	6
3. Instructions Worksheet.....	7
4. Define Project Area Worksheet .....	8
4.1. Overview .....	8
5. Setup Worksheet .....	10
5.1. Overview .....	10
Basics.....	10
Advanced Tips .....	11
5.2. Choose Watershed Scale.....	12
Basics.....	12
Advanced Tips .....	12
5.3. Select Watersheds to Screen .....	13
Basics.....	13
Advanced Tips .....	17
5.4. Select Indicators and Weights.....	18
Basics.....	18
Advanced Tips .....	21
5.5. Run Screening Button .....	22
Basics.....	22
Advanced Tips .....	23
5.6. Respond to Warning Messages.....	24
Basics.....	24
Advanced Tips .....	25
5.7. Reset Screening Button.....	26
6. Notes Worksheet .....	27
7. Results Worksheet .....	28
7.1. Overview .....	28
Basics.....	28
Advanced Tips .....	28
7.2. Sort and Filter.....	29
8. Bubble Plot Worksheet .....	30

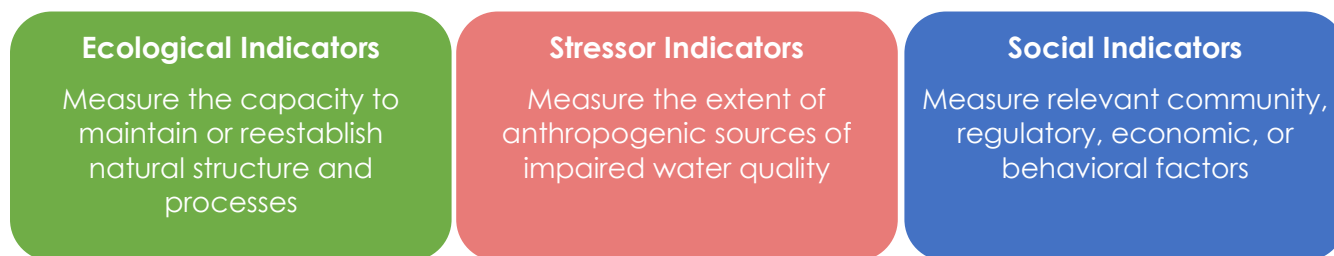
9.	Bubble Plot Options Worksheet.....	31
9.1.	Overview .....	31
9.2.	Reposition Axes.....	32
9.3.	Toggle Screening to Plot .....	33
9.4.	Label Bubbles .....	34
	Basics.....	34
	Advanced Tips .....	36
9.5.	Edit Bubble Sizes .....	37
9.6.	Edit Bubble Colors.....	38
9.7.	Highlight Bubbles .....	41
9.8.	Save As Image File.....	43
10.	Map Worksheet .....	44
10.1.	Overview .....	44
10.2.	Create Custom Map .....	45
10.3.	Highlight Watersheds of Interest.....	48
10.4.	Save Map as PDF File.....	49
11.	Indicator Data Worksheet(s).....	50
12.	Explore Indicator Data Menu .....	51
12.1.	Overview .....	51
12.2.	Select an Indicator to Explore .....	53
12.3.	Select a Covariate Indicator .....	54
12.4.	Save or Copy a Chart .....	55
12.5.	Change Watershed Selection Button.....	56
13.	Indicator Info Worksheet.....	60
13.1.	Overview .....	60
13.2.	Filter Table .....	61
13.3.	Add Indicator Info .....	62
14.	Add Indicators Worksheet .....	64
14.1.	Overview .....	64
14.2.	Enter New Indicator Information.....	65
14.3.	Enter New Indicator Data.....	66
14.4.	Add Indicators Button .....	68
15.	HUC Subsets Worksheet .....	69
15.1.	Overview .....	69
15.2.	Create a New Watershed Subset Button .....	70
15.3.	Manually Add a Subset List .....	74

## 1. Introduction & Background

### 1.1. RPS Overview

Recovery Potential Screening (RPS) is a systematic method for comparing watersheds based on characteristics that may influence the relative likelihood of successful watershed restoration or protection. RPS was developed to provide states and other planners with a flexible screening tool to guide prioritization of watersheds according to differences in key environmental and social factors affecting prospects for restoration and protection success.

RPS involves identifying a group of watersheds to be compared and a specific purpose for comparison, selecting appropriate indicators of recovery potential in three categories (Ecological, Stressor, and Social; Figure 1), and calculating recovery potential index scores for the watersheds. Index scores include the Ecological Index, Stressor Index, and Social Index and are calculated by combining indicators from each category. For example, the Ecological Index is calculated from all ecological indicators while the Stressor Index is calculated from all stressor indicators. In addition, an overall Recovery Potential Integrated (RPI) Index score is calculated by combining the Ecological Index, Stressor Index, and Social Index.



**Figure 1. RPS uses three categories of recovery potential indicators to compare watersheds.**

### 1.2. Excel RPS Tool

The Excel RPS Tool is a custom-coded workbook designed to facilitate setting up an RPS screening, perform all recovery potential index calculations, and display results. The Excel RPS Tool:

- Stores indicator data which characterize subwatershed conditions and characteristics.
- Contains a user-friendly interface for setting up a screening.
- Automatically calculates RPS index scores and ranks for the screened subwatersheds.
- Displays results in customizable table, plot, and map form.
- Can be readily updated with user-generated indicator data.

The Excel RPS Tool is designed for use by anyone with basic familiarity with Microsoft Excel. This User Guide provides detailed, step-by-step directions on how to use the tool.

### 1.3. File Versions

Multiple Excel RPS Tool files are available for download from the [EPA RPS website](#). These files are explained below:

- **Standard File:** The Standard File starts as a blank template which can be configured for any state in the contiguous U.S. and provides access to the most up-to-date HUC12 indicator data maintained by the EPA. Users begin by choosing their state of interest and the file imports indicator data for all HUC12 subwatersheds<sup>1</sup> in the selected state from the EPA's online indicator database (<https://gispub.epa.gov/arcgis/rest/services/r4/wsio/MapServer>).
- **Custom Files:** Custom Files have been developed for a subset of states and territories. Unlike the Standard File, these contain pre-loaded indicator data and do not import data from the EPA's online indicator database. The pre-loaded data typically includes indicators which have been calculated from state-specific or territory-specific

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<sup>1</sup> HUC12s are 12-digit hydrologic units from the National Watershed Boundary Dataset maintained by the US Geological Survey (USGS) and other federal agencies.

datasets in addition to national datasets. In some cases, these files allow users to screen additional or alternative watershed units beyond HUC12 subwatersheds (e.g., HUC14 subwatersheds).

- **Generic Template File:** The Generic Template File enables a user to define their own geographic area of interest (e.g., river basin or multi-state region) and add indicator data for up to three different watershed scales within that area of interest. Once a user has added watershed units and indicator data, a screening can be run to calculate the RPS indices, and results can be viewed in table or graph form. Mapping is not supported in this version of the Excel RPS Tool.
- **Legacy Files:** The Legacy Files were last updated in August 2022 and contain 300+ pre-loaded HUC12 indicators. Each file stores indicator data for a single state (e.g., the Maine file contains indicator data for all HUC12s in Maine). These files are no longer maintained with updated indicator data and have been replaced with the new Standard File described above that imports indicator data from the EPA’s online database for any user-selected state.

**Table 1. Comparison of Excel RPS Tool versions.**

Excel RPS Tool Version	Geographic Scope	Watershed Scale	Indicator Data
<b>Standard File</b>	Automatically configured for a user-selected state in the contiguous US	HUC12 subwatersheds only	Imported from the EPA’s online database of indicators calculated from national datasets
<b>Custom Files</b>	Pre-configured for an individual state or territory	Varies by file; may include multiple watershed scales in a single file	Pre-loaded with indicators calculated from state-specific, territory-specific, and national datasets
<b>Generic Template File</b>	Defined by user	Defined by user	Supplied by user
<b>Legacy Files</b>	Pre-configured for an individual state in the contiguous US	HUC12 subwatersheds only	Pre-loaded with indicators calculated from national datasets

#### 1.4. User Guide Organization

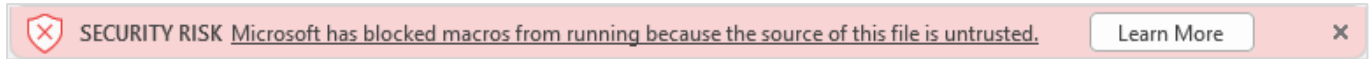
The Excel RPS Tool is made up of several worksheets within a Microsoft Excel workbook. Some worksheets contain interactive menus and buttons while others store data for viewing and use in RPS calculations.

Each section of this User Guide describes a worksheet in the Excel RPS Tool. Worksheet contents are summarized and step-by-step instructions are provided for interactive features within the worksheet. For some worksheets and features, a set of advanced tips are also provided for users that have become proficient in basic use of the tool.

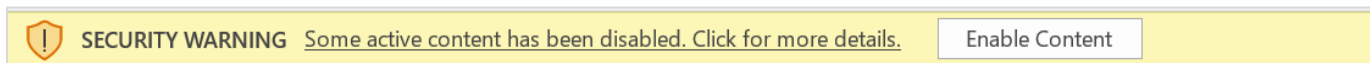
## 2. Enabling Macros

The Excel RPS Tool files contains macros but they are not a security risk. The macros are needed for the tool to function. The following instructions describe how to enable macros when first opening an Excel RPS Tool file.

1. If the red Security Risk banner is displayed (see image below), then follow steps a through c below. If the red Security Risk banner does not appear, skip to step 2.



- a. Remove **Mark of the Web** by following steps on this [Microsoft website](#). If this option is not available to you, or does not resolve the red Security Risk banner, move to step b.
  - b. **Change macro settings in the Trust Center** by following directions in the section titled “Change macro settings in the Trust Center” on this [Microsoft website](#). If your macros were already enabled, or this does not resolve the red Security Risk banner, move to step c.
  - c. Designate the folder containing your downloaded RPS Tool as a **Trusted Location** by following steps on this [Microsoft website](#).
2. If the yellow Security Warning banner is displayed (see image below), then click the *Enable Content* button to allow macros to run.



### 3. Instructions Worksheet

The **Instructions** worksheet provides an abridged set of instructions for using the Excel RPS Tool. The **Instructions** worksheet is intended to serve as a built-in reference for users of the Excel RPS Tool. It does not supplant the more detailed instructions presented in this User Guide.

Listed at the top of the **Instructions** are four key pieces of information for the tool file you are working with:

- **Project Area** – The state, river basin, or other geographic area that the file is configured to screen. This row will be blank if you are opening the Standard File for the first time and will be filled after defining a Project Area.
- **Watershed Scales** – The watershed scales that the file is configured to screen. The term “watershed scale” refers to pre-defined watershed delineations. A typical tool file is able to screen HUC12 subwatersheds. Some Custom Files are able to screen additional watershed scales such as 14-digit hydrologic units (HUC14s) or other custom watershed delineations created by state water agencies.
- **Version Date** – The date the file was last updated to add new user features or modify existing features.
- **Indicator Data Retrieval Date (Standard File Only)** – The date when indicator data were imported from the EPA’s online indicator database into the file. This row is only displayed in the Standard File and will be blank if you are opening the Standard File for the first time. The date will be filled after defining a Project Area.

Excel RPS Tool - Standard File

**Project Area:**  
**Watershed Scales:** HUC12  
**RPS Tool Version Date:** October 26, 2023  
**Indicator Data Retrieval Date:**

---

This file is coded to perform Recovery Potential Screening (RPS) calculations for HUC12 subwatersheds in a user-selected state. This procedure supports prioritization of HUC12s for restoration and protection activities using ecological, stressor, and social indicator data and summary index scores. For information about RPS, please visit [www.epa.gov/rps](http://www.epa.gov/rps).

This file should function properly in Excel 2016, 2019, 2021, and 365. The file will not function in Excel Online.

Below is a brief overview of how to use the Excel RPS Tool. Refer to the user guide for detailed, step-by-step directions. The user guide is provided in a zip folder along with this file and is also available at [www.epa.gov/rps/rps-training-and-user-support](http://www.epa.gov/rps/rps-training-and-user-support).

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**1. ENABLE MACROS**

This file contains macros, but they are not a security risk. The macros are needed for the tool to function. If a yellow **SECURITY WARNING** banner is displayed, click the **Enable Content** button. If a red **SECURITY RISK** banner is displayed, open the user guide and follow the directions in the Enabling Macro section.

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**2. DEFINE PROJECT AREA**

This file starts as a blank template that can be configured for any state in the contiguous U.S. Choose your state of interest by going to the **Define Project Area** worksheet.

INSTRUCTIONS | Notes | Setup | Results | Bubble\_Plot | Bubble\_Plot\_Options | HUC8\_Map

## 4. Define Project Area Worksheet

### 4.1. Overview

The **Define Project Area** worksheet is found in the Standard File only. The worksheet is used to configure the file for a specific state in the contiguous U.S. The file is configured by automatically retrieving and importing indicator data for all HUC12 subwatersheds in the selected state from the EPA's online indicator database.

Users should understand the following when using the **Define Project Area** worksheet:

- The **Define Project Area** worksheet is only visible when the Standard File is opened for the first time. The worksheet is no longer accessible after a user has selected a state. Users must download and open a fresh copy of the Standard File to import data for another state or to import updated indicator data.
- A working internet connection is needed to import indicator data from the EPA's online indicator database.
- Wait times of up to 5 minutes can be expected to retrieve indicator data for large states. Saving and closing other Microsoft files before clicking the **Define Project Area** button can reduce wait times and prevent performance issues.

This worksheet is used to customize this file by adding indicator data for any state in the contiguous U.S.

Click the **Define Project Area** button below to choose your state of interest. The tool will automatically retrieve indicator data for all HUC12 subwatersheds in the selected state from EPA's online indicator database (<https://gispub.epa.gov/arcgis/rest/services/r4/wsio/MapServer>).

Wait times of up to 5 minutes can be expected to retrieve data for large states. Saving and closing other Microsoft files before clicking the **Define Project Area** button can reduce wait times and prevent performance issues.

**DEFINE PROJECT AREA**

INSTRUCTIONS

**Define Project Area**

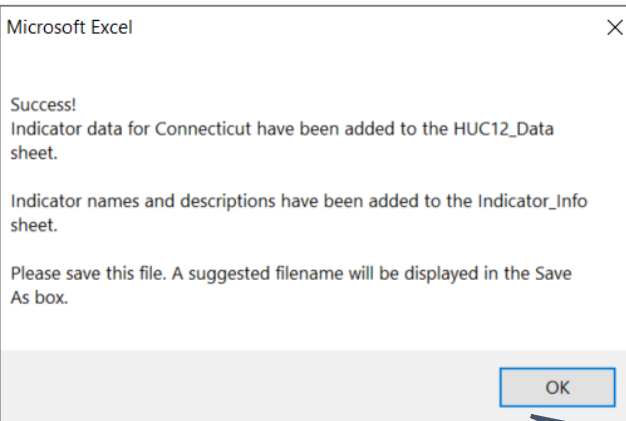
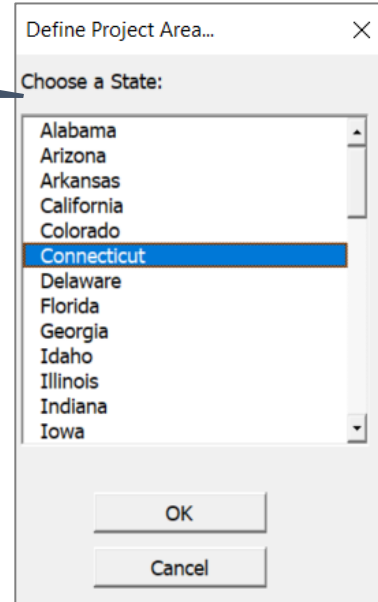
The following section describes how to use the **DEFINE PROJECT AREA** button to configure the file for a user-selected state.



To configure the file for a state, click the **DEFINE PROJECT AREA** button on the *Define Project Area* worksheet.

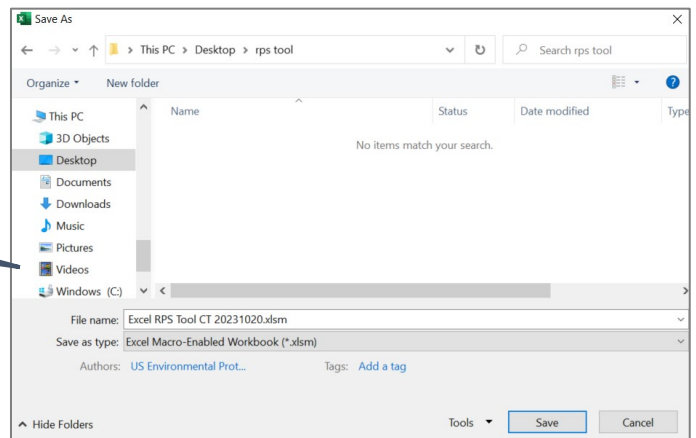
**DEFINE PROJECT AREA**

Click the up/down arrows to find your state of interest in the popup selection menu. Highlight the state name and click **OK**.



A popup message will display after the file imports indicator data from the EPA's online HUC12 database for the selected state. Click **OK**.

The *Save As* prompt will appear with a suggested filename that includes the selected state and date. Navigate to the preferred folder for saving the file and edit the file name as desired. Click **Save** to save the file.



## 5. Setup Worksheet

### 5.1. Overview

#### Basics

The **Setup** worksheet is your “home base” for configuring and running a Recovery Potential Screening. It is the first worksheet you should use after opening the tool file, reviewing instructions, and planning your Recovery Potential Screening run. The **Setup** worksheet is the only worksheet where you can choose (and change) the watersheds and indicators that are used in your screening run.

The screenshot displays the 'Setup Worksheet' interface with four main sections for selecting indicators and watersheds. At the top, there are buttons for 'RUN SCREENING' and 'RESET SCREENING'. Below these are four columns:

- Select Watersheds:** Includes instructions, a 'Select Watersheds' button, a 'Clear Watershed Selections' button, and a table with 'HUC12 ID' as the header.
- Select Ecological Indicators:** Includes instructions, a 'Select Ecological Indicators' button, a 'Clear Ecological Indicator Selections' button, and a table with 'Ecological Indicator' and 'Weight' columns.
- Select Stressor Indicators:** Includes instructions, a 'Select Stressor Indicators' button, a 'Clear Stressor Indicator Selections' button, and a table with 'Stressor Indicator' and 'Weight' columns.
- Select Social Indicators:** Includes instructions, a 'Select Social Indicators' button, a 'Clear Social Indicator Selections' button, and a table with 'Social Indicator' and 'Weight' columns.

At the bottom, a navigation bar contains tabs for 'INSTRUCTIONS', 'Notes', 'Setup' (highlighted with a red box), 'Results', 'Bubble\_Plot', 'Bubble\_Plot\_Options', and 'HUC8\_Map'.

The **Setup** worksheet is organized into four sections:

- In the **Select Watersheds** section you will specify which watersheds will be included in the screening.
- In the **Select Ecological Indicators** section you will specify which ecological indicators will be used in the screening and how those ecological indicators will be weighted.
- In the **Select Stressor Indicators** section you will specify which stressor indicators will be used in the screening and how those stressor indicators will be weighted.
- In the **Select Social Indicators** section you will specify which social indicators will be used in the screening and how those social indicators will be weighted.

After selecting watersheds, indicators, and weights, you will click the **RUN SCREENING** button to populate other worksheets in the tool with screening results. The **Setup** worksheet also includes a **RESET SCREENING** button to clear the current watershed/indicator selections from the **Setup** worksheet and screening results from other worksheets so that a new screening run can be configured from scratch.

The following sections provide step-by-step instructions for how to:

- **Choose Watershed Scale**
- **Select Watersheds to Screen**
- **Select Indicators and Weights**
- **Run Screening Button**
- **Respond to Warning Messages**
- **Reset Screening Button**

### Advanced Tips

- Completing the setup process is far easier if you have already planned out your screening by identifying the screening purpose, watersheds of interest, and relevant indicators (from the full list available) beforehand.
- The process of selecting watersheds and indicators to screen can be streamlined by copying and pasting watershed IDs, indicator names, and indicator weights that have already been compiled in other spreadsheets. This is faster than typing or selecting individually from popup menus on the **Setup** worksheet. Instructions for copying and pasting watersheds and indicators into the **Setup** worksheet are provided in the following sections.
- After setting up and running a screening, you may want to make minor adjustments to your screening by adding or removing watersheds, adding or removing indicators, or adjusting indicator weights. Do not click the **RESET SCREENING** button on the **Setup** worksheet if you want to make minor adjustments to an existing screening since clicking the **RESET SCREENING** button will clear all selections from the **Setup** worksheet. Instead, to adjust an existing screening, simply make the desired changes on the **Setup** worksheet and then re-click the **RUN SCREENING** button. This will update results stored on other worksheets to reflect the changes made to watershed and indicator selections on the **Setup** worksheet.
- Save completed screening runs and change the file name before beginning a new run with different watersheds or indicators, or before using **RESET SCREENING**.

## 5.2. Choose Watershed Scale

### Basics

Some Custom Files are pre-loaded with indicator data for multiple watershed scales (e.g., HUC12 and HUC14 subwatersheds). If your tool file includes multiple watershed scales, you must specify which scale your screening will consider on the **Setup** worksheet.

Watershed scale options are displayed right below the **Select Watersheds** section title on the **Setup** worksheet.

To select a watershed scale, click the option button next to the watershed scale name.

If your RPS tool contains watershed data at one scale only, there will be no options buttons visible.

**Select Watersheds**

Select watersheds to include in the screening by clicking the *Select Watersheds* button below. To clear your selections, click the *Clear Watershed Selections* button.

HUC12     HUC14

HUC12 ID

### Advanced Tips

- Users must select only **one** watershed scale per screening run (i.e., you cannot screen watersheds from multiple scales in a single screening run).
- Clicking a watershed scale button will prepare the watershed and indicator popup menus on the **Setup** worksheet for next steps. For example, clicking the HUC12 option button will add HUC12 IDs to the popup menu displayed when the **Select Watersheds** button is clicked.
- Be aware that changing to a different watershed scale will reset the **Setup** worksheet by clearing any selected watersheds, indicators, and weights. If you have begun to setup your screening run by entering watersheds, indicators, or weights on the **Setup** worksheet then those entries will be deleted if you click a different watershed scale button and will not be recovered by returning to the original scale.

### 5.3. Select Watersheds to Screen

#### Basics

A Recovery Potential Screening run can include all watersheds in the Project Area that the Excel RPS Tool is designed for or a targeted subset of watersheds of interest. Users must decide which watersheds to screen based on the purpose and goals of their screening.

In the **Select Watersheds** section of the **Setup** worksheet, you will specify which watersheds to include in the screening by entering a list of watershed IDs (one ID per row). Four options are available for entering watersheds IDs.

**Select Watersheds to Screen Option 1 – Add All Watersheds**

Click the *Select Watersheds* button. A popup menu will display with a list of watershed IDs that can be selected for the screening.

**Select Watersheds**

Select watersheds to include in the screening by clicking the *Select Watersheds* button below. To clear your selections, click the *Clear Watershed Selections* button.

HUC12     HUC14

*Select Watersheds*

*Clear Watershed Selections*

HUC12 ID

Select Watersheds...

**Select from list of watersheds**

Select watersheds to include in your screening by highlighting their names in the box below and clicking the Add Selected Watersheds button.

Or click the Add All Watersheds button to select all watersheds for your screening.

*Add Selected Watersheds*

*Add All Watersheds*

**Named Subset from the HUC\_Subsets Sheet**

Select from a subset of watersheds by selecting the subset of interest from the drop-down menu and clicking the Added Selected Subset button. This option is only available one of more watershed subsets have been defined on the HUC\_Subsets worksheet.

*Add Selected Subset*

*Exit*

**Select Watersheds**

Select watersheds to include in the screening by clicking the *Select Watersheds* button below. To clear your selections, click the *Clear Watershed Selections* button.

HUC12     HUC14

*Select Watersheds*

*Clear Watershed Selections*

HUC12 ID

020200070101 (Lake Mohawk-Walkill River)
020200070102 (Papakating Creek)
020200070103 (Beaver Run-Walkill River)
020200070104 (Quarryville Brook-Walkill River)

Click the *Add All Watersheds* button. This will select all watersheds for the screening by adding the full list of watershed IDs to column A of the **Setup** worksheet.

**Select Watersheds to Screen Option 2 –  
Select Watersheds Individually**

Click the **Select Watersheds** button. A popup menu will display with a list of watershed IDs that can be selected for the screening.

**Select Watersheds**  
Select watersheds to include in the screening by clicking the **Select Watersheds** button below. To clear your selections, click the **Clear Watershed Selections** button.

HUC12     HUC14

**Select Watersheds**

**Clear Watershed Selections**

HUC12 ID
----------

In the popup menu, highlight the watersheds you would like to include in your screening by clicking on their IDs/names.

Multiple watersheds can be highlighted by dragging the mouse cursor down or by holding the Ctrl key and then clicking on each watershed ID individually.

Select Watersheds...

**Select from list of watersheds**  
Select watersheds to include in your screening by highlighting their names in the box below and clicking the **Add Selected Watersheds** button.  
Or click the **Add All Watersheds** button to select all watersheds for your screening.

020200070101 (Lake Mohawk-Walkill River)
020200070102 (Papakating Creek)
020200070103 (Beaver Run-Walkill River)
020200070104 (Quarryville Brook-Walkill River)
020200070201 (Upper Wawayanda Creek)
020200070202 (Lower Wawayanda Creek)
020200070203 (Upper Pochuck Creek)
020200070206 (Rutgers Creek)
020200070207 (Lower Pochuck Creek-Walkill River)
020301010404 (Sparkill Creek-Hudson River)
020301010405 (East River-Hudson River)
020301030101 (Upper Wanaque River)
020301030102 (Ringwood River)
020301030103 (Lower Wanaque River)
020301030203 (Mahwah River)
020301030204 (Middle Ramapo River)
020301030205 (Lower Ramapo River)
020301030301 (Upper Whippany River)
020301030302 (Troy Brook)
020301030303 (Lower Whippany River)

**Add Selected Watersheds**

**Add All Watersheds**

**Named Subset from the HUC\_Subsets Sheet**  
Select from a subset of watersheds by selecting the subset of interest from the drop-down menu and clicking the **Add Selected Subset** button. This option is only available if one or more watershed subsets have been defined on the HUC\_Subsets worksheet.

**Add Selected Subset**

**Exit**

Click the **Add Selected Watersheds** button to add the highlighted watersheds to the list of watershed IDs for screening.

You still have the opportunity to select additional watersheds after clicking the **Add Selected Watersheds** button. Repeat the previous step until all watersheds of interest have been selected for the screening, then click the **Exit** button to close the popup menu.

**Select Watersheds**  
Select watersheds to include in the screening by clicking the **Select Watersheds** button below. To clear your selections, click the **Clear Watershed Selections** button.

HUC12     HUC14

**Select Watersheds**

**Clear Watershed Selections**

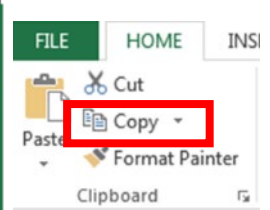
HUC12 ID
020200070104 (Quarryville Brook-Walkill River)
020200070201 (Upper Wawayanda Creek)
020200070202 (Lower Wawayanda Creek)
020200070203 (Upper Pochuck Creek)
020200070206 (Rutgers Creek)
020200070207 (Lower Pochuck Creek-Walkill River)
020301010404 (Sparkill Creek-Hudson River)

**Select Watersheds to Screen Option 3 – Copy and Paste Watershed IDs**

To use this option, you must already have a pre-existing list of watershed IDs to screen in a separate worksheet or file. The list of watershed IDs must be formatted with one ID per row.

Open the worksheet containing the pre-existing list of watershed IDs to screen. Select the list and click “Copy” on the Excel menu.

20200070104
20200070201
20200070202
20200070203
20200070206
20200070207
20301010404



Go back to the *Setup* worksheet and set the cursor to cell A24 (the first cell of the watershed ID list in the **Select Watersheds** section).

**Select Watersheds**

Select watersheds to include in the screening by clicking the *Select Watersheds* button below. To clear your selections, click the *Clear Watershed Selections* button.

HUC12     HUC14

Select Watersheds

Clear Watershed Selections

HUC12 ID

24

Choose “Paste Values” from the Excel menu to paste the watershed IDs into the **Select Watersheds** section.

HUC12 ID	
20200070104	
20200070201	
20200070202	
20200070203	
20200070206	
20200070207	
20301010404	

**Select Watersheds to Screen Option 4 – Add a Watershed Subset from the HUC Subsets Sheet**

To use this option, you must already have a subset of watersheds defined on the *HUC\_Subsets* worksheet. A subset is a list of watersheds that meet certain user-defined selection criteria, such as minimum levels of agricultural land cover or impervious cover. See Section 13 (HUC Subsets Worksheet) of this guide for step-by-step instructions on how to define a watershed subset.

Click the *Select Watersheds* button. This displays the watershed selection popup menu.

**Select Watersheds**

Select watersheds to include in the screening by clicking the *Select Watersheds* button below. To clear your selections, click the *Clear Watershed Selections* button.

HUC12     HUC14

Select Watersheds

Clear Watershed Selections

HUC12 ID

Select Watersheds...

**Select from list of watersheds**  
 Select watersheds to include in your screening by highlighting their names in the box below and clicking the Add Selected Watersheds button.  
 Or click the Add All Watersheds button to select all watersheds for your screening.

020200070101 (Lake Mohawk-Walkill River)  
 020200070102 (Papakating Creek)  
 020200070103 (Beaver Run-Walkill River)  
 020200070104 (Quarryville Brook-Walkill River)  
 020200070201 (Upper Wawayanda Creek)  
 020200070202 (Lower Wawayanda Creek)  
 020200070203 (Upper Pochuck Creek)  
 020200070206 (Rutgers Creek)  
 020200070207 (Lower Pochuck Creek-Walkill River)  
 020301010404 (Sparkill Creek-Hudson River)  
 020301010405 (East River-Hudson River)  
 020301030101 (Upper Wanaque River)  
 020301030102 (Ringwood River)  
 020301030103 (Lower Wanaque River)  
 020301030203 (Mahwah River)  
 020301030204 (Middle Ramapo River)  
 020301030205 (Lower Ramapo River)  
 020301030301 (Upper Whippany River)  
 020301030302 (Troy Brook)  
 020301030303 (Lower Whippany River)

Add Selected Watersheds  
 Add All Watersheds

**Named Subset from the HUC\_Subsets Sheet**  
 Select from a subset of watersheds by selecting the subset of interest from the drop-down menu and clicking the Added Selected Subset button. This option is only available if one or more watershed subsets have been defined on the HUC\_Subsets worksheet.

New Jersey HUC12 Subset

Add Selected Subset  
 Exit

Click the *Named Subset from the HUC\_Subsets Sheet* option. This activates the drop-down menu containing the names of watershed subsets that have been defined on the *HUC\_Subsets* worksheet. The drop-down menu will be blank if you have not yet defined a watershed subset.

Choose the name of the watershed subset that you would like to add to the screening.

Click the *Add Selected Subset* button to add the watersheds in the subset to the list of watershed IDs for screening. The selected subset will appear in column A of the *Setup* sheet.

	Select Watersheds
13	Select watersheds to include in the screening by clicking the <i>Select Watersheds</i> button below. To clear your selections, click the <i>Clear Watershed Selections</i> button.
14	
15	<input checked="" type="radio"/> HUC12 <input type="radio"/> HUC14
16	
17	Select Watersheds
18	
19	Clear Watershed Selections
20	
21	HUC12 ID
22	
23	020301040403
24	020301040404
25	020301040405
26	020302020903
27	020402010101
28	



## Advanced Tips

- The watershed ID list in the **Select Watersheds** section must begin in cell A24 of the **Setup** worksheet and must contain one watershed ID per row.
- Watershed names alone cannot be added to the watershed ID list. Watershed names can be included in the text but must occur after the watershed ID. For example, the Jacks River HUC12 (HUC12 ID 031501010102) can be entered as “031501010102” or “031501010102 (Jacks River)” but not “Jacks River”.
- When manually typing watershed IDs or copying and pasting from another worksheet, be sure that all IDs are present in column A of the **Indicator Data** worksheet for the watershed scale you are screening (e.g., the **HUC12\_Data** worksheet HUC12 subwatersheds are being screened). The tool cannot screen watersheds that are not present in the **Indicator Data** worksheet.
- Use the **HUC Subsets** worksheet to store lists of watershed IDs that will be of interest for future screenings. For example, you can use the **HUC Subsets** worksheet to store lists of HUC12 IDs within each HUC8 in the Project Area.
- Do not omit leading zeros from watershed IDs (e.g., “04030001” cannot be entered as “4030001”). Omitting leading zeros will cause errors in the screening run.
- If HUC8 watersheds are being screened, the first 8 characters in each watershed ID are used to extract indicator values from the indicator data worksheet. Any text after the eighth character is ignored. Similarly, if HUC12 subwatersheds are being screened, only the first 12 characters in each watershed ID are used to extract indicator values from the indicator data sheet. This concept applies across all watershed scales.

#### 5.4. Select Indicators and Weights

RPS index scores and ranks are calculated for each watershed included in a screening using ecological, stressor, and social indicators. The choice of which indicators to use for a screening depends on the purpose of the screening and the nature of the watersheds being screened. Thus, users should review the full list of indicators and their definitions in the **Indicator Info** worksheet before selecting indicators on the **Setup** worksheet.

##### Basics

At least one ecological indicator, one stressor indicator, and one social indicator must be selected in order to perform a Recovery Potential Screening run. Neutral indicator values are available in each category if one or more categories are not of interest. In general, three to ten indicators per category are recommended. If too few indicators are selected, index scores will not adequately reflect the factors influencing recovery potential. If too many indicators are selected, index scores will reflect random noise in the indicator data rather than true patterns in recovery potential.

Indicator weights determine the relative influence of each indicator on index scores. Weights must be numeric but any set of numeric values can be used. A typical approach is to select a certain number of weight categories (e.g., 3 = high; 2 = medium; 1 = low) and assign weights to indicators based on their relevance to the purpose of the screening and data quality considerations.

Two options are available for selecting indicators and weights on the **Setup** worksheet. Step-by-step instructions for each option are provided on the following pages.

**Select Indicators and Weights Option 1 – Select from Popup Menu**

Click on the *Select Ecological Indicators* button. A popup menu will display a list of ecological indicators that can be selected for the screening.

**Select Ecological Indicators**  
 Select ecological indicators to include in the screening by clicking the *Select Ecological Indicators* button below. To clear your selections, click the *Clear Ecological Indicator Selections* button.

*Select Ecological Indicators*

*Clear Ecological Indicator Selections*

Ecological Indicator	Weight

By default, the list will include all ecological indicators that are available for the screening. Users can filter the list to display groups of indicators by subcategory. Example subcategories include forest cover or wetland cover.

To filter the list by subcategory, select the subcategory of interest from the drop-down menu.

Select Ecological Indicators...

Use this menu to select Ecological indicators for your screening.

By default, the box below displays a list of all Ecological indicators available for screening. To view smaller groups of indicators, choose an indicator subcategory from the drop-down list

Double-click any indicator name in the box to view its description.

Forest Cover

- % Forest in WS (2016)
- % Forest in HCZ (2016)
- % Forest in RZ (2016)
- % Forest Change in WS (2001-16)
- % Forest Change in HCZ (2001-16)
- % Forest Change in RZ (2001-16)
- % Forest Remaining in WS

*Add Selected Indicators*

*Exit*

Highlight the indicators you would like to include in your screening by clicking on their name.

Double-clicking an indicator name will display a popup box with its description.

Click the *Add Selected Indicators* button to add the highlighted indicators to the list of indicators selected for the screening.

You still have the opportunity to select additional indicators after clicking the *Add Selected Indicators* button. Repeat the previous step until all indicators of interest have been selected for the screening then click the *Exit* button to close the popup menu.

By default, indicators selected from the popup menu will be assigned a weight of 1.

Indicator weights can be adjusted by placing the cursor on the cell containing the weight and typing in a new weight.

**Select Ecological Indicators**  
 Select ecological indicators to include in the screening by clicking the *Select Ecological Indicators* button below. To clear your selections, click the *Clear Ecological Indicator Selections* button.

*Select Ecological Indicators*

*Clear Ecological Indicator Selections*

Ecological Indicator	Weight
% Woody Vegetation (2006) in Riparian Zone	2
% Natural Cover, N-index1 (2006) in Watershed	1
NFHAP Habitat Condition Index	1

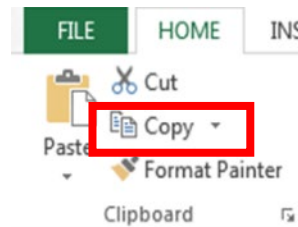
Repeat these steps in the **Select Stressor Indicators** section to select stressor indicators and weights and again in the **Select Social Indicators** section to select social indicators and weights.

**Select Indicators and Weights Option 2 – Copy and Paste Indicator List**

To use this option, you must already have a pre-existing list of ecological indicator names and weights stored in a separate worksheet or file. The pre-existing indicator list must be formatted with one indicator per row, with the indicator name in the first column and the indicator weight in the second column.

Open the worksheet with the pre-existing indicator list. Select the indicator names and weights and click “Copy” on the Excel menu.

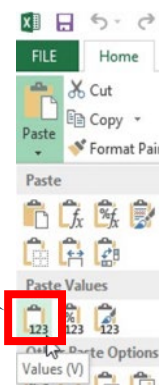
% N-Index1 in WS (2011)	2
Soil Stability, Mean in WS	1
% National Ecological Framework (NEF) in WS (2001)	1



	C	D
13	<b>Select Ecological Indicators</b>	
14	Select ecological indicators to include in the screening by clicking the	
15	Select Ecological Indicators button below. To clear your selections, click	
16	the Clear Ecological Indicator Selections button.	
17		
18		
19	Select Ecological Indicators	
20		
21	Clear Ecological Indicator Selections	
22		
23	<b>Ecological Indicator</b>	<b>Weight</b>
24		
25		
26		

Go back to the *Setup* worksheet and set the cursor to cell C24 (the first cell of the indicator list in the Ecological Indicators section).

Select “Paste Values” from the Excel menu to paste the ecological indicators and weights into the **Select Ecological Indicators** section.



	C	D
13	<b>Select Ecological Indicators</b>	
14	Select ecological indicators to include in the screening by clicking the	
15	Select Ecological Indicators button below. To clear your selections, click	
16	the Clear Ecological Indicator Selections button.	
17		
18		
19	Select Ecological Indicators	
20		
21	Clear Ecological Indicator Selections	
22		
23	<b>Ecological Indicator</b>	<b>Weight</b>
24	% N-Index1 in WS (2011)	2
25	Soil Stability, Mean in WS	1
26	% National Ecological Framework (NEF) in WS (2001)	1
27		
28		

Repeat these steps in the **Select Stressor Indicators** section to select stressor indicators and weights and again in the **Select Social Indicators** section to select social indicators and weights.

### Advanced Tips

- The Ecological Indicator list must begin in cell C24 of the **Setup** worksheet and must contain one indicator per row.
- The Stressor Indicator list must begin in cell G24 of the **Setup** worksheet and must contain one indicator per row.
- The Social Indicator list must begin in cell K24 of the **Setup** worksheet and must contain one indicator per row.
- The Ecological, Stressor, and Social Indicator lists must be continuous (no blank rows). If blank rows are present, any indicators below the first blank row will not be included in the screening.
- When viewing the lists of available Ecological, Stressor, and Social indicators, remember that the lists can be filtered to only display indicators within a subcategory of interest. When selecting indicators in multiple subcategories, users should click the **Add Selected Indicators** button before changing to a different subcategory.
- When copying and pasting from another worksheet, be sure that indicator names exactly match names in the header row (row 7) of the **Indicator Data** worksheet for the selected watershed scale (e.g., the **HUC12\_Data** worksheet if HUC12 subwatersheds are being screened). Any differences in indicator spelling, capitalization, or whitespace will result in errors when the screening is run.
- Indicator weights can be set to zero. A weight of zero means that the indicator has no effect on index scores.
- Indicator weights can be set to negative values. A negative weight will reverse the directional effect of the indicator on index scores. The standard directionality is for larger indicator values to increase Ecological Index, Stressor, and Social Index scores. A negative weight will reverse directionality so that smaller values increase Ecological Index, Stressor, and Social Index scores.
- For ecological indicators, higher numbers correspond to healthier conditions; for stressor indicators, higher numbers indicate greater stress on watershed processes and aquatic ecosystems; for social indicators, higher numbers correspond to more favorable characteristics for watershed prioritization.
- Indicator selections within each category (Ecological, Stressor, and Social) should be topically diverse. A diverse set of indicators will reflect a range of factors relevant to recovery potential rather than one single topic.
- Users may want to consider numeric redundancy as part of the indicator selection process. Non-redundant indicators can be identified by examining correlation coefficients between indicator pairs.
- Up to 20 indicators can be selected in each category.

## 5.5. Run Screening Button

### Basics

After selecting watersheds, indicators, and weights for your screening, use the **RUN SCREENING** button to auto-calculate Ecological Index, Stressor Index, Social Index, and Recovery Potential Integrated (RPI) Index scores for each watershed. Clicking the **RUN SCREENING** button will populate other worksheets in the Excel RPS Tool with screening results. Any results from previous screenings will be cleared from other worksheets in the Excel RPS Tool when the **RUN SCREENING** button is clicked.

When the **RUN SCREENING** button is clicked from the **Setup** worksheet, the tool will first check to verify that watersheds, indicators, and weights have been selected by the user. The tool will then look for potential issues with indicator data.

If no data issues are found, index scores will be automatically calculated and screening results will be added to other worksheets in table, plot, and map form. If indicators data issues are identified, a warning message will appear. Indicator data warnings are described in the next section.

After auto-calculating index scores and populating worksheets with the screening results, a message box will appear to notify you that your screening successfully ran to completion.

If your screening includes several thousand watersheds, processing times of up to 1 minute can be expected before the message box appears.

Click **OK** and then proceed to other worksheets to review screening results.

## Advanced Tips

- After clicking the **RUN SCREENING** button an error message may appear. A screening will not successfully run to completion and an error message will be displayed if any of the following errors occur:
  - Watersheds, indicators, and/or weights are not specified.
  - One or more watershed IDs entered in the **Select Watersheds** section do not have an exact match in column A of the **Indicator Data** worksheet for the watershed scale you are screening (e.g., the **HUC12\_Data** worksheet if HUC12 subwatersheds are being screened).
  - One or more indicator names entered in the **Select Ecological Indicators**, **Select Stressor Indicators**, or **Select Social Indicators** sections do not have an exact match in the header row of the **Indicator Data** worksheet (e.g., the **HUC12\_Data** worksheet if HUC12 subwatersheds are being screened).
  - One or more of the indicators selected for the screening contain non-numeric data in the **Indicator Data** worksheet. Indicator data must be numeric (blank cells are allowed for missing data).

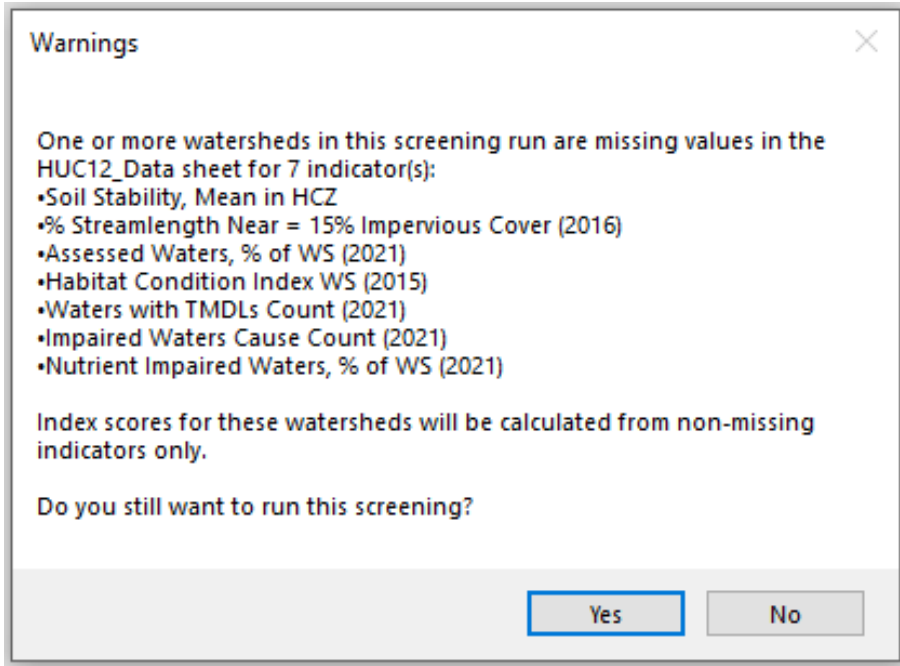
## 5.6. Respond to Warning Messages

### Basics

After clicking the **RUN SCREENING** button on the **Setup** worksheet, the tool will automatically check for potential issues with indicator data, including:

- **Missing indicator values.** In most cases, each indicator will have a numeric value for every watershed selected for the screening in the **Indicator Data** worksheet. However, indicator values may be missing for one or more watersheds. Missing indicator values are denoted as blank cells in the **Indicator Data** worksheet. If a watershed is missing indicator values, then RPS index scores for that watershed will be calculated from non-missing indicators only. In rare cases, a watershed will be missing values of all ecological, stressor, and social indicators selected for the screening. If a watershed is missing values for all indicators, RPS index scores cannot be calculated for that watershed.
- **Equal-value indicators.** Equal value indicators are indicators that have the same exact value for every watershed selected for the screening. Equal value indicators therefore provide no information on recovery potential differences between watersheds. RPS index calculations are based on the assumption that indicator values vary between watersheds and cannot be applied to equal value indicators. An equal-value indicator can be included in a screening but normalized values of the equal-value indicator are set to 0.5 for all watersheds to prevent index calculation errors.

After clicking the **RUN SCREENING** button, a message box will appear if the tool finds any indicator data issues. The warning message will notify users if missing indicator data or equal-value indicators were found and will list the names of indicators with issues. Users have the option to continue the screening by clicking **Yes** on the message box or to stop the screening to adjust indicator selections by clicking **No**.





### Advanced Tips

- Users can remove indicators with missing values or equal-value indicators by clicking **No** on the warning message box and deleting the names of indicators from the **Select Ecological Indicators**, **Select Stressor Indicators**, and/or the **Select Social Indicators** sections.
- Decisions on whether to remove indicators with missing values can be based on the number of watersheds with missing data. Missing indicator values are denoted as blank cells on the indicator data worksheet. As the number of watersheds with missing data increases, the value of the indicator for describing recovery potential differences between watersheds decreases. If most of the watersheds selected for screening are missing values of an indicator, it is likely advantageous to remove that indicator from the screening, particularly if it can be replaced with another indicator with a more complete record that describes a similar watershed characteristic.
- Equal-value indicators should be removed from a screening since they provide no information on recovery potential differences between watersheds. The exception is when a user intentionally selects an equal-value indicator as the only indicator for one of the Ecological, Stressor, or Social groups to evaluate the effect on RPI index scores. For example, selecting an equal-value indicator as the only Social indicator will nullify the effect of Social Index scores on the RPI Index since all watersheds will receive an equal Social Index score.

### 5.7. Reset Screening Button

The **RESET SCREENING** button on the **Setup** worksheet can be used to produce a “clean slate” version of the Excel RPS Tool. Do not click the **RESET SCREENING** button unless you have saved the current screening setup and results under a separate filename or you are sure you do not want to store the current screening setup and results for future use.

Clicking the **RESET SCREENING** button will clear all watershed and indicator selections from the **Setup** worksheet and any screening results stored on other worksheets. The only worksheets not affected are the **Indicator Data** worksheets (e.g., **HUC12\_Data**).

The screenshot shows the 'RUN SCREENING' section of the Excel RPS Tool. The 'RESET SCREENING' button is highlighted with a red box. Below it are three main sections: 'Select Watersheds', 'Select Ecological Indicators', 'Select Stressor Indicators', and 'Select Social Indicators'. Each section contains a list of indicators with columns for 'Indicator' and 'Weight'. The 'Setup' worksheet is active in the Excel interface.

Ecological Indicator		Weight
% Woody Vegetation in RZ (2016)		3
% N-Index2 in HCZ (2016)		3
Soil Stability, Mean in HCZ		2
Habitat Condition Index WS (2015)		2

Stressor Indicator		Weight
% Developed, Low Intensity in WS (2016)		2
% Agriculture in WS (2016)		2
% Streamlength Near ≥ 15% Impervious Cover (2016)		2
Synthetic Nitrogen Fertilizer Application in WS		3
Impaired Waters Cause Count (2021)		3
Nutrient Impaired Waters, % of WS (2021)		3

Social Indicator		Weight
% Protected Land, All Types (2019)		1
Nonpoint Control Projects Count		1
Assessed Waters, % of WS (2021)		2
Waters with TMDLs Count (2021)		3

## 6. Notes Worksheet

The **Notes** worksheet provides users with a space to document information related to their screening run, including a screening run name, screening objectives, watershed scale screened, and notes on indicator selection and weighting.

Filling the **Notes** worksheet is optional, its contents are not used in any of the auto-calculation methods in the Excel RPS Tool.

6	<b>Screening Run Name:</b>	New Jersey Urban/Suburban Nutrient Screening
7		
8	<b>Objectives:</b>	Identify New Jersey HUC12s with significant urban/suburban sources of
9		nutrients that are restoration priorities
10	<b>Watershed Scale:</b>	HUC12
11		
12	<b>Indicator Selection Notes:</b>	Focus on indicators relevant to recovery from urban/suburban sources of nutrients.
13		
14		

< > ... | INSTRUCTIONS | **Notes** | Setup | Results | Bubble\_Plot | Bubble\_Plot\_Options | HUC8\_Map

## 7. Results Worksheet

### 7.1. Overview

#### Basics

The **Results** worksheet displays a table of Ecological Index, Stressor Index, Social Index, and Recovery Potential Integrated (RPI) Index scores and ranks for each watershed selected for screening. Also displayed are values of the ecological, stressor, and social indicators selected for the screening. All base indicator values are also displayed to allow for sorting or filtering according to base indicator values.

Index scores and ranks are automatically calculated and added to the **Results** worksheet after clicking the **RUN SCREENING** button on the **Setup** worksheet. Watersheds are displayed in the same order as they are entered in the **Select Watersheds** section of the **Setup** worksheet.

Ecological Index, Stressor Index, and Social Index scores are calculated as the average of weight-adjusted, normalized indicator values. RPI scores are calculated from Ecological Index, Stressor Index, and Social Index scores. Index scores can be interpreted using the following guidelines:

- **Higher** Ecological Index scores correspond to **higher** recovery potential.
- **Lower** Stressor Index scores correspond to **higher** recovery potential.
- **Higher** Social Index scores correspond to **higher** recovery potential.
- **Higher** RPI Index scores correspond to **higher** recovery potential.

Watershed ID	Watershed Name	Ecological Index	Ecological Rank	Stressor Index	Stressor Rank	Social Index	Social Rank	RPI Score	RPI Rank
020200070101	Lake Mohawk-Walkkill River	44.87	107	9.61	25	33.24	141	56.17	66
020200070102	Papakating Creek	39.90	152	25.99	139	38.13	64	50.68	125
020200070103	Beaver Run-Walkkill River	38.35	165	11.87	44	31.57	196	52.69	102
020200070104	Quarryville Brook-Walkkill River	48.88	82	14.05	54	35.40	107	56.74	60
020200070201	Upper Wawayanda Creek	45.38	104	8.89	24	31.59	195	56.03	70
020200070202	Lower Wawayanda Creek	43.97	119	22.58	114	36.10	100	52.50	103
020200070203	Upper Pochuck Creek	38.91	159	24.17	122	7.57	270	40.77	232
020200070206	Rutgers Creek	36.79	179	11.22	38	27.83	259	51.13	123
020200070207	Lower Pochuck Creek-Walkkill River	38.68	162	22.41	112	6.59	271	40.95	229
020301010404	Sparkill Creek-Hudson River	15.97	258	25.54	136	27.60	260	39.34	242
020301010405	East River-Hudson River	17.07	255	44.95	244	35.24	110	35.79	256
020301030101	Upper Wanaque River	41.60	142	9.93	29	36.83	87	56.17	67
020301030102	Ringwood River	44.75	111	3.27	7	38.77	51	60.09	45

#### Advanced Tips

- The formula used to calculate each weight-adjusted normalized indicator value is:

$$Ind_{Norm} = Weight * \frac{(Ind - Ind_{Min})}{(Ind_{Max} - Ind_{Min})}$$

where  $Ind_{Norm}$  is the weight-adjusted normalized indicator value,  $weight$  is the indicator weight,  $Ind$  is the raw indicator value,  $Ind_{Min}$  is the minimum indicator value for watersheds selected for screening, and  $Ind_{Max}$  maximum indicator value for watersheds selected for screening.

- RPI scores are calculated from Ecological Index, Stressor Index, and Social Index scores using the formula:

$$RPI = \frac{[Ecological\ Index + Social\ Index + (100 - Stressor\ Index)]}{3}$$

- Ecological Index, Social Index, and RPI Index ranks are determined by sorting index scores from highest to lowest (i.e., the watershed with the highest Ecological Index score receives a rank of 1).
- Stressor Index ranks are determined by sorting index scores from lowest to highest (i.e., the watershed with the lowest Stressor Index score receives a rank of 1).

## 7.2. Sort and Filter

By default, the **Results** table displays indicator data and index scores for all watersheds included in the screening and sorted by watershed ID. Users can sort the **Results** table based on values in any column in the table (e.g., from highest to lowest Ecological Index score). Users can also filter the **Results** table to only display watersheds that meet certain criteria (e.g., watersheds within a particular ecoregion).

To sort the **Results** table, right-click on the name of the column that you would like to use for sorting. Scroll to **Sort** in the popup menu and select a sorting option.

% Riparian Zone (R7) in Watershed	% Hydrologically Connect
67705639	
75266778	
56091445	
58351704	
63491534	
06067519	
03809443	
60551596	
23969159	
23682768	
60131782	
55719195	
61391447	
08013937	
43142814	

**EcoRegion (2010) Level 3, 1st Code (Largest Area)**

- Sort Smallest to Largest
- Sort Largest to Smallest
- Sort by Color
- Clear Filter From "EcoRegion (2010) ..."
- Filter by Color
- Number Filters

Search

- (Select All)
- 65
- 66
- 67
- 68
- 69
- 71
- 73
- 74

OK Cancel

To filter the **Results** table, click the drop-down arrow next to the column you would like to use to filter and select a filter option.

### 8. Bubble Plot Worksheet

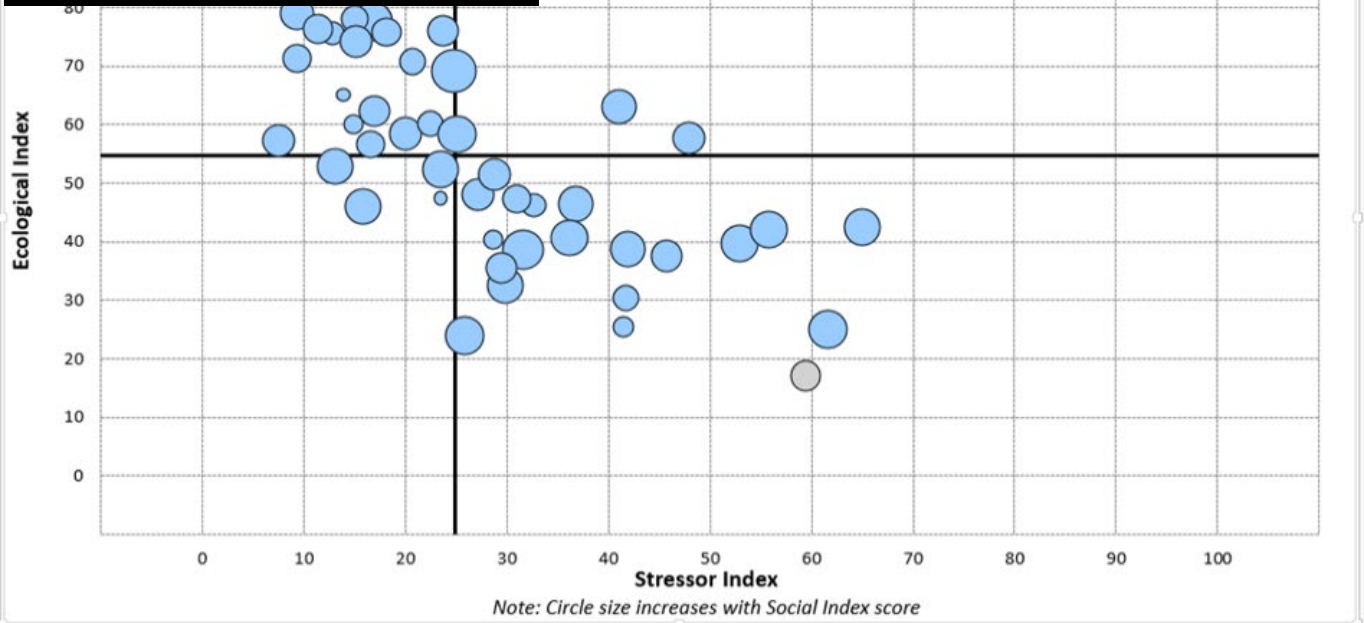
The **Bubble Plot** worksheet contains a bubble plot that displays RPS results.

The **Bubble Plot** is automatically created when the **RUN SCREENING** button is clicked on the **Setup** worksheet. It contains one “bubble” for each watershed selected for screening, with the Stressor Index score plotted on the horizontal (x) axis, Ecological Index score plotted on the vertical (y) axis, and Social Index plotted as the bubble size. Larger bubbles have higher Social Index scores relative to smaller bubbles.

The bubble plot can be customized using controls on the **Bubble Plot Options** worksheet.

The bubble plot displays Ecological Index, Stressor Index, and Social Index scores for watersheds included in your screening. Hover over any bubble with your mouse cursor to view a popup information box with index scores and ranks for that watershed.

Falling Water River Upper (051301080702)  
 Ecological Index: 17  
 Stressor Index: 59  
 Social Index: 24  
 RPI Score: 27.216  
 RPI Rank: 48



Navigation bar: Setup | Results | **Bubble Plot** | Bubble Plot Options | HUC12\_Map | HUC8\_Data | HUC12\_Data

## 9. Bubble Plot Options Worksheet

### 9.1. Overview

The **Bubble Plot Options** worksheet provides users the ability to customize the **Bubble Plot** worksheet that displays screening results.

The following sections provide step-by-step instructions for how to use the **Bubble Plot Options** worksheet to:

- **Reposition Axes**
- **Toggle Between Plotting a Subset Only Screening or an All Watersheds Screening**
- **Add Labels to Bubbles**
- **Edit Bubble Sizes**
- **Edit Bubble Colors**
- **Highlight Bubbles**
- **Save an Image File of the Bubble Plot**

9.2. Reposition Axes

The horizontal axis and vertical axis of the **Bubble Plot** can be set to any user-defined position.

By default, the horizontal axis is positioned at the median of Ecological Index scores for the active screening and the vertical axis is positioned at the median of Stressor Index scores.

Users have two options for repositioning **Bubble Plot** axes:

- Reposition to new index percentiles – Under this option, users can reposition axes to any desired percentile of Ecological Index and Stressor Index scores (25<sup>th</sup> percentile, 75<sup>th</sup> percentile, etc.);
- Reposition to specific index scores – Under this option, users can reposition axes to any desired Ecological and Stressor Index score (e.g., index scores of 50).

**Reposition Axes Option 1 –  
Reposition to New Percentiles**

To reposition axes to new percentiles, select the “User-Defined Percentiles” option from the drop-down menu in the **Reposition Axes** section of the **Bubble Plot Options** worksheet.

**REPOSITION AXES**

By default, axes cross at the median of Ecological Index (horizontal axis) and Stressor Index (vertical axis) scores listed in the Summary\_Scores sheet. Axes can be repositioned to:

(a) User-Defined Percentiles ▼

This option will position axes to percentiles entered below.

Enter a new Stressor Index percentile for the y-axis (0-100):

Enter a new Ecological Index percentile for the x-axis (0-100):

Then enter new a new Stressor Index percentile for the vertical axis and a new Ecological Index percentile for the horizontal axis in the designated cells.

**REPOSITION AXES**

Enter a new Stressor Index percentile for the y-axis (0-100):

Enter a new Ecological Index percentile for the x-axis (0-100):

**Reposition Axes Option 2 –  
Reposition to Specific Index Scores**

To reposition axes to specific index scores, select the “User-Defined Index Scores” option from the drop-down menu in the **Reposition Axes** section of the **Bubble Plot Options** worksheet.

**REPOSITION AXES**

By default, axes cross at the median of Ecological Index (horizontal axis) and Stressor Index (vertical axis) scores listed in the Summary\_Scores sheet. Axes can be repositioned to:

(b) User-Defined Index Scores ▼

This option will position axes to Index Scores entered below.

Enter a new Stressor Index score for the y-axis (0-100):

Enter a new Ecological Index score for the x-axis (0-100):

Then enter new Stressor Index score for the vertical axis and a new Ecological Index score for the horizontal axis in the designated cells.

**REPOSITION AXES**

Enter a new Stressor Index score for the y-axis (0-100):

Enter a new Ecological Index score for the x-axis (0-100):

After entering new index percentiles or scores, click the **REPOSITION AXES** button.

Axes on the **Bubble Plot** will be automatically moved to the new index percentiles or scores.

To move **Bubble Plot** axes back to their default position, click the **RESET AXES** button.



### 9.3. Toggle Screening to Plot

By default, the **Bubble Plot** displays Ecological Index, Stressor Index, and Social Index scores listed in the **Summary Scores** worksheet. These scores are derived from indicators that are normalized to minimum and maximum values for the subset of watersheds included in the screening. Index scores are therefore relative rather than absolute, they depend on the subset of watersheds selected for screening. A given watershed will have two different sets of index scores for two screenings that include different groups of watersheds.

Users may be interested in how the subset of watersheds selected for screening compares to all other watersheds in the Project Area. For example, users may want to know whether ecological conditions in the screened subset are above- or below-average for the Project Area as a whole. Such questions can be answered by running the same screening on all watersheds in the Project Area and then reviewing the resulting index scores for the watershed subset of interest. To streamline this process, the Excel RPS Tool allows users to view an alternate version of the bubble plot with index scores that result from a screening that includes all watersheds in the Project Area. This can be done on-the-fly in the **Select Screening to Plot** section of the **Bubble Plot Options** worksheet without adjusting settings on the **Setup** worksheet or creating a new file.

The **Select Screening to Plot** section contains option buttons to toggle between a “Subset Only” screening or an “All Watersheds” screening. A “Subset Only” screening includes only those watersheds selected for screening on the **Setup** worksheet. An “All Watersheds” screening includes all watersheds in the Project Area. Note that if you selected all watersheds in the Project Area on the **Setup** worksheet then there is no difference between the two options.

**SELECT SCREENING TO PLOT**

If your screening focuses on a subset of watersheds from the project area, you may want to know if Ecological and Stressor Index scores for your subset are generally above or below average for the project area. Clicking the "ALL WATERSHEDS SCREENING" option below will plot scores from a screening that includes all watersheds in the project area, with axes set to the median of all Ecological and Stressor Index scores. Clicking the "SUBSET ONLY SCREENING" option will return to the default option of plotting scores from the screening that only includes those watersheds selected on the Setup sheet.

**SUBSET ONLY SCREENING**  
 **ALL WATERSHEDS SCREENING**

By default, the **Bubble Plot** displays index scores resulting from “Subset Only” screening.

Click the **ALL WATERSHEDS SCREENING** option button to view index scores resulting from a screening that includes all watersheds in the Project Area. The **Bubble Plot** worksheet will automatically update with new index scores for the “All Watersheds” screening.

If you have viewed bubble plot for the “All Watersheds” screening and want to return to the “Subset Only” screening bubble plot, click the **SUBSET ONLY SCREENING** button. The **Bubble Plot** worksheet will automatically update with index scores for the “Subset Only” screening.

9.4. Label Bubbles

Bubbles in the **Bubble Plot** worksheet can be labeled to identify one or more watersheds. Bubbles can be labeled with the watershed name or the watershed ID. Users also have the option to highlight labeled bubbles to make them stand out from other unlabeled bubbles.

Basics

To label bubbles, first select a label option from the drop-down menu in the **Add Labels to Bubbles** section of the *Bubble Plot Options* worksheet.

Users can choose to have labels display watershed names or watershed IDs.

**ADD LABELS TO BUBBLES**

Select a watershed identifier for labeling:  
Watershed Name ▼

Click the button below to label all bubbles:  
**ADD ALL LABELS**

Or, select watersheds individually from the list below (repeat to label multiple watersheds):  
  ▼

*Highlight Selected Watershed*

Note: To highlight the watershed, the box above must be checked *BEFORE* selecting from the drop-down list.

Label locations can be changed by clicking on the label in the bubble plot and dragging to the desired location.

Click the button below to remove labels and highlighting:  
**REMOVE LABELS**

Add Labels Option 1 – Label All Bubbles

If you would like to add labels to all bubbles on the *Bubble Plot* worksheet, click the **ADD ALL LABELS** button. Labeling all bubbles is generally not recommended if your screening includes more than 20 watersheds.

Click the button below to label all bubbles:  
**ADD ALL LABELS**

**Add Labels Option 2 – Label Bubbles Individually**

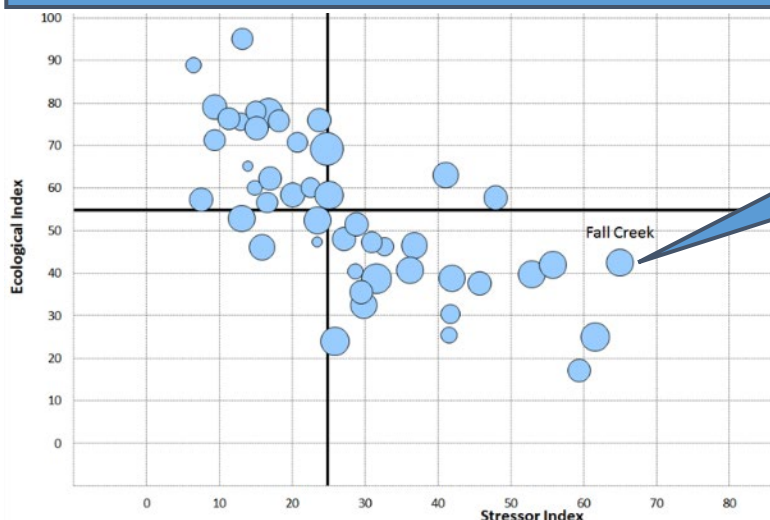
To label individual bubbles in the *Bubble Plot*, select the watershed to label from the drop-down menu in the **Add Labels to Bubbles** section of the *Bubble Plot Options* worksheet. Watersheds names are displayed in the drop-down menu alphabetically from A to Z. Watershed IDs are displayed in ascending numerical order.

Or, select watersheds individually from the list below (repeat to label multiple watersheds):

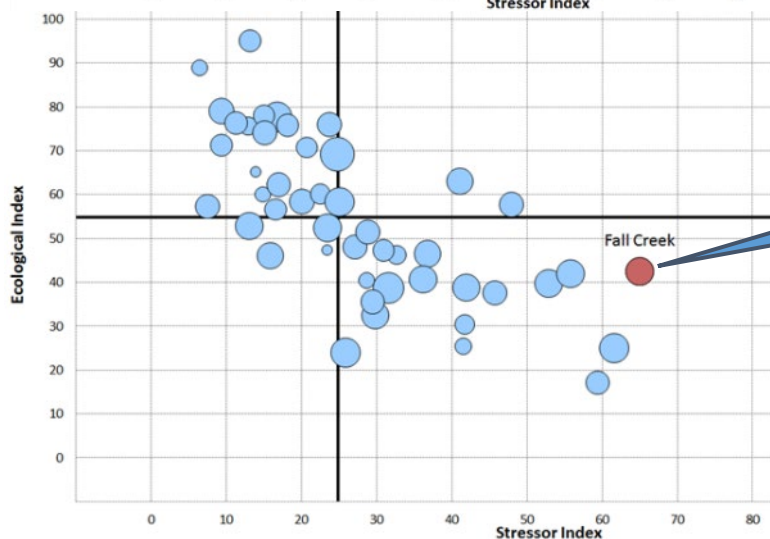
To highlight the labeled bubble, check the **Highlight Selected Watershed** box before selecting a watershed from the drop-down menu.

**Highlight Selected Watershed**

A label will be automatically added to the bubble for the selected watershed.



The labeled bubble will also be highlighted if the **Highlight Selected Watershed** box is checked when selecting the watershed from the drop-down menu.



To remove labels from the *Bubble Plot*, click the **REMOVE LABELS** button. This will also remove any highlighting from labeled bubbles.

**REMOVE LABELS**

### Advanced Tips

- Label text, formatting, and position can be edited manually after labels are added.
- To edit label text, click on the label in the **Bubble Plot** worksheet and revise the text as desired.
- To edit label formatting (font size, color, etc.) click on the label in the **Bubble Plot** worksheet and use Excel's font formatting menu.
- To edit the position of a label, click on the label in the **Bubble Plot** worksheet and drag it to the desired location.

### 9.5. Edit Bubble Sizes

The size of each bubble in the **Bubble Plot** is based on the Social Index score for the corresponding watershed (i.e., bubbles for watersheds with higher Social Index scores are larger than bubbles for watersheds with lower Social Index scores).

While users cannot adjust the size of an individual bubble, they can collectively increase or decrease the size of all bubbles to improve the look of the **Bubble Plot**.

A common reason for editing bubble sizes is to reduce overlap between bubbles with similar Ecological Index and Stressor Index scores.

The screenshot shows the 'EDIT BUBBLE SIZES' section of the worksheet. It includes a text input field for a bubble size (with '10' entered), a note that the default size is 20, and two buttons: 'RESIZE BUBBLES' and 'RESET BUBBLE SIZES'. Two blue callout boxes provide instructions: the top one explains how to enter a new size and the range of possible sizes; the bottom one explains the function of the 'RESIZE BUBBLES' and 'RESET BUBBLE SIZES' buttons.

To adjust bubble sizes, enter a new size in the **Edit Bubble Sizes** section of the **Bubble Plot Options** worksheet.

Bubble sizes can range from 1 (small) to 300 (large). The default bubble size is 20.

Click the **RESIZE BUBBLES** button to apply the new bubble size. The Bubble Plot worksheet will automatically be updated with the new bubble sizes.

To return to the default size, click the **RESET BUBBLE SIZES** button.

**EDIT BUBBLE SIZES**

Enter a bubble size (1 - 300):

The default bubble size is 20.

Click the button below to resize:

**RESIZE BUBBLES**

**RESET BUBBLE SIZES**

9.6. Edit Bubble Colors

The **Bubble Plot** worksheet displays three pieces of information for each watershed included in your screening: the Ecological Index score on the y-axis, Stressor Index score on the x-axis, and Social Index score using the bubble size. The **Bubble Plot** worksheet can also display a fourth piece of information by shading bubbles different colors to reflect different values of an indicator. This feature is implemented in the **Edit Bubble Colors** section of the **Bubble Plot Options** worksheet.

To display indicator values using bubble colors, users must select the number of **Classes** to display, a method for defining **Class Breaks**, and a **Color Scheme**. These terms are defined below.

- **Classes** – The number of groups or bins to separate watersheds into. Up to 10 classes can be selected.
- **Class Breaks** – The cutoff indicator values used to define class membership. Three options are available for defining class breaks:
  - *Quantile Breaks* result in classes that have an equal number of watersheds. For example, if four classes are selected then then quantile breaks option would result in each class containing one-quarter of the total number of watersheds using the 25<sup>th</sup> percentile, 50<sup>th</sup> percentile, and 75<sup>th</sup> percentile of indicator values as class breaks.
  - *Equal-Interval Breaks* result in classes that cover an equal range of indicator values. For example, if four classes are selected for an indicator with a minimum value of 0% and a maximum value of 100%, then the equal-interval breaks option would result in each class spanning 25 percentage points use values of 25%, 50%, and 75% as class breaks. Under the equal-interval option, the definition of breaks is independent of the number of watersheds within each class. Depending on the distribution of indicator values, some classes may contain zero watersheds.
  - *User-Defined Breaks* are supplied by the user to apply user-specified class breaks.
- **Color Scheme** – The primary color(s) used to shade bubbles. Options are blue, green, or blue-green.

Select a classification method: **Quantile Breaks**

- Quantile Breaks
- Equal-Interval Breaks
- User-Defined Breaks

After selecting an indicator, choose a method for defining class breaks (Quantile, Equal-Interval, or User-Defined) from the classification method drop-down menu.

Select the number of classes: **4**

- 3
- 4**
- 5
- 6
- 7
- 8
- 9
- 10

Next, choose the number of classes to use for plotting (between 2 and 10).

If the Quantile or Equal-Interval options are selected for defining class breaks, then break values will be automatically calculated.

If the User-Defined option is selected, a popup form will display for you to enter class breaks.

In the class break form, the lower bound of the first class will automatically be set to the minimum value of the selected indicator. The upper bound of the last class will be set to the indicator's maximum value.

Enter break values for each class in the "Upper Bound" column. The lower bound of the next class will be calculated automatically by adding 0.01 to the upper bound you entered for the preceding class.

When all breaks have been entered, click the **OK** button.

Define Class Breaks...

Enter the upper bound for each class below.

Click OK when finished.

	Lower Bound		Upper Bound
Class 1:	26.43	to	40
Class 2:	40.01	to	60
Class 3:	60.01	to	80
Class 4:	80.01	to	93.42
Class 5:		to	
Class 6:		to	
Class 7:		to	
Class 8:		to	
Class 9:		to	
Class 10:		to	

OK Cancel

Select a color scheme: **Blue-Green**

- Blue
- Green
- Blue-Green**

Finally, select a color scheme to use for shading bubbles. Options are blue, green, or blue-green.

EDIT BUBBLE COLORS

Select Indicator for Adjusting Colors

Select a classification method:

Select the number of classes:

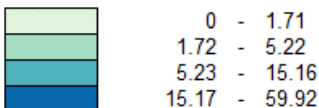
Select a color scheme:

Click the button below to update bubble colors:

**UPDATE BUBBLE COLORS**

Legend

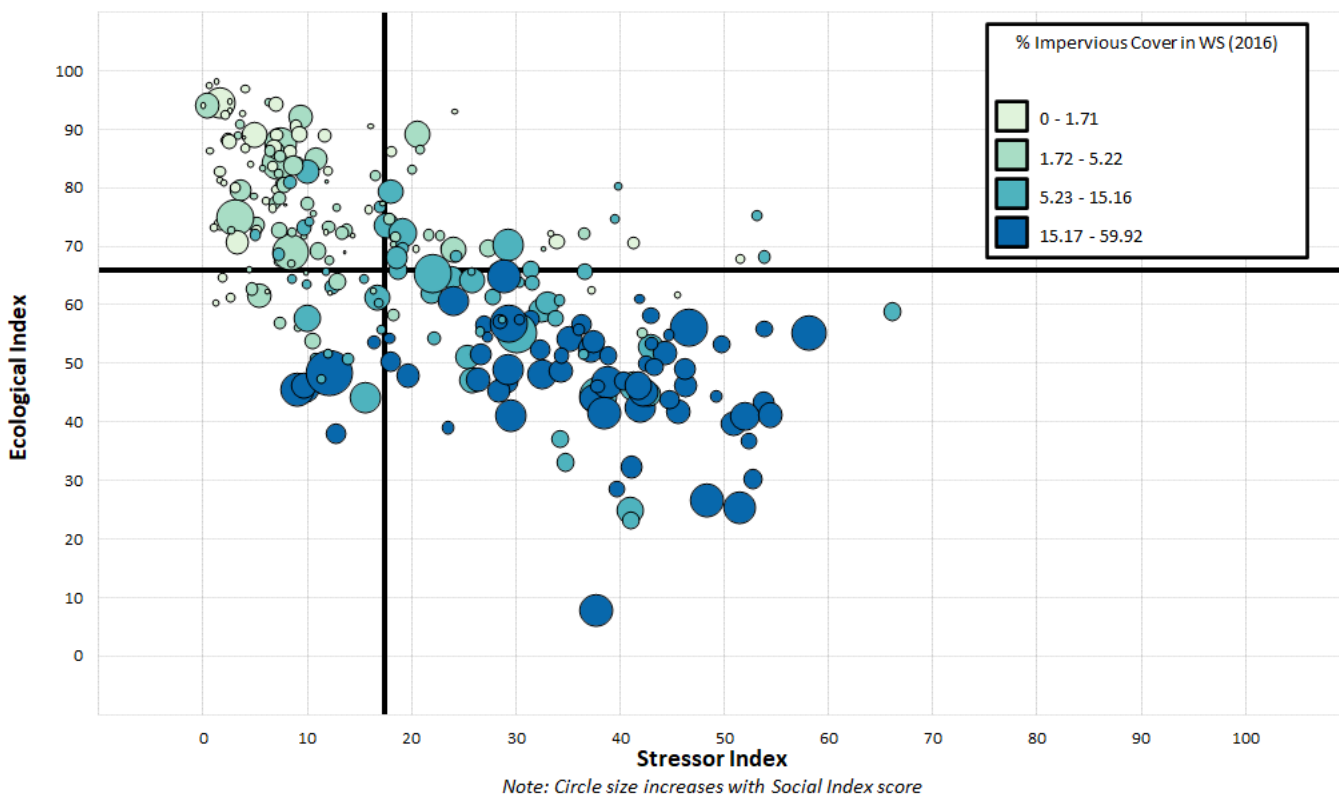
% Impervious Cover in WS (2016)



After you have selected the indicator to plot, the method for defining class breaks, the number of classes, and the color scheme, a legend will display in the **Edit Bubble Colors** section that illustrates your selections.

Click the **UPDATE BUBBLE COLORS** button to apply the selected settings to the **Bubble Plot** worksheet.

After clicking the **UPDATE BUBBLE COLORS** button, the **Bubble Plot** worksheet will automatically update to shade bubbles according to the selected indicator. Users can adjust bubble color settings at any time by revising selections in the **Edit Bubble Colors** section of the **Bubble Plot Options** sheet and clicking the **UPDATE BUBBLE COLORS** button.



To return to the default bubble plot (all bubbles shaded the same color), click the **RESET BUBBLE COLORS** button.

**RESET BUBBLE COLORS**



9.7. Highlight Bubbles

Bubbles can be highlighted in the bubble plot to call attention to one or more watersheds of interest. Two options are available for choosing watersheds to highlight.

**Highlight Bubbles Option 1 –  
Select Individual Watersheds**

Click the **Highlight Bubbles** button to display a popup menu with highlighting options.

**HIGHLIGHT BUBBLES**

Click the button below to select watersheds to highlight on the bubble plot:

**HIGHLIGHT BUBBLES**

The popup menu contains a list of watersheds included in the screening. Select individual watersheds to highlight by clicking on their ID and name.

Highlight Bubbles...

Choose watersheds to highlight in the bubble plot by selecting their names in the box below and clicking the Highlight Selected Watersheds button.

Or click the Highlight Filtered Watersheds from Results button to highlight watersheds that have been filtered on the Results sheet.

- 020200070101 (Lake Mohawk-Walkill River)
- 020200070102 (Papakating Creek)
- 020200070103 (Beaver Run-Walkill River)
- 020200070104 (Quarryville Brook-Walkill River)
- 020200070201 (Upper Wawayanda Creek)
- 020200070202 (Lower Wawayanda Creek)
- 020200070203 (Upper Pochuck Creek)
- 020200070206 (Rutgers Creek)
- 020200070207 (Lower Pochuck Creek-Walkill River)
- 020301010404 (Sparkill Creek-Hudson River)
- 020301010405 (East River-Hudson River)
- 020301030101 (Upper Wanaque River)
- 020301030102 (Ringwood River)
- 020301030103 (Lower Wanaque River)

Select an outline width and color:

Highlight Selected Watersheds

Highlight Filtered Watersheds from Results

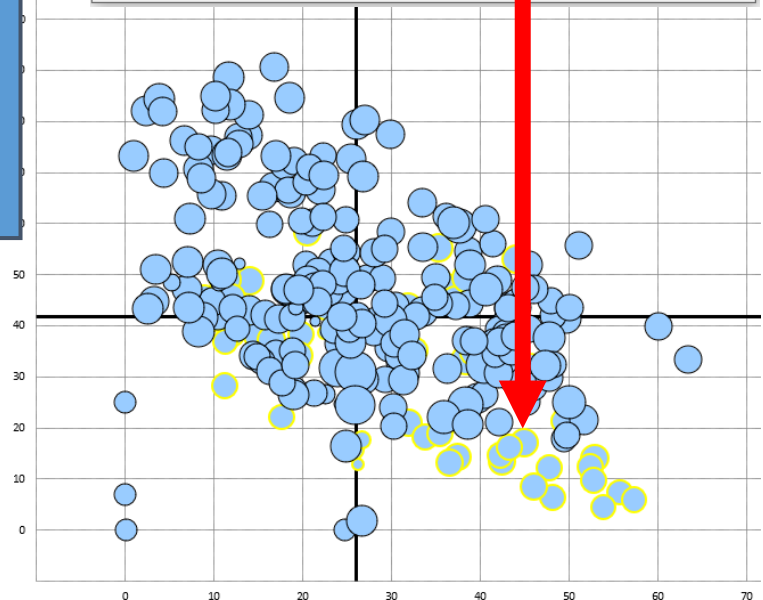
Remove Highlighting

Exit

By default, bubbles are highlighted with a yellow outline and a medium outline width. Users can adjust these settings by choosing a different outline color or width.

After the watersheds of interest are selected, click the **Highlight Selected Watersheds** button to highlight the bubbles for the selected watersheds.

You still have the opportunity to select additional watersheds after clicking the **Highlight Selected Watersheds** button. Repeat the previous step until all watersheds of interest have been selected for highlighting, then click the Exit button to close the popup menu.



**Highlight Bubbles Option 2 –  
Highlight Filtered Watersheds from the Results Worksheet**

To use this option, you must have already applied filters on the **Results** worksheet to display watersheds that meet user-specified criteria. For example, the **Results** worksheet could be filtered to only display watersheds with top-ranked Ecological Index, Stressor Index, and/or Social Index scores. See Section 5 of this guide for instructions on how to filter the **Results** worksheet.

**HIGHLIGHT BUBBLES**

Click the button below to select watersheds to highlight on the bubble plot:

**HIGHLIGHT BUBBLES**

Click the **Highlight Bubbles** button to display a popup menu with highlighting options.

By default, bubbles are highlighted with a yellow outline and a medium outline width. Users can adjust these settings by choosing a different outline color or width.

Click the **Highlight Filtered Watersheds from Results** button. The tool will automatically highlight bubbles for the watersheds that are displayed on the **Results** worksheet.

Highlight Bubbles... [X]

Choose watersheds to highlight in the bubble plot by selecting their names in the box below and clicking the Highlight Selected Watersheds button.

Or click the Highlight Filtered Watersheds from Results button to highlight watersheds that have been filtered on the Results sheet.

- 020200070101 (Lake Mohawk-Walkill River)
- 020200070102 (Papakating Creek)
- 020200070103 (Beaver Run-Walkill River)
- 020200070104 (Quarryville Brook-Walkill River)
- 020200070201 (Upper Wawayanda Creek)
- 020200070202 (Lower Wawayanda Creek)
- 020200070203 (Upper Pochuck Creek)
- 020200070206 (Rutgers Creek)
- 020200070207 (Lower Pochuck Creek-Walkill River)
- 020301010404 (Sparkill Creek-Hudson River)
- 020301010405 (East River-Hudson River)
- 020301030101 (Upper Wanaque River)
- 020301030102 (Ringwood River)
- 020301030103 (Lower Wanaque River)

Select an outline width and color:

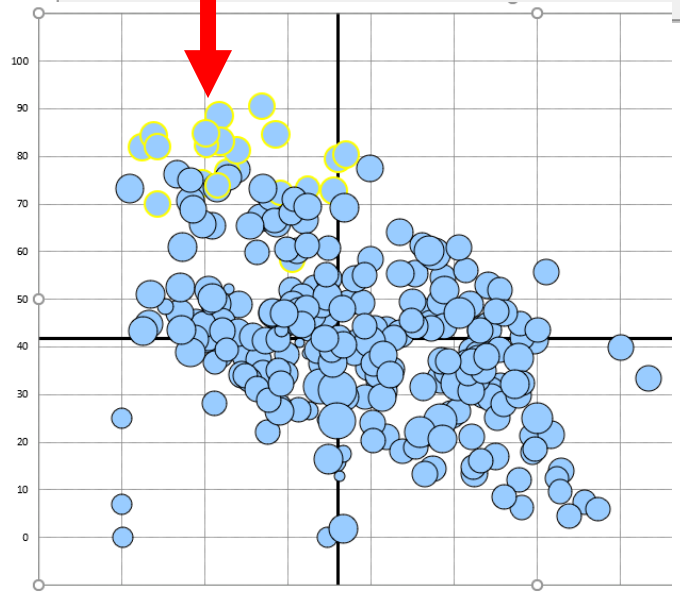
 
   

Highlight Selected Watersheds

**Highlight Filtered Watersheds from Results**

Remove Highlighting

Exit



9.8. Save As Image File

A copy of the **Bubble Plot** worksheet can be saved as an image file for use in reports or presentations.

**SAVE AS IMAGE FILE**

Click the button below to save the bubble plot as an image (.jpg) file:

**SAVE BUBBLE PLOT**

The **Bubble Plot** can be saved as an image file from the **Save As Image File** section of the **Bubble Plot Options** worksheet.

First, click the **SAVE BUBBLE PLOT** button.

You will then be prompted to enter a filename for the image file.

Type a filename into the space provided and click **OK**.

**Chart Export**

Please enter a filename.  
The plot will be saved in the current directory as filename.jpg

Test

OK Cancel

A message box will notify you that the image file saved in JPEG format using the filename you provided.

The file will be saved in the same directory that the RPS Tool file is saved in.

Two PDF files storing the contents of the **Setup** sheet and **Notes** sheet are also saved to provide a record of the screening settings used to produce the **Bubble Plot** image file.

**Microsoft Excel**

File saved in current directory as Test.jpg  
A record of the Setup and Notes worksheets have also been saved.

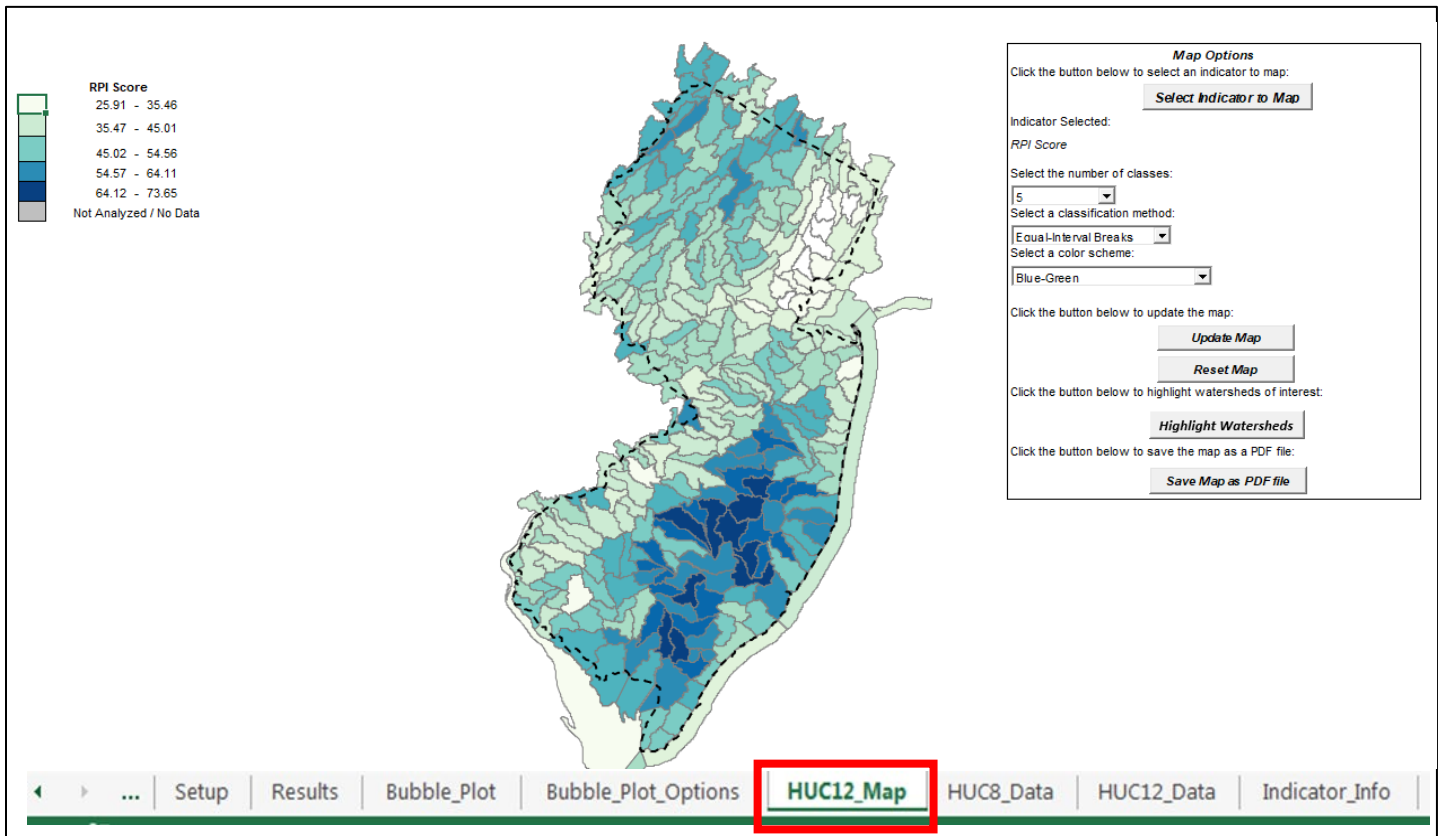
OK

## 10. Map Worksheet

### 10.1. Overview

The **Map** worksheet that displays screening results in map form. The **Map** worksheet is automatically created when the **RUN SCREENING** button is clicked on the **Setup** worksheet. By default, the **Map** worksheet displays Recovery Potential Integrated (RPI) index scores.

The name of the **Map** worksheet displayed in the bottom tab of your Excel RPS Tool will reflect the scale of watersheds selected for screening. For example, if you screened HUC12 subwatersheds, then the **Map** worksheet will be named **HUC12\_Map**. Most Excel RPS Tool files have a map worksheet for HUC12 subwatersheds and, if the tool is also setup to screen HUC14 watersheds, a map for HUC14s. Excel RPS Tool files that are setup to screen other watershed scales may not have a map for those additional watershed scales.



The following sections describe how to:

- **Create a Custom Map**
- **Highlight Watersheds of Interest**
- **Save the Map as a PDF File**

## 10.2. Create Custom Map

Users can customize the **Map** worksheet to shade watersheds on the map using any indicator or index. To customize the **Map** worksheet, users must select the mapped indicator, the number of **Classes** to display, a method for defining **Class Breaks**, and a **Color Scheme**. These terms are defined below.

- **Classes** – The number of groups or bins to separate watersheds into. Up to 10 classes can be selected.
- **Class Breaks** – The cutoff indicator values used to define class membership. Three options are available for defining class breaks:
  - *Quantile Breaks* result in classes that have an equal number of watersheds. For example, if four classes are selected then the quantile breaks option would result in each class containing one-quarter of the total number of watersheds using the 25<sup>th</sup> percentile, 50<sup>th</sup> percentile, and 75<sup>th</sup> percentile of indicator values as class breaks.
  - *Equal-Interval Breaks* result in classes that cover an equal range of indicator values. For example, if four classes are selected for an indicator with a minimum value of 0% and a maximum value of 100%, then the equal-interval breaks option would result in each class spanning 25 percentage points using values of 25%, 50%, and 75% as class breaks. Under the equal-interval option, the definition of breaks is independent of the number of watersheds within each class. Depending on the distribution of indicator values, some classes may contain zero watersheds.
  - *User-Defined Breaks* are supplied by the user to utilize user-specific class breaks.
- **Color Scheme** – The primary color(s) used to shade watersheds on the map. Options are blue, green, or blue-green.

The image shows a screenshot of the 'Map Options' section and a 'Select Indicator for Display' popup menu. The 'Map Options' section includes a button labeled 'Select Indicator to Map'. The popup menu has two dropdown menus for 'Select Indicator Category' and 'Select Indicator Subcategory', both set to 'Index Scores & Ranks'. A list of indicators is shown, with 'RPI Score' highlighted. A 'Select Indicator for Display' button is at the bottom of the popup, and an 'Exit' button is below it. Several blue callout boxes provide instructions: one points to the 'Select Indicator to Map' button, another explains the dropdown menus, a third points to the 'RPI Score' indicator, and a fourth points to the 'Select Indicator for Display' button.

**Map Options**  
Click the button below to select an indicator to map:  
**Select Indicator to Map**

To map an indicator, first click the *Select Indicator to Map* button in the **Map Options** section of the **Map** worksheet. This launches a popup menu for choosing an indicator to map.

Use the drop-down menus to choose the category and subcategory of the indicator that you would like to map.  
Any Ecological, Stressor, Social or indicator can be selected for mapping, regardless of whether it was included in your screening or not.  
Index scores such as Ecological Index can also be selected.

Select Indicator for Display  
Use this menu to select an indicator for display.  
Choose an indicator category and subcategory of interest from the drop-down menu. Then highlight the indicator name from the list and click the Select Indicator button.

Select Indicator Category:  
Index Scores & Ranks

Select Indicator Subcategory:  
Index Scores & Ranks

Ecological Index  
Ecological Rank  
Stressor Index  
Stressor Rank  
Social Index  
Social Rank  
RPI Score  
RPI Rank

Select Indicator for Display

Exit

Highlight the name of the indicator that you would like to map. Only one indicator can be mapped at a time.

Click the *Select Indicator for Display* button to choose the highlighted indicator.

Select the number of classes:

- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10

After selecting an indicator, choose the number of classes to use for mapping (between 2 and 10).

Select a classification method:

- Quantile Breaks
- Equal-Interval Breaks
- User-Defined Breaks

Next, select a method for defining class breaks (Quantile, Equal-Interval, or User-Defined).

If the Quantile or Equal-Interval options are selected for defining class breaks, then break values will be calculated automatically.

If the User-Defined option is selected, a popup form will display for entering class breaks.

In the class break form, the lower bound of the first class will automatically be set to the minimum value of the selected indicator. The upper bound of the last class will be set to the indicator's maximum value.

Enter break values for each class in the "Upper Bound" column. The lower bound of the next class will be calculated automatically by adding 0.01 to the upper bound you entered for the preceding class.

When all breaks have been entered, click the **OK** button.

**Define Class Breaks...**

Enter the upper bound for each class below.  
Click OK when finished.

	Lower Bound	to	Upper Bound
Class 1:	2.41	to	25
Class 2:	25.01	to	50
Class 3:	50.01	to	75
Class 4:		to	100
Class 5:		to	
Class 6:		to	
Class 7:		to	
Class 8:		to	
Class 9:		to	
Class 10:		to	

Select a color scheme:

- Blue
- Green
- Blue-Green

Finally, select a color scheme to use for shading watersheds in the map. Options are blue, green, or blue-green.

**Map Options**

Click the button below to select an indicator to map:

**Select Indicator to Map**

Indicator Selected:  
*RPI Score*

Select the number of classes:  
5

Select a classification method:  
Equal-Interval Breaks

Select a color scheme:  
Blue-Green

Click the button below to update the map:

**Update Map**

**Reset Map**

Click the button below to highlight watersheds of interest:

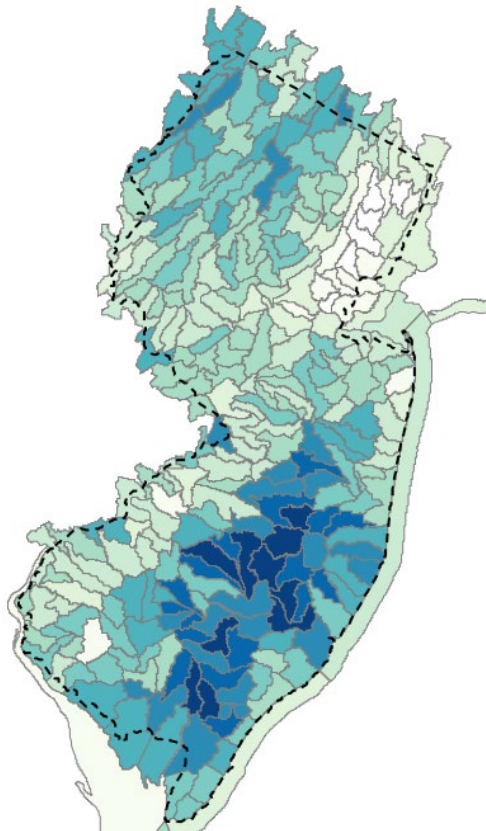
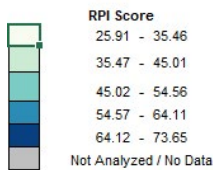
**Highlight Watersheds**

Click the button below to save the map as a PDF file:

**Save Map as PDF file**

After you have selected the indicator to map, the number of classes, the method for defining class breaks, and the color scheme click the **UPDATE MAP** button to apply the selected settings to the watershed map.

The **Map** worksheet will automatically update to shade watersheds according to the selected indicator or index. Users can adjust map settings at any time by revising selections in the **Map Options** section of the **Map** worksheet and clicking the **UPDATE MAP** button.



To return to the default map (displaying Recovery Potential Integrated Index scores), click the **RESET MAP** button.

**Reset Map**

### 10.3. Highlight Watersheds of Interest

Watersheds can be highlighted on the map to call attention to one or more watersheds of interest.

Click the button below to highlight watersheds of interest:

**Highlight Watersheds**

Click the *Highlight Watersheds* button to display a popup menu with highlighting options.

Select Watersheds... ×

Choose watersheds to highlight in the map by selecting their names in the box below and clicking the Highlight Selected Watersheds button.

020200070101 (Lake Mohawk-Walkill River)

020200070102 (Papakating Creek)

020200070103 (Beaver Run-Walkill River)

020200070104 (Quarryville Brook-Walkill River)

020200070201 (Upper Wawayanda Creek)

020200070202 (Lower Wawayanda Creek)

020200070203 (Upper Pochuck Creek)

020200070206 (Rutgers Creek)

020200070207 (Lower Pochuck Creek-Walkill River)

020301010404 (Sparkill Creek-Hudson River)

020301010405 (East River-Hudson River)

020301030101 (Upper Wanaque River)

020301030102 (Ringwood River)

020301030103 (Lower Wanaque River)

020301030203 (Mahwah River)

020301030204 (Middle Ramapo River)

020301030205 (Lower Ramapo River)

020301030301 (Upper Whippany River)

Select an outline width and color:

*Highlight Selected Watersheds*

*Remove Highlighting*

*Exit*

The popup menu contains a list of watersheds included in the screening. Select individual watersheds to highlight by clicking on their ID/name.

By default, watersheds are highlighted with a yellow outline and a medium outline width. Users can adjust these settings by choosing a different outline color or width.

After the watersheds of interest are selected, click the *Highlight Selected Watersheds* button to highlight the watersheds on the map.

You still have the opportunity to select additional watersheds after clicking the *Highlight Selected Watersheds* button. Repeat the previous step until all watersheds of interest have been selected for the highlighting, then click the Exit button to close the popup menu.

48



### 10.4. Save Map as PDF File

The watershed map on the **Map** worksheet can be saved as a PDF file for use in reports or presentations.

**Map Options**  
 Click the button below to select an indicator to map:  
  
 Indicator Selected:  
 RPI Score  
 Select the number of classes:  
  
 Select a classification method:  
  
 Select a color scheme:  
  
 Click the button below to update the map:  
  
  
 Click the button below to highlight watersheds of interest:  
  
 Click the button below to save the map as a PDF file:

The watershed map can be saved as a PDF by clicking the **SAVE MAP AS PDF FILE** button from the **Map Options** section of the **Map** worksheet.

You will then be prompted to enter a filename for the PDF file.  
 Type a filename into the space provided and click **OK**.

Please enter a filename.  
 The map will be saved in the current directory as filename.pdf

Microsoft Excel  
 File saved in current directory as Test.pdf  
 A record of the Setup and Notes worksheets have also been saved.

A message box will notify you that the PDF file saved using the filename you provided.  
 The file will be saved in the same directory that the RPS Tool file is saved in.  
 Two PDF files storing the contents of the **Setup** sheet and **Notes** sheet are also saved to provide a record of the screening settings used to produce the watershed map.

### 11. Indicator Data Worksheet(s)

The **Indicator Data** worksheet contains a table of indicator values for all watersheds in the Project Area covered by your Excel RPS Tool file.

Indicators are grouped by category in the **Indicator Data** worksheet and are ordered from left-to-right as Base, Ecological, Stressor, and Social indicators. Indicator categories are displayed in row 6. Indicator names are displayed in row 7.

The name of the **Indicator Data** worksheet displayed in the bottom tab of your Excel RPS Tool will reflect the watershed scale of the indicator data it stores. For example, the **Indicator Data** worksheet for HUC12 subwatersheds is named **HUC12\_Data**. If your tool file includes multiple watershed scales (e.g., both HUC14 and HUC12) then it will contain multiple **Indicator Data** worksheets, one for each scale (e.g., **HUC14\_Data** and **HUC12\_Data**).

6 BASE INDICATORS					
7	Hydrologic Unit Code 12-Digit (HUC12)	Name HUC12 Watershed	Hydrologic Unit Code 8-Digit (HUC8)	Name HUC8 Watershed	Hydrologic Unit Code 6-Digit (HUC6)
8	020200070101	Lake Mohawk-Walkill River	02020007	Rondout	020200
9	020200070102	Papakating Creek	02020007	Rondout	020200
10	020200070103	Beaver Run-Walkill River	02020007	Rondout	020200
11	020200070104	Quarryville Brook-Walkill River	02020007	Rondout	020200
12	020200070201	Upper Wawayanda Creek	02020007	Rondout	020200
13	020200070202	Lower Wawayanda Creek	02020007	Rondout	020200
14	020200070203	Upper Pochuck Creek	02020007	Rondout	020200
15	020200070206	Rutgers Creek	02020007	Rondout	020200
16	020200070207	Lower Pochuck Creek-Walkill River	02020007	Rondout	020200
17	020301010404	Sparkill Creek-Hudson River	02030101	Lower Hudson	020301
18	020301010405	East River-Hudson River	02030101	Lower Hudson	020301
19	020301030101	Upper Wanaque River	02030103	Hackensack-Passaic	020301
20	020301030102	Ringwood River	02030103	Hackensack-Passaic	020301
21	020301030103	Lower Wanaque River	02030103	Hackensack-Passaic	020301
22	020301030203	Mahwah River	02030103	Hackensack-Passaic	020301
23	020301030204	Middle Ramapo River	02030103	Hackensack-Passaic	020301
24	020301030205	Lower Ramapo River	02030103	Hackensack-Passaic	020301
25	020301030301	Upper Whippany River	02030103	Hackensack-Passaic	020301
26	020301030302	Troy Brook	02030103	Hackensack-Passaic	020301
27	020301030303	Lower Whippany River	02030103	Hackensack-Passaic	020301
28	020301030401	Upper Rockaway River	02030103	Hackensack-Passaic	020301
29	020301030402	Beaver Brooker	02030103	Hackensack-Passaic	020301
30	020301030403	Middle Rockaway River	02030103	Hackensack-Passaic	020301
31	020301030404	Lower Rockaway River	02030103	Hackensack-Passaic	020301
32	020301030501	Upper Pequannock River	02030103	Hackensack-Passaic	020301
33	020301030502	Lower Pequannock River	02030103	Hackensack-Passaic	020301
34	020301030503	Morris Canal-Pompton River	02030103	Hackensack-Passaic	020301
35	020301030601	Great Brook-Passaic River	02030103	Hackensack-Passaic	020301
36	020301030602	Black Brook-Passaic River	02030103	Hackensack-Passaic	020301

Results	Bubble_Plot	Bubble_Plot_Options	HUC12_Map	HUC8_Data	HUC12_Data	Indicator_Info	HUC_Subsets
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## 12. Explore Indicator Data Menu

### 12.1. Overview

The Excel RPS Tool includes built-in functions for exploring the statistical properties of indicator data. This information can be useful when making decisions on which indicators to include in a screening.

Indicator statistics are displayed within the **Explore Indicator Data** menu. To open the menu, select an indicator data worksheet tab (**HUC12\_Data**, **HUC14\_Data**, etc.). Then click the **EXPLORE INDICATOR DATA** button.

This worksheet contains the complete base, ecological, stressor, and social indicator dataset for all HUC12s in the project area (state/basin/region) that is listed on the *Instructions* worksheet.

Indicators can be added to the table from the *Add\_Indicators* worksheet.

Click the *Explore Indicator Data* button below to review indicator summary statistics, histograms, ecoregional variation, and correlations.

**EXPLORE INDICATOR DATA**

Result | Bubble\_Plot | Bubble\_Plot\_Options | HUC12\_Map | HUC8\_Data | **HUC12\_Data** | Indicator\_Info | HUC\_Subsets

Explore Indicator Data... ×

**Use this interface to explore indicator data. To begin, select an indicator of interest from the drop-down menus below.**

Select Indicator Category:  Select Indicator Subcategory:

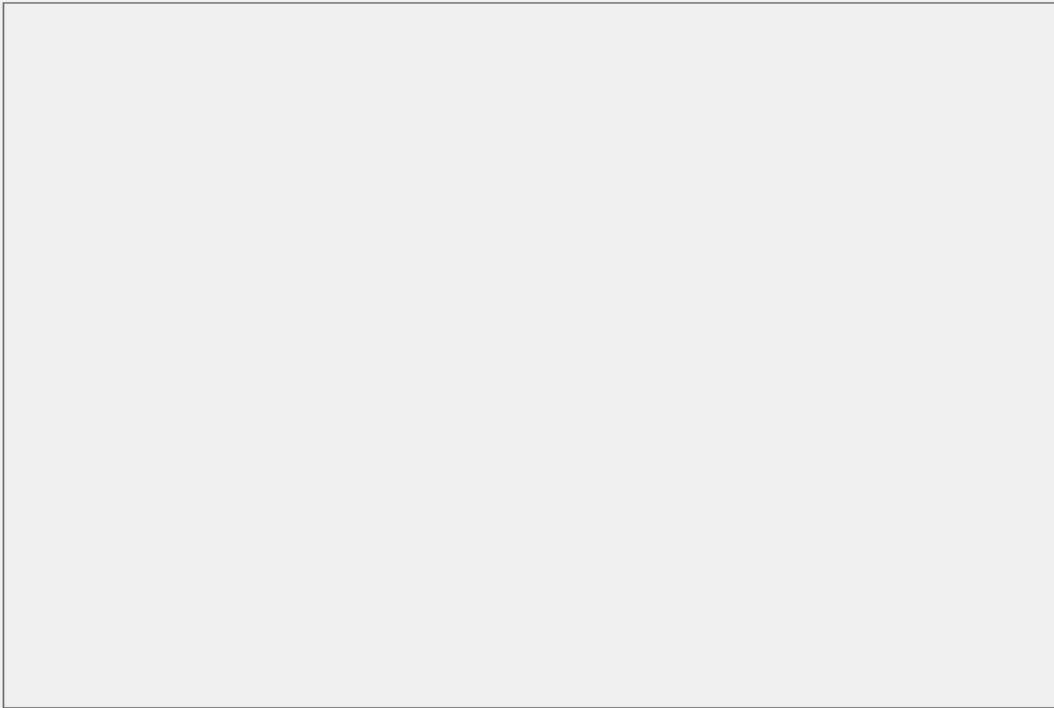
Select Indicator Name:

*By default, all watersheds in the project area are included in the data summary. Click the button below to select a subset of watersheds for data exploration.*

Watershed Selection:

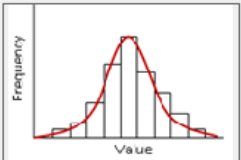
Summary Stats | Ecoregional Variation | Correlation

**This panel displays summary statistics and a histogram for the indicator selected above.**

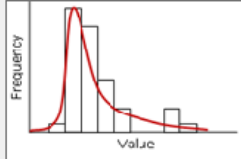


*The shape of the histogram reveals information about the distribution of indicator values.*

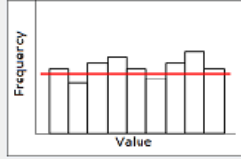
*Histogram for data with normal (bell-shaped) distribution.*



*Histogram for data with skewed distribution.*



*Histogram for data with even distribution.*



Minimum	<input type="text"/>	Median	<input type="text"/>	25th Percentile	<input type="text"/>	Standard Deviation	<input type="text"/>
Maximum	<input type="text"/>	Mean	<input type="text"/>	75th Percentile	<input type="text"/>	Number/Percent Blanks	<input type="text"/>

The **Explore Indicator Data** menu contains drop-down menus for selecting an indicator to explore and three tabs for reviewing the statistical properties of the selected indicator:

- The **Summary Stats** tab displays summary statistics (minimum, maximum, mean, etc.) and a histogram of indicator values;
- The **Ecoregional Variation** tab displays a boxplot of indicator summary statistics by Level 3 Ecoregion (<https://www.epa.gov/eco-research/level-iii-and-iv-ecoregions-continental-united-states>). The tab also contains a table listing the number of watersheds in each ecoregion and the number of watersheds with blank or missing values of the selected indicator per ecoregion. The **Ecoregional Variation** tab is only visible when reviewing indicator data for HUC12 subwatersheds.
- The **Correlation** tab contains additional drop-down menus for users to select a second covariate indicator to evaluate correlation between two indicators. Correlation statistics and a scatterplot of indicator values are displayed in the tab.

By default, all watersheds in your tool's study area are included in the indicator data summary. The menu also contains the **CHANGE WATERSHED SELECTION** button for selecting a custom subset of watersheds for the indicator data summary.

The following sections describe how to:

- **Select an Indicator to Explore**
- **Select a Covariate Indicator to Review Correlation**
- **Save or Copy a Chart**
- **Use the Change Watershed Selection Button**

12.2. Select an Indicator to Explore

To explore the statistical properties of an indicator, select the indicator of interest from the drop-down menus at the top of the *Explore Indicator Data* menu.

Explore Indicator Data... X

**Use this interface to explore indicator data. To begin, select an indicator of interest from the drop-down menus below.**

Select Indicator Category: Base Select Indicator Subcategory: All Base Indicators

Select Indicator Name: [Empty]

*By default, all watersheds in the project area are included in the data summary. Click the button below to select a subset of watersheds for data exploration.*

Watershed Selection: All Watersheds Change Watershed Selection...

Summary Stats | Ecoregional Variation | Correlation

First choose the indicator category and subcategory from the dropdown menus.

**Use this interface to explore indicator data. To begin, select an indicator of interest from the drop-down menus below.**

Select Indicator Category: Ecological Select Indicator Subcategory: All Ecological Indicators

Select Indicator Name: [Empty]

*By default, all watersheds in the project area are included in the data summary. Click the button below to select a subset of watersheds for data exploration.*

Watershed Selection: All Watersheds Change Watershed Selection...

Summary Stats | Ecoregional Variation | Correlation

- All Ecological Indicators
- Forest Cover
- Wetlands Cover
- Woody Vegetation Cover
- Natural Land Cover (All Types)
- Soil Attributes
- Stream Order
- Aquatic Life and Habitat

Then choose the indicator name from the *Select Indicator Name* menu.

Select Indicator Name: [Empty]

- % Forest in WS (2011)
- % Forest in HCZ (2011)
- % Forest in RZ (2011)
- % Forest Change in WS (2001-11)
- % Forest Change in HCZ (2001-11)
- % Forest Change in RZ (2001-11)
- % Forest Remaining in WS

The *Summary Stats* and *Ecoregional Variation* tabs will automatically populate with statistical information for the selected indicator. Click on each tab name to view its contents.

Summary Stats | Ecoregional Variation | Correlation

This panel displays summary statistics and a histogram for the indicator selected above.

The shape of the histogram reveals information about the distribution of indicator values.

Histogram for data with normal (bell-shaped) distribution.

Histogram for data with skewed distribution.

Histogram for data with even distribution.

Save Chart to File | Copy Chart to Clipboard

Minimum	0	Median	24.6548	25th Percentile	10.2477	Standard Deviation	21.2657
Maximum	86.4888	Mean	28.1901	75th Percentile	44.8842	Number/Percent Blanks	0 (0%)

12.3. Select a Covariate Indicator

The **Correlation** tab of the **Explore Indicator Data** menu contains additional drop-down menus for users to select a second covariate indicator to evaluate correlation between two indicators.

Summary Stats | Ecoregional Variation | **Correlation**

This panel displays information on the strength of correlation between the indicator selected above and any other covariate indicator.

Select Covariate Category: **Ecological**    Select Covariate Subcategory: All Ecological Indicators

Select Covariate Name:

First choose the indicator category and subcategory from the dropdown menus.

This panel displays information on the strength of correlation between the indicator selected above and any other covariate indicator.

Select Covariate Category: **Ecological**    Select Covariate Subcategory: **All Ecological Indicators**

Select Covariate Name:

- All Ecological Indicators
- Forest Cover**
- Wetlands Cover
- Woody Vegetation Cover
- Natural Land Cover (All Types)
- Soil Attributes
- Stream Order
- Aquatic Life and Habitat

Then choose the indicator name from the **Select Covariate Name** menu.

This panel displays information on the strength of correlation between the indicator select

Select Covariate Category: Ecological    Select Covariate Subcategory: Forest Cover

Select Covariate Name: **% Forest in HCZ (2016)**

- % Forest in WS (2016)
- % Forest in HCZ (2016)**
- % Forest in RZ (2016)
- % Forest Change in WS (2001-16)
- % Forest Change in HCZ (2001-16)
- % Forest Change in RZ (2001-16)
- % Forest Remaining in WS

The scatterplot and correlation statistics will automatically populate with values for the selected indicator and the covariate indicator.

Summary Stats | Ecoregional Variation | **Correlation**

Select Covariate Category: Ecological    Select Covariate Subcategory: All Ecological Indicators

Select Covariate Name: **% Forest in HCZ (2016)**

The scatterplot illustrates whether values for the two indicators vary together or randomly.

Scatterplot showing strong positive correlation

Scatterplot showing moderate positive correlation

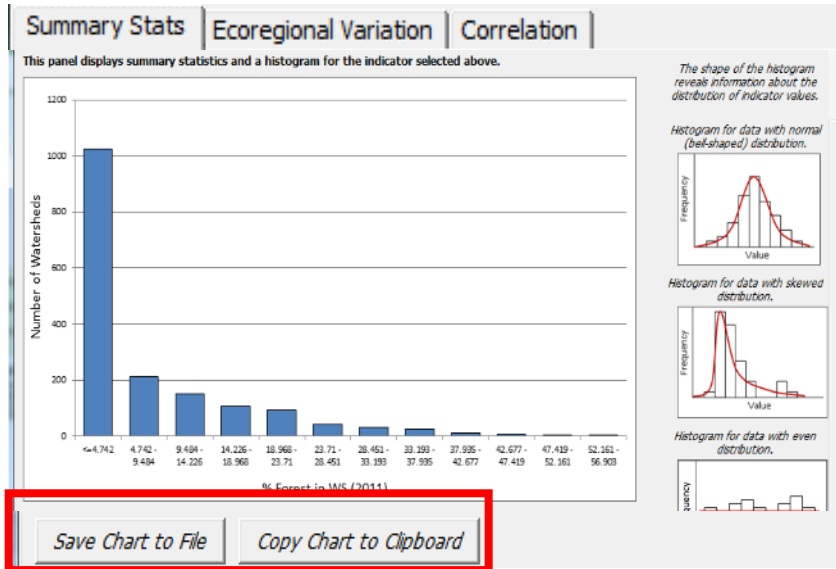
Scatterplot showing weak correlation

Save Chart to File    Copy Chart to Clipboard

Correlation Coefficient (R)	Coefficient of Determination (R-Squared)
0.4501	0.2026

12.4. Save or Copy a Chart

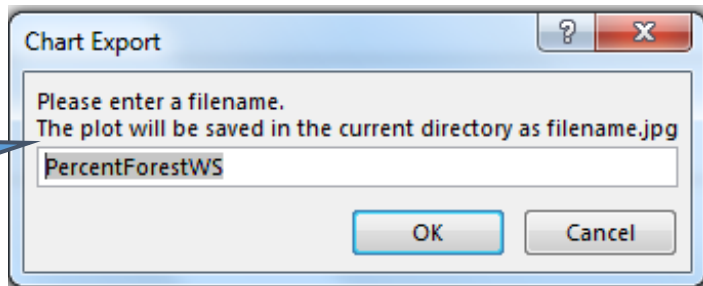
The *Summary Stats*, *Ecoregional Variation*, and *Correlation* tabs each have buttons that allow users to save or copy an image of the histogram, ecoregional boxplot, or correlation scatterplot.



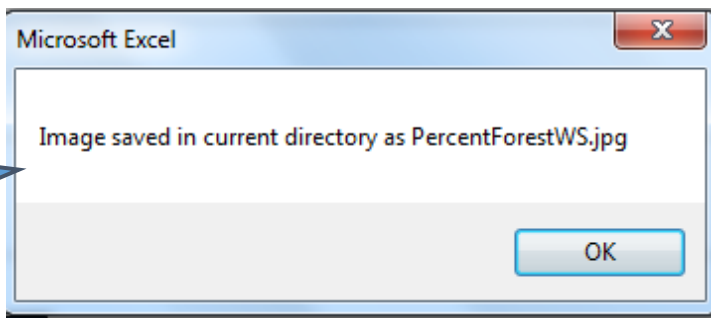
A copy of your chart can be saved as an image file in JPEG format by clicking the **SAVE CHART TO FILE** button.



Enter a filename for the chart image in the Chart Export box. Click **OK**.



A message box will then display to notify you that the image was successfully saved. The file will be saved in the same folder as your RPS tool file.

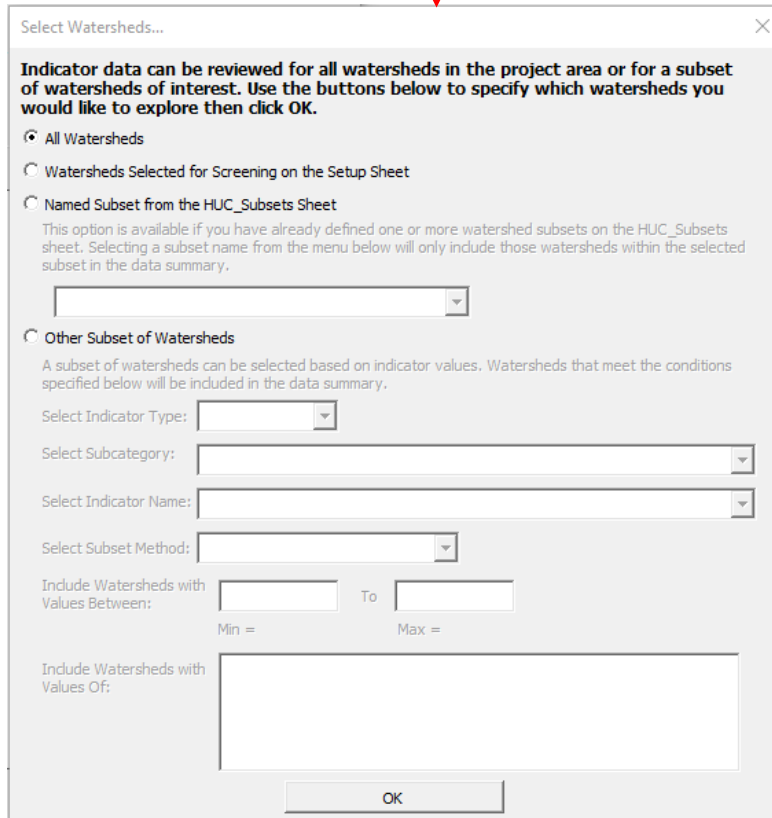
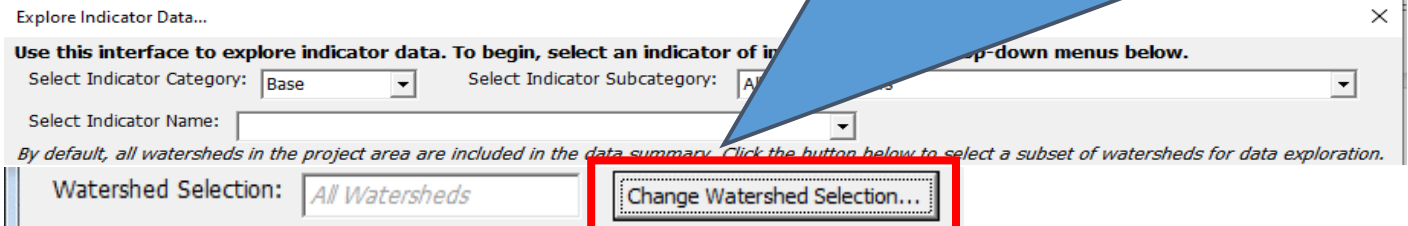


An image of your chart can also be copied to the clipboard by clicking the **COPY CHART TO CLIPBOARD** button. You can then paste your chart into a report document or other file using the Paste menu button or by typing Ctrl-V.



12.5. Change Watershed Selection Button

By default, the *Explore Indicator Data* menu displays indicator statistical properties for all watersheds in your tool’s study area. You can instead explore indicator data for just a subset of watersheds using the **CHANGE WATERSHED SELECTION** button at top of the *Explore Indicator Data* menu. Clicking the button will launch the *Select Watersheds* menu.



The *Select Watersheds* menu contains four option buttons for choosing watersheds to include in your indicator data summary. By default, the **ALL WATERSHEDS** button is selected.

All Watersheds

The second option button selects watersheds that have already been chosen for an RPS screening on the *Setup* worksheet.

Watersheds Selected for Screening on the Setup Sheet

To use this option, you must have previously entered a list of watershed IDs in the *Select Watersheds* section of the *Setup* worksheet (see Section 5.3).



The third option button selects watersheds that have already been defined in a named watershed subset on the *HUC\_Subsets* worksheet.

To use this option, you must have previously entered one or more watershed subsets on the *HUC\_Subsets* worksheet (see Section 15).

Named Subset from the HUC\_Subsets Sheet

**Named Subset from the HUC\_Subsets Sheet**

This option is available if you have already defined one or more watershed subsets on the HUC\_Subsets sheet. Selecting a subset name from the menu below will only include those watersheds within the selected subset in the data summary.

To choose a watershed subset, click the **NAMED SUBSET FROM THE HUC\_SUBSETS SHEET** option button.

The drop-down menu below the button will automatically fill with subset names from the *HUC\_Subsets* sheet. Select the name of the subset of interest.

The fourth option button allows you to select a group of watersheds based on the values of any indicator stored in the RPS Tool.

Other Subset of Watersheds

Clicking the **OTHER SUBSET OF WATERSHEDS** option button will activate drop-down menus for selecting the indicator type, name, and values to use for your watershed selection.

**Other Subset of Watersheds**

A subset of watersheds can be selected based on indicator values. Watersheds that meet the conditions specified below will be included in the data summary.

Select Indicator Type:

Select Indicator Name:

Select Subset Method:

Include Watersheds with Values Between:  To   
Min = Max =

Include Watersheds with Values Of:

OK

After clicking the **OTHER SUBSET OF WATERSHEDS** option button, choose the type of indicator for selecting watersheds (Base, Ecological, Stressor, or Social) from the **Select Indicator Type** drop-down menu and the indicator subcategory from the following dropdown.

Select Indicator Type: Ecological

Select Indicator Name: All Ecological Indicators

Select Subset Method: Forest Cover

Include Watersheds with Values Between: Wetlands Cover

Watersheds with Values Between: Woody Vegetation Cover

Include Watersheds with Values Between: Natural Land Cover (All Types)

Watersheds with Values Between: Soil Attributes

Include Watersheds with Values Between: Stream Order

Watersheds with Values Between: Aquatic Life and Habitat

Then choose the name of the indicator for selecting watersheds from the **Select Indicator Name** drop-down menu.

Select Indicator Name: Name HUC12 Watershed

Select Subset Method: Name HUC12 Watershed

Watersheds with Values Between: Hydrologic Unit Code 8-Digit (HUC8)

Include Watersheds with Values Between: Name HUC8 Watershed

Watersheds with Values Between: Hydrologic Unit Code 6-Digit (HUC6)

Include Watersheds with Values Between: Name HUC6 Watershed

Watersheds with Values Between: Area of HUC12 Watershed (Grid)

Include Watersheds with Values Between: % Land in HUC12 Watershed (2016)

Watersheds with Values Between: % Water in HUC12 Watershed (2016)

Next, choose a subset method for selecting watersheds from the **Select Subset Method** drop-down menu.

The Range of Values option allows you to specify minimum and maximum values of interest for the selected indicator. Watersheds with indicator values in the specified range will be included in the indicator data summary.

The Unique Values option allows you to select one or more unique values of interest for the selected indicator. Watersheds with the specified values will be included in the data summary. The unique values option will typically only be used for categorical variables.

Select Subset Method: Range of Values

Unique Values

If you choose the Range of Values method, enter the range of values of interest for the selected indicator in the text boxes.

For reference, the tool will display minimum and maximum values of the selected indicator below the boxes.

Select Indicator Name: % Agriculture in WS (2011)

Select Subset Method: Range of Values

Include Watersheds with Values Between: 50 To 100

Min = 6.4517 Max = 95.8199

If you choose the Unique Values method, a list of unique indicator values will automatically display in the selection box below the **Select Subset Method** drop-down menu.

Choose one or more of the unique indicator values by highlighting the values in the selection box.

Select Indicator Name: Name HUC12 Watershed

Select Subset Method: Unique Values

Include Watersheds with Values Between: Min = Max =

Include Watersheds with Values Of: Absecon Bay

Absecon Creek

Alexauken Creek-Delaware River

Allegheny Creek-Delaware River

Ambrose Brook

Assisunk Creek

OK

After choosing an option for selecting watersheds to include in the indicator data summary, click the **OK** button at the bottom of the **Select Watersheds** menu.

Select Watersheds... ✕

**Indicator data can be reviewed for all watersheds in the project area or for a subset of watersheds of interest. Use the buttons below to specify which watersheds you would like to explore then click OK.**

All Watersheds  
 Watersheds Selected for Screening on the Setup Sheet  
 Named Subset from the HUC\_Subsets Sheet  
This option is available if you have already defined one or more watershed subsets on the HUC\_Subsets sheet. Selecting a subset name from the menu below will only include those watersheds within the selected subset in the data summary.

Other Subset of Watersheds  
A subset of watersheds can be selected based on indicator values. Watersheds that meet the conditions specified below will be included in the data summary.

Select Indicator Type:

Select Indicator Name:

Select Subset Method:

Include Watersheds with Values Between:  To   
Min = Max =

Include Watersheds with Values Of:

- Absecon Bay
- Absecon Creek
- Alexauken Creek-Delaware River
- Allegheny Creek-Delaware River
- Ambrose Brook
- Assiscunk Creek

The **Explore Indicator Data** menu will now only display indicator summary statistics, histograms, correlations, and other statistical properties for the group of watersheds specified on the **Select Watersheds** menu. You can adjust your watershed selection at any time by clicking the **CHANGE WATERSHED SELECTION** button on the **Explore Indicator Data** menu.

### 13. Indicator Info Worksheet

#### 13.1. Overview

The **Indicator Info** worksheet contains a table of indicator information, including the category of each indicator (Base, Ecological, Stressor, or Social), subcategory, the watershed scale(s) that each indicator is quantified at, and a description of what watershed characteristic the indicator measures.

Indicator Name/Glossary Term	Category	Subcategory	Watershed Scale(s)	Description
% Forest in WS (2016)	Ecological Indicator	Forest Cover	HUC12	Percent of the HUC12 classified as forest cover by the 2016 CDL-NLCD Hybrid Land Cover dataset. Forest cover classes include 'Deciduous Forest' (code 141), 'Evergreen Forest' (code 142), and 'Mixed Forest' (code 143) in the 2016 CDL-NLCD Hybrid Land Cover dataset. Calculated as Forest area divided by HUC12 area, multiplied by 100. See also 2016 CDL-NLCD Hybrid Land Cover glossary definition.
% Forest in HCZ (2016)	Ecological Indicator	Forest Cover	HUC12	Percent of the HUC12 that is in the Hydrologically Connected Zone and classified as forest cover by the 2016 CDL-NLCD Hybrid Land Cover dataset. Forest cover classes include 'Deciduous Forest' (code 141), 'Evergreen Forest' (code 142), and 'Mixed Forest' (code 143) in the 2016 CDL-NLCD Hybrid Land Cover dataset. Calculated as forest area in the Hydrologically Connected Zone divided by HUC12 area, multiplied by 100. See also 2016 CDL-NLCD Hybrid Land Cover and Hydrologically Connected Zone glossary definitions.
% Forest in RZ (2016)	Ecological Indicator	Forest Cover	HUC12	Percent of the HUC12 that is in the Riparian Zone and classified as forest cover by the 2016 CDL-NLCD Hybrid Land Cover dataset. Forest cover classes include 'Deciduous Forest' (code 141), 'Evergreen Forest' (code 142), and 'Mixed Forest' (code 143) in the 2016 CDL-NLCD Hybrid Land Cover dataset. Calculated as forest area in the Riparian Zone divided by HUC12 area, multiplied by 100. See also 2016 CDL-NLCD Hybrid Land Cover and Riparian Zone glossary definitions.
% Forest Change in WS (2001-16)	Ecological Indicator	Forest Cover	HUC12	The change in the percentage of the HUC12 with forest cover from 2001 to 2016. Calculated from the National Land Cover Database 2016 (NLCD 2016) 2001 and 2016 Land Cover Datasets (January 2019 version). Forest cover classes include 'Deciduous Forest', 'Evergreen Forest', and 'Mixed Forest'; codes 41, 42, and 43 in the 2001 and 2016 Land Cover datasets. Positive values denote an increase in forest; negative values denote a decrease in forest. Does not count areas that changed to/from the 'Open Water' class (code 11) since these were assumed to be errors. Equation used: (Area Changing To Forest – Area Changing From Forest)/(HUC12 Area) * 100.
% Forest Change in HCZ (2001-16)	Ecological Indicator	Forest Cover	HUC12	The change in the percentage of the HUC12 with forest cover in the Hydrologically Connected Zone (HCZ) from 2001 to 2016. Calculated from the National Land Cover Database 2016 (NLCD 2016) 2001 and 2016 Land Cover Datasets (January 2019 version). Forest cover classes include 'Deciduous Forest', 'Evergreen Forest', and 'Mixed Forest'; codes 41, 42, and 43 in the 2001 and 2016 Land Cover datasets. Positive values denote an increase in forest; negative values denote a decrease in forest. Does not count areas that changed to/from the 'Open Water' class (code 11) since these were assumed to be errors. Equation used: (Area Changing To Forest – Area Changing From Forest)/(HUC12 Area) * 100.

Bubble\_Plot | Bubble\_Plot\_Options | HUC12\_Map | HUC8\_Data | HUC12\_Data | Indicator\_Info | HUC\_Subsets | Add\_Indicators

The following sections describe how to:

- **Filter the Indicator Info Table**
- **Add Indicator Info**

13.2. Filter the Indicator Info Table

The indicator information table can be filtered to view information for a specific indicator category (Base, Ecological, Stressor, or Social), indicator subcategory, or watershed scale by clicking the drop-down arrow next to the column name and selecting a filter option.

In the example below, the table is filtered to only display information for Ecological indicators.

6	Indicator Name/Glossary Term	Category	Subcategory	Watershed Scale(s)
	% Forest in WS (2016)		Forest Cover	HUC12
61	% Forest in HCZ (2016)		Forest Cover	HUC12
62	% Forest in RZ (2016)		Forest Cover	HUC12
63	% Forest Change in WS (2001-16)		Forest Cover	HUC12
64	% Forest Change in HCZ (2001-16)		Forest Cover	HUC12

6	Indicator Name/Glossary Term	Category	Subcategory	Watershed Scale(s)
	% N-Index1 Change in WS (2001-16)	Ecological Indicator	Natural Land Cover (All Types)	HUC12
85	% N-Index1 Change in HCZ (2001-16)	Ecological Indicator	Natural Land Cover (All Types)	HUC12
86				



13.3. Add Indicator Info

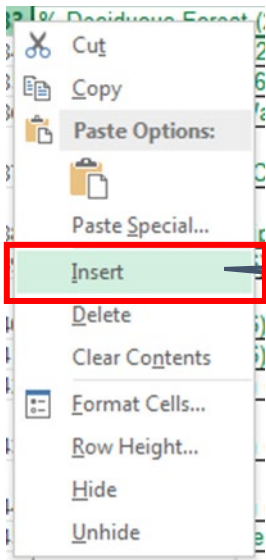
The **Indicator Info** worksheet can be updated by users to store information for new indicators added to the **Indicator Data** worksheet(s).

To add indicator information for a new indicator, first insert a row for the new indicator.

Right-click the margin of the **Indicator Info** worksheet (where row numbers are displayed) where you would like to insert the new row.

For example, if you would like to add information for a new Ecological indicator, right-click the margin of the first Stressor indicator row.

1	Indicator Name/Glossary Term	Category	Subcategory
	PHWA Water Quality Sub-Index, ER Percentile	Ecological Indicator	Integrated Waters
139	Neutral Variable, Ecological Category	Ecological Indicator	Neutral Variable
140	% Urban in WS (2016)	Stressor Indicator	Urban/Developed
141	% Urban in HCZ (2016)	Stressor Indicator	Urban/Developed



After right-clicking, select “Insert” from the Excel popup menu.

A new row will be inserted into the indicator information table.

Type the name of the new indicator in the Indicator Name column.

1	Indicator Name/Glossary Term	Category	Subcategory	Watershed Scale(s)
141	New Ecological Indicator			

Type the category of the new indicator (Base, Ecological, Stressor, or Social) in the Indicator Category column.

1	Indicator Name/Glossary Term	Category
141	New Ecological Indicator	Ecological Indicator

Type the subcategory of the new indicator. Users can enter an existing subcategory or a new subcategory.

Note that the subcategory entered here will only be relevant for sorting and filtering the *Indicator Info* sheet. The subcategory drop-down menus in other worksheets will store new indicators under a “user-added” subcategory.

1	Indicator Name/Glossary Term	Category	Subcategory
141	New Ecological Indicator	Ecological Indicator	Ecological Subcategory

Type the watershed scale of the new indicator in the Indicator Scale(s) column. For example, if the indicator is calculated for HUC12s in the Project Area then type “HUC12”.

1	Indicator Name/Glossary Term	Category	Subcategory	Watershed Scale(s)
141	New Ecological Indicator	Ecological Indicator	Ecological Subcategory	HUC12

Type a description of the new indicator in the Indicator Description column.

1	Indicator Name/Glossary Term	Category	Subcategory	Watershed Scale(s)	Description
41	New Ecological Indicator	Ecological Indicator	Ecological Subcategory	HUC12	Example new Ecological indicator.

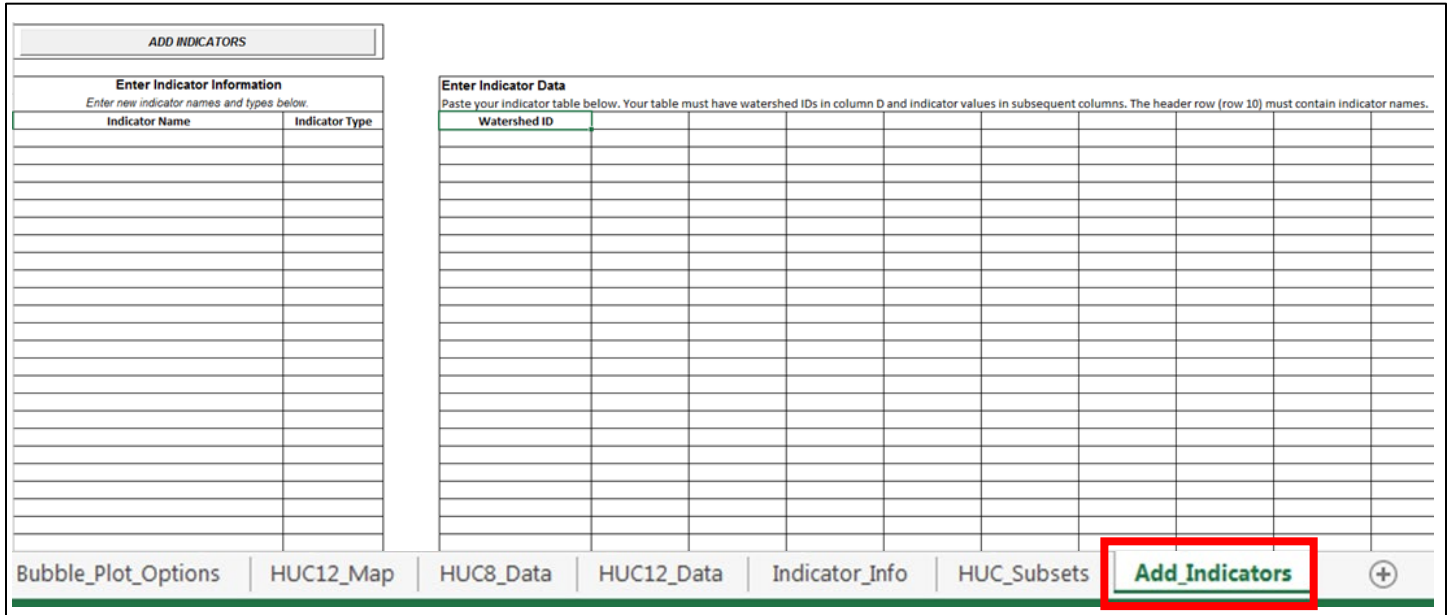
Repeat these steps for each new indicator added to the *Indicator Data* worksheet.

## 14. Add Indicators Worksheet

### 14.1. Overview

New indicators can be added to the Excel RPS Tool from the **Add Indicators** worksheet for use in a screening run. Note that the Excel RPS Tool does not include features for calculating new indicators. New indicators must be calculated outside of the Excel RPS Tool and, once calculated, can be added at any time. New indicators are inserted into new columns on the **Indicator Data** worksheet and will display in the indicator menus on the **Setup**, **Bubble Plot Options**, and **Map** worksheets.

If your Excel RPS Tool file is setup to screen multiple watersheds scales then new indicators must be added separately for each watershed scale. For example, if you would like to add new HUC12 indicators and new HUC14 indicators, you must add the HUC12 indicators in a separate step from the HUC14 indicators. Up to 50 indicators can be added at a time for each scale.



The **Add Indicators** worksheet is organized into two sections:

- In the **Enter Indicator Information** section you will enter a list of new indicator names and types (Ecological, Stressor, Social, or Base).
- In the **Enter Indicator Data** section you will paste in a table of indicator values for watersheds in the Study Area.

The following sections provide step-by-step instructions for how to:

- **Enter New Indicator Information**
- **Enter New Indicator Data**
- **Use the Add Indicators Button**



14.2. Enter New Indicator Information

In the **Enter Indicator Information** section of the **Add Indicators** worksheet, you will enter the name and type of each new indicator. This information is used to update the indicator menus on the **Setup, Bubble Plot Options, and Map** worksheets.

**Enter New Indicator Information Option 1 – Type New Indicator Names and Types**

In the **Enter Indicator Information** section, select cell A11 and type the name of the first new indicator.

Then enter the new indicator type in cell B11. Indicator type must be Ecological, Stressor, Social, or Base.

Repeat until each new indicator name and type has been added.

**Enter New Indicator Information Option 2 – Copy and Paste New Indicator Names and Types**

To use this option you must already have a pre-existing list of new indicator names and types stored in a separate worksheet. The pre-existing indicator list must be formatted with one indicator per row with the indicator name in the first column and indicator type in the second column.

Open the worksheet with the pre-existing indicator list. Select the indicator names and types and click “Copy” on the Excel menu.

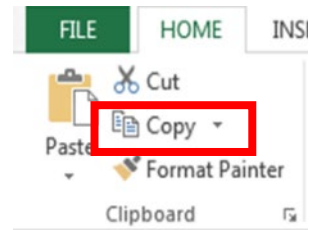
Go back to the **Add Indicators** worksheet and set the cursor to cell A11 in the **Enter Indicator Information** section.

Select “Paste Values” from the Excel menu to paste the new indicator names and types into the **Enter Indicators Information** section.

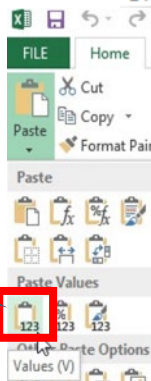
A	B
<b>Enter Indicator Information</b>	
<i>Enter new indicator names and types below.</i>	
Indicator Name	Indicator Type
Index of Biotic Integrity Score	Ecological

A	B
<b>Enter Indicator Information</b>	
<i>Enter new indicator names and types below.</i>	
Indicator Name	Indicator Type
Index of Biotic Integrity Score	Ecological
Number of CAFOs in WS	Stressor
% MS4 Area	Social

Index of Biotic Integrity Score	Ecological
Number of CAFOs in WS	Stressor
% MS4 Area	Social



A	B
<b>Enter Indicator Information</b>	
<i>Enter new indicator names and types below.</i>	
Indicator Name	Indicator Type



A	B
<b>Enter Indicator Information</b>	
<i>Enter new indicator names and types below.</i>	
Indicator Name	Indicator Type
Index of Biotic Integrity Score	Ecological
Number of CAFOs in WS	Stressor
% MS4 Area	Social

14.3. Enter New Indicator Data

In the **Enter Indicator Data** section of the **Add Indicators** worksheet, you will copy and paste a table of new indicator values for watersheds in the Study Area. These values are used to update the indicator data table in the **Indicator Data** worksheet.

To add new indicators, you must first prepare a table of new indicator values in a separate spreadsheet file. An example indicator table is displayed below. Note the following characteristics of the table:

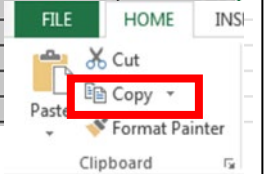
1. The table must have watershed IDs entered in the first column. Your table does not need to have a row for every watershed in the study area. Any watersheds that are missing from your table will have blank cells for the new indicators when added to the **Indicator Data** worksheet. Your table can include extra watersheds that are not in the study area; however, those watersheds will be skipped when updating the **Indicator Data** worksheet. Watersheds can be sorted in any order in your table.
2. The table must have indicator values in subsequent columns.
3. The table must have a header row with indicator names. Names of new indicators cannot match an existing indicator name already in the tool. We recommend limiting indicator names to 50 characters or less to properly display in tool menus.
4. Values of new ecological, stressor, and social indicators in your table should be numeric or blank. Non-numeric values will be skipped when updating the **Indicator Data** worksheet. Non-numeric values are allowed for base indicators.

	A	B	C	D
1	HUC12	Index of Biotic Integrity Score	Number of CAFOs in WS	% MS4 Area
2	031501010101	98.50	5	0.00
3	031501010102	99.35	3	0.00
4	031501010103	78.42	0	18.02
5	031501010104		1	7.96
6	031501010105	47.08	0	5.88
7	031501010106	53.29	0	9.56
8	031501010301	46.89	0	4.21
9	031501010302	50.24	6	4.52
10	031501010303	57.43	2	9.08
11	050500010102		1	3.06
12	050500010103	83.32	1	37.50
13	050500010105	80.97	0	2.13
14	051100020101	42.89	0	0.92
15	051100020102	46.93	0	0.82
16	051100020105		0	0.41
17	051100020106	55.19	1	0.69
18	051100020108	50.26	0	0.00
19	051100020109	50.61	0	0.34
20	051100020201		0	0.38
21	051100020203	54.46	2	0.83
22	051100020501	53.91	0	0.00

After you have prepared your indicator data table in a separate spreadsheet file, you will copy and paste the table into the **Enter Indicator Data** section.

Open the spreadsheet file containing your pre-calculated new indicators. Select the cells containing watershed IDs and new indicator values in that file (including the header row) and click “Copy” on the Excel menu.

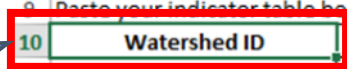
	A	B	C	D
1	HUC12	Index of Biotic Integrity Score	Number of CAFOs in WS	% MS4 Area
2	031501010101	98.50	5	0.00
3	031501010102	99.35	3	0.00
4	031501010103	78.42	0	18.02
5	031501010104		1	7.96
6	031501010105	47.08	0	5.88
7	031501010106	53.29	0	9.56
8	031501010301	46.89	0	4.21
9	031501010302	50.24	6	4.52
10	031501010303	57.43	2	9.08
11	050500010102		1	3.06
12	050500010103	83.32	1	37.50
13	050500010105	80.97		
14	051100020101	42.89		
15	051100020102	46.93		
16	051100020105			
17	051100020106	55.19		



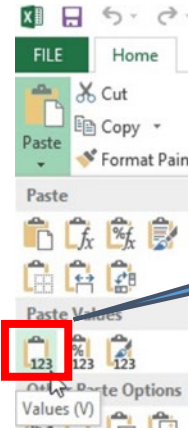
Go back to the **Add Indicators** worksheet and set the cursor to cell D10.

Note that by default cell D10 contains the text “Watershed ID”. This text is included as a placeholder and should be overwritten by your indicator data table.

	D	E	F
8	<b>Enter Indicator Data</b>		
9	Paste your indicator table below. Your table must have watershed IDs		
10	Watershed ID		
11			
12			
13			
14			



Select “Paste Values” from the Excel menu to paste the indicator data table into the **Add Indicators** worksheet.



	D	E	F	G
8	<b>Enter Indicator Data</b>			
9	Paste your indicator table below. Your table must have watershed IDs in column D and indicator valu			
10	HUC12	Index of Biotic Integrity Score	Number of CAFOs	% MS4 Area
11	031501010101	98.49662401	5	0
12	031501010102	99.35390734	3	0
13	031501010103	78.42011275	0	18.02
14	031501010104		1	7.96026228
15	031501010105	47.0843994	0	5.880882549
16	031501010106	53.28558028	0	9.559236623
17	031501010301	46.89142972	0	4.214230407
18	031501010302	50.2423724	6	4.519161244
19	031501010303	57.42810532	2	9.08079115
20	050500010102		1	3.058646903
21	050500010103	83.31772027	1	37.5
22	050500010105	80.97092932	0	2.125675012
23	051100020101	42.88632856	0	0.921042273
24	051100020102	46.93380457	0	0.816190158
25	051100020105		0	0.408689922

14.4. Add Indicators Button

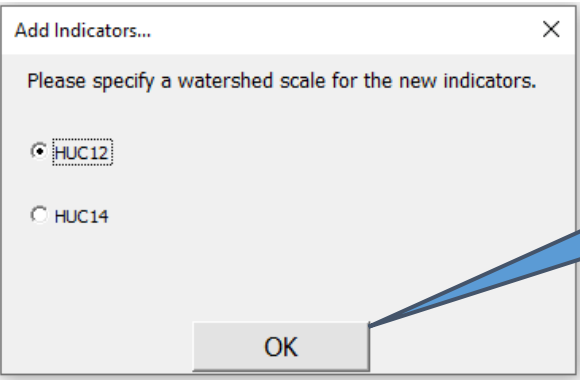
After entering new indicator names, types, and values use the **ADD INDICATORS** button to update the other tool worksheets with new indicators.

Clicking the **ADD INDICATORS** button from the *Add Indicators* worksheet will display a message box listing the requirements for adding new indicators. Review that the requirements are met and click **YES** to continue.



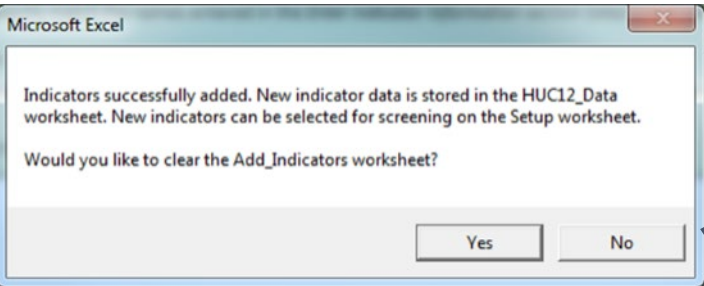
Enter Indicator Information	
Enter new indicator names and types below.	
Indicator Name	Indicator Type
Index of Biotic Integrity Score	Ecological
Number of CAFOs in WS	Stressor
% MS4 Area	Social

Enter Indicator Data	
Paste your indicator table below. Your table must have water	
HUC12	Index of Biotic Integrity Score
031501010101	98.49662401
031501010102	99.35390734
031501010103	78.42011275
031501010104	



If your tool file includes multiple watershed scales, a message box will prompt you to specify which scale the new indicators apply to. Select the option button for the appropriate watershed scale and click **OK**.

The tool will then check to verify that indicator names, types, and values have been correctly entered on the *Add Indicators* worksheet. The tool will also look for potential issues with new indicator data. If no data issues are found, the new indicators will be automatically added as new columns to the *Indicator Data* worksheet and will be added to menus on the *Setup*, *Bubble Plot Options*, and *Map* worksheets. If issues are identified, an error message will appear.



A message box will appear to notify you that your new indicators were successfully added to the tool file. The message box will prompt you to clear new indicator names, types, and values from the *Add Indicators* worksheet. If you would like to automatically clear the *Add Indicators* worksheet click **YES**. Or click **NO** to clear manually.

It is strongly recommended that you enter information for the new indicators (name, type, scale, and description) to the *Indicator Info* worksheet. Refer to the *Indicator Info* worksheet section of this guide for instructions on inserting information for new indicators.

## 15. HUC Subsets Worksheet

### 15.1. Overview

When setting up an RPS screening, you'll often want to focus on just a subset of watersheds of interest rather than all watersheds in the Project Area. The **HUC Subsets** worksheet provides a space to identify and store groups of watershed subsets for use in a screening. For example, within the **HUC Subsets** tab you can generate a list of HUC12 subwatersheds that are located in a particular HUC8 of interest or that have a certain land cover profile.

Watershed subsets include only a portion of all watersheds in the Project Area. A watershed subset is a list of watershed IDs that meet one or more user-defined selection criteria. Watershed subsets are stored on the **HUC Subsets** worksheet with one watershed ID per row. A subset can be added to the **Select Watersheds** section of the **Setup** worksheet to screen and compare the watersheds in the subset. Watershed subsets are defined automatically with the **CREATE A NEW WATERSHED SUBSET** button or entered manually.

**CREATE A NEW WATERSHED SUBSET**

**Example Subset**

- 010000000001
- 010000000002
- 010000000003
- 010000000004
- 010000000005
- 010000000006
- 010000000007
- 010000000008
- 010000000009
- 010000000010

Bubble\_Plot\_Options | HUC12\_Map | HUC8\_Data | HUC12\_Data | Indicator\_Info | **HUC\_Subsets** | Add\_Indicators

The following sections provide step-by-step instructions for how to:

- **Use the Create a New Watershed Subset Button**
- **Manually Add a Subset List**

15.2. Create a New Watershed Subset Button

The RPS Tool includes an interface for defining a watershed subset. The interface can be accessed by clicking the **CREATE A NEW WATERSHED SUBSET** button on the **HUC Subsets** worksheet.

Before clicking the button, you should already have in mind a set of criteria or conditions for defining your watershed subset.

**CREATE A NEW WATERSHED SUBSET**

The **Define Watershed Subset** interface will now display. The interface contains four components:

1. Text boxes for entering a subset name and description.
2. Drop-down menus and boxes for defining a subset condition. A “subset condition” is an indicator, and a set of values for that indicator, that is used to select the watersheds included in the subset (at least 50% cropland cover in the watershed, for example). Up to 10 conditions can be defined for a given subset.
3. A list of subset conditions that have been entered for the current subset with buttons for removing a condition and defining how the conditions are used.
4. The **ADD SUBSET TO HUC\_SUBSETS** sheet button with an optional check box to save a record of the subset name, description, and conditions in PDF format.

Define Watershed Subset... ✕

**On this menu you can define and store a subset of watersheds of interest based on one or more indicators.**  
 For example, a subset could include all watersheds with agricultural land cover greater than 50%. Use the controls below to specify which watersheds to include in your subset. The selected watershed IDs will be stored as a new list on the HUC\_Subsets sheet and can be copy/pasted onto the Setup sheet for screening.

Enter Subset Name (required, 50 character limit):

Enter Subset Description (optional):

A "subset condition" is an indicator, and set of values for that indicator, used to define watersheds to include in the subset. Use the menus below to define a subset condition then click the "Add Condition" button to add it to the list of conditions defined in the box to the right. Up to 10 subset conditions can be defined but must be entered one-at-a-time using the menus below.

Select Indicator Category:

Select Indicator Subcategory:

Select Indicator:

Select Subset Method:

Include Watersheds with Values Between:  To   
Min = Max =

Include Watersheds with Values Of:

Subset conditions are listed below after they are added with the "Add Condition" button. Up to 10 conditions can be defined.

Your subset can include watersheds that meet at least one of the subset conditions or only those watersheds that meet all of the subset conditions. Use the option buttons to select a subsetting method.

Watersheds must meet:  At Least One Condition  All Conditions

**3**

You can remove a subset condition by highlighting it in the list above and clicking the "Remove Selected Condition" button below.

When you have defined all of your subset conditions click the "Add Subset to HUC\_Subsets Sheet" button below to add the list of watershed IDs to the HUC\_Subsets sheet.

Check this box to save a copy of the subset name, description, and conditions as a PDF for your records. If this box is checked, the PDF file will be saved after clicking the "Add Subset to HUC\_Subsets Sheet" button below. The PDF file will be saved in the same directory as this tool file and will be named using the subset name.

**Add Subset to HUC\_Subsets Sheet**

If your tool file includes multiple watershed scales, a popup box will display after you click the **CREATE A NEW WATERSHED SUBSET** button.

The popup box will contain a list of watershed scales and ask you to specify the scale to use for defining your subset.

A subset can only contain watersheds from a single scale. Choose your desired scale and click OK.

On the **Define Watershed Subset** menu, type a name for your subset in the **Enter Subset Name** text box and an optional description in the **Enter Subset Description** text box.

You can now begin to define subset conditions. First select an indicator category (Base, Ecological, Stressor, or Social), indicator subcategory, and indicator name.

Next, choose a subset method from the **Select Subset Method** drop-down menu.

The Range of Values option allows you to specify minimum and maximum values of interest for the selected indicator. Watersheds with indicator values in the specified range will be included in the subset.

The Unique Values option allows you to select one or more unique values of interest for the selected indicator. Watersheds with the specified values will be included in the subset. The unique values option will typically only be used for categorical indicators.

If you choose the Range of Values method, enter the range of values of interest for the selected indicator in the text boxes.  
 For reference, the tool will display minimum and maximum values of the selected indicator below the boxes.

If you choose the Unique Values method, a list of unique indicator values will automatically display in the selection box below the **Select Subset Method** drop-down menu.  
 Choose one or more of the unique indicator values by highlighting the values in the selection box.

After you have selected an indicator type, name, subset method, and indicator values for your subset condition, click the **ADD CONDITION** button.  
 The condition will now be added to the list of subset conditions on the right side of the interface.  
 Repeat this process as needed to enter up to ten conditions for your subset.

You can remove any subset condition from the list by highlighting it and clicking the **REMOVE SELECTED CONDITION** button.

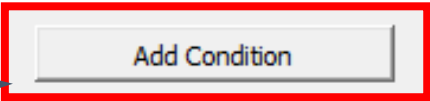
Select Indicator: % Agriculture in WS (2016)  
 Select Subset Method: Range of Values  
 Include Watersheds with Values Between: 50 To 100  
 Min = 0 Max = 72.5051

---

Select Indicator: Name HUC8 Watershed  
 Select Subset Method: Unique Values  
 Include Watersheds with Values Between: [ ] To [ ]  
 Min = [ ] Max = [ ]

Include Watersheds with Values Of:

- Chincoteague
- Cohansey-Maurice
- Crosswicks-Neshaminy
- Delaware Bay**
- Great Egg Harbor
- Hackensack-Passaic
- Lower Delaware



Subset conditions are listed below after they are added with the "Add Condition" button. Up to 10 conditions can be defined.

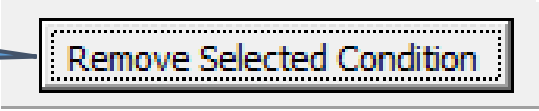
Your subset can include watersheds that meet at least one of the subset conditions or only those watersheds that meet all of the subset conditions. Use the option buttons to select a subsetting method.

Watersheds must meet:  At Least One Condition  All Conditions

% Agriculture in WS (2016) = 50 To 100  
 Name HUC8 Watershed = Delaware Bay

You can remove a subset condition by highlighting it in the list above and clicking the "Remove Selected Condition" button below.

Remove Selected Condition





The *Define Watershed Subset* interface contain two option buttons for choosing how the subset conditions will be used to select watersheds to include in your subset. The option buttons are displayed on the right side of the interface above the subset list.

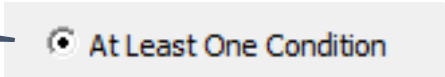
Subset conditions are listed below after they are added with the "Add Condition" button. Up to 10 conditions can be defined.

Your subset can include watersheds that meet at least one of the subset conditions or only those watersheds that meet all of the subset conditions. Use the option buttons to select a subsetting method.

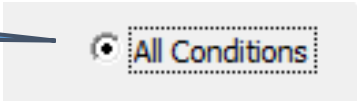
Watersheds must meet:  At Least One Condition  All Conditions

% Agriculture in WS (2016) = 50 To 100  
Name HUC8 Watershed = Delaware Bay

If the **AT LEAST ONE CONDITION** button is selected, then your subset will include any watershed that meets at least one condition in the subset condition list.



If the **ALL CONDITIONS** button is selected, then your subset will only include watersheds that meet all of the conditions in the subset condition list.



After defining your subset conditions and selecting an option for applying the conditions (i.e., At Least One Condition versus All Conditions), you are ready to add the watershed subset to your tool file with the **ADD SUBSET TO HUC\_SUBSETS SHEET** button.

By default, a record of the subset name, description, and conditions are saved in a PDF file when the **ADD SUBSET TO HUC\_SUBSETS SHEET** button is clicked. The PDF file is saved in the same folder as your tool file using the subset name in the PDF filename. If you would like to create your subset without saving a record of the subset settings, uncheck the box above the **ADD SUBSET TO HUC\_SUBSETS SHEET** button.

After clicking the **ADD SUBSET TO HUC\_SUBSETS SHEET** button, the tool will automatically identify watersheds that satisfy your subset conditions. The subset name and list of watershed IDs in the subset will be added to the first available column in the *HUC Subsets* worksheet for use in a screening run.

When you have defined all of your subset conditions click the "Add Subset to HUC\_Subsets Sheet" button below to add the list of watershed IDs to the HUC\_Subsets sheet.

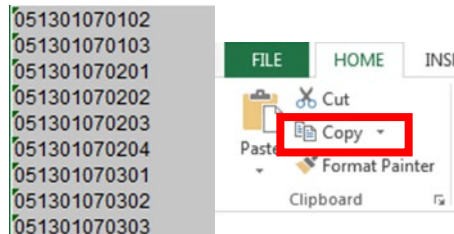
Check this box to save a copy of the subset name, description, and conditions as a PDF file for your records. If this box is checked, the PDF file will be saved after clicking the "Add Subset to HUC\_Subsets Sheet" button below. The PDF file will be saved in the same directory as this tool file and will be named using the subset name.

**Add Subset to HUC\_Subsets Sheet**

Delaware Bay Cropland
020200070207
020301050104
020301050107
020401050603
020401050902
020401050905
020402010401
020402010402

15.3. Manually Add a Subset List

To add a new subset list to the *HUC Subsets* worksheet, select the pre-existing list of watershed IDs from a separate worksheet (formatted with one ID per row) and click “Copy” on the Excel menu.



Set the cursor to row 8 in the first open column on the *HUC Subsets* worksheet.

	Conasauga 03150101 (7)	Barren 05110002 (13)	Upper Cumberland 05130101 (10)
7			
8	031501010102	051100020101	051301010201
9	031501010103	051100020102	051301010501
10	031501010104	051100020105	051301010502
11	031501010106	051100020106	051301010503
12	031501010301	051100020108	051301010601
13	031501010302	051100020201	051301010602
14	031501010303	051100020203	051301010603
15		051100020501	051301010604
16		051100020503	051301010605
17		051100020601	051301010701
18		051100020602	
19		051100020604	
20		051100020605	

Select “Paste Values” from the Excel menu to paste the watershed IDs into the *HUC Subsets* worksheet.

If desired, type a descriptive header for the subset list in row 7. Save the tool file. The new subset list is now stored for future use in a screening run.

