

Prioritize, Target, Measure Application (PTMApp) Web User's Guide



Prepared by Houston Engineering Inc.



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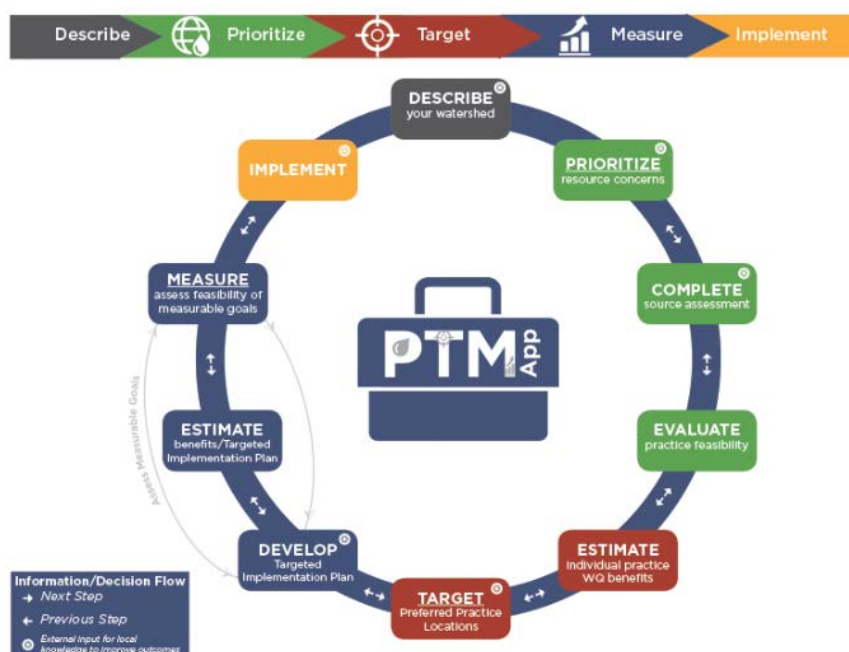
1 INTRODUCTION

The Prioritize, Target, and Measure Application (PTMApp) is a vision for state-wide desktop and web applications. These applications can be used by water quality practitioners to provide the technical bridge between the general description of the types of strategies in a local water plan and the identification of implementable on-the-ground Best Management Practices (BMPs) and Conservation Practices (CPs).

PTMApp can be used by Soil and Water Conservation Districts (SWCD), watershed districts, county local water planners, agency staff, and decision-makers to interactively and in real-time prioritize resources and the issues impacting them, target specific fields to place CPs and BMPs, and measure water quality improvement by tracking the expected nutrient and sediment load reductions delivered to priority resources. These applications enable practitioners to develop water quality improvement scenarios and prioritized and targeted water quality implementation plans, estimate the cost effectiveness of the scenario for improving water quality, and report the results to pursue funds for project implementation. The primary user of the application is envisioned as water quality practitioners employed by a local government. The intent is to develop and provide access to water quality information to address the common business needs of SWCDs, watershed districts, watershed management organizations and counties with limited technical support.

PTMApp–Web provides access to the various products created using PTMApp–Desktop. The PTMApp–Desktop products are uploaded to the web server by the individual creating the products. Placement of the PTMApp–Desktop products into the web environment requires authorization by the PTMApp–Web Administrator. To use PTMApp–Web you MUST create a user account which requires approval by the web administrator. Once Access is granted by the web administrator, the user will be able to view all watersheds on PTMApp–Web.

The PTMApp products (see **Figure 1**) are created using PTMApp–Desktop and can be accessed using PTMApp–Web. These products can be used to complete a pollutant source assessment, evaluate the feasibility of BMPs, estimate the water quality benefits of one or more practices, and assess the ability to achieve measurable goals. The sequential use of the products allows the user to create a targeted implementation strategy to improve water quality, whether within a local drainage area or a large watershed. The products are also



Prioritize, Target and Measure Application (PTMApp) Products.

useful for developing targeted grant applications for improving water quality, and further refining implementation strategies described in Watershed Restoration and Protection Strategies (WRAPS).

Once you have a user account, there are currently three tools available to view, interact with and retrieve the PTMApp products. These tools include an 'Interactive Map', a 'Table Generator,' and a 'Targeted BMP Action Report' generator also called 'Action Report'. Commonly used PTMApp products can be viewed and printed using the interactive map. A summary of the products and their uses can be found on the PTMApp Website (<https://ptmapp.bwsr.state.mn.us/>). The Table Generator allows the user to download the tabular PTMApp data in a .csv to their desktop, for additional analysis and the creation of secondary products. The Targeted BMP Action Report allows the user to create individualized bmp reports based on various user specified parameters which provides flexibility and ease-of-use for the user.

2 UPLOADING DATA TO THE PTMAPP-WEB SERVER

The data products are created using PTMApp-Desktop and must be uploaded to the web server before they can be accessed through PTMApp-Web at <https://ptmapp.bwsr.state.mn.us/>. Only a portion of the data created by PTMApp-Desktop are uploaded to the web server. The geodatabase with the geospatial data needed to create PTMApp output products can approach ~ 100 GB for a large watershed (~ 1,500 square miles). PTMApp-Web performance diminishes for large watersheds because of the volume of data.

The instructions and the ESRI ArcGIS license requirements needed to upload the data generated using PTMApp-Desktop is provided elsewhere (https://ptmapp.bwsr.state.mn.us/files/PTMApp_User_Guide.pdf). Directions on how to access PTMApp data on the web once your data has been uploaded can be found in the next section. ***Once you've completed the tasks in Section 3, you will receive an email from the web administrator letting you know you've gained access to use PTMApp-Web.***

3 GAINING ACCESS TO PTMAPP-WEB DATA

Access to the PTMApp products through PTMApp-Web is restricted¹ to those given explicit access by the PTMApp-Web Administrator. PTMApp products are typically created for Clean Water Fund Accelerated Implementation Grants, development of a One Watershed One Plan or Watershed Management Plan, completion of a water quality targeted implementation strategy, refining of a WRAPS implementation strategy, and/or other planning/implementation of local water management efforts. A user account is provided only to individuals that can demonstrate involvement in one of these efforts.

¹ Access is limited because the application contains information about possible practice locations for improving water quality, which require additional field verification to ensure feasibility.

Once access has been granted by the PTMApp-Web Administrator, the user can login and has full access to all data/watersheds on the PTMApp Web site.

3.1 CREATING A USER ACCOUNT

Access to the data and tools within PTMApp-Web is gained only after a user account is created and approved by the PTMApp-Web administrator. To obtain a user account go to <https://ptmapp.bwsr.state.mn.us/> and click on 'Create PTMApp Account' link on the bottom of the page:



Web Application Sign In

Sign in using your registered account:
NOTE: This application is currently in testing and therefore access is restricted those involved in select One Watershed One Plan Pilots or application development.

Username

Password

☐ Remember me?

[Forgot your password?](#)

New User?

[Create PTMApp Account](#)

The Prioritize, Target, and Measure Application (PTMApp) is a vision for a state-wide desktop and web application which be used by practitioners to provide the technical bridge between the general description of the types of strategies in a local water plan and the identification of implementable on-the-ground Best Management Practices (BMPs) and Conservation Practices (CPs).

PTMApp can be used in a workshop environment by Soil and Water Conservation Districts (SWCD), watershed districts, county local water planning, agency staff and decision-makers to interactively and in real-time, **PRIORITIZE** resources and the issues impacting them, **TARGET** specific fields to place CPs and BMPs, and **MEASURE** water quality improvement by tracking the expected nutrient and sediment load reductions delivered to priority resources.

The tool enables practitioners to build prioritized and targeted implementation scenarios, measure the cost-effectiveness of the scenario for improving water quality, and report the results to pursue funds for project implementation.

[PTMApp - Desktop](#)

[PTMApp - Web](#)

[Documentation](#)

[Collaborators](#)

An innovation solution from:



RED RIVER WATERSHED
MANAGEMENT BOARD

International Water Institute
Supporting Flood Research and Watershed Education

Complete the information on the registration form and hit 'Register':

PTM App

Login to PTMApp Web

Register - Create a New Account

Username

First Name

Last Name

Email

Phone Number

Password

Confirm password

Primary Organization

Access Justification

Register

Fill out the information and hit 'Register'

PTMApp - Desktop PTMApp - Web Theory & Documentation Collaborators

You should be diligent and deliberate when completing the access justification line of the registration form. The web administrator will use this information to reach a decision about whether your request for access should be granted. Reasons for access include identifying your role as a local government water quality practitioner and ***your participation in a project utilizing PTMApp, including Accelerated Implementation Grants, the development of a One Watershed One Plan or Watershed Management Plan, a water quality targeted implementation strategy, refinement of a WRAPS implementation strategy or involvement in local water management efforts. Be sure to include your telephone number so you can be contacted if the web administrator has any questions concerning your request.*** Press the “register” button when the form is complete.

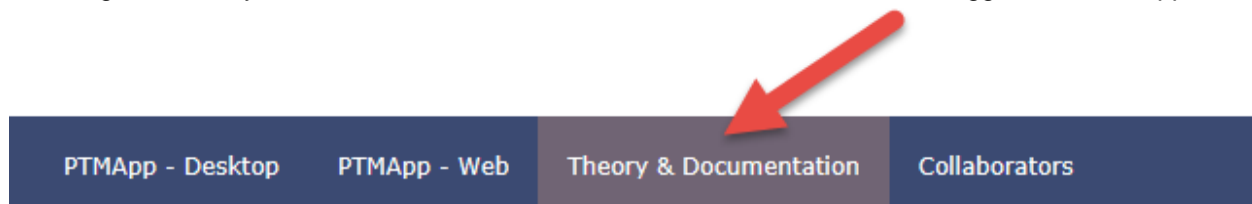
You will receive an email from the web administrator confirming or denying access generally within 4 hours if requested during normal business hours. You may receive a telephone call seeking additional information about the need for access, should it appear that access may be denied.

Once you have been provided access to PTMApp-Web, you will have access to all public datasets which have been previously uploaded by the web administrator to the web application.

4 USING PTMAPP-WEB

The ultimate vision of PTMApp-Web is the ability to develop, assess, and evaluate the benefits of targeted implementation plans on the fly. PTMApp-Web presently includes three tools for using the enhanced geospatial water quality data created using PTMApp-Desktop. These tools are the 'Interactive Map', 'Table Generator', and 'Targeted BMP Action Report'.

Using the data within PTMApp-Web requires a working knowledge of the enhanced geospatial water quality data products. Resources to help you understand the products are provided on the 'Theory and Documentation' page of the PTMApp website: <https://ptmapp.bwsr.state.mn.us/>. This can be accessed by selecting the "Theory & Documentation" tab located on the bottom ribbon when logged into PTMApp Web.



Descriptions of the data tables can be found by downloading the Data Catalog. Descriptions of the attributes for fields within the data tables can be found by downloading the Attribute Catalog. Links to each of these are highlighted below:

Documentation, Theory and Training Opportunities

Help Documents

PTMApp - Theory and Development Documentation (3/14/16)

PTMApp - Desktop User Guide

PTMApp - Web User Guide

Download QA/QC Desktop Outputs

Download Attribute Catalog

Download Data Catalog

Version Updates

Performing Lake and Storage Routing in PTMApp

Workshops

Develop Inputs

Run PTMApp Desktop

Build Products

Other Documentation

Decision Support Tools – Use Comparison Matrix

Hydro-conditioning Steps/Method

PTMApp Use and hDEM Conditioning Level

Webinars

(September 22nd, 2015) Using GIS and Mobile Tools to Track Implementation and Compliance of Water Quality Projects September 22nd

(September 11th, 2015) PTMApp Blue Ribbon Panel – PTMApp Desktop

(July 29th, 2015) The Basics: How to do Hydrologic Conditioning

(July 8th, 2015) Science and Theory Behind Water Quality Enhanced Geospatial products

(June 10th 2015) Integrating Modeling & WQ Enhanced Geospatial Products Into Restoration Strategies

(May 19th, 2015) Enhanced Geospatial Products: Solving WQ Problems

Training Opportunities

No current training planned

An innovation solution from:

Get Help: For technical help or problems with PTMApp - Desktop or PTMApp - Web email: Ptma@tickets.assembla.com. See [technical help policy](#).

This webpage includes other resources for learning more about PTMApp input and output products. The user of PTMApp-Web is responsible for becoming familiar with the enhanced water quality geospatial products within PTMApp-Desktop which is the basis of data displayed in PTMApp-Web.

4.1 TECHNICAL SETTINGS




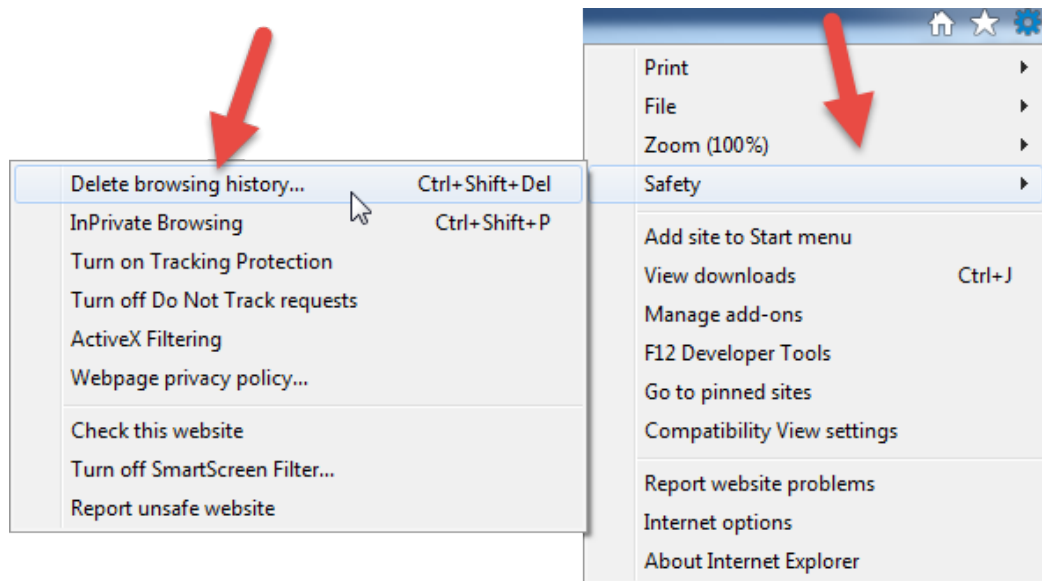
Tip: Before you begin working in PTMApp-Web, here are three very important item you should consider and/or complete:

- 1) To print from the Interactive Map feature in PTMApp-Web, you **MUST TURN POPUP BLOCKERS OFF**. Maps will not print unless this feature is disengaged. Guidance on turning this feature off in Internet Explorer and Google Chrome browsers can be found in sections 4.1.3 and 4.1.4, respectively.
- 2) **PRINTING LARGE AREAS WITH IMAGES AS A BACKGROUND REQUIRES CONSIDERABLE COMPUTER RESOURCES AND MAY TAKE LONG PERIODS OF TIME**. Please consider zooming in and printing smaller areas if working with large datasets.
- 3) Recent updates to PTMApp-Web may not be realized on your machine if you do not clear your web browser's cache. We strongly recommend **CLEARING YOUR BROWSER CACHE** prior to printing maps or using the Action Report in PTMApp-Web. You only need to clear your browser's cache if that browser had previously been used to access PTMApp-Web. Guidance on how to clear your cache in Internet Explorer and Google Chrome can be found in sections 4.1.1 and 4.1.2, respectively.

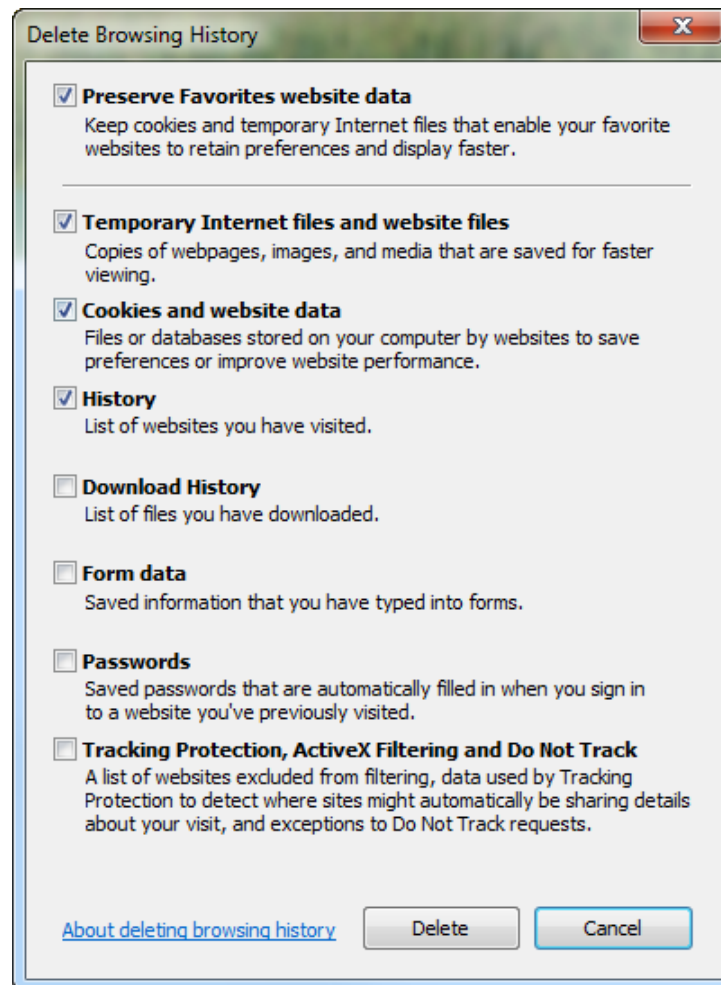
4.1.1 HOW TO CLEAR YOUR INTERNET EXPLORER BROWSER CACHE

The following guidance can be used for clearing your Internet Explorer (IE) browser cache and cookies in IE versions 9, 10, and 11.

To clear your browser cache in IE, first click the tools icon () in the upper right of your browser screen, then click 'Select' and 'Delete browsing history'.




In the 'Delete Browsing History' window, be sure to have each of the boxes checked, as shown in the figure below, then hit 'Delete'.

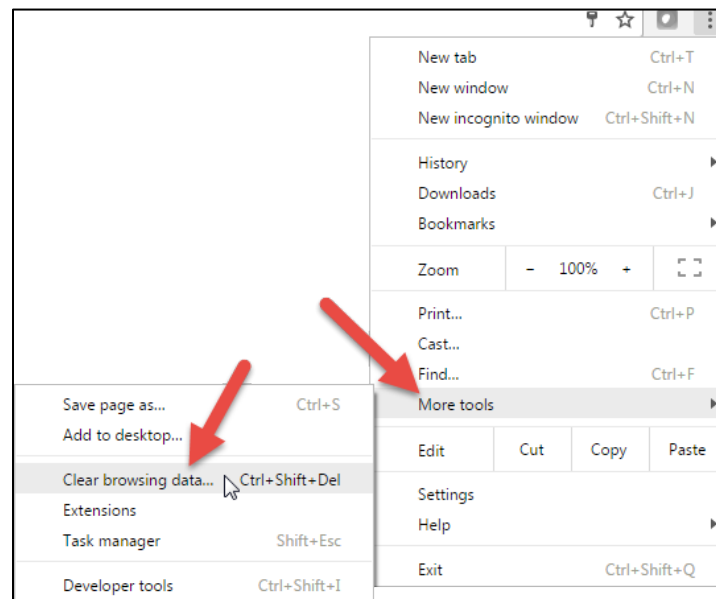


You should see the icon below at the bottom of the screen, verifying your browser history has been deleted.

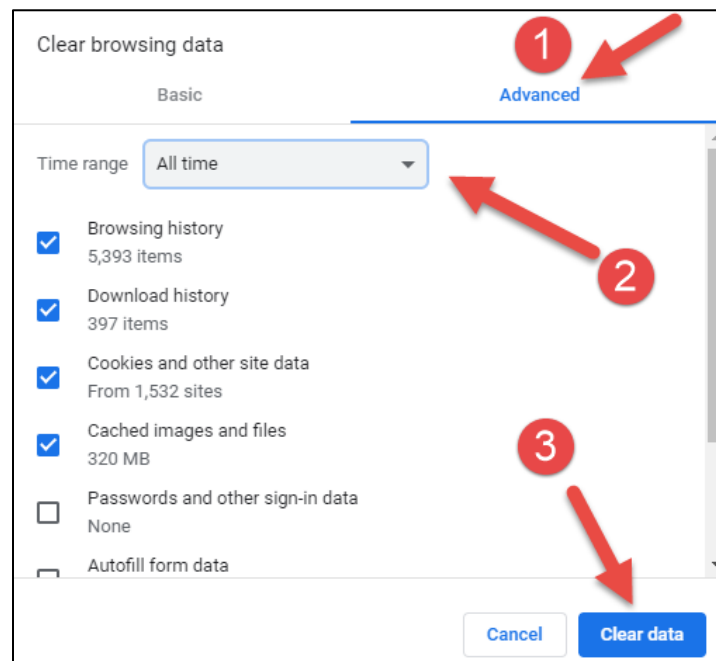
Internet Explorer has finished deleting the selected browsing history.

4.1.2 HOW TO CLEAR YOUR GOOGLE CHROME BROWSER CACHE

To clear your browser cache in Chrome, click the tools button () in the top right of the screen, then click 'More tools' and 'Clear browsing data':



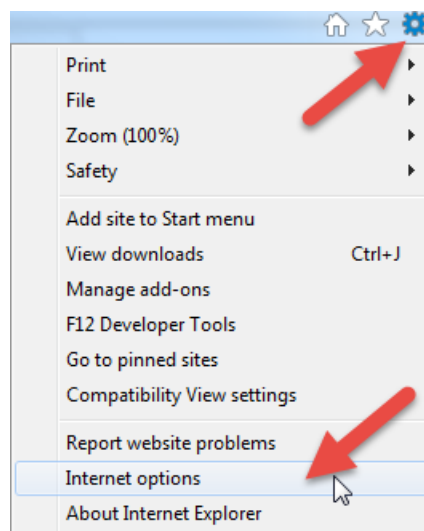
In the dialog box that appears, select the “advanced” tab then choose “All Time” for your time range to delete previous cache, cookies, and browsing history. After these items are selected, click the ‘Clear data’ button.



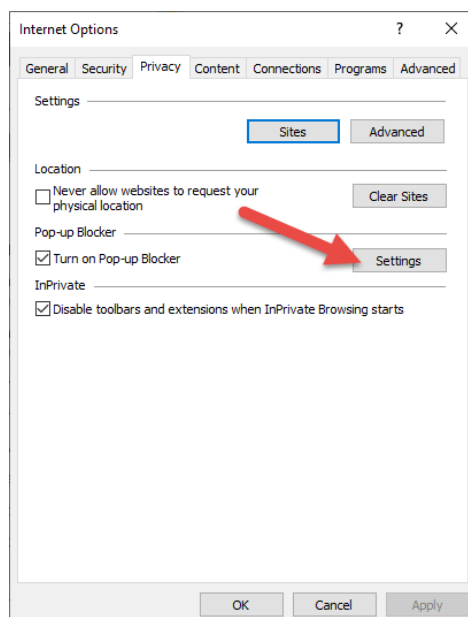
4.1.3 HOW TO TURN OFF YOUR INTERNET EXPLORER POPUP BLOCKER

The popup blocker on your internet browser MUST be turned off or otherwise disengaged for the PTMApp website to print maps from PTMApp-Web. IE users can follow the instructions below to turn off their popup blocker. Other internet browsers (e.g. Mozilla Firefox) follow similar methods, with the Popup Blocker being deactivated within the browser's settings. Instructions for allowing printing within Google Chrome are found in the next section.

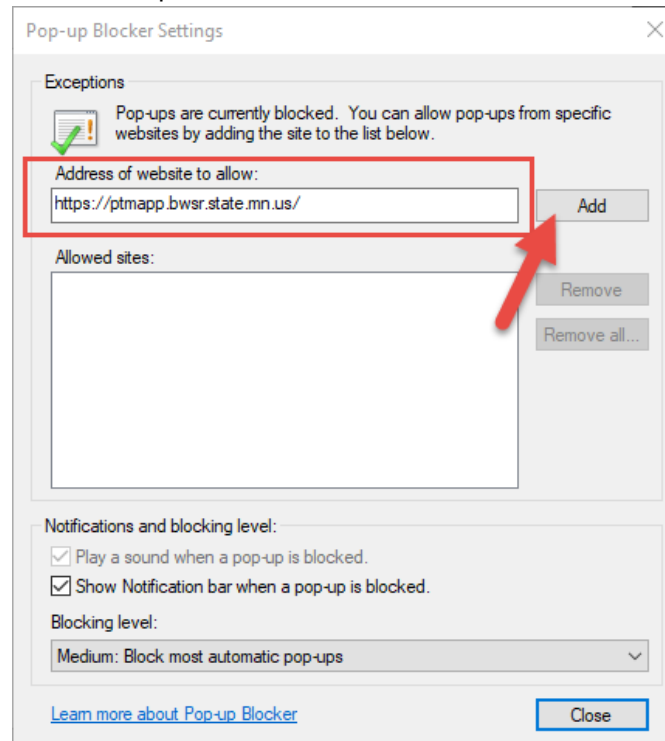
- 1) Click on the 'Tools' button (looks like a gear and is denoted by top arrow in figure below) in the upper-right corner of the IE window and click 'Internet Options'.



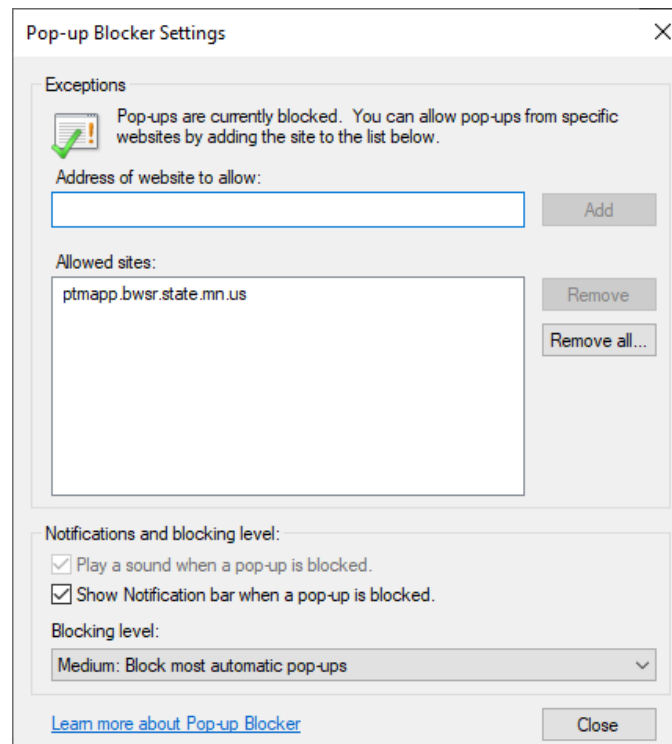
- 2) On the 'Privacy' tab under 'Pop-up Blocker', click 'Settings'



- 3) In the 'Pop-up Blocker Settings' dialog window, copy and paste the PTMApp website into the open box denoted with the red square below, then click 'Add':



- 4) The PTMApp website should appear in the 'Allowed Sites' window, as below:



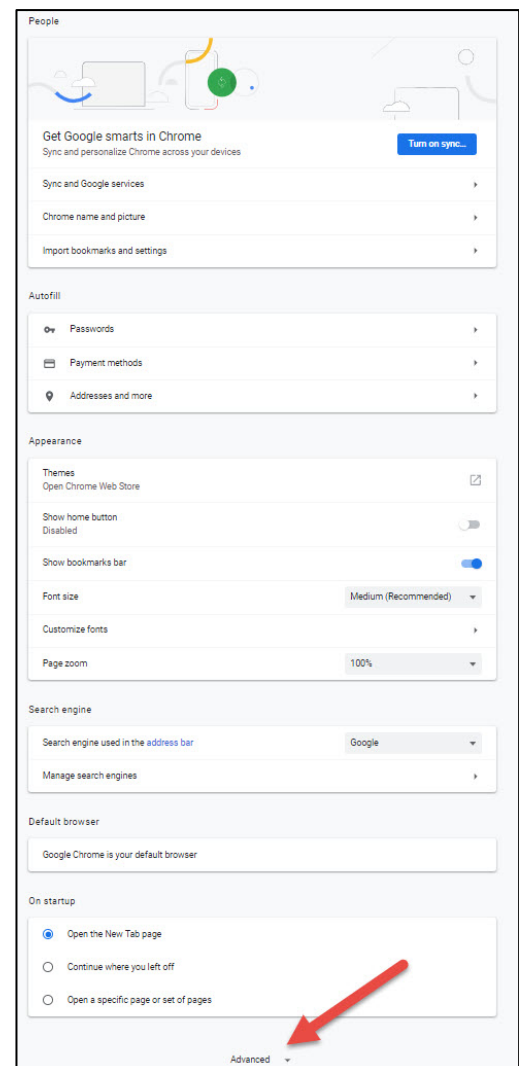
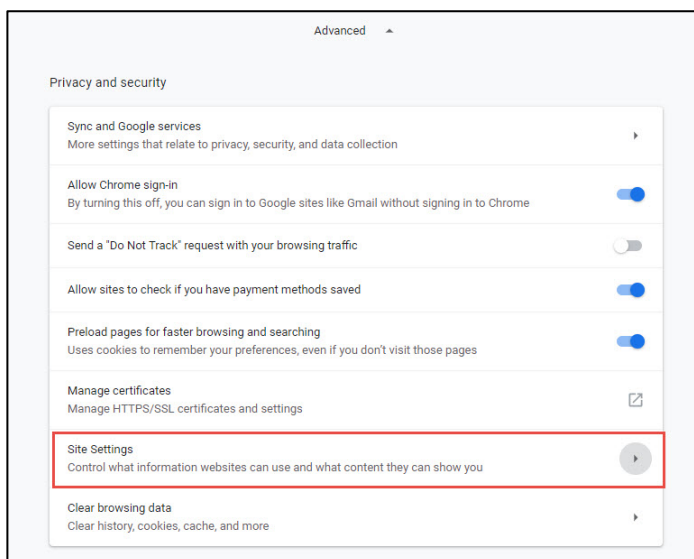
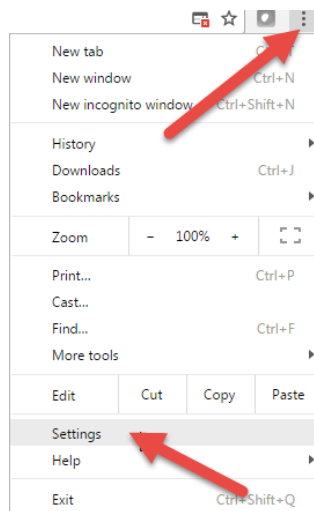
4.1.4 HOW TO TURN OFF YOUR GOOGLE CHROME POPUP BLOCKER

The popup blocker on your internet browser **MUST** be turned off or otherwise disengaged for the PTMApp website to print maps from PTMApp-Web. Google Chrome users can follow the instructions below to turn off their popup blocker. Other internet browsers (e.g. Mozilla Firefox) follow similar methods, with the Popup Blocker being deactivated within the browser's settings. Instructions for allowing printing within IE are found in the previous section.

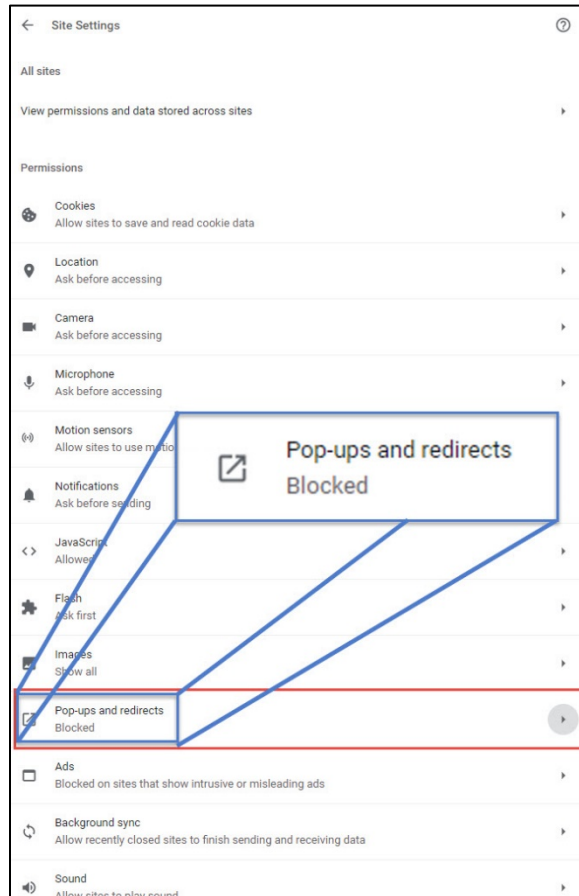
- 1) Click on the 'Customize and Control Google Chrome' icon (three vertical dots in figure below) in the upper-right of the Chrome window and navigate to 'Settings'.

- 2) In Settings, click 'Show Advanced Settings'

- 3) Once the Advance Settings are available, click 'Site Settings' under the 'Privacy and Security' header




- 4) In the Site Settings window, scroll down to the 'Pop-ups and redirects' Section and select it



- 5) In the "Pop-ups and redirects" window select "Add" next to the "Allow" option.



- 6) Copy and paste PTMApp-Web's URL into the open dialog box.



Add a site

Site

[*].example.com

Cancel Add

Once complete, hit the 'Done' button. The PTMApp website should now appear in the Pop-up exceptions list.

4.2 THE DASHBOARD TO DISPLAY STATUS

When you sign in, you will automatically be returned to the PTMApp-Web dashboard page (shown below). The dashboard provides information about the data you are viewing. These include information about when the data was created and summary statistics about pollutant loads at the most downstream location of the watershed area.

You may change the watershed being viewed by using the “select watershed” pull down menu, automatically updating the “Data Status” and “Summary Statistics” information.

The screenshot displays the PTM App Dashboard. The top navigation bar includes the PTM App logo, a home icon, and user information (Hello ksagamit, Log off). The dashboard is divided into two main sections: a left sidebar and a main map area.

Left Sidebar:

- Watershed:** A section with a "Select Watershed:" dropdown menu. The selected option is "Ashley Creek - Ashley (huc0701C)". A red callout bubble points to this menu with the text "Select watershed from pull down menu".
- Data Status:** Displays "Data Creation Date: Sun Jun 16 2019", "Name of Data Creator: Paul Hedlund", and "Data Upload Date: Thu Jun 20 2019".
- Summary Statistics:** Lists "Drainage Area Size: 125 sq. miles", "No. of Resource Locations: 6", and "No. of Catchments: 1842". It also includes "Estimated Annual Average Yield to Watershed Outlet:" with sub-values: "Sediment yield (tons/acre/yr): 0.01", "Total Phosphorus Yield (lb/acre/yr): 0.15", and "Total Nitrogen Yield (lb/acre/yr): 2.72".

Main Map Area:

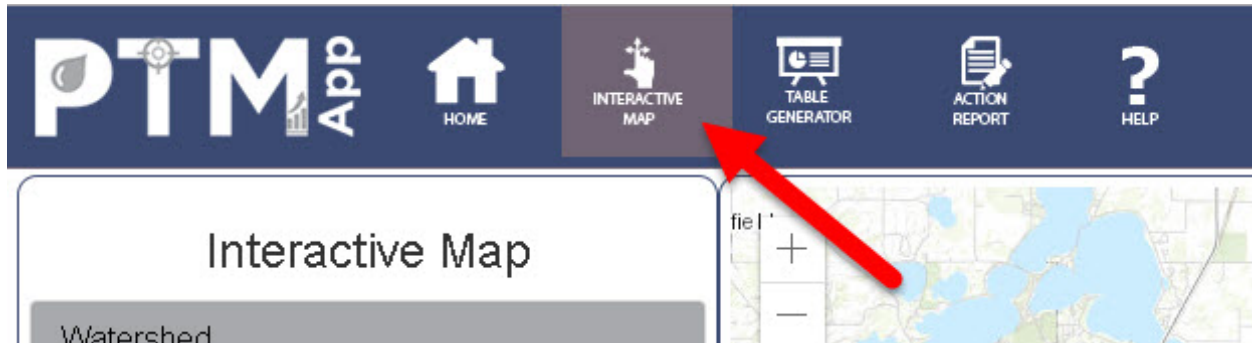
- A map of the Ashley Creek watershed, outlined in red. The map shows surrounding areas including Lake Oakes, Lake Reno, Lake Minniewaska, and Lake Umbagog. It also displays major roads like State Highway 55 and State Highway 102, and towns such as Ashland, Ashland Center, and Ashland.
- A red callout bubble points to the watershed boundary with the text "Select watershed from pull down menu".

Footer:

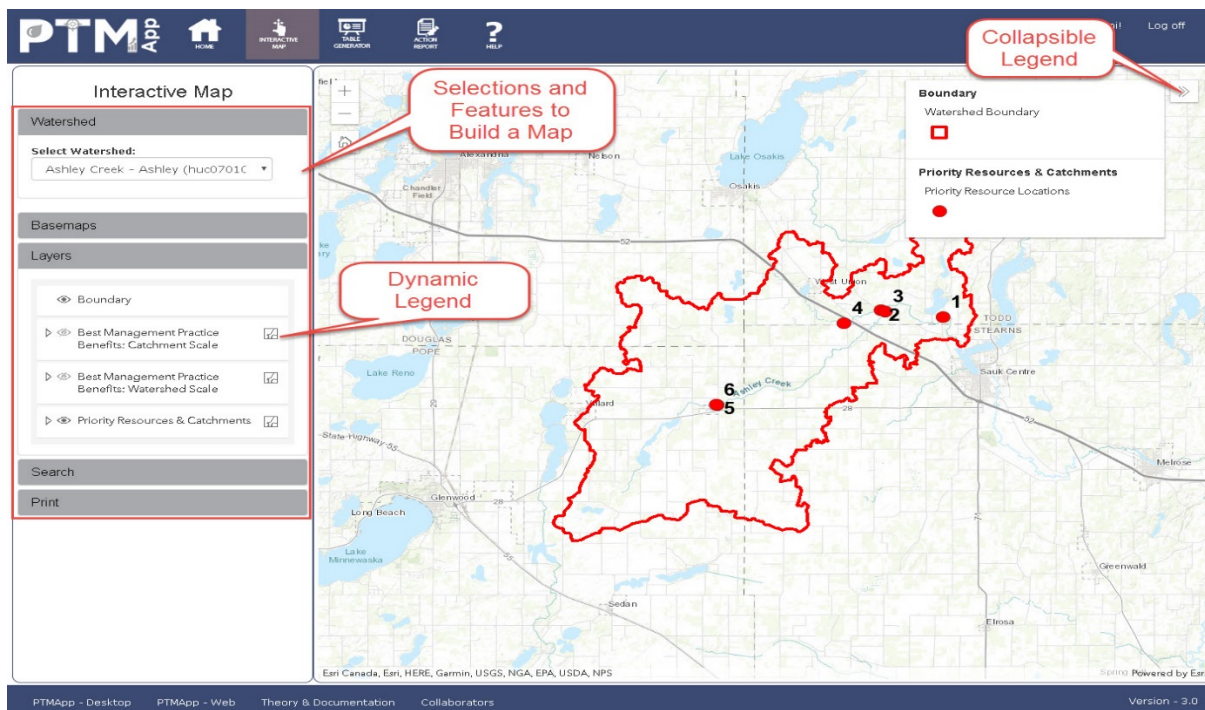
The footer contains the text "Eri Canada, Eri, HERE, Garmin, USGS, NGA, EPA, USDA, NPS" and "Powered by Esri".

4.3 INTERACTIVE MAP

The Interactive Map is accessed from any page by pressing the button located with the web page header.



Pressing the Interactive Map button opens the Interactive Map. The Interactive Map page includes several features (in red square below) which modify the information displayed on the screen and allows printing of the map on the screen. The user can manipulate this information on the Interactive Map using the features on the left-hand-side of the page to create, print, and save the various maps needed for water quality plans and reports.

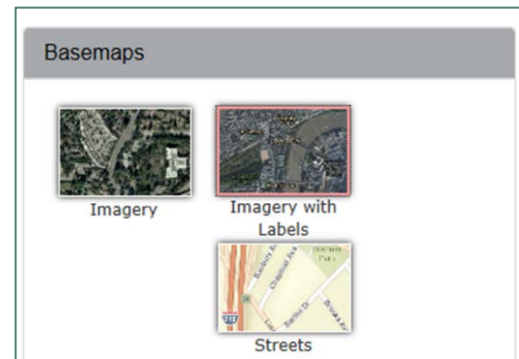


The features on the left-hand-side of the Interactive Map page allow the user to select the watershed to be displayed on the screen, the type of background used as the base map, the geospatial layers

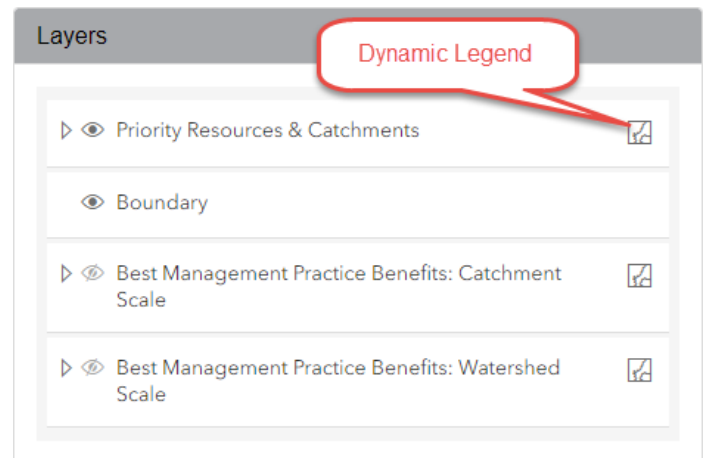
displayed, and the legend which controls how the data are displayed. A search feature and a button to print the map on the screen is also included.

The general process to create and print an interactive map is as follows:




1. Use the “select watershed” pull down menu to display the watershed of interest. You will have access to all watersheds loaded on PTMAApp-Web.
2. Press “basemap” on the collapsible menu and select the desired basemap to be displayed on the map. Please be advised that basemap options are limited to those provided through ESRI web services.

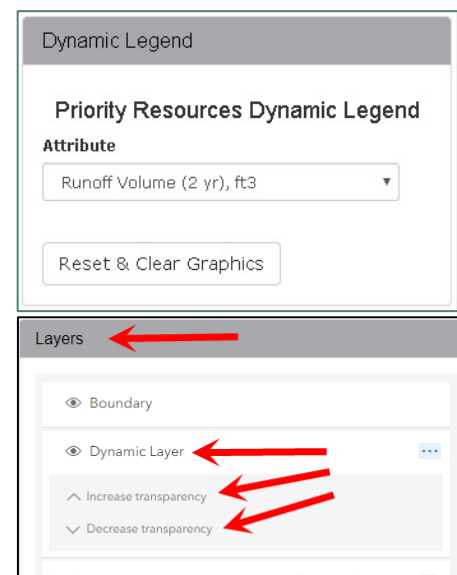


3. Press the “Layers” tab on the collapsible menu. Several different types of layers are provided within PTMAApp-Web. The layer titles describe the type of geospatial data available for display on the map; i.e., the locations of the priority resource concerns and catchments, watershed boundary, benefits of BMPs at both the catchment and watershed scale and the potential BMP locations. **A priority resource concern is the location where load reduction information is available within PTMAApp-Web and the locations**



MUST be determined during the creation of the data in PTMAApp-Desktop. Catchment boundaries and loads to the catchment are also under the priority resources and catchments tab.

A layer may be displayed or hidden on the Interactive Map by clicking on the “eye” symbol. The  symbol means a layer is being displayed, while the  symbol means it is hidden. These selections will automatically update the data shown on the screen and the map legend. It is important to note, some layer elements are nested and will not display unless the main layer is selected to be visible. Most layers shows a “dynamic legend” symbol  on the right-hand-side. The dynamic legend can be accessed by clicking on the dynamic legend symbol. Once the dynamic legend is accessed, an attribute can be selected for display on the Interactive Maps. When an attribute is selected it appears as a layer where transparency can be increased and decreased. The dynamic legend will go away when Reset & Clear Graphics is clicked.





Some processing time is needed once the attribute is selected before the interactive map is updated.

The “Reset & Clear Graphics” button is used to clear the Interactive Map display. The button is normally used prior to beginning the process of displaying new information on the Interactive Map.

4. The “Search” tab could be used to search address, location, or another geographic feature on the map. This may be useful if you wish to show catchments and catchment-specific sediment, TN, or TP loading or hydrology information overlying important bodies of water or certain addresses.

Search

Find address or place







Boundary

Watershed Boundary



Dynamic Layer

Runoff Volume (2 yr), ft3

-  > 491,865 - 1,150,747
-  > 247,413 - 491,865
-  > 138,964 - 247,413
-  > 62,350 - 138,964
-  0 - 62,350
-  Other

Priority Resources & Catchments

Priority Resource Locations



4.4 PRINTING YOUR MAP

Once your map has been created with the Interactive Map tool, it can be formatted and printed to be used in water quality planning documents or grant applications. This feature is the fifth and final feature layer on the left-hand-side of the Interactive Map:

The 'Print' feature has the option to print in a layout format or map only format. The layout format includes map elements in the exported graphic (title, scalebar, legend, etc.) while the map only format consists of only visual data displayed along with the basemap. In the Layout tab the options are to add a title, page setup, file format. The Advanced options are optional and include: scale, author, copyright and DPI (dots per inch). The map only tab has the options for a file name, file format, and the width and height of the map. Width and Height are in pixels. The conversion from inches to pixels is 1 inch = 96 pixels. An 8.5"x11" = 2550x3300+ pixels. The advanced options are to set the scale and DPI of the file.

The image displays two side-by-side screenshots of the 'Print' interface, illustrating the options for exporting a map.

Left Screenshot (Layout Tab):


- Export:** The 'Layout' tab is selected (highlighted with a red box).
- Title:** A text input field containing 'My Title Name'.
- Page setup:** A dropdown menu is open, showing options: 'Letter ANSI A Landscape' (selected), 'A3 Landscape', 'A3 Portrait', 'A4 Landscape', 'A4 Portrait', 'Letter ANSI A Portrait', 'Tabloid ANSI B Landscape', and 'Tabloid ANSI B Portrait'. A purple dashed arrow points from this menu to the 'Page setup' label.
- File format:** A dropdown menu set to 'PDF'. A purple dashed arrow points from this menu to the 'File format' label.
- Advanced Options:**
 - ☐ Set scale: 288895.277144
 - Author:** My Name
 - Copyright:** Year
 - DPI:** 96
 - ☒ Include legend
- Export:** A blue button.
- Exported Files:** A section with the text 'Your exported files will appear here.'

Right Screenshot (Map Only Tab):

- Export:** The 'Map Only' tab is selected (highlighted with a red box).
- File Name:** A text input field containing 'File name'.
- File format:** A dropdown menu set to 'PDF'. A purple dashed arrow points from this menu to the 'File format' label.
- Width:** 800
- Height:** 1100
- Advanced Options:**
 - ☐ Set scale: 288895.277144
 - DPI:** 96
 - ☒ Include attribution
- Export:** A blue button.
- Exported Files:** A section with the text 'Your exported files will appear here.'



TIP: If your map isn't printing both the map and legend, try using different 'Page Setup' options. The 'A3 Landscape' option will fit most legend items onto a typical page size.


Each exported map will appear as a download cloud button  located at the bottom under “Exported Files”. When selected, a new tab will open up and display the exported map.



TIP: If downloading to a PDF format the user must have a PDF reader on the computer being used. All other formats will work as normal.

You should also set your Map Extent to fully contain the area you wish to print. You can use the plus/minus buttons (shown to the right) to zoom in and out.



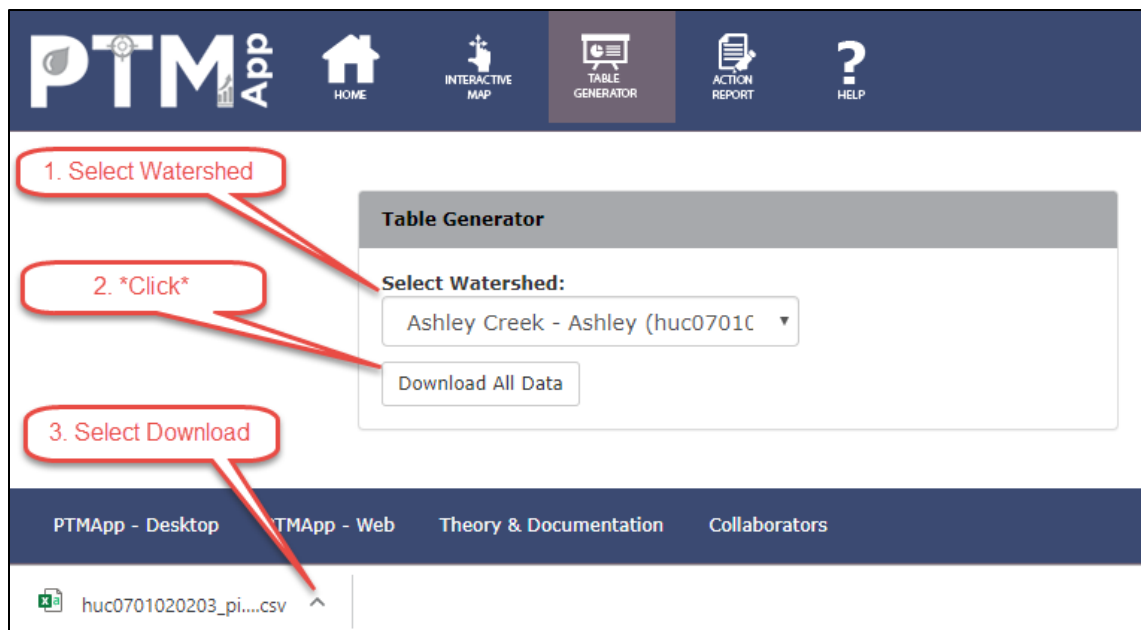
You can also use the default extent () to revert to the original map layout, which is typically the watershed boundary.

4.5 TABLE GENERATOR

The Table Generator is accessed from any page by pressing the 'Table Generator' button located on the web page header.



The Table Generator allows the user to download all the tabular data from PTMApp-Web for a selected watershed. The data is stored in a .csv format. When the watershed of interest is selected and the "Download All Data" is selected the CSV file will appear in the bottom left corner of the web browser. The user can then save this to a specified location. Please note: the download setting may vary by browser and personal settings.



4.6 ACTION REPORT

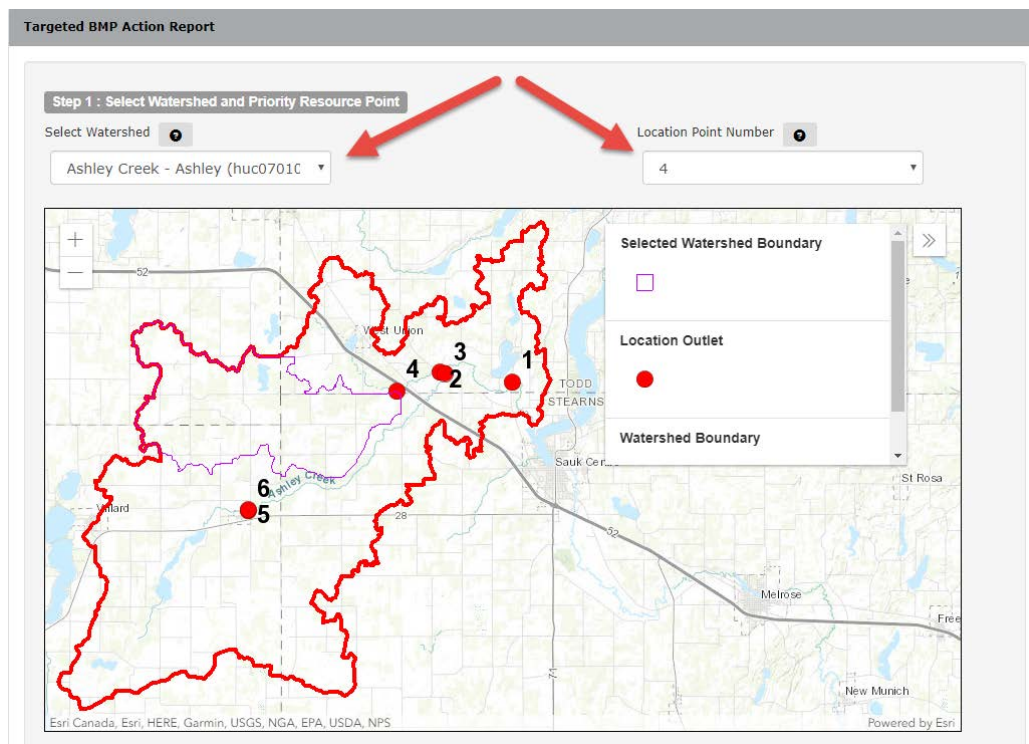
The Targeted BMP Action Report (or simply: Action Report) is accessed from any page by pressing the 'Action Report' button located on the web page header.



This tool allows the user to develop a targeted BMP action plan from PTMApp-Web for a selected watershed based on resource location points. The final product is a report up to 4 full pages, including one page for the report details and map and up to 3 additional pages with a table showing the BMPs resulting from the selection. Due to the page limit, a maximum 40 BMPs will be printed in any given report. Please note: this tool is a working beta and functional improvements are expected in the near future.

To tailor the targeted BMP action plan, various user selected criteria are laid out in a 4-step process and are as follows:

Step 1. From the dropdown menus, the user selects the watershed of interest along with the specific Location Point Number (numbered red points) in the watershed for generating the report. Once a Location Point Number is selected, the watershed boundary defined by the point will appear on the map in a thin purple line. It should be noted the Location Point Numbers were predefined when the data was created.



Step 2: Next, the user must select one water quality parameter to use to select the BMPs for the Action Report.

Step 2 : Select Parameter

Sediment

Sediment

Total Phosphorus

Total Nitrogen

Step 3: Third, the user must select the type of practices/treatment groups which are to be considered in the report analysis. The BMP information, including the estimated load reduction and cost, is summarized by treatment group. PTMApp's 'Theory and Documentation' page defines which BMPs are included in each group. It should be noted that available option(s) for BMPs to be considered are given bold text while unavailable option(s) have plain font (e.g. biofiltration below). When hovering over the unavailable options check box, a symbol will also appear indicating the absence of this treatment group. The absence of practice types is likely due to the decision made to exclude practices when PTMApp-Desktop was run. When types of practices are selected, they can be spatially seen on the map located in the "Step 1" box.

Step 3 : Select Type of Practice (Treatment Group)

☒ Source Reduction ☐ Biofiltration ☐ Filtration ☐ Infiltration ☐ Storage ☐ Protection

Step 4: Lastly, the user must review and select from 5 different options relating to the basis for the practice selection and finish by clicking on the "Generate Report" button.

Step 4 : Basis For Practice Selection

Method to Rank BMPs Cost-Effectiveness (lowest \$/mas)

Method Used to Select BMPs Number of Highest Ranked BMPs 40

Outlet Location Watershed Outlet

Storm Event 2 - Year

Anticipated Practice Performance

	25 th percentile for Q1 (low)	Median for Q2 (expected)	75 th percentile for Q3 (high)
Source Reduction	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Biofiltration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Filtration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Infiltration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Storage	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Protection	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Generate Report Reset Selections

The breakdown of these selections is as follows:

- A. **Method to Rank BMPs:** This selection method chooses BMPs from most to least preferred or the probable implementation order.
- Option: *Cost-Effectiveness* – ranks the BMPs from lowest to highest cost-effectiveness based on the \$/mass reduced by the practice. This is the default and most common choice.
 - Option: *Load Reduction* – ranks the BMPs based on the treatment magnitude of the parameter selected in “Step 2” (Sediment, Phosphorus, or Nitrogen).
 - Option: *Cost* – rank BMPs based on the lowest BMP cost.

Method to Rank BMPs

Cost-Effectiveness (lowest \$/mas

Cost-Effectiveness (lowest \$/mass)

Load Reduction

Cost

Number of Highest Ranked BMPs

- B. **Method Used to Select BMPs:** This is a method of selecting which BMPs should be included in the report and works in combination with the prior “Method to Rank BMPs” selection. It is important to note that the maximum number of BMPs that will be printed in the report is 40. Examples below are for Sediment so the reporting unit for mass is in tons but will be pounds if Phosphorus or Nitrogen is selected for the water quality parameter.

Method Used to Select BMPs

Number of Highest Ranked BMPs

Less than Maximum Cost-Effectiveness

Range of Cost-Effectiveness

Cost

- a. Option: *Number of Highest Ranked BMPs* – This option simply ranks the data based on the prior ranking selection (i.e. ‘Method to Rank BMPs’) with no filters. Additionally, the user can input the number of BMPs to print in the report. The default is 40 which is also the maximum number that can be printed.

Number of Highest Ranked BMPs

40

- b. Option: *Less than Maximum Cost-Effectiveness* – This option allows the user to screen and not consider any BMPs exceeding a user-defined cost-effectiveness threshold (\$/mass).

Less than Maximum Cost-Effectiveness

1000000 (\$/ton)

- c. Option: *Range of Cost-Effectiveness* – This option allows the user to define both the lower and upper cost-effectiveness thresholds (\$/mass) for BMPs printed in the report.

Range of Cost-Effectiveness

Min 54 Max 1000000 (\$/ton)

- d. Option: *Minimum Load Reduction* – This option allows the user to screen any BMPs that have load reduction below a user-defined minimum (mass).

Minimum Load Reduction ▼ 0 (ton)

- e. Option: *Range of Load Reduction* – This option allows the user to define both the lower and upper load reduction thresholds (mass) for BMPs printed in the report.

Range of Load Reduction ▼ Min 0 Max 4 (ton)

- f. Option: *Maximum Cost* – This option allows the user to screen and not consider any BMPs exceeding a user-defined BMP maximum cost threshold (\$).

Maximum Cost ▼ 1000000 (\$)

- g. Option: *Cost Range* – This option allows the user to define both the lower and upper BMP cost thresholds (\$) for BMPs printed in the report.

Cost Range ▼ Min 0 Max 1000000 (\$)

- C. **Outlet Location:** In this parameter, the user chooses whether the load reductions, cost-effectiveness, and ranks are based on load reduction benefits to the edge of field (i.e. catchment outlet) or based on load reduction benefits to the downstream outlet point defined by the Location Point Number selected in Step 1 (i.e. watershed outlet – this is the default option).

Outlet Location ?

Watershed Outlet ▼

Watershed Outlet

Catchment Outlet

- D. **Storm Event:** In this parameter, the user chooses whether BMP benefits are estimated from the 2-year 24-hour (default) or 10-yr 24-hour storm event.


Storm Event ?

2 - Year ▼

2 - Year

10 - Year

- E. **Anticipated Practice Performance:** Based on the user selected 'type of practice' in step 3, options for the respective anticipated practice performance become enabled in this parameter. By default, they are populated with the 'Median for Q2 (expected)' option. This represents the 50th percentile. The other two options for any given 'type of practice' are 25th percentile (Q1, Low) or 75th percentile (Q3, High). These performance estimates are calculated in PTMap-Desktop based on a reduction ratio derived from the empirical statistical distribution of BMP effectiveness specific to each 'type of practice.'

Anticipated Practice Performance 			
	25 th percentile for Q1 (low)	Median for Q2 (expected)	75 th percentile for Q3 (high)
Source Reduction	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Biofiltration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Filtration	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Infiltration	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Storage	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Protection	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>

4.7 REQUESTING HELP



The user can request help from the web administrator by pressing the help button from any page and completing the help request form:

Comment Form | Report a Bug

Please let us know if you have comments about the tools on this site or found a tool that doesn't seem to be working properly.

Name
Kris Guentzel

Comment

The Comment field is required.

Submit

The 'Name' field will auto-populate the name of the registered user. Please be detailed in your comment as to what your problem may be. Once done, click 'Submit'. The help request form is then emailed to the web administrator, who opens a trouble ticket and coordinates the response to the user.

Patience is required during the use of PTMApp-Web when using large datasets. The application has been tested using data for watersheds approaching 2,000 square miles. The amount of data processed for large watersheds is tens of millions of records, which can require considerable time to display on the Interactive Map, Table Generator, and Action Report pages. Printing these large files is also a known issue.

5 PTMAPP-WEB PRODUCT EXAMPLES

The following sections walk through specific examples of how to use and apply PTMApp-Web to generate the maps, tables, and data needed for watershed planning, to apply for grant applications, or to estimate progress to a water quality goal, among other tasks. The “Standard” PTMApp products can largely be created through the web. The Standard products are those meeting the majority of the daily business needs of local water quality practitioners. Data for each of these examples comes from Ashley Creek, in the Sauk River Watershed District, but could also be generated for any other watershed.

Water quality data and BMP information generated in PTMApp-Desktop can be displayed and summarized visually in PTMApp-Web within the Interactive Map Section of the PTMApp website. This section allows the user to generate maps for each watershed available on PTMApp-Web.

The subsections below outline the steps necessary to generate maps describing sediment and nutrient sources and BMP locations, costs, and removal efficiencies. These maps are formatted in PTMApp-Web and exported to an image file, which can be easily inserted into Microsoft Word documents or printed for use in meetings. As PTMApp-Desktop standard output products and naming conventions do not typically change between projects, these steps could easily be followed for any watershed you may be investigating.

5.1 SOURCE ASSESSMENT PLANNING MAPS – IDENTIFY THE LARGEST SOURCES OF RUNOFF, SEDIMENT, TOTAL PHOSPHORUS (TP), AND TOTAL NITROGEN (TN)

Source assessment maps are maps which identify areas contributing the greatest amounts of sediment, total phosphorus, or total nitrogen downstream. These maps can be very useful when identifying specific areas within your watershed to install practices or to focus conservation efforts. Detailed below is a step-by-step guide for creating source assessment maps. Each of the examples provided was created within the Interactive Map section of PTMApp-Web.

5.1.1 EXAMPLE 1: CATCHMENT LOADING SOURCE ASSESSMENT

HOW TO:

Description – In this step, you will create a source assessment map which shows the sediment yield (tons/acre/year) generated within each catchment and delivered to the catchment outlet.

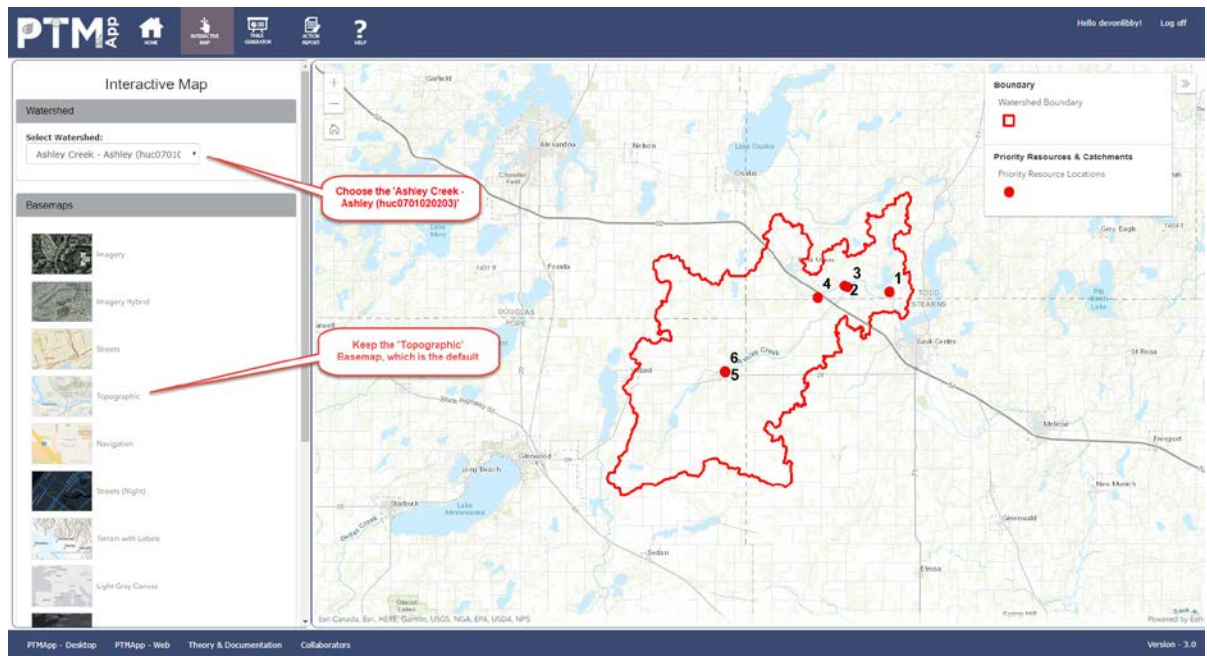
Use/Need – This is important as it represents each catchment’s delivery of sediment to edge-of-field or nearest concentrated flowpath (e.g. stream or ditch channel) and could be used to determine pollutant ‘hotspots’ on the landscape.



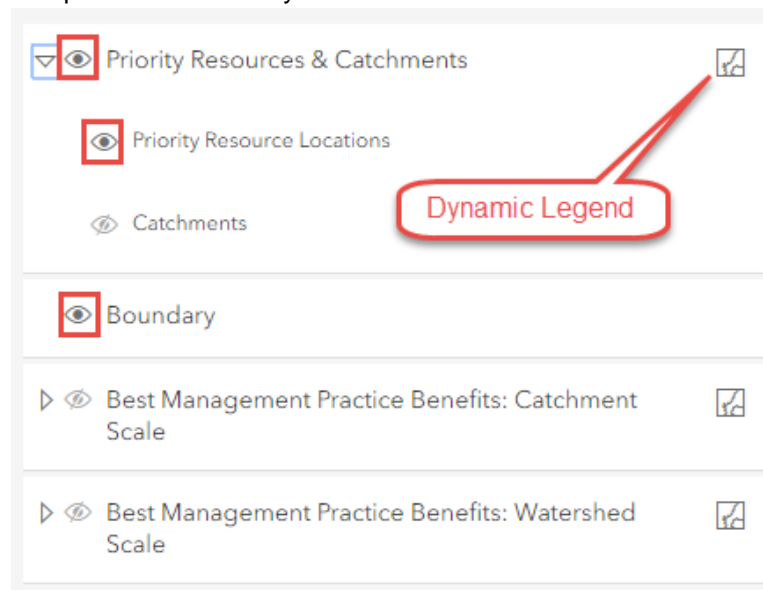
TIP: Before making a new map, always click the ‘Reset & Clear Graphics’ button in the Dynamic Legend tab if a map had previously been made. This button removes all existing layers on your map to start you off with a fresh Basemap!


Steps to Create

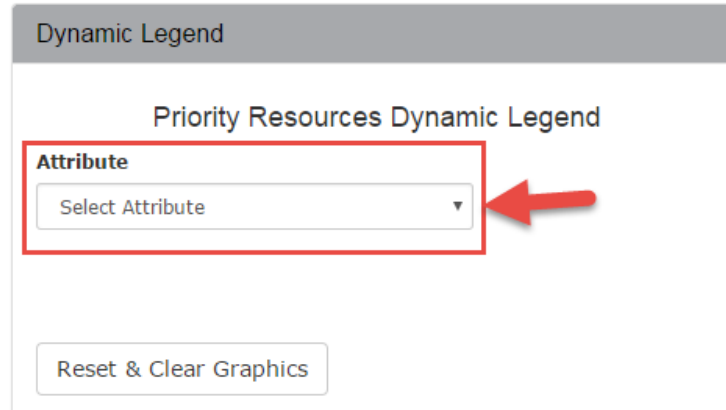
- 1) For your watershed, choose 'Ashley Creek – Ashley (huc0701020203)' and for your Basemap, choose 'Topographic'. Any other ESRI basemap could be chosen, but the default Topographic basemap should work well for this map.



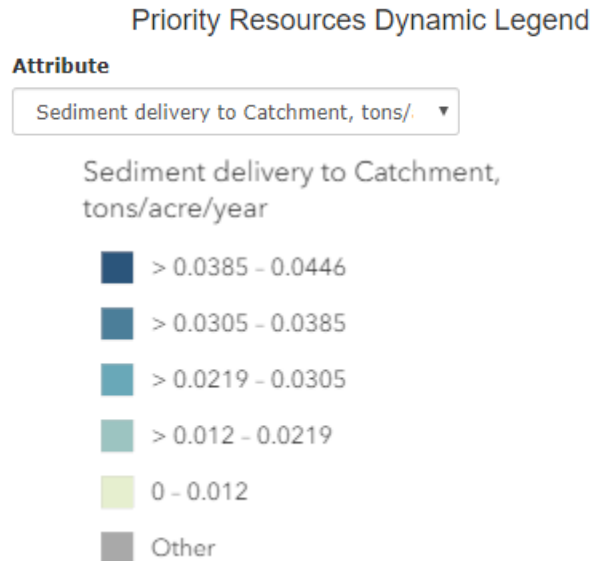
- 2) In the 'Layers' tab, make sure 'Boundary' and 'Priority Resources' are checked and click on the Dynamic Legend Graphic next to 'Priority Resources & Catchments.'



- 3) Clicking the  icon will activate the Dynamic Legend tab as shown below:



- 4) In the 'Attribute' dropdown, select 'Sediment delivery to Catchment, tons/acre/year'. This attribute shows the sediment yield (tons/acre/year) generated within each catchment and delivered to its outlet.



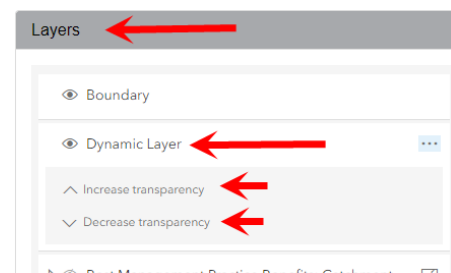
Due to programming compatibility limitations, the legend break values are currently unable to be edited by the user. This issue is being addressed and the capability will be added as soon as it is resolved. Currently, the default break values are determined by a 'natural breaks' classification.

- 5) If you wish, you can print this map within the 'Print' layer using the 'layout' or 'map' export options (see section 4.4 for more details on this process and available options).



data.

TIP: Don't forget that when attributes are selected in the 'Dynamic Legend' layer, a new layer appears in the 'Layers' section where transparency can be increased and decreased for the newly displayed



Print

Export

Layout Map Only

Title

Catchment Sediment Yield (

Page setup

Letter ANSI A Landscape

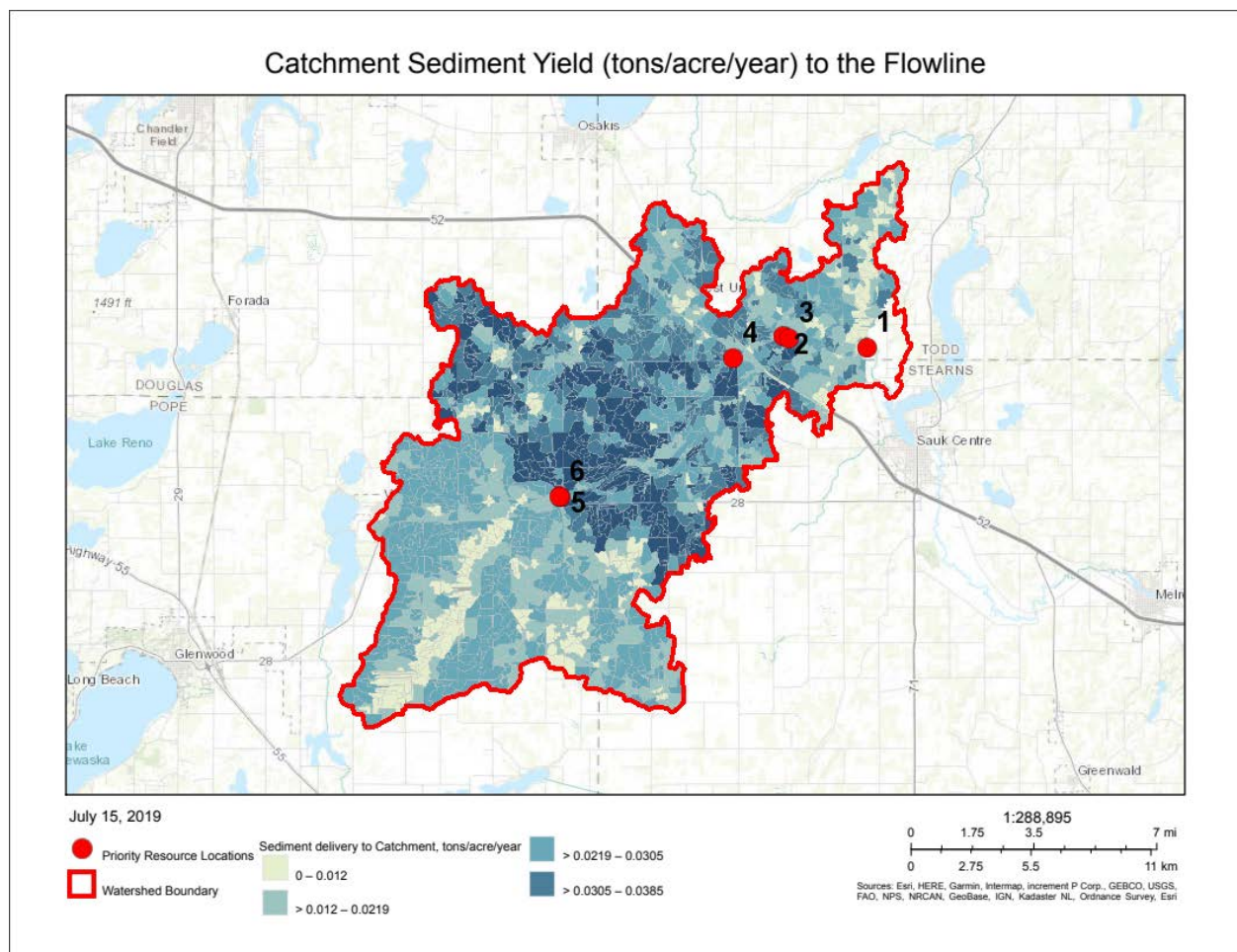
File format

PDF

Advanced Options

Export

6) If using the 'layout' export option, your map should look something like this.



5.1.2 EXAMPLE 2: RESOURCE LOCATION SOURCE ASSESSMENT

HOW TO:

Description – The resource location source assessment map describes the sediment, TP, or TN load generated in each catchment which is delivered to the priority resource point. This differs from the Catchment Yield/Load Map as it describes the amount of sediment, TP, or TN reaching a downstream priority resource location (e.g. lake, stream, river, or water quality monitoring station) as opposed to just the catchment outlet.



Use/Need – The resource location source assessment map is important as it illustrates the amount of sediment, TP, or TN reaching and impacting downstream locations and can be directly compared with water quality goals at each resource point.


Steps

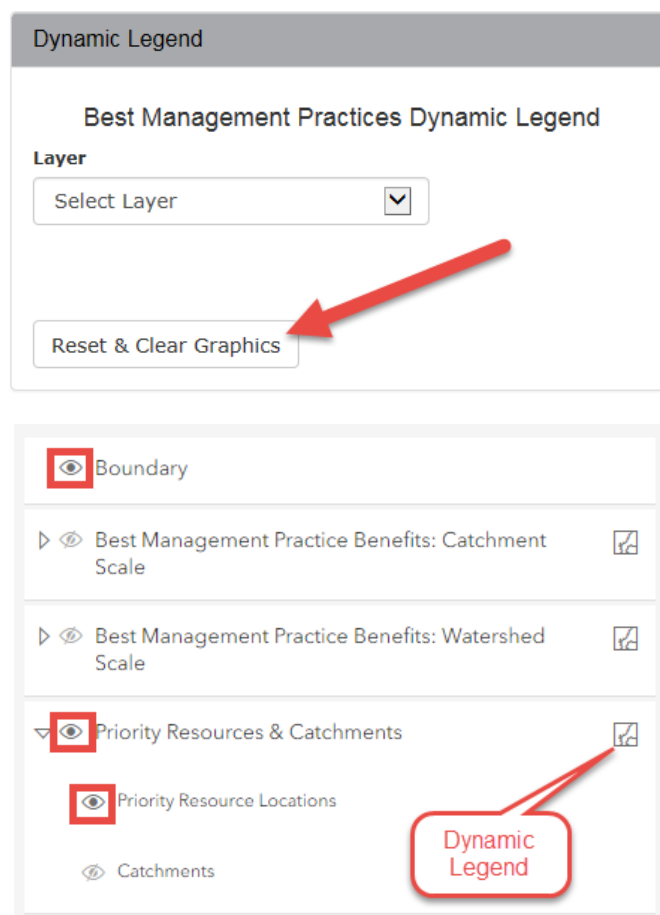
- 1) If another map is open. Click 'Reset & Clear Graphics' in the Dynamic Legend tab:

This will clear out any information you currently have on your map

- 2) Similar to the steps in Example 1, for your watershed, choose 'Ashley Creek – Ashley (huc0701020203)' and for your Basemap, choose 'Topographic'.

- 3) In the 'Layers' tab, make sure 'Boundary' and 'Priority Resources' are marked visible  and click on the Dynamic Legend Graphic  next to 'Priority Resources & Catchments'.

- 4) Clicking the  icon will activate the Dynamic Legend tab as shown:



- 5) In the 'Attribute' dropdown, select 'Sediment delivery to Resource of Concern, tons/year'. This attribute shows the sediment load (tons/year) delivered from the catchment outlet to the priority resource point of concern. This selection activates a new selection to appear titled 'Priority Resource.' In this case, we want to know the amount of sediment delivered from each catchment to the watershed outlet. The watershed outlet in this example is priority resource point 1. In the 'Priority Resource' dropdown, choose '1'. PTMApp-Web will then automatically generate a map showing sediment delivery from each individual catchment to priority resource point 1.

Dynamic Legend

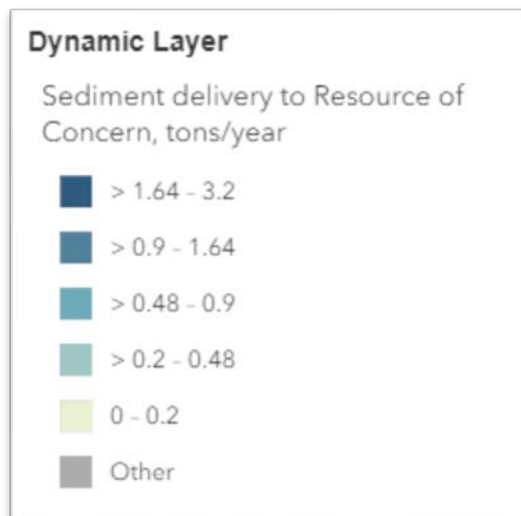
Priority Resources Dynamic Legend

Attribute

Select Attribute

- Select Attribute
- Runoff Volume (2 yr), ft3
- Runoff Volume (10 yr), ft3
- Peak Discharge (2 yr Event), cfs
- Peak Discharge (10 yr Event), cfs
- Sediment delivery to Catchment, tons/year
- Sediment delivery to Catchment, tons/acre/year
- Total Nitrogen delivery to Catchment, lbs/year
- Total Nitrogen delivery to Catchment, lbs/acre/year
- Total Phosphorus delivery to Catchment, lbs/year
- Total Phosphorus delivery to Catchment, lbs/acre/year
- Sediment delivery to Resource of Concern, tons/year**
- Sediment delivery to Resource of Concern, tons/acre/year
- Total Nitrogen delivery to Resource of Concern, lbs/year
- Total Nitrogen delivery to Resource of Concern, lbs/acre/year
- Total Phosphorus delivery to Resource of Concern, lbs/year
- Total Phosphorus delivery to Resource of Concern, lbs/acre/year
- Sediment delivery to Catchment, %
- Total Nitrogen delivery to Catchment, %
- Total Phosphorus delivery to Catchment, %

- 6) Due to programming compatibility limitations, the legend break values are currently unable to be edited by the user. This issue is being addressed and the capability will be added as soon as it is resolved. Currently, the default break values are determined by a 'natural breaks' classification.



Dynamic Legend

Priority Resources Dynamic Legend

Attribute

Sediment delivery to Resource of Concern

Priority Resource

Select Priority Resource

- Select Priority Resource
- 1**
- 2
- 3
- 4
- 5
- 6

- 7) If you wish, you can print this map within the 'Print' layer using the 'layout' or 'map' export options (see section 4.4 for more details on this process and available options).

Print

Export

Layout Map Only

Title

Sediment Load to the Ashley

Page setup

Letter ANSI A Landscape

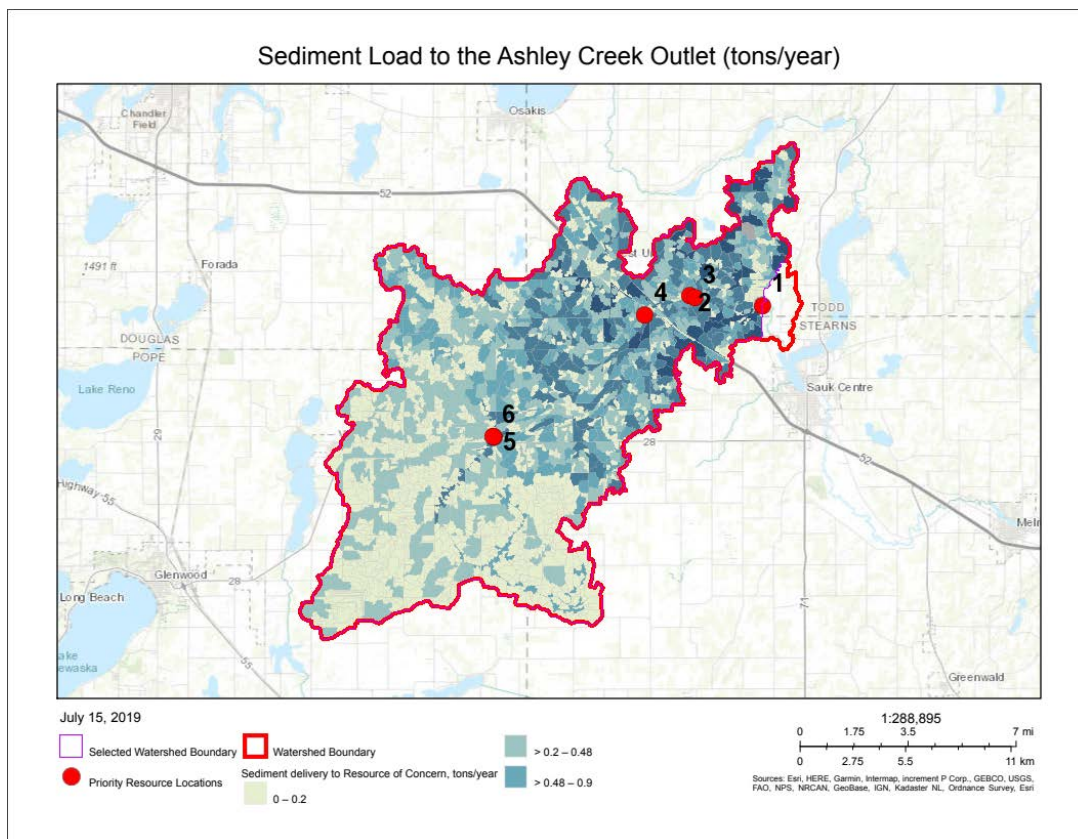
File format

PDF

Advanced Options

Export

- 7) For this map, we can name it "Sediment Load to the Ashley Creek Outlet (tons/year)". After adding the title, click 'Export Map as Image'.
- 8) Your final map should look something like this:





TIP: The previous map could also be created for UPSTREAM priority resource points as well.

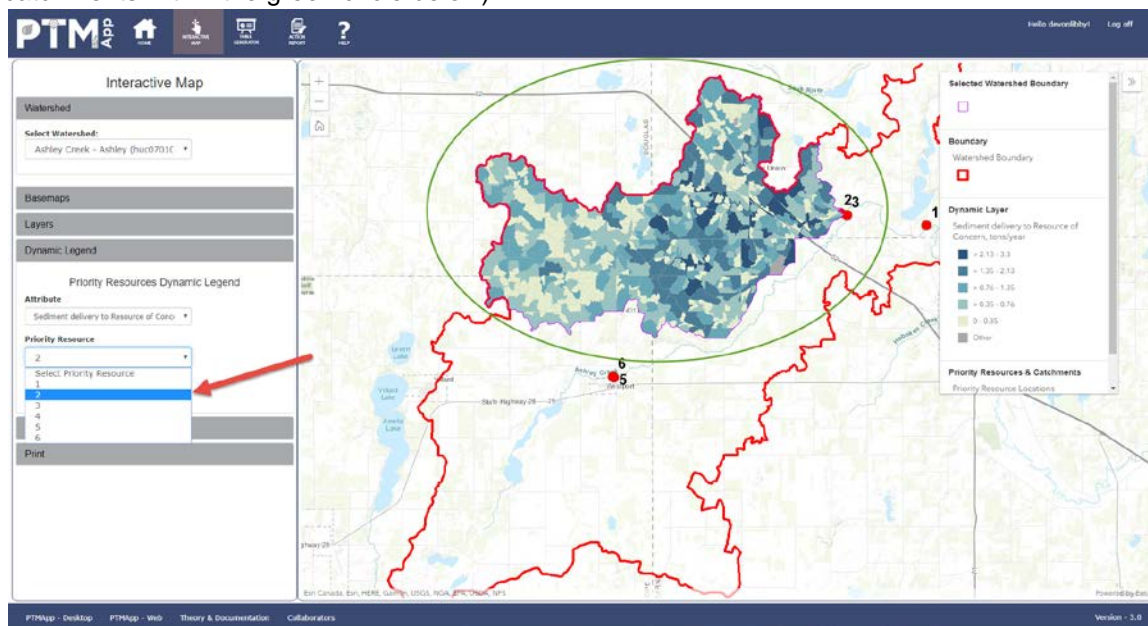
HOW TO:


Description – If you need a Source Assessment Map for other upstream priority resources, you only need to change one item from the previous steps (see below).

Use/Need – This map may be important as you might have different water quality goals for tributaries than you do for the main stream/river in your study area. You should also note that similar catchments may have different yields/loads depending on what priority resource you're looking at.

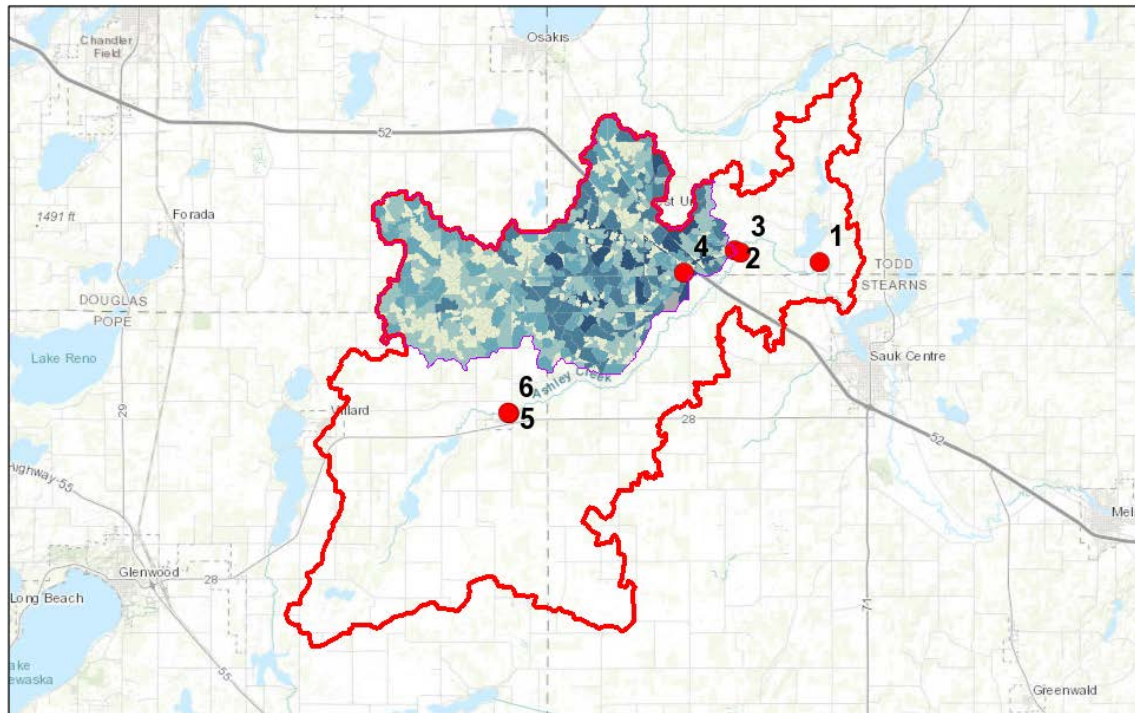
Steps to Create

- 1) Follow steps 1-4 as detailed above, but use priority resource '2' instead of '1' (see red arrow in figure below). Priority resource 2 is the outlet of Silver Creek, a tributary to Ashley Creek. Choosing Resource Point 2 then updates your catchment loading values in your map (see catchments within the green circle below).

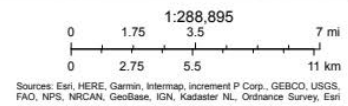


- 2) If you wish to print the map, you may want to zoom in and re-center the Silver Creek Watershed in your map viewer or select default map view by clicking the  symbol. Your new map should look like this:

Sediment Load to Silver Creek Outlet (tons/year)



July 15, 2019



5.2 BMPS: TECHNICAL FEASIBILITY AND EFFECTIVENESS

One of the predominant uses of PTMApp is determining where BMP opportunities are technically feasible on the landscape, what their benefits are (both at the edge-of-field and at downstream water resource), and their estimated cost to install. BMP locations and benefits can be shown on a map in PTMApp-Web for various uses, and can display information on location, water quality benefit, area treated, and cost-effectiveness among other items.

The following PTMApp product examples walk the user through the steps necessary to create various BMP treatment group-specific maps. PTMApp groups BMPs based on how they treat sediment, TP, and TN. The six BMP treatment groups, and example BMPs which would fit within each group, are listed in the table below.

PTMApp-Desktop Group Code	BMP Treatment Group	BMP Examples in Each Treatment Group
1	Storage	Water and Sediment Control Basin (WASCOB); Embankment Pond; Wetland Restoration/Creation; Drainage Water Management/Controlled Drainage Structure
2	Filtration	Grassed Waterway, Filter/Buffer Strip
3	Bio-filtration	Denitrifying bioreactor
4	Infiltration	2-stage Ditch; Infiltration Trench
5	Protection	Grade Stabilization; Tillage Management (e.g. No-Till or Reduced Till); Shoreline Protection
6	Source Reduction	Nutrient Management; Cover Crops; Perennial Crops; Critical Planting Areas

Each of the following maps could be generated for any or all of the treatment groups.

Five product examples are shown below, but many more products could be created with the attributes available on PTMApp-Web. A full list of these attributes, and their association with the underlying PTMApp-Desktop data, can be found on the PTMApp-Web Attribute Catalog in Appendix A of this document.

5.2.1 EXAMPLE 3: LOCATE BMP OPPORTUNITIES AND THEIR UPSTREAM DRAINAGE AREA

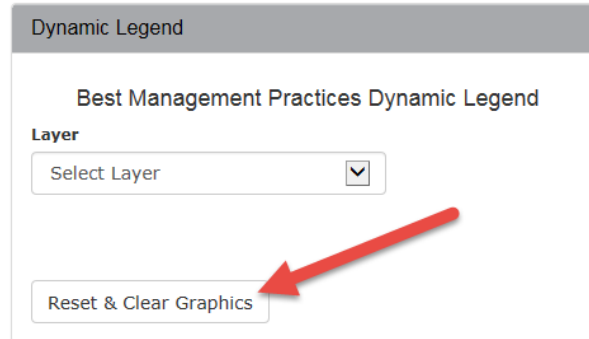
HOW TO:

Description – Illustrate where storage practices are feasible on the landscape (according to PTMApp-Desktop) and the amount of upstream area each will treat.



Use/Need – Determine the drainage area. This map could be used to locate and rank the BMPs which treat the largest upstream drainage area.

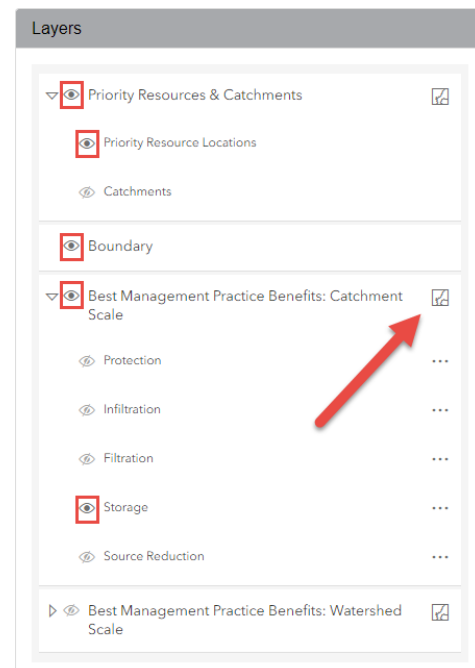
Steps to Create

- 1) If another map is open. Click 'Reset & Clear Graphics' in the Dynamic Legend tab:

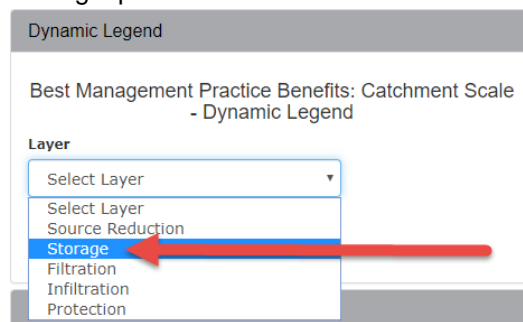


This will clear out any information you currently have on your map


- 2) Return to the Layers tab and make the Boundary, Priority Resources & Catchments, and Best Management Practice Benefits: Catchment Scale with the sublayer Storage (optional) are visible , then click on the Best Management Practice Benefits: Catchment Scale Dynamic Legend icon :



- 3) This will activate the Dynamic Legend tab. In the Dynamic Legend tab in the Layer dropdown select 'storage' practices:



- 4) Selecting storage practices will activate another dropdown: 'Attribute'. Select the 'Area, ft2' attribute, which will display each storage practice's upstream watershed area in square-feet. You could also create maps for any of the other BMPs group types shown above as well.

Note: The 'storage' under the layer 'Best Management Practice benefits: Catchment Scale' will have to be made invisible  **Storage** since it is on top of the new dynamic layer symbolizing drainage area.

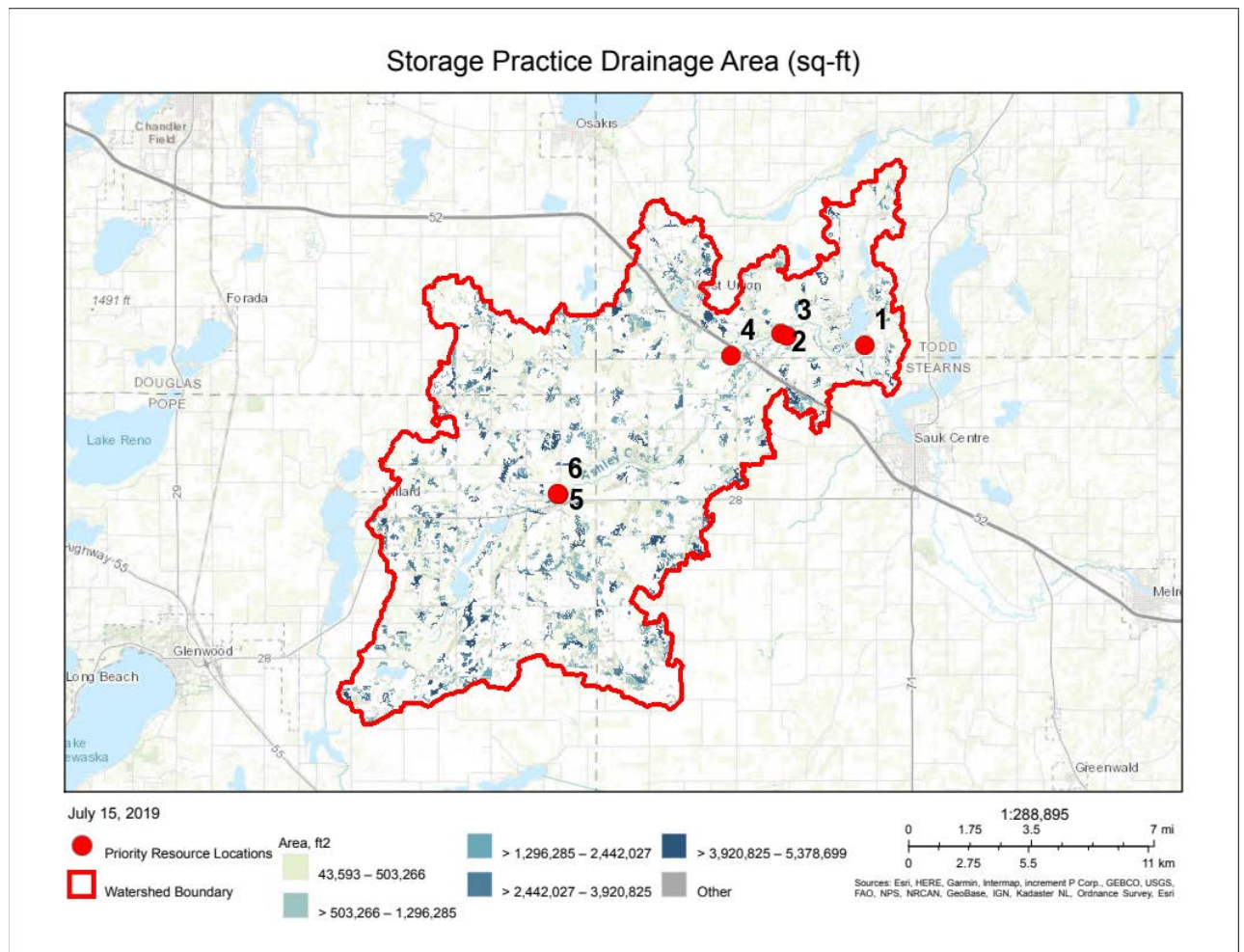
Dynamic Legend

Best Management Practice Benefits: Catchment Scale
- Dynamic Legend

Layer
Storage

Attribute
Select Attribute
Area, ft2
Water Treated (2 yr event) , ft3 or feet/sec
Water Treated (10 yr event), ft3 or feet/sec
Sediment at BMP delivered to catchment, tons/year

- 5) If you wish, you can print this map:



5.2.2 EXAMPLE 4: BMP EFFECTIVENESS FOR REDUCING TOTAL PHOSPHORUS AT THE BMP

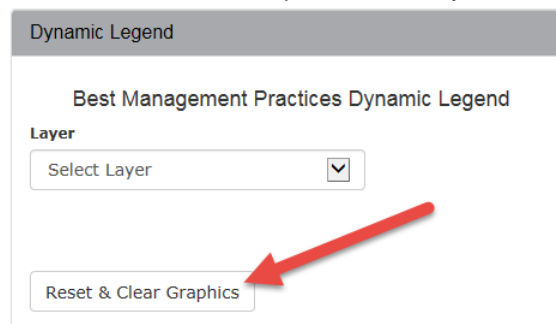
HOW TO:

Description – Illustrate where storage practices are feasible on the landscape (according to PTMApp-Desktop) AND their effectiveness for treating total phosphorus at the BMP.



Use/Need – Grant applications, watershed planning activities, etc.

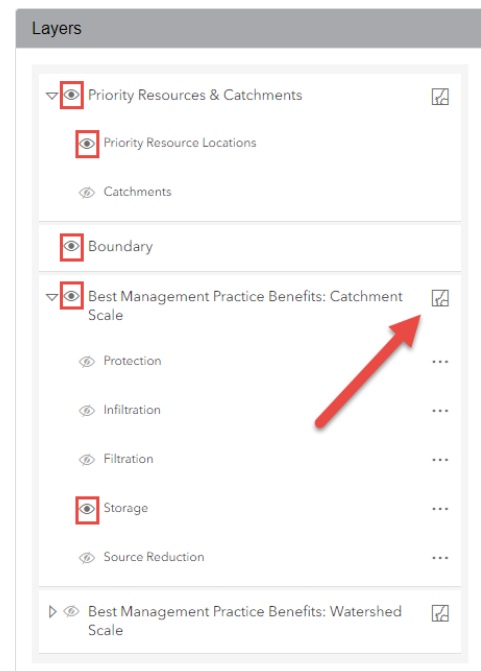
Steps to Create

- 1) If another map is open. Click 'Reset & Clear Graphics' in the Dynamic Legend tab:

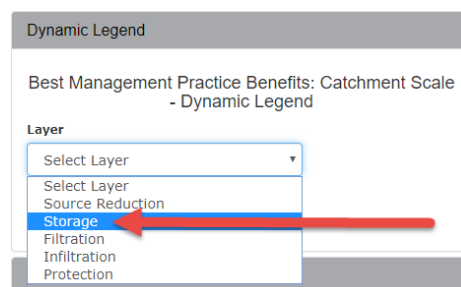


This will clear out any information you currently have on your map

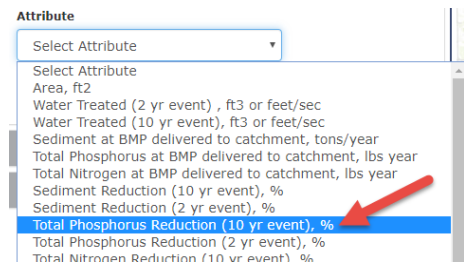
- 2) Return to the Layers tab and make the Boundary, Priority Resources & Catchments, and Best Management Practice Benefits: Catchment Scale with the sublayer Storage (optional) are visible , then click on the Best Management Practice Benefits: Catchment Scale Dynamic Legend icon :



- 3) This will activate the Dynamic Legend tab for Best Management Practices. For the Layer dropdown choose 'storage' practices.




- 4) Choosing storage practices automatically creates another dropdown: 'Attribute'. Choose the 'Total Phosphorus Reduction (10 yr event), %'. This will show all storage practices on the landscape and their estimated effectiveness at reducing total phosphorus as a percentage between 0-100%.

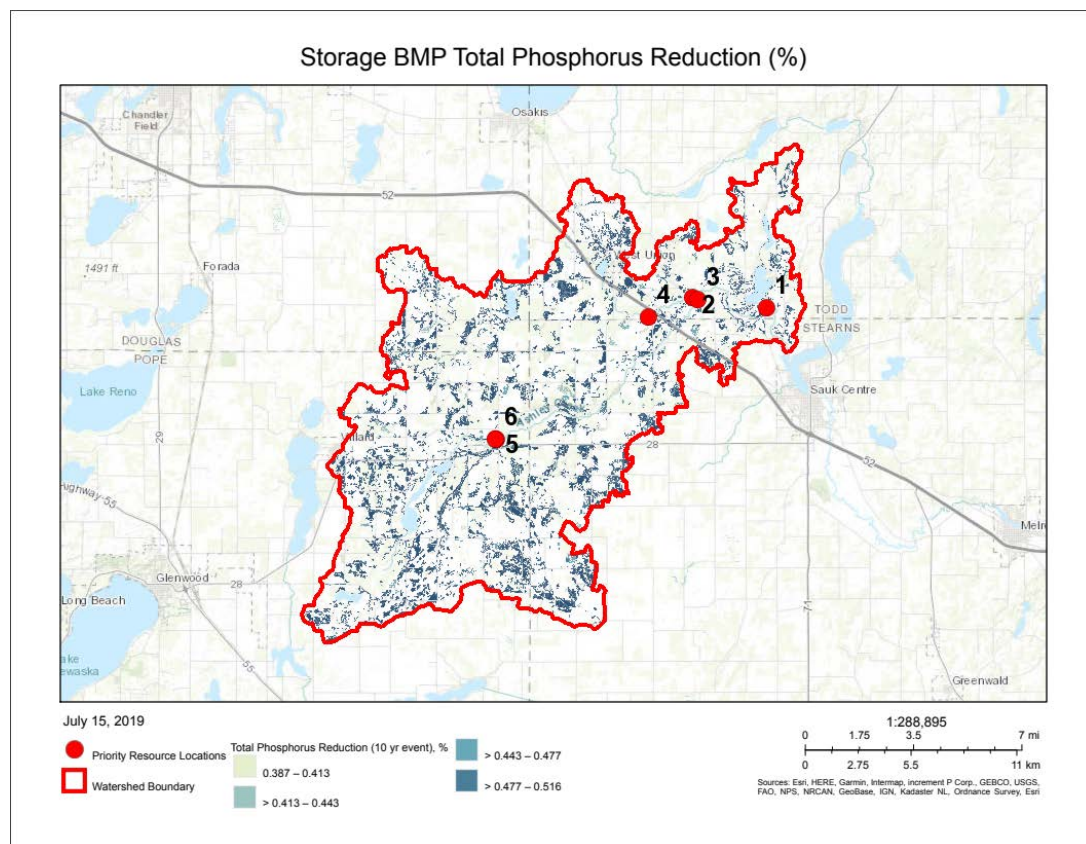


Note: Due to programming compatibility limitations, the legend break values are currently unable to be edited by the user. This issue is being addressed and the capability will be added as soon as it is resolved. Currently, the default break values are determined by a 'natural breaks' classification.

- 5) Based on the BMP statistics run with this dataset, all storage BMPs are within 38.7-53.7% effective at reducing total phosphorus delivered to the BMP.

Note: The 'storage' under the layer 'Best Management Practice benefits: Catchment Scale' will have to be made invisible  Storage since it is on top of the new dynamic layer.

- 6) This map can also be printed, and should look like this:



5.2.3 EXAMPLE 5: BMP EFFECTIVENESS FOR REDUCING SEDIMENT AT THE CATCHMENT OUTLET (EDGE-OF-FIELD)

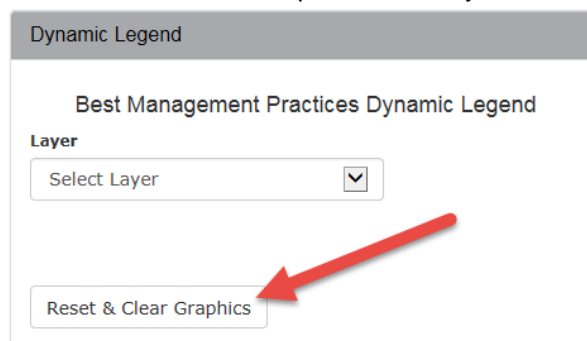
HOW TO:

Description – Illustrate where filtration practices are feasible on the landscape (according to PTMApp-Desktop) AND their effectiveness for treating sediment at the catchment outlet.



Use/Need – Determine BMP effectiveness for treating sediment, TP, or TN before delivery to the edge-of-field or concentrated flowpath (i.e. what gets into waterways); use in grant applications, watershed planning, setting/benchmarking water quality goals.

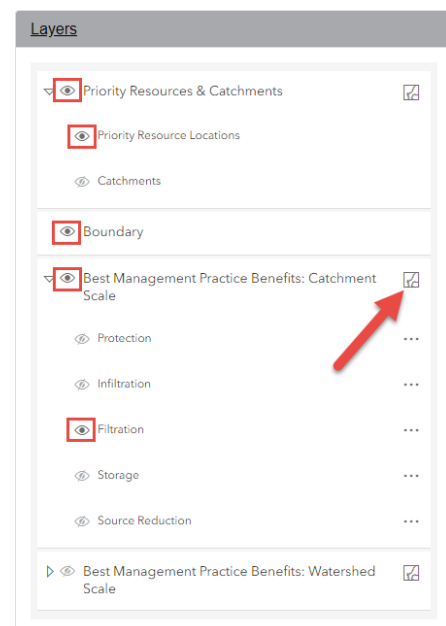
Steps

- 1) If another map is open. Click 'Reset & Clear Graphics' in the Dynamic Legend tab:

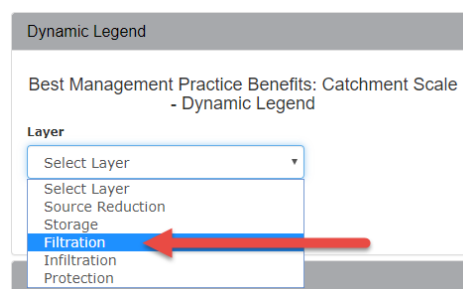


This will clear out any information you currently have on your map

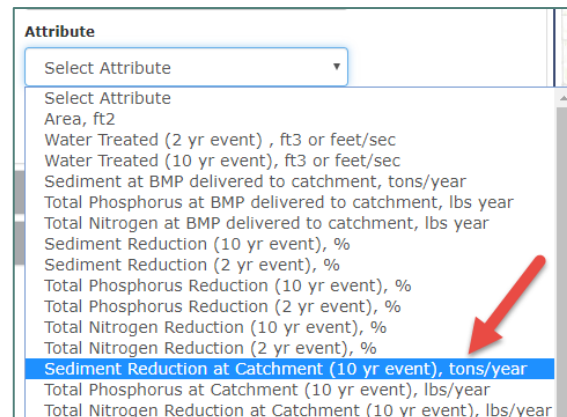
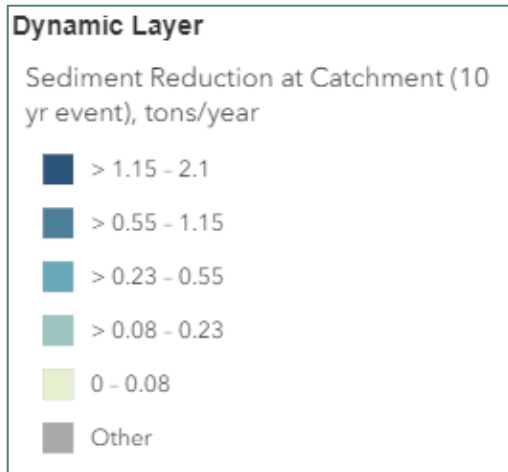
- 2) Return to the Layers tab and make the Priority Resources & Catchments, Boundary, and Best Management Practice Benefits: Catchment Scale with the sublayer Filtration (optional) are visible , then click on the Best Management Practice Benefits: Catchment Scale Dynamic Legend icon  :



- 3) This will activate the Dynamic Legend tab for Best Management Practices. For the Layer dropdown choose 'filtration' practices.

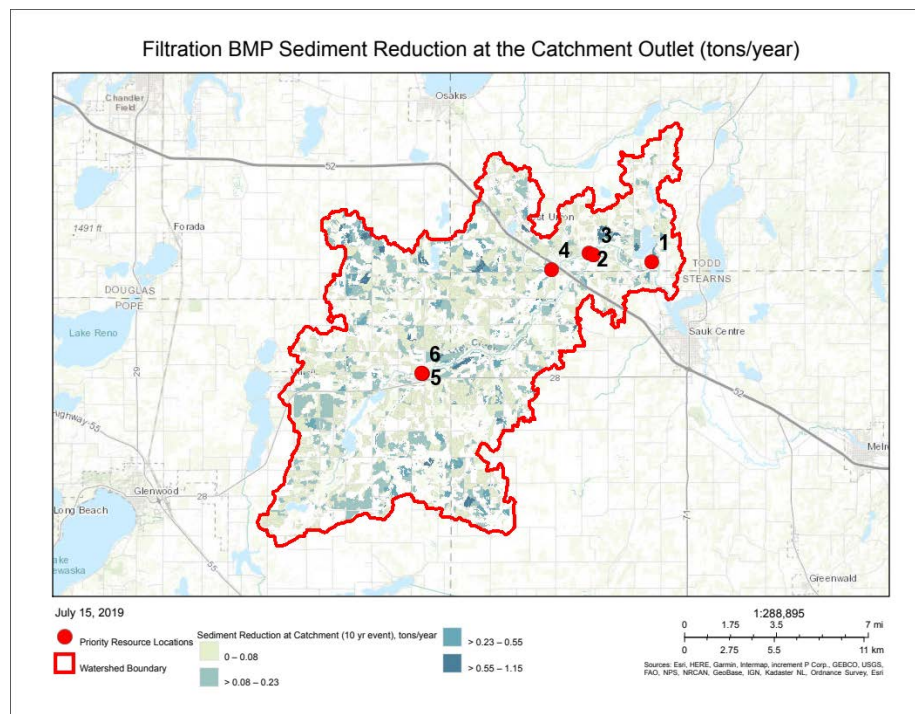


- 4) Choosing filtration practices automatically creates another dropdown: 'Attribute'. Choose the 'Sediment Reduction at Catchment (10 yr event), tons/year'. This will show all filtration practices on the landscape and their estimated effectiveness at reducing sediment (units = tons/year) as measured at the catchment outlet. The legend is below:



Note: 1) The 'filtration' under the layer 'Best Management Practice benefits: Catchment Scale' will have to be made invisible Filtration since it is on top of the new dynamic layer symbolizing sediment reduction. 2) Due to programming compatibility limitations, the legend break values are currently unable to be edited by the user. This issue is being addressed and the capability will be added as soon as it is resolved. Currently, the default break values are determined by a 'natural breaks' classification.

- 5) Printed map should look like this,



5.2.4 EXAMPLE 6: BMP EFFECTIVENESS FOR REDUCING SEDIMENT AT THE PRIORITY RESOURCE

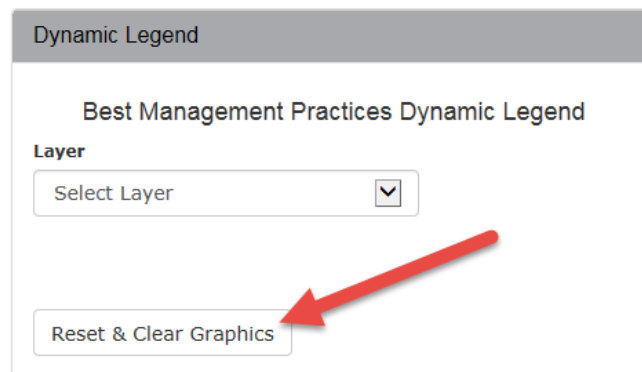
HOW TO:

Description – Illustrate where filtration practices are feasible on the landscape (according to PTMApp-Desktop) AND their effectiveness for treating sediment at the outlet of Silver Creek (priority resource point #2 in the Ashley Creek Watershed).



Use/Need – Determine sediment, TP, or TN delivery to a downstream resource of concern. This could include a river/stream outlet, lake outlet, monitoring location, etc. This map could be used in grant applications or watershed planning to illustrate the BMPs (in this case filtration BMPs) which have the highest reduction potential to a certain resource location.

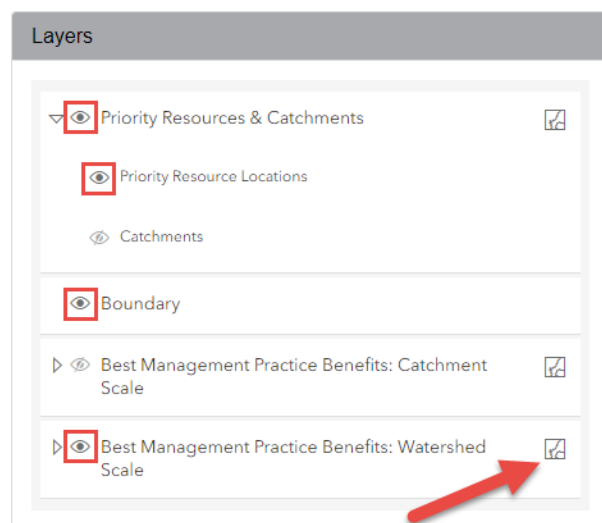
Steps to Create

- 1) If another map is open. Click 'Reset & Clear Graphics' in the Dynamic Legend tab:



This will clear out any information you currently have on your map

- 2) Return to the Layers tab and make the Boundary, Priority Resources & Catchments, and Best Management Practice Benefits: Catchment Scale are visible , then click on the Best Management Practice Benefits: Watershed Scale Dynamic Legend icon :



- 3) This will activate the Dynamic Legend tab:
- 4) In the Dynamic Legend tab, choose the following options for each dropdown menu:
 - a. Attribute: 'Sediment Reduction at Resource (10 yr event), tons/year'
 - b. Priority Resource: '2'
 - i. *Note: This is the resource point at the confluence of Silver Creek with Ashley Creek.*
 - c. Treatment Group: 'Filtration'

Dynamic Legend

Best Management Practice Benefits: Watershed Scale
- Dynamic Legend

Attribute

←

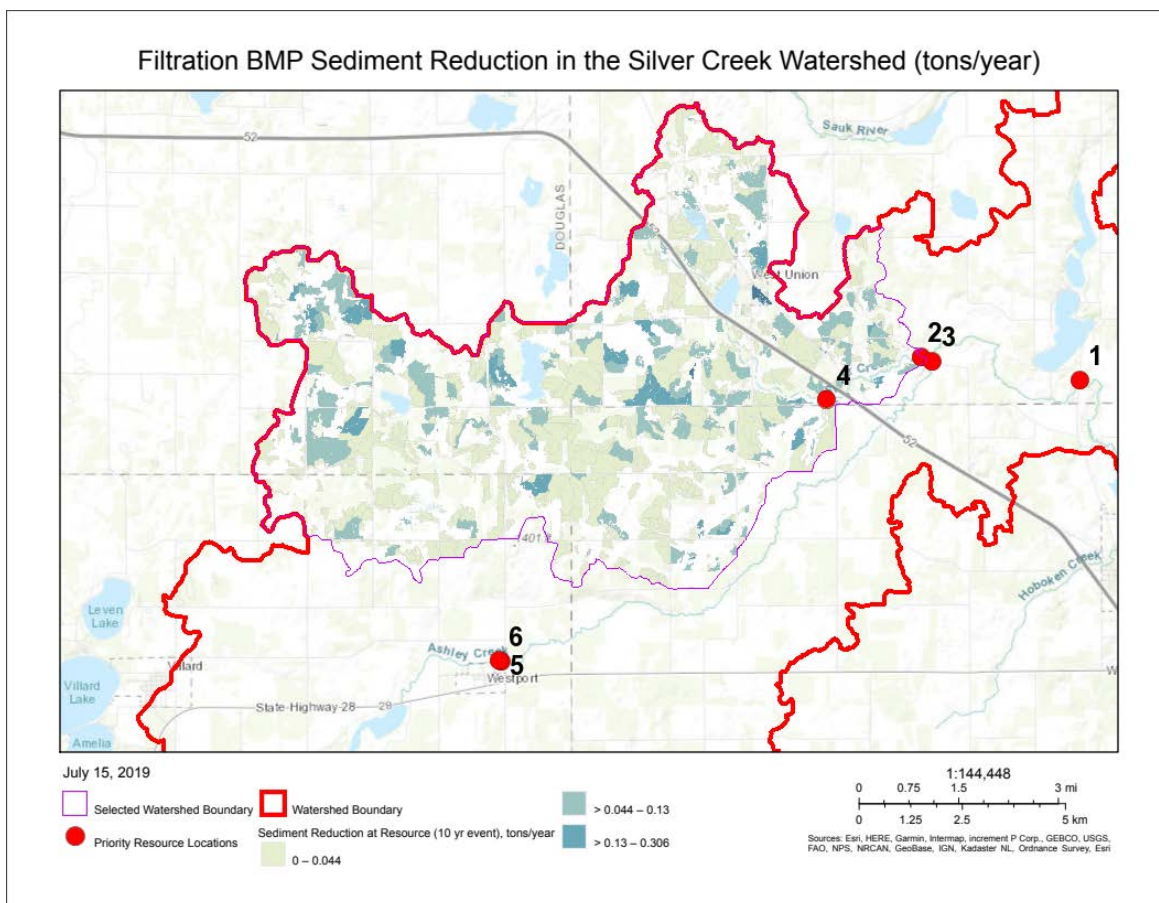
Priority Resource

←

Treatment Group

←

- 5) If you wish, you can print this map. Since this area is smaller than the project area, you should also consider centering the Silver Creek Watershed in the map area so that the active BMP treatment areas are contained within the map. Your final product should look like this:



Similarly, if you wanted to know the impact of your BMPs at treating sediment at your watershed outlet, you could have instead chosen priority resource point '1', the priority resource point associated with the project area outlet.

Priority resource points available to you in PTMApp-Web are based on those chosen by project partners and other stakeholder during creation of these data products in PTMApp-Desktop. Only those created in PTMApp-Desktop are available to resolve data in the web portal.

5.2.5 EXAMPLE 7: BMP COST EFFECTIVENESS

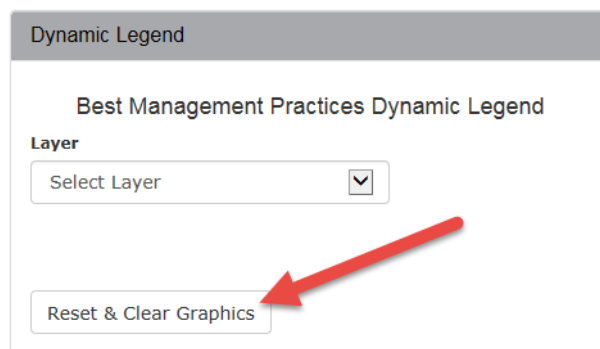
HOW TO:

Description – Illustrate where filtration practices are feasible on the landscape (according to PTMApp-Desktop) and their cost-effectiveness (dollars/ton) at reducing sediment delivered to a specific location.



Use/Need – Probably the most widely used factor for gauging and comparing various BMPs across a watershed is the effectiveness of each BMP in retaining targeted pollutants per dollar spent. For the Ashley Creek Watershed data used in this example, BMP cost effectiveness is summarized in dollars/ton for sediment and dollars/lb for TP and TN. To find the most cost-effective BMP(s), you want to look for the LOWEST dollar/ton or dollar/lb value(s). This map has uses in grant applications, watershed planning, and other conservation efforts.

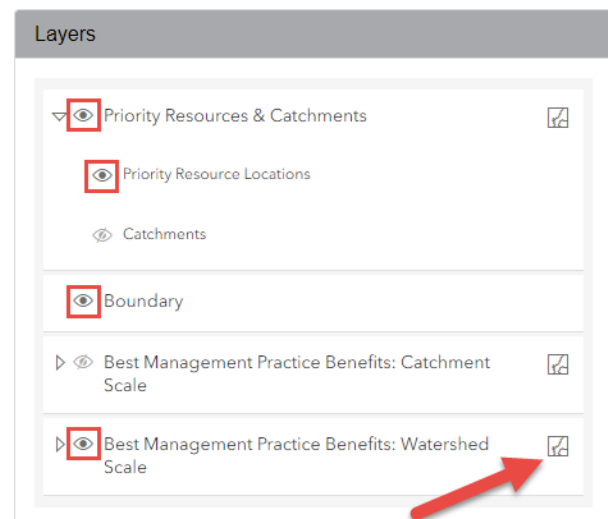
Steps to Create

- 1) If another map is open. Click 'Reset & Clear Graphics' in the Dynamic Legend tab:



This will clear out any information you currently have on your map

- 2) Return to the Layers tab and make the Boundary, Priority Resources & Catchments, and Best Management Practice Benefits: Catchment Scale are visible , then click on the Best Management Practice Benefits: Watershed Scale Dynamic Legend icon :



- 3) This will open the Dynamic Legend tab. In the 'Attribute' dropdown menu, select the 'Sediment Treatment Cost (10 yr event), dollars/ton' attribute, for Priority Resource, choose '2' and for Treatment Group, choose 'Filtration'. PTMap-Web will populate the map to show the cost-effectiveness of all filtration BMPs providing sediment loading treatment to priority resource 2, or the Silver Creek outlet.

Dynamic Legend

Best Management Practice Benefits: Watershed Scale
- Dynamic Legend

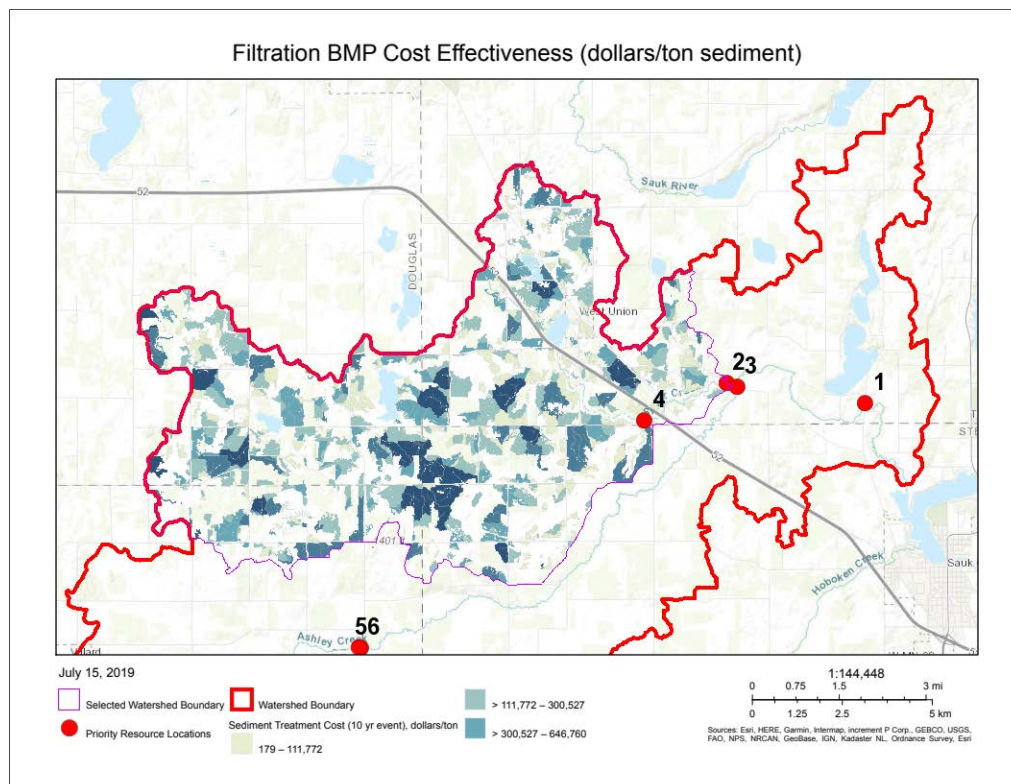
Attribute
Sediment Treatment Cost (10 yr) ←

Priority Resource
2 ←

Treatment Group
Filtration ←

Reset & Clear Graphics

- 4) Due to programming compatibility limitations, the legend break values are currently unable to be edited by the user. This issue is being addressed and the capability will be added as soon as it is resolved. Currently, the default break values are determined by a 'natural breaks' classification.
- 5) Printing this map should generate a map that looks like the one below. *Keep in mind that the lighter colored practices are the preferred practices, as they are more cost-effective (i.e. have the lowest dollar/ton of sediment treated).*



5.3 USING THE TABLE GENERATOR FOR PLANNING AND GRANT SUBMITTAL

The functionality of the Interactive Map provides for a visual understanding of source loads and BMP opportunity locations and impact. To apply for grant applications, though, you need a list of these source loads and BMP effectiveness values. The Table Generator can be used to extract this information and summarize it at scales that meet the needs of LGUs and their respective water quality plans. ***Be advised that you can download any of the data on the web using the Table Generator and complete analysis within Excel. This requires some knowledge of the PTMApp-Desktop product's naming conventions.***

Below are examples of products which can be created with the .csv downloaded from Table Generator. These output products were created for the Ashley Creek Watershed in the Sauk River Watershed District but can also be created for any watershed in PTMApp-Web.

5.3.1 EXAMPLE 8: SOURCE ASSESSMENT: CATCHMENT LOAD REACHING PRIORITY RESOURCES

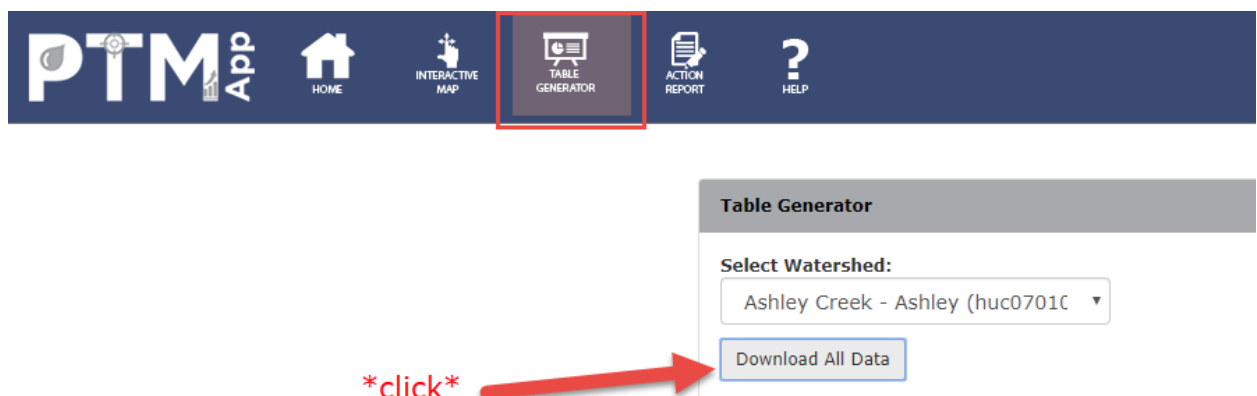
HOW TO:

Description – Create a table listing the sediment load generated in each catchment and delivered to each of its downstream priority resource points.

Use/Need – Determining catchment locations contributing excessive runoff to resource locations to prioritize for BMP and CP implementation.

Steps to Create:

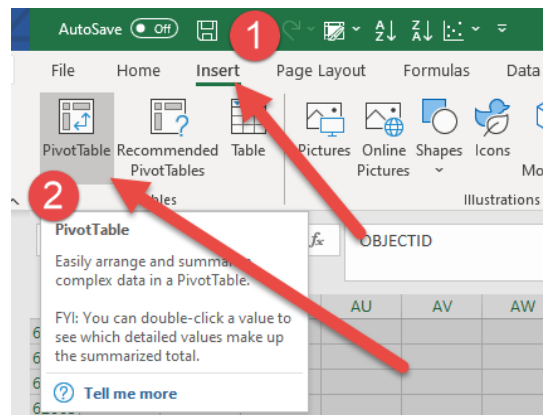
- 1) In the 'Select Watershed' dropdown menu choose your watershed. Then click 'Download All Data' in the Table Generator window:



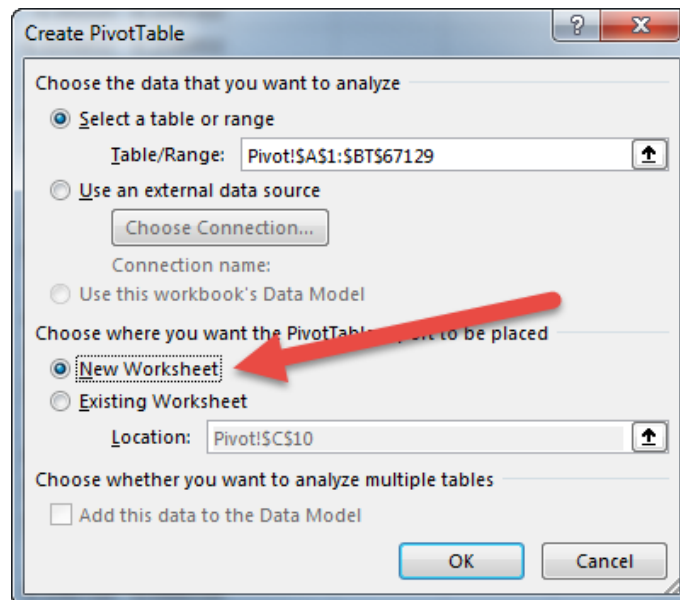
- 2) This button downloads one or more Excel spreadsheets which contain the PTMApp-Desktop data used to populate the data in PTMApp Web. For small datasets (i.e. HUC-12 or small HUC-10

watersheds) you will see one CSV file. For larger watersheds you may see multiple files. This is because, for larger watersheds, showing all the data in one spreadsheet would not allow the user to view the data in Microsoft Office Excel as it would exceed the limit for rows per spreadsheet, which is 1,048,576 for Office 2007 and newer versions. In those cases, the data were split by 'Pivot_ID'. For very large watersheds (HUC-8 watersheds or larger) even a single 'Pivot_ID' may exceed the row limit in Excel. In those cases, a 'README' file was created to state this. Data can instead be viewed in a text editor application. The below guidance follows pivot table creation assuming only one CSV file is created for your watershed (as in Ashley Creek Watershed).

- 3) For BMP-specific operations, creating a Pivot table in Excel is the most efficient way to summarize and rank data.
- 4) To create a pivot table, select all cells (Ctrl+A keyboard shortcut) and navigate to Insert >> PivotTable.

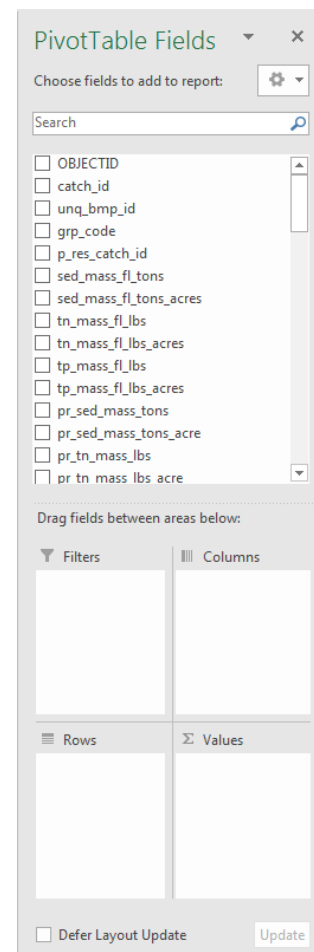


- 5) The 'Create PivotTable' dialog box will open:



Click on 'New Worksheet' to place the pivot table in a separate worksheet. Then click OK.

- 6) You should see the 'PivotTable Fields' dialog box open on an empty worksheet:



- 7) Data will be sorted into Rows, Columns, and Value fields to be analyzed. Additionally the 'Filter' field allows you to select data within a certain field. Its use will be discussed in later examples. **To find sediment load generated in each catchment and delivered to each of its downstream priority resource points , choose the following options:**
- Rows:** 'catch_id' - Catchment ID
 - Columns:** 'p_res_catch_id' - Unique whole number ID for priority resource catchment
 - Values:** 'pr_sed_mass_tons' – Sediment mass in tons delivered from catchment outlet to priority resource catchment outlet
 - Filter:** NONE

Assigning these data to each of the categories above should yield the results below:

PivotTable Fields

Choose fields to add to report:

Search

☐ OBJECTID
☒ catch_id
☐ unq_bmp_id
☐ grp_code
☒ p_res_catch_id
☐ sed_mass_fl_tons
☐ sed_mass_fl_tons_acres
☐ tn_mass_fl_lbs
☐ tn_mass_fl_lbs_acres
☐ tp_mass_fl_lbs
☐ tp_mass_fl_lbs_acres
☒ pr_sed_mass_tons
☐ pr_sed_mass_tons_acre
☐ pr_tn_mass_lbs
☐ pr_tn_mass_lbs_acre
☐ pr_tp_mass_lbs
☐ pr_tp_mass_lbs_acre
☐ sed_mass_fl_rank
☐ tn_mass_fl_rank

Drag fields between areas below:

Filters

Columns
p_res_catch_id

Rows
catch_id

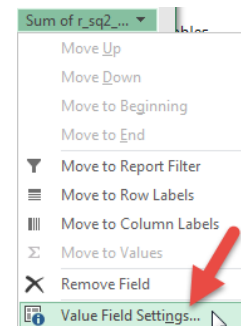
Values
Sum of pr_sed_mass_tons

☐ Defer Layout Update Update

Row Labels	1	2	3	4	5	6 (blank)	Grand Total
26	0.237965423						0.237965423
66	0.377454232						0.377454232
80	0.305110639						0.305110639
131	0.081898812						0.081898812
159	0.429855008						0.429855008
161	0.552990568						0.552990568
180	0.491231259						0.491231259
182	0.478896707						0.478896707
233	0.477107314						0.477107314
261	0.140763828	0.219610011					0.36037384
263	0.377749728						0.377749728
300	0.137764976						0.137764976
308	0.301247537						0.301247537
334	0.107118261						0.107118261
337	0.461443117						0.461443117
361	0.226324288	0.353095535					0.579419823
386	0.113050614	0.176373766					0.28942438
405	0.510959918						0.510959918
417	0.609302901	0.950592338					1.559895239
421	0.120856642	0.188552193					0.309408836
422	0.153389932	0.239308386					0.392698317
474	0.2288843	0.357089489					0.585973789
526	0.325273157						0.325273157
612	0.720033394						0.720033394
673	0.435312165						0.435312165
686	0.049997531						0.049997531
694	0.170880738						0.170880738
777	0.67994673						0.67994673
844	0.152878388	0.238510311	0.299801141				0.69118984
873	0.71442162						0.71442162
883	0.324704906	0.506582186					0.831287092
903	2.972051658						2.972051658
905	0.084207606						0.084207606
933	0.136432019	0.212851822	0.2675491				0.616832941
961	1.237276628	1.930313611					3.167590238
962	0.039139395						0.039139395
965	0.255661621						0.255661621
967	0.150566255						0.150566255
1049	0.080741618						0.080741618
1060	0.002098011	0.003273172					0.005371183
1079	0.138820465	0.216578109					0.355398574



TIP: Within 'Select Values', be sure to choose an operation besides 'Count' to analyze your data. For most cases with PTMApp data, SUM is the best choice as either (1) there is only one value to analyze or (2) you're adding multiple values within a given area (e.g. catchment). To adjust this value, click on the Values dropdown arrow and select 'Value Field Settings'. Within the Value Field Settings dialog box, click 'Sum' and hit OK.



- 8) In this table, each catchment ID is listed to the left and the priority resource point value is listed on the top. The sediment load (tons/year) generated in each catchment and delivered to each priority resource point is found under the numbered columns. A 'Totals' row is provided at the bottom of the table (need to scroll down to find), which is a sum of all catchment loads delivered to the resource point. There is also a 'Totals' column on the right-hand-side of the table, which is a sum of the catchments' contribution to all resource points. Scrolling through this table you can see many catchments contribute to multiple priority resources, and their values tend to decline moving downstream.

- 9) You can sort the columns to find which catchments contribute greater load to each priority resource point or export to a table and use within GIS with other PTMApp-Desktop data.

5.3.2 EXAMPLE 9: IDENTIFY BMPS FOR GRANT FUNDING – BY LOAD REDUCTION

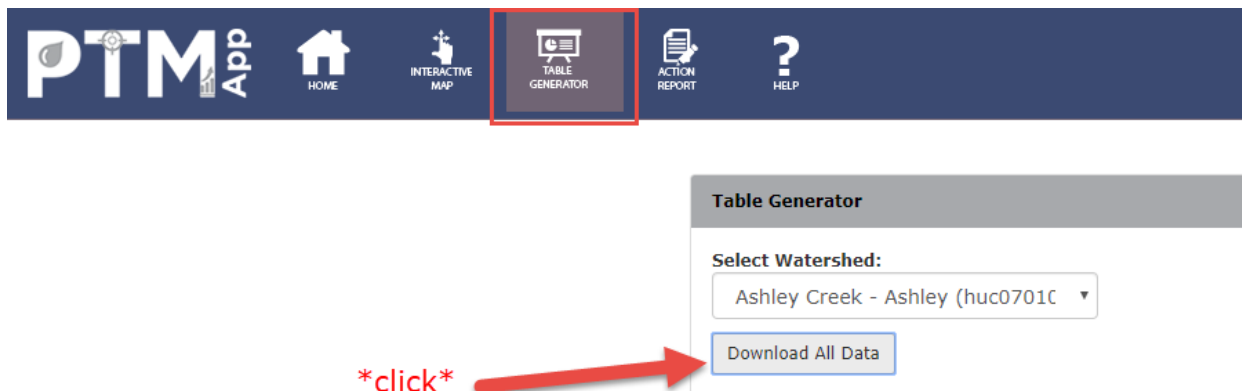
HOW TO:

Description – Create a table ranking BMPs based on their ability to remove sediment at each priority resource point.

Use/Need – A list of BMP opportunities which could be used in a prospective grant application to install best-of-best practices for reaching a water quality goal at a specific resource. This methodology is for sediment but could also easily be applied for TP or TN reductions.

Steps to Create:

- 1) Click 'Download All Data' in the Table Generator window:

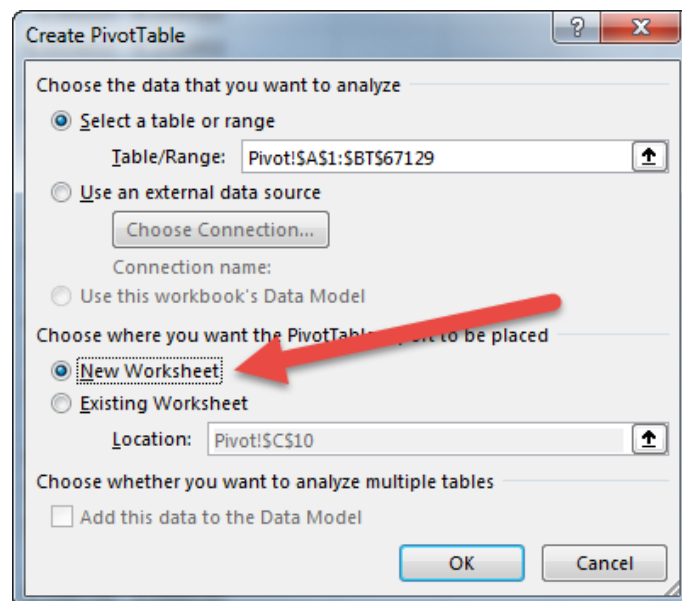
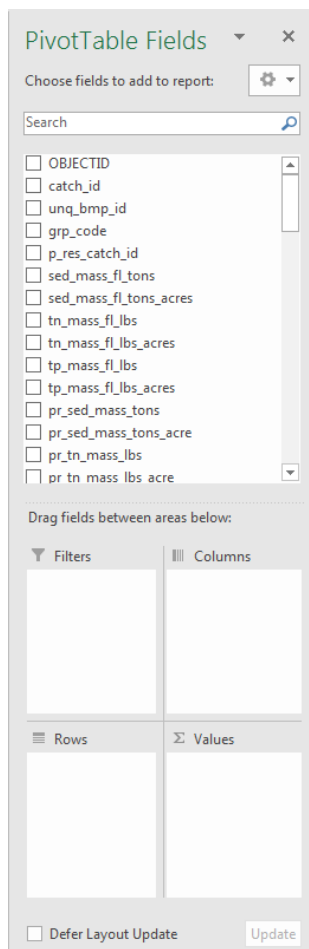
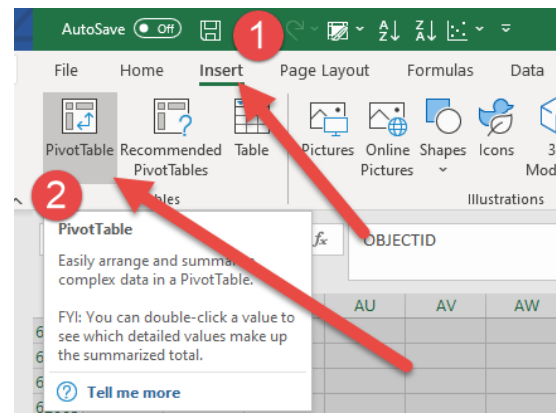


- 2) This button downloads a single Excel spreadsheet which contain the PTMApp-Desktop data used to populate the data in PTMApp-Web:

- 3) For BMP-specific operations, creating a Pivot table in Excel is the most efficient way to summarize and rank data.
- 4) To create a pivot table, select all cells (Ctrl+A keyboard shortcut) and navigate to Insert >> PivotTable.
- 5) The 'Create PivotTable' dialog box will open:

Click on 'New Worksheet' to place the pivot table in a separate worksheet. Then click OK.

- 6) You should see the 'PivotTable Fields' dialog box open on an empty worksheet:



- 7) Data will be sorted into Rows, Values, and Filter fields to be analyzed. Columns will not be used in this example. **To find the BMPs with the highest sediment reduction to priority resources, choose the following options:**
- Rows:** 'unq_bmp_id' - Unique BMP ID
 - Columns:** EMPTY
 - Values:** 'r_sq2_10' – median sediment load reduction (tons/year) based on a 10-year, 24-hour runoff event
 - Filter:** 'p_res_catch_id' – priority resource ID

Assigning these data to each of the categories above should yield the results below:

	A	B	C	D
1	p_res_catch_id	(All)		
2				
3	Row Labels	Sum of r_sq2_10		
4	1_500022_6	0.411047371		
5	10_500013_6	0.00071		
6	100_500175_6	0.004571321		
7	1000_501533_6	0.002303215		
8	10004_502966_2	0.13279496		
9	1001_501579_6	0.818710216		
10	10010_503431_2	0.071478897		
11	100125_503879_5	0.002910032		
12	100190_502082_1	0.170720168		
13	100192_2125_1	0.113573816		
14	1002_501751_6	0.004864095		
15	10020_502913_2	0.059927171		
16	10029_2614_2	0.015127357		
17	1003_1384_6	0.00873903		
18	100301_2235_1	0.069675509		
19	10032_2551_2	0.141126506		
20	10033_2714_2	0.03461782		
21	10036_503017_2	0.235402296		
22	100395_502124_1	0.264289427		
23	1004_1620_6	0.180480195		
24	10058_503013_2	0.160731502		
25	1006_501562_6	0.234221692		
26	10063_503145_2	0.123109222		
27	10064_503167_2	0.133726735		
28	1007_501579_6	0		
29	100804_502005_1	0.065387673		
30	10081_503006_2	0.076820455		
31	10085_2932_2	0.029590062		
32	10088_502884_2	0.06573858		
33	1009_500374_2	0.093742001		
34	1009_501604_6	0.001426177		
35	101_263_6	0.039874098		
36	1010_501604_6	0.000812153		
37	1011_1733_6			
38	10119_503128_2	0.030682716		

PivotTable Fields

Choose fields to add to report:

Search

- ☐ OBJECTID
- ☐ catch_id
- ☒ unq_bmp_id
- ☐ grp_code
- ☒ p_res_catch_id
- ☐ sed_mass_fl_tons
- ☐ sed_mass_fl_tons_acres
- ☐ tn_mass_fl_lbs
- ☐ tn_mass_fl_lbs_acres
- ☐ tp_mass_fl_lbs
- ☐ tp_mass_fl_lbs_acres
- ☐ pr_sed_mass_tons
- ☐ pr_sed_mass_tons_acre
- ☐ pr_tn_mass_lbs
- ☐ pr_tn mass lbs acre

Drag fields between areas below:

Filters

p_res_catch_id

Columns

Rows

unq_bmp_id

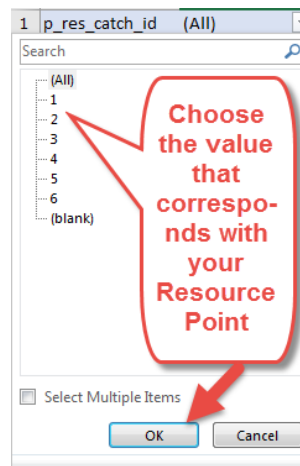
Values

Sum of r_sq2_...

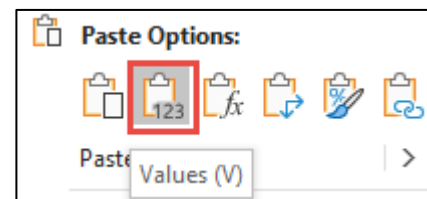
☐ Defer Layout Update

Update

- 8) Using the filter option (shown below), you can select specific priority resource points. This dropdown should be in cell B1.

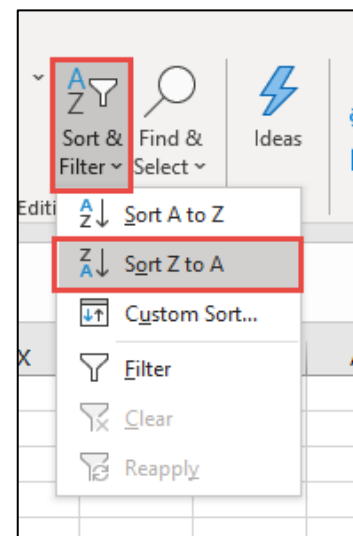


- 9) Choosing Resource point #6, for example, lists sediment reduction values for all BMPs upstream of priority resource point #6 in Ashley Creek. To sort these and find the **MOST EFFECTIVE** of these BMPs, select the columns that contain your BMP ID and reduction values (Columns A & B) and paste them (VALUES ONLY) into a new window. Click on 'Sort & Filter' and 'Sort Z to A'. After deleting the unnecessary remaining rows (listing the 'Grand Total' and 'p_res_catch_id'), you should be left with these two columns: 'Row Labels' and 'Sum of r_sq2_10'.
- 10) Select Column B and Click on 'Sort & Filter' and 'Sort Largest to Smallest'. Select 'Expand the Selection' in the 'Sort Warning' dialog box and select 'sort'



	A	B	C	D	E
1	Row Label	Sum of r_sq2_10			
2	p_res_cat	6			
3	Grand Tot	268.3384			
4	664487_50	0.028369			
5	664407_50	0.132622			
6	664360_50	0.405264			
7	664017_50	0.145375			
8	663345_50	0.195972			

Delete



	A	B	C	D	E	F	G	H	I	J	K	L
1	Row Label	Sum of r_sq2_10										
2	378157_50	1.887805										
3	3963_5064	1.856928										
4	309761_50	1.767605										
5	431899_62	1.765164										
6	4060_5064	1.678171										
7	3500_5057	1.616241										
8	362050_50	1.593939										
9	3502_5057	1.522609										
10	3960_6292	1.50937										
11	429296_50	1.499473										
12	579755_50	1.399576										
13	3019_5048	1.347547										
14	560964_50	1.347129										
15	416820_50	1.330858										
16	543395_50	1.302258										
17	414339_50	1.293124										
18	540464_50	1.266135										
19	2941_5047	1.265356										
20	3385_5053	1.24693										
21	5009_5079	1.211419										
22	4121_5069	1.209801										
23	379993_50	1.196399										
24	5391_5087	1.180195										
25	3818_5059	1.164437										
26	3951_5062	1.154459										
27	3098_5050	1.151595										

Sheet1 Sheet2 huc0701020203_pivot (4) ...

Average: 1.485381933 Count: 40 Numerical Count: 20 Min: 1.211419376 Max: 1.88780502 Sum: 29.70763865

11) Here the top 20 BMPs are selected, which have a combined annual sediment reduction of 29.7 tons.



TIP: If you want to only select certain BMP types, it's as simple as adding the field 'grp_code' to filters portion of your pivot table and setting the appropriate filters for the desired query.

HOW TO:

Steps to Create

Once your pivot table is created following steps 1-6 above, choose the following attributes in each layer:

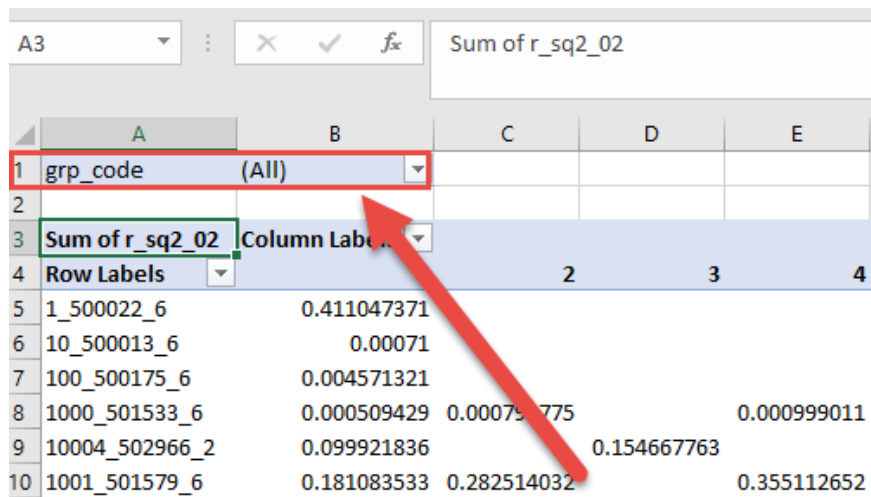
- Rows:** 'unq_bmp_id' - Unique BMP ID
- Columns:** 'p_res_catch_id' – priority resource ID
- Values:** 'r_sq2_10' – median sediment load reduction (tons/year) based on a 10-year, 24-hour runoff event

d. **Filter:** 'grp_code' – BMP treatment group

Assigning these data to each of the categories above should yield the results below:

Row Labels	1	2	3	4	5	6 (blank)	Grand Total
1_500022_6	0.411047371						0.411047371
10_500013_6	0.00071						0.00071
100_500175_6	0.004571321						0.004571321
1000_501533_6	0.000509429	0.000794775		0.000999011			0.002303215
10004_502966_2	0.099921836	0.154667763					0.254589598
1001_501579_6	0.181083533	0.282514032		0.355112652			0.818710216
10010_503431_2	0.063239773	0.09866233		0.124015935			0.285918039
100125_503879_5	0.002910032						0.002910032
100190_502082_1	0.067004593	0.103715574					0.170720168
100192_2125_1	0.113573816						0.113573816
1002_501751_6	0.0018994	0.002964155					0.004864095
10020_502913_2	0.070515535						0.070515535
10029_2614_2	0.015127357						0.015127357
1003_1384_6	0.00873903						0.00873903
100301_2235_1	0.069675509						0.069675509
10032_2551_2	0.055389614	0.085736892					0.141126506
10033_2714_2	0.013586872	0.021030949					0.03461782
10036_503017_2	0.052066627	0.081230758		0.102104911			0.235402296
100395_502124_1	0.28845896						0.28845896
1004_1620_6	0.180480195						0.180480195
10058_503013_2	0.313671125						0.313671125
1006_501562_6	0.234221692						0.234221692
10063_503145_2	0.131663696	0.205412613		0.258198211			0.59527452
10064_503167_2	0.029577876	0.046145362		0.058003497			0.133726735
1007_501579_6	0	0		0			0
100804_502005_1	0.025540753	0.03984692					0.065387673
10081_503006_2	0.086477729						0.086477729
10085_2932_2	0.029590062						0.029590062
10088_502884_2	0.06573858						0.06573858
1009_500374_2	0.036616096	0.057125905					0.093742001
1009_501604_6	0.001426177						0.001426177
101_263_6	0.039874098						0.039874098
1010_501604_6	0.000812153						0.000812153
1011_1733_6							
10119_503128_2	0.006786448	0.010587748		0.013308519			0.030682716
101209_502045_1	0.162037329	0.252799458		0.31776222			0.732599007
101259_503879_5	0.010396773						0.010396773
10126_503335_2	0.03590775	0.056020793		0.070416652			0.162345195
1013_501422_6	0.001499049	0.002338713		0.002939701			0.006777463
1014_501763_6	0.336961002	0.525703302					0.862664304
101436_502261_1	0.132204853	0.206256889		0.259259443			0.597721185

Now shown in the Pivot Table are the annual sediment reductions (tons/year) for BMPs at each priority resource point. Here you can see some BMPs treat multiple priority resource points. If you wish, you can filter by BMP group by adjusting the 'grp_code' filter (Cell B1).



	A	B	C	D	E
1	grp_code	(All)			
2					
3	Sum of r_sq2_02	Column Labels			
4	Row Labels		2	3	4
5	1_500022_6	0.411047371			
6	10_500013_6	0.00071			
7	100_500175_6	0.004571321			
8	1000_501533_6	0.000509429	0.00075775		0.000999011
9	10004_502966_2	0.099921836		0.154667763	
10	1001_501579_6	0.181083533	0.282514032		0.355112652

You can choose to look at specific group codes should you be interested in only certain BMP types. A list of common BMPs within each BMP group is shown in the table below.

PTMApp-Desktop Group Code	BMP Treatment Group	BMP Examples in Each Treatment Group
1	Storage	Water and Sediment Control Basin (WASCOB); Embankment Pond; Wetland Restoration/Creation; Drainage Water Management/Controlled Drainage Structure
2	Filtration	Grassed Waterway, Filter/Buffer Strip
3	Bio-filtration	Denitrifying bioreactor
4	Infiltration	2-stage Ditch; Infiltration Trench
5	Protection	Grade Stabilization; Tillage Management (e.g. No-Till or Reduced Till); Shoreline Protection
6	Source Reduction	Nutrient Management; Cover Crops; Perennial Crops; Critical Planting Areas

Lastly, follow step #9 above to copy and paste your data to a new Worksheet and sort to find the BMPs with the highest reduction amounts.



TIP: You may want to use the steps above for other PTMApp attributes that describe sediment, TP, and TN reduction for BMPs. Simply change the 'Values' layer in your pivot table to the attribute name below and continue with the same analysis as above.

Value Filter Name	Description	Unit and Scale of Results
SQ2_10	Sediment reduction (10 yr event), %	% at BMP
SQ2_02	Sediment reduction (2 yr event), %	% at BMP
PQ2_10	Total Phosphorus reduction (10 yr event), %	% at BMP
PQ2_02	Total Phosphorus reduction (2 yr event), %	% at BMP
NQ2_10	Total Nitrogen reduction (10 yr event), %	% at BMP
NQ2_02	Total Nitrogen reduction (2 yr event), %	% at BMP
C_SQ2_10	Sediment reduction at catchment (10 yr event), tons/year	tons/year at catchment outlet
C_PQ2_10	Total Phosphorus reduction at catchment (10 yr event), lbs/year	lbs/year at catchment outlet
C_NQ2_10	Total Nitrogen reduction at catchment (10 yr event), lbs/year	lbs/year at catchment outlet
C_SQ2_02	Sediment reduction at catchment (2 yr event), tons/year	tons/year at catchment outlet
C_PQ2_02	Total Phosphorus reduction at catchment (2 yr event), lbs/year	lbs/year at catchment outlet
C_NQ2_02	Total Nitrogen reduction at catchment (2 yr event), lbs/year	lbs/year at catchment outlet
R_SQ2_10	Sediment reduction at resource (10 yr event), tons/year	tons/year at resource location
R_PQ2_10	Total Phosphorus reduction at resource (10 yr event), lbs/year	lbs/year at resource location
R_NQ2_10	Total Nitrogen reduction at resource (10 yr event), lbs/year	lbs/year at resource location
R_SQ2_02	Sediment reduction at resource (2 yr event), tons/year	tons/year at resource location
R_PQ2_02	Total Phosphorus reduction at resource (2 yr event), lbs/year	lbs/year at resource location
R_NQ2_02	Total Nitrogen reduction at resource (2 yr event), lbs/year	lbs/year at resource location

Practice Type	BMP ID Number	Drainage Area Treated (sq-ft)	PTMApp Cost (\$)	Estimated Annual Sediment Reduction (tons)	Cost-Effectiveness to Treat Sediment (\$/ton)	Estimated Annual TP Reduction (lbs)	Cost-Effectiveness to Treat TP (\$/lb)	Estimated Annual TN Reduction (lbs)	Cost-Effectiveness to Treat TN (\$/lb)
Source Reduction	1404_1956_6	55,025	\$10.64	0.0	\$466.41	0.054	\$197.58	0.20	\$53.36
Source Reduction	544_500857_6	3,911,526	\$641.29	1.3	\$490.61	2.689	\$238.48	17.15	\$37.39
Source Reduction	1272_2052_6	72,756,591	\$121.58	0.2	\$492.10	0.589	\$206.56	3.94	\$30.85
Source Reduction	1101_1669_6	57,253	\$113.55	0.2	\$494.08	0.534	\$212.77	3.43	\$33.12
Source Reduction	278_500446_6	3,391	\$17.51	0.0	\$501.09	0.080	\$219.35	0.49	\$35.99
Source Reduction	1288_502051_6	194	\$3.09	0.0	\$505.92	0.015	\$209.54	0.09	\$33.85
Source Reduction	3118_504700_6	20,441	\$18.88	0.0	\$507.06	0.100	\$189.51	0.57	\$33.15
Source Reduction	428_500605_6	100,653	\$8.31	0.0	\$507.24	0.037	\$227.26	0.21	\$38.79
Source Reduction	277_961_6	74,123,595	\$35.22	0.1	\$512.35	0.149	\$235.61	0.83	\$42.24
Source Reduction	1574_2300_6	113,925	\$6.87	0.0	\$516.53	0.033	\$209.62	0.21	\$32.12
Grant Total from BMPs in Selection			\$2,059.00	5.3		9.610		59.11	

Disclaimer: Practices shown are from raw results created using PTMApp-Desktop and uploaded to the web. Users should review actual locations for practicability to implement. Cost-Effectiveness values may vary slightly from actual calculation based on number of significant digits shown. The number of practices printed is based on selection criteria but is limited to 40, or up to 3 pages.

5.4.1 EXAMPLE 10: FIND THE TOP 40 MOST COST-EFFECTIVE MANAGEMENT PRACTICES (SOURCE REDUCTION) BASED ON SEDIMENT REDUCTION BENEFITS AT THE CATCHMENT OUTLET (I.E. EDGE-OF-FIELD)

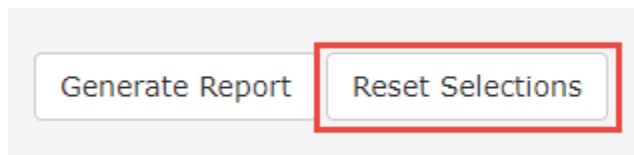
HOW TO:

Description – Generate a list of the top 40 most cost-effective management practices based on reduction benefits at the edge-of-field/catchment outlet (according to PTMApp-Desktop). In this example, sediment will be used as the water quality parameter of interest.

Use/Need – Determine the 40 most cost-effective management locations for treating sediment, TP, or TN before delivery to the edge-of-field or concentrated flowpath (i.e. what gets into waterways); use in grant applications, watershed planning, setting/benchmarking water quality goals.

Steps to Create

- 1) If an Action Report is already generated, Click 'Reset Selection' at the bottom of the page:



This will clear the selected information back to the default settings and should be pressed if any previous maps were generated in the same PTMAApp-Web session.

- 2) In 'Step 1: Select Watershed and Priority Resource Point' choose 'Ashley Creek – Ashley (huc0701020203)' for the watershed and '2' for the 'Location Point Number'

- By choosing location point two – we are specifying that we are only concerned with the top 40 management practices in the Silver Creek Watershed.

It is important to note that the map displayed in this step will print in the report the way it is seen in this window, except for the legend being removed and placed outside the data frame. Set the scale and position the map accordingly.

- 3) In 'Step 2: Select Parameter', select 'Sediment' from the dropdown (this is default)

- This drop down selects the water quality parameter (Sediment, TN, TP) of concern which the ranking will be based.

- 4) In 'Step 3: Select Type of Practice (Treatment Group)' select 'Source Reduction'

- In this step, the user specifies which practice types should be considered in the Action Report. In this example, we are only concerned with management practices so only 'Source Reduction' practices are selected. Note: 'Biofiltration' is unable to be selected. When this dataset was created, it was predefined that biofiltration practices were not to be considered and therefore were generated in the dataset.


- 5) In 'Step 4: Basis For Practice Selection' select the following:


- 'Method to Rank BMPs' – 'Cost-Effectiveness (lowest \$/mass)' (This is default)
 - This is the most popular method to rank BMPs and is derived from dividing BMP cost (\$) by the reduction benefit mass (tons for sediment or pounds for TN and


TP). This normalizes that data for all BMPs showing the best return on investment. In this example sediment was selected in step 2 so this will be the water quality reduction applied to the calculation for ranking, however, the generated report will additionally supply the statistics of the other water quality benefits received from the BMP.


- 'Method Used to Select BMPs' – 'Number of Highest Ranked BMPs' (This is default)
 - This option works in combination with the 'Method to Rank BMPs' – The default applied in this example simply ranks the most cost-effective BMPs. Other options in this drop down serve to filter the data by setting thresholds or ranges for BMP inclusion/exclusion based on cost-effectiveness, total load reduction, and total cost.
- '(# of BMPs to Print) max 40' – '40' (This is default)
 - This option is dynamic based on the selection of the 'Method Used to Select BMPs' selected by the user. For additional information on these options see (section 4.6, step 4, B).
- 'Outlet Location' – 'Catchment Outlet'
 - In this example, we are looking at edge-of-field or catchment benefits from the BMPs so 'Catchment Outlet' is selected. If 'Watershed Outlet' was selected, BMP reductions would be measured at the 'Location Point Number' outlet selected in step 1.
- 'Storm Event' – '2-year'
 - In this example, we are measuring BMP benefits/reductions for a 2-year, 24-hour design storm event. The other option is a 10-year, 24-hour storm event.
- 'Anticipated performance'
 - Source Reduction – Median Q2 (expected) (This is default)
 - Anticipated performance of BMP types is derived from a reduction ratio which is based on the empirical statistical distribution of BMP effectiveness for each practice type. This section will default to the Median Q2 effectiveness for practice types selected in step 3.


Step 4 : Basis For Practice Selection

Method to Rank BMPs 
 Cost-Effectiveness (lowest \$/mas ▼)

Method Used to Select BMPs 
 Number of Highest Ranked BMPs ▼ 40 (# of BMPs to Print) max 40

Outlet Location 
 Catchment Outlet ▼

Storm Event 
 2 - Year ▼

Anticipated Practice Performance 

	25 th percentile for Q1 (low)	Median for Q2 (expected)	75 th percentile for Q3 (high)
Source Reduction	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Biofiltration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Filtration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Infiltration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Storage	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Protection	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

- 6) Lastly, select “Generate Report” at the bottom of the page. Depending on the size of the area and complexity of the parameters selected, this process may take a while. Databases are queried on input parameters and calculations are done on the fly to generate the report. The report will download as a pdf.

This full Action Report for this example can be view in Appendix A: 6.5 Action Report Example 10.

5.4.2 EXAMPLE 11: FIND THE TOP 40 MOST COST-EFFECTIVE MANAGEMENT PRACTICES (SOURCE REDUCTION) BASED ON SEDIMENT REDUCTION BENEFITS AT THE RESOURCE POINT (WATERSHED) OUTLET

HOW TO:

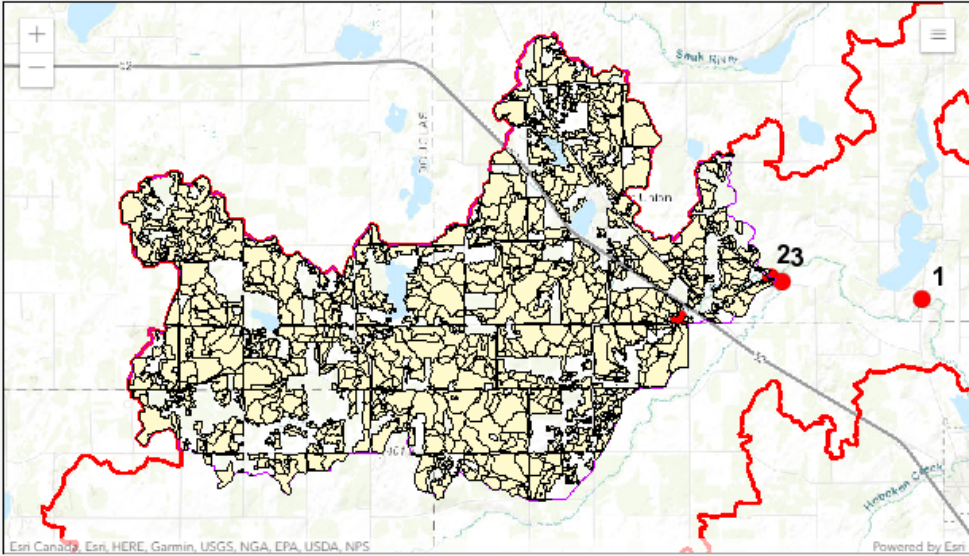
This example has identical user input parameters to the previous example, “5.4.1 Example 10”, except for the BMP reduction benefits and subsequently the cost-effectiveness will be based on the Resource Point (Watershed) Outlet. This is accomplished by changing the ‘Output Location’ in Step 4 to ‘Watershed Outlet’. All other parameters remain the same (see figure below).

Targeted BMP Action Report

Step 1 : Select Watershed and Priority Resource Point

Select Watershed

Location Point Number



Step 2 : Select Parameter

Step 3 : Select Type of Practice (Treatment Group)

☒ Source Reduction ☐ Biofiltration ☐ Filtration ☐ Infiltration ☐ Storage ☐ Protection

Step 4 : Basis For Practice Selection

Method to Rank BMPs

Method Used to Select BMPs

Outlet Location

Storm Event

Anticipated Practice Performance

	25 th percentile for Q1 (low)	Median for Q2 (expected)	75 th percentile for Q3 (high)
Source Reduction	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Biofiltration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Filtration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Infiltration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Storage	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Protection	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The full Action Report for this example can be view in Appendix A: 6.6 Action Report Example 11.

When comparing the differences between Action Report Example 10 and 11, one can see that many of the same practices are pulled but with varying order, reductions, and cost-effectiveness. These differences can also be seen in the totals for each report (below).

Practice Type	BMP ID Number	Drainage Area Treated (sq-ft)	PTMApp Cost (\$)	Estimated Annual Sediment Reduction (tons)	Cost-Effectiveness to Treat Sediment (\$/ton)	Estimated Annual TP Reduction (lbs)	Cost-Effectiveness to Treat TP (\$/lb)	Estimated Annual TN Reduction (lbs)	Cost-Effectiveness to Treat TN (\$/lb)
Watershed Outlet									
Grant Total from BMPs in Selection			\$2,906.00	3.4		12,350		75.46	
Catchment Outlet									
Grant Total from BMPs in Selection			\$2,059.00	5.3		9,610		59.11	

5.4.3 EXAMPLE 12: FIND THE MOST COST-EFFECTIVE PRACTICES BASED ON PHOSPHORUS REDUCTION BENEFITS AT THE RESOURCE POINT (WATERSHED) OUTLET WITH MINIMUM LOAD REDUCTION REQUIREMENTS

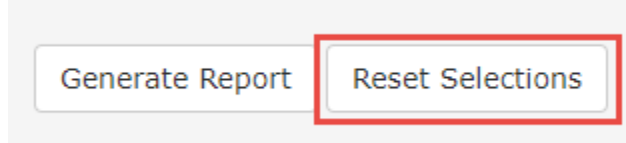
HOW TO:

Description – Generates a list of most cost-effective BMPs based on a minimum reduction benefit at the Resource Point (Watershed) Outlet according to PTMApp-Desktop. In this example, Phosphorus will be used as the water quality parameter of interest and only BMPs with reductions over 1 pound annually will be considered.

Use/Need – Determine the most cost-effective BMPs for treating sediment, TP, or TN before delivery to Watershed outlet. Additionally, the example shows how to qualify a minimum benefit reduction; use in grant applications, watershed planning, setting/benchmarking water quality goals.

Steps to Create

- 1) If an Action Report is already generated, Click 'Reset Selection' at the bottom of the page:



This will clear the selected information back to the default settings

- 2) In 'Step 1: Select Watershed and Priority Resource Point' choose 'Ashley Creek – Ashley (huc0701020203)' for the watershed and '1' for the 'Location Point Number'

Step 1 : Select Watershed and Priority Resource Point

Select Watershed: Ashley Creek - Ashley (huc07010)

Location Point Number: 1

- By choosing location point one – we are specifying that we are looking for most cost-effective practices in the entire watershed based of TP reductions at the watershed outlet.

It is important to note that the map displayed in this step will print in the report the way it is seen in this window except for the legend being removed and placed outside the data frame. Set the scale and position the map accordingly.

- 3) In 'Step 2: Select Parameter', select 'Total Phosphorus' from the dropdown

Step 2 : Select Parameter

Total Phosphorus

- This drop down selects the water quality parameter (Sediment, TN, TP) of concern which the ranking will be based.

- 4) In 'Step 3: Select Type of Practice (Treatment Group)' select 'Source Reduction', 'Filtration', 'Infiltration', 'Storage', and 'Protection'

Step 3 : Select Type of Practice (Treatment Group)

☒ Source Reduction ☐ Biofiltration ☒ Filtration ☒ Infiltration ☒ Storage ☒ Protection

- In this step, the user specifies which practice types should be considered in the action report. In this example, we are looking at all the possibilities available in the dataset, so every available type of practice is selected. Note: 'Biofiltration' is unable to be selected. When this dataset was created, it was predefined that biofiltration practices were not to be considered and therefore were generated in the dataset.


- 5) In 'Step 4: Basis For Practice Selection' select the following:


- 'Method to Rank BMPs' – 'Cost-Effectiveness (lowest \$/mass)' (This is default)
 - This is the most popular method to rank BMPs and is derived from dividing BMP cost (\$) by the reduction benefit mass (tons for sediment or pounds for TN and TP). This normalizes that data for all BMPs showing the best return on investment. In this example total Phosphorus was selected in step 2 so this will be the water quality reduction applied to the calculation for ranking, however, the generated report will additionally supply the statistics of the other water quality benefits received from the BMP.
- 'Method Used to Select BMPs' – 'Minimum Load Reduction'
 - This option works in combination with the 'Method to Rank BMPs' – By setting a minimum load reduction, a qualifier is set to the cost-effectiveness in order to ensure a threshold for reduction is met. Increases can be expected in overall (\$/lb), total cost, and total TP reduction benefits selected benefits. Other options


in this drop down serve to filter the data by setting thresholds or ranges for BMP inclusion/exclusion based on cost-effectiveness, total load reduction, and total cost.


- '(lb)' – '1'
 - This option is dynamic based on the selection of the 'Method Used to Select BMPs' selected by the user. In this example, it represents the minimum poundage for annual TP reduction to be included in the report. For additional information on these options see (section 4.6, step 4, B).
- 'Outlet Location' – 'Watershed Outlet'
 - In this example, we are looking at 'Watershed Outlet' which is BMP reductions measured at the 'Location Point Number' outlet selected in step 1. In this case, that is the entire watershed. The other option is Catchment Outlet or edge-of-field benefits from the BMPs selected.
- 'Storm Event' – '2-year'
 - In this example, we are measuring BMP benefits/reductions for a 2-year, 24-hour design storm event. The other option is a 10-year, 24-hour storm event.
- 'Anticipated performance'
 - Source Reduction – Median Q2 (expected) (This is default)
 - Filtration – Median Q2 (expected) (This is default)
 - Infiltration – Median Q2 (expected) (This is default)
 - Storage – Median Q2 (expected) (This is default)
 - Protection – Median Q2 (expected) (This is default)
 - Anticipated performance of BMP types is derived from a reduction ratio which is based on the empirical statistical distribution of BMP effectiveness for each practice type. This section will default to the Median Q2 effectiveness for practice types selected in step 3.


Step 4 : Basis For Practice Selection

Method to Rank BMPs 
 Cost-Effectiveness (lowest \$/mas ▼)

Method Used to Select BMPs 
 Minimum Load Reduction ▼ 1 (lb)

Outlet Location 
 Watershed Outlet ▼

Storm Event 
 2 - Year ▼

Anticipated Practice Performance 

	25 th percentile for Q1 (low)	Median for Q2 (expected)	75 th percentile for Q3 (high)
Source Reduction	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Biofiltration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Filtration	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Infiltration	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Storage	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Protection	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>

Generate Report Reset Selections

- 6) Lastly, select “Generate Report” at the bottom of the page. Depending on the size of the area and complexity of the parameters selected, this process may take a while. Databases are queried on input parameters and calculations are done on the fly to generate the report. The report will download as a pdf.

This full Action Report for this example can be view in Appendix A: 6.7 Action Report Example 12.

5.4.4 EXAMPLE 13: FIND PRACTICES WITH THE GREATEST NITROGEN LOAD REDUCTION AT THE RESOURCE POINT (WATERSHED) OUTLET WITH A COST-EFFECTIVENESS QUALIFIER

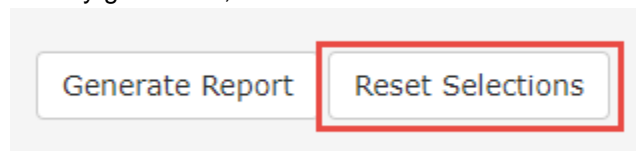
HOW TO:

Description – Generates a list of BMPs based on largest reduction benefits at the Resource Point (Watershed) Outlet according to PTMApp-Desktop. In this example, Nitrogen will be used as the water quality parameter of interest and only BMPs meeting a minimum cost-effectiveness value will be considered.

Use/Need – Determine the BMPs with the largest reduction benefits for treating sediment, TP, or TN before delivery to Watershed outlet. Additionally, the example shows how to qualify a minimum cost-effectiveness. This allows the user to generate a report focused at finding the BMPs providing the greatest reduction benefits while still maintaining an acceptable return on investment; use in grant applications, watershed planning, setting/benchmarking water quality goals.

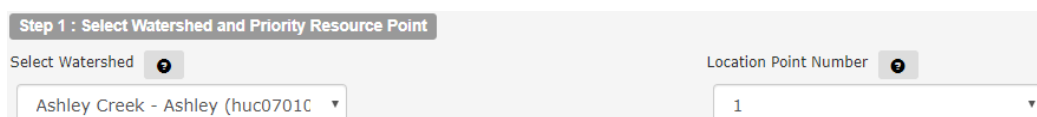
Steps to Create

- 1) If an Action Report is already generated, Click ‘Reset Selection’ at the bottom of the page:



This will clear the selected information back to the default settings

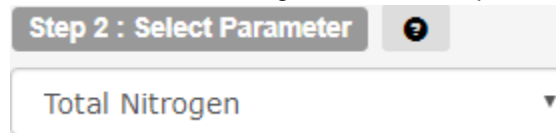
- 2) In ‘Step 1: Select Watershed and Priority Resource Point’ choose ‘Ashley Creek – Ashley (huc0701020203)’ for the watershed and ‘1’ for the ‘Location Point Number’



- *By choosing location point one – we are specifying that we are looking for most cost-effective practices in the entire watershed based of TN reductions at the watershed outlet.*

It is important to note that the map displayed in this step will print in the report the way it is seen in this window except for the legend being removed and placed outside the data frame. Set the scale and position the map accordingly.

- 3) In 'Step 2: Select Parameter', select 'Total Nitrogen' from the dropdown



The screenshot shows a web interface for 'Step 2 : Select Parameter'. There is a button with a question mark icon. Below it is a dropdown menu that has been opened, showing 'Total Nitrogen' as the selected parameter.

- This drop down selects the water quality parameter (Sediment, TN, TP) of concern which the ranking will be based.

- 4) In 'Step 3: Select Type of Practice (Treatment Group)' select 'Source Reduction', 'Filtration', 'Infiltration', 'Storage', and 'Protection'



The screenshot shows a web interface for 'Step 3 : Select Type of Practice (Treatment Group)'. There is a button with a question mark icon. Below it are several checkboxes: 'Source Reduction' (checked), 'Biofiltration' (unchecked), 'Filtration' (checked), 'Infiltration' (checked), 'Storage' (checked), and 'Protection' (checked).


- In this step, the user specifies which practice types should be considered in the Action Report. In this example, we are looking at all the possibilities available in the dataset, so every available type of practice is selected. Note: 'Biofiltration' is unable to be selected. When this dataset was created, it was predefined that biofiltration practices were not to be considered and therefore were generated in the dataset.


- 5) In 'Step 4: Basis for Practice Selection' select the following:


- 'Method to Rank BMPs' – 'Load Reduction'
 - This method focuses the report on magnitude of the reduction benefit regardless of the cost.
- 'Method Used to Select BMPs' – 'Less than Maximum Cost-Effectiveness'
 - This option works in combination with the 'Method to Rank BMPs' – Specifically a threshold is set for acceptable cost-effectiveness ensuring an acceptable return on investment. Other options in this drop down serve to filter the data by setting thresholds or ranges for BMP inclusion/exclusion based on total load reduction and total cost.
- '(\$/lb)' – '100'
 - This option is dynamic based on the selection of the 'Method Used to Select BMPs' selected by the user. In this example, it represents the maximum allowable cost-effectiveness. In this example, a BMP is excluded from the report if it cost more than \$100 per pound of TN it removes. For additional information on these options see (section 4.6, step 4, B).
- 'Outlet Location' – 'Watershed Outlet'
 - In this example, we are looking at 'Watershed Outlet' which is BMP reductions measured at the 'Location Point Number' outlet selected in step 1. In this case, that is the entire watershed. The other option is Catchment Outlet or edge-of-field benefits from the BMPs selected.
- 'Storm Event' – '2-year'


- In this example, we are measuring BMP benefits/reductions for a 2-year, 24-hour design storm event. The other option is a 10-year, 24-hour storm event.
- 'Anticipated performance'
 - Source Reduction – Median Q2 (expected) (This is default)
 - Filtration – Median Q2 (expected) (This is default)
 - Infiltration – Median Q2 (expected) (This is default)
 - Storage – Median Q2 (expected) (This is default)
 - Protection – Median Q2 (expected) (This is default)
- Anticipated performance of BMP types is derived from a reduction ratio which is based on the empirical statistical distribution of BMP effectiveness for each practice type. This section will default to the Median Q2 effectiveness for practice types selected in step 3.


Step 4 : Basis For Practice Selection

Method to Rank BMPs 
 Load Reduction ▼

Method Used to Select BMPs 
 Less than Maximum Cost-Effectiv ▼ 100 (\$/lb)

Outlet Location 
 Watershed Outlet ▼

Storm Event 
 2 - Year ▼

Anticipated Practice Performance 

	25 th percentile for Q1 (low)	Median for Q2 (expected)	75 th percentile for Q3 (high)
Source Reduction	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Biofiltration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Filtration	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Infiltration	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Storage	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Protection	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>

Generate Report Reset Selections

- 6) Lastly, select “Generate Report” at the bottom of the page. Depending on the size of the area and complexity of the parameters selected, this process may take a while. Databases are queried on input parameters and calculations are done on the fly to generate the report. The report will download as a pdf.

This full Action Report for this example can be view in Appendix A: 6.8 Action Report Example 13.

Below are some examples from report totals using different values for “Less than Maximum Cost-Effectiveness”. These results show how important it can be to set a reasonable value when querying maximum reduction values to ensure the user is getting an appropriate return on investment for targeted BMPs.

Practice Type	BMP ID Number	Drainage Area Treated (sq-ft)	PTMApp Cost (\$)	Estimated Annual Sediment Reduction (tons)	Cost-Effectiveness to Treat Sediment (\$/ton)	Estimated Annual TP Reduction (lbs)	Cost-Effectiveness to Treat TP (\$/lb)	Estimated Annual TN Reduction (lbs)	Cost-Effectiveness to Treat TN (\$/lb)
Maximum of \$100/lb									
Grant Total from BMPs in Selection			\$119,004.00	23.88		666.506		9022.40	
Maximum of \$200/lb									
Grant Total from BMPs in Selection			\$340,710.00	26.31		693.240		9440.95	
No Maximum Set – Number of Highest Ranked BMPs									
Grant Total from BMPs in Selection			\$403,404.00	26.78		692.906		9487.05	

6 APPENDIX A: PTMAPP-WEB ATTRIBUTE CATALOG

Listed below are the attribute catalogs for the PTMApp-Web Interactive Map and Table Generator. These tables are listed in different sections, but access similar PTMApp-Desktop data.

Each PTMApp-Web Interactive Map attribute is associated with the original PTMApp-Desktop data, including the table it's found in (Table Name), its attribute name within the table (Attribute Name), the original GIS data type (Data Type), a description of what the data means (Description), and the PTMApp-Desktop module and button the data is create in (Processed In).

The Table Generator data are summarized very similarly, but with another attribute that links the Table Generator attribute with its pair in the Interactive Map feature, should you wish to compare.

6.1 INTERACTIVE MAP ATTRIBUTE TABLE: PRIORITY RESOURCES & CATCHMENTS

PTMApp-Web Attributes -- Priority Resources & Catchments					
PTMApp-Web	PTMApp-Desktop				
Attribute Name	Table Name	Attribute Name	Date Type	Description	Processed In
Runoff Volume (2 yr), ft3	table_catchment	RO_vol_2yr	Double	Catchment runoff volume in cubic feet for 2-year 24-hr rainfall event	Catchments and Loading > Summarize Catchment Loadings
Runoff Volume (10 yr), ft3	table_catchment	RO_vol_10yr	Double	Catchment runoff volume in cubic feet for 10-year 24-hr rainfall event	Catchments and Loading > Summarize Catchment Loadings
Peak Discharge (2 yr Event), cfs	table_catchment	PeakQ_2yr	Double	Catchment peak discharge in cubic feet per second for 2-year 24-hr rainfall event	Catchments and Loading > Summarize Catchment Loadings
Peak Discharge (10 yr Event), cfs	table_catchment	PeakQ_10yr	Double	Catchment peak discharge in cubic feet per second for 10-year 24-hr rainfall event	Catchments and Loading > Summarize Catchment Loadings
Sediment delivery to catchment, tons/year	table_catchment	sed_mass_fl_tons	Double	Annual sediment mass (delivered to the catchment outlet) in tons, summed over the catchment	Catchments and Loading > Summarize Catchment Loadings
Sediment delivery to catchment, tons/acre/year	table_catchment	sed_mass_fl_tons_acre	Double	Annual sediment yield (delivered to the catchment outlet) in tons/acre/year, summed over the catchment	Catchments and Loading > Summarize Catchment Loadings
Total Nitrogen delivery to catchment, lbs/year	table_catchment	tn_mass_fl_lbs	Double	Annual total nitrogen mass (delivered to the catchment outlet) in pounds, summed over the catchment	Catchments and Loading > Summarize Catchment Loadings
Total Nitrogen delivery to catchment, lbs/acre/year	table_catchment	tn_mass_fl_lbs_acre	Double	Annual total nitrogen yield (delivered to the catchment outlet) in pounds/acre/year, summed over the catchment	Catchments and Loading > Summarize Catchment Loadings
Total Phosphorus delivery to catchment, lbs/year	table_catchment	tp_mass_fl_lbs	Double	Annual total phosphorus mass (delivered to the catchment outlet) in pounds, summed over the catchment	Catchments and Loading > Summarize Catchment Loadings
Total Phosphorus delivery to catchment, lbs/acre/year	table_catchment	tp_mass_fl_lbs_acre	Double	Annual total phosphorus yield (delivered to the catchment outlet) in pounds/acre/year, summed over the catchment	Catchments and Loading > Summarize Catchment Loadings
Sediment delivery to resource of concern, tons/year	table_p_res_catchment_route	pr_sed_mass_tons	Double	Sediment mass in tons delivered from catchment outlet to priority resource catchment outlet	Catchments and Loading > Sediment,

PTMApp-Web Attributes -- Priority Resources & Catchments					
PTMApp-Web	PTMApp-Desktop				
Attribute Name	Table Name	Attribute Name	Date Type	Description	Processed In
					TP and TN Channel Routing
Sediment delivery to resource of concern, tons/acre/year	table_p_res_catchment_route	pr_sed_mass_tons_acre	Double	Sediment yield in tons per acre delivered from catchment outlet to priority resource catchment outlet	Catchments and Loading > Sediment, TP and TN Channel Routing
Total Nitrogen delivery to resource of concern, lbs/year	table_p_res_catchment_route	pr_tn_mass_lbs	Double	Total nitrogen mass in tons delivered from catchment outlet to priority resource catchment outlet	Catchments and Loading > Sediment, TP and TN Channel Routing
Total Nitrogen delivery to resource of concern, lbs/acre/year	table_p_res_catchment_route	pr_tn_mass_lbs_acre	Double	Total nitrogen yield in tons per acre delivered from catchment outlet to priority resource catchment outlet	Catchments and Loading > Sediment, TP and TN Channel Routing
Total Phosphorus delivery to resource of concern, lbs/year	table_p_res_catchment_route	pr_tp_mass_lbs	Double	Total phosphorus mass in tons delivered from catchment outlet to priority resource catchment outlet	Catchments and Loading > Sediment, TP and TN Channel Routing
Total Phosphorus delivery to resource of concern, lbs/acre/year	table_p_res_catchment_route	pr_tp_mass_lbs_acre	Double	Total phosphorus yield in tons per acre delivered from catchment outlet to priority resource catchment outlet	Catchments and Loading > Sediment, TP and TN Channel Routing
Sediment delivery to catchment, %	table_r_catchment	sed_mass_fl_rank	Double	Annual sediment yield (delivered to the catchment outlet) ranking, relative to all catchments	Catchments and Loading > Priority Resource Delivery
Total Nitrogen delivery to catchment, %	table_r_catchment	tn_mass_fl_rank	Double	Annual total nitrogen yield (delivered to the catchment outlet) ranking, relative to all catchments	Catchments and Loading > Priority Resource Delivery
Total Phosphorus delivery to catchment, %	table_r_catchment	tp_mass_fl_rank	Double	Annual total phosphorus yield (delivered to the catchment outlet) ranking, relative to all catchments	Catchments and Loading > Priority Resource Delivery

PTMApp-Web Attributes -- Priority Resources & Catchments					
PTMApp-Web	PTMApp-Desktop				
Attribute Name	Table Name	Attribute Name	Date Type	Description	Processed In
WQI delivery to catchment, %	table_r_catchment	wqi_mass_fl	Double	Water quality index ranking based on sediment, total nitrogen, and total phosphorus (delivered to the catchment outlet), relative to all catchments	Catchments and Loading > Priority Resource Delivery
Sediment delivery to resource of concern, %	table_r_p_res_catchment	sed_mass_pr_rank	Double	Annual sediment yield (delivered to the priority resource) ranking, relative to priority resource catchment	Catchments and Loading > Priority Resource Delivery
Total Nitrogen delivery to resource of concern, %	table_r_p_res_catchment	tn_mass_pr_rank	Double	Annual total nitrogen yield (delivered to the priority resource) ranking, relative to priority resource catchment	Catchments and Loading > Priority Resource Delivery
Total Phosphorus delivery to resource of concern, %	table_r_p_res_catchment	tp_mass_pr_rank	Double	Annual total phosphorus yield (delivered to the priority resource) ranking, relative to priority resource catchment	Catchments and Loading > Priority Resource Delivery
WQI delivery to resource of concern, %	table_r_p_res_catchment	wqi_mass_pr	Double	Water quality index ranking based on sediment, total nitrogen, and total phosphorus (delivered to priority resource outlet), relative to priority resource catchments	Catchments and Loading > Priority Resource Delivery

6.2 INTERACTIVE MAP ATTRIBUTE TABLE: BMP BENEFITS: WATERSHED SCALE

PTMApp-Web Attributes – Best Management Practice Benefits: Watershed Scale					
PTMApp-Web	PTMApp-Desktop				
Attribute Name	Table Name	Attribute Name	Date Type	Description	Processed In
Sediment reduction at resource (10 yr event), tons/year	table_ba_load_red	R_SQ2_10	Float	sediment reduction at resource of concern based upon median (Q2) effectiveness @ resource of concern based on 10 year, 24 hour event (tons/year)	Benefits Analysis > Generate Benefits Tables
Total Phosphorus reduction at resource (10 yr event), lbs/year	table_ba_load_red	R_PQ2_10	Float	Phosphorus reduction at resource of concern based upon median (Q2) effectiveness @ resource of concern 10 year, 24 hour event (pounds/year)	Benefits Analysis > Generate Benefits Tables
Total Nitrogen reduction at resource (10 yr event), lbs/year	table_ba_load_red	R_NQ2_10	Float	Nitrogen reduction at resource of concern based upon median (Q2) effectiveness @ resource of concern 10 year, 24 hour event (pounds/year)	Benefits Analysis > Generate Benefits Tables
Sediment reduction at resource (2 yr event), tons/year	table_ba_load_red	R_SQ2_02	Float	sediment reduction at resource of concern based upon median (Q2) effectiveness @ resource of concern based on 2 year, 24 hour event (tons/year)	Benefits Analysis > Generate Benefits Tables
Total Phosphorus reduction at resource (2 yr event), lbs/year	table_ba_load_red	R_PQ2_02	Float	Phosphorus reduction at resource of concern based upon median (Q2) effectiveness @ resource of concern 2 year, 24 hour event (pounds/year)	Benefits Analysis > Generate Benefits Tables
Total Nitrogen reduction at resource (2 yr event), lbs/year	table_ba_load_red	R_NQ2_02	Float	Nitrogen reduction at resource of concern based upon median (Q2) effectiveness @ resource of concern 2 year, 24 hour event (pounds/year)	Benefits Analysis > Generate Benefits Tables
Sediment treatment cost (10 yr event), dollars/ton	table_ca_bmp_costeff	CI_SQ2_10	Float	sediment cost index (BMP cost/reduction) at resource of concern based upon median (Q2) effectiveness @ resource of concern based on 10 year, 24 hour event	Cost Analysis
Total Phosphorus treatment cost (10 yr event), dollars/lb	table_ca_bmp_costeff	CI_PQ2_10	Float	Phosphorus cost index (BMP cost/reduction) at resource of concern	Cost Analysis

PTMApp-Web Attributes – Best Management Practice Benefits: Watershed Scale

PTMApp-Web	PTMApp-Desktop				
Attribute Name	Table Name	Attribute Name	Date Type	Description	Processed In
				based upon median (Q2) effectiveness @ resource of concern 10 year, 24 hour event	
Total Nitrogen treatment cost (10 yr event), dollars/lb	table_ca_bmp_costeff	CI_NQ2_10	Float	Nitrogen cost index (BMP cost/reduction) at resource of concern based upon median (Q2) effectiveness @ resource of concern 10 year, 24 hour event	Cost Analysis
Sediment treatment cost (2 yr event), dollars/ton	table_ca_bmp_costeff	CI_SQ2_02	Float	sediment cost index (BMP cost/reduction) at resource of concern based upon median (Q2) effectiveness @ resource of concern based on 2 year, 24 hour event	Cost Analysis
Total Phosphorus treatment cost (2 yr event), dollars/lb	table_ca_bmp_costeff	CI_PQ2_02	Float	Phosphorus cost index (BMP cost/reduction) at resource of concern based upon median (Q2) effectiveness @ resource of concern 2 year, 24 hour event	Cost Analysis
Total Nitrogen treatment cost (2 yr event), dollars/lb	table_ca_bmp_costeff	CI_NQ2_02	Float	Nitrogen cost index (BMP cost/reduction) at resource of concern based upon median (Q2) effectiveness @ resource of concern 2 year, 24 hour event	Cost Analysis

6.3 INTERACTIVE MAP ATTRIBUTE TABLE: BMP BENEFITS: CATCHMENT SCALE

PTMApp-Web Attributes -- Best Management Practice Benefits: Catchment Scale					
PTMApp-Web	PTMApp-Desktop				
Attribute Name	Table Name	Attribute Name	Date Type	Description	Processed In
Area, ft2	BMP results table (e.g. 'storage')	wtArea_ft	Float	watershed	Benefits Analysis > Reduction Ratio
Water treated (2 yr Event), ft3 or feet/sec	BMP results table (e.g. 'storage')	D_2yr24hr	Float	volume or velocity of water delivered for 2 year, 24 hour precip event (cubic feet or feet/sec)	Benefits Analysis > Reduction Ratio
Water treated (10 yr Event), ft3 or feet/sec	BMP results table (e.g. 'storage')	D_10yr24hr	Float	volume or velocity of water delivered for 10 year, 24 hour precip event (cubic feet or feet/sec)	Benefits Analysis > Reduction Ratio
Sediment at BMP delivered to catchment, tons/year	bmp_implementation	SedCat_tn	Float	Sediment at the BMP that will be delivered to the catchment outlet, tons	Benefits Analysis > Treatment Trains (from user-created BMP shapefile)
Total Phosphorus at BMP delivered to catchment, lbs/year	bmp_implementation	tpCat_lbs	Float	Phosphorus at the BMP that will be delivered to a catchment outlet, pounds	Benefits Analysis > Treatment Trains (from user-created BMP shapefile)
Total Nitrogen at BMP delivered to catchment, lbs/year	bmp_implementation	tnCat_lbs	Float	Nitrogen at the BMP that will be delivered to a catchment outlet, pounds	Benefits Analysis > Treatment Trains (from user-created BMP shapefile)
Sediment reduction (10 yr event), %	BMP results table (e.g. 'storage')	SQ2_10	Float	Median (Q2) % reduction in sediment at BMP based upon 10 year, 24 hour event	Benefits Analysis > Reduction Efficiency
Sediment reduction (2 yr event), %	BMP results table (e.g. 'storage')	SQ2_02	Float	Median (Q2) % reduction in sediment at BMP based upon 2 year, 24 hour	Benefits Analysis > Reduction Efficiency
Total Phosphorus reduction (10 yr event), %	BMP results table (e.g. 'storage')	PQ2_10	Float	Median (Q2) % reduction in Phosphorus at BMP based upon 10 year, 24 hour event	Benefits Analysis > Reduction Efficiency
Total Phosphorus reduction (2 yr event), %	BMP results table (e.g. 'storage')	PQ2_02	Float	Median (Q2) % reduction in Phosphorus at BMP based upon 2 year, 24 hour	Benefits Analysis > Reduction Efficiency
Total Nitrogen reduction (10 yr event), %	BMP results table (e.g. 'storage')	NQ2_10	Float	Median (Q2) % reduction in Nitrogen at BMP based upon 10 year, 24 hour event	Benefits Analysis > Reduction Efficiency

PTMApp-Web Attributes -- Best Management Practice Benefits: Catchment Scale

PTMApp-Web	PTMApp-Desktop				
Attribute Name	Table Name	Attribute Name	Date Type	Description	Processed In
Total Nitrogen reduction (2 yr event), %	BMP results table (e.g. 'storage')	NQ2_02	Float	Median (Q2) % reduction in Nitrogen at BMP based upon 2 year, 24 hour	Benefits Analysis > Reduction Efficiency
Sediment reduction at catchment (10 yr event), %	BMP results table (e.g. 'storage')	C_SQ2_10	Float	sediment reduction at catchment based upon median (Q2) effectiveness @ resource of concern based on 10 year, 24 hour event (tons/year)	Benefits Analysis > Estimate Load Reductions
Total Phosphorus reduction at catchment (10 yr event), %	BMP results table (e.g. 'storage')	C_PQ2_10	Float	Phosphorus reduction at catchment based upon median (Q2) effectiveness @ resource of concern 10 year, 24 hour event (pounds/year)	Benefits Analysis > Estimate Load Reductions
Total Nitrogen reduction at catchment (10 yr event), %	BMP results table (e.g. 'storage')	C_NQ2_10	Float	Nitrogen reduction at catchment based upon median (Q2) effectiveness @ resource of concern 10 year, 24 hour event (pounds/year)	Benefits Analysis > Estimate Load Reductions
Sediment reduction at catchment (2 yr event), %	BMP results table (e.g. 'storage')	C_SQ2_02	Float	sediment reduction at catchment based upon median (Q2) effectiveness @ resource of concern based on 2 year, 24 hour event (tons/year)	Benefits Analysis > Estimate Load Reductions
Total Phosphorus reduction at catchment (2 yr event), %	BMP results table (e.g. 'storage')	C_PQ2_02	Float	Phosphorus reduction at catchment based upon median (Q2) effectiveness @ resource of concern 2 year, 24 hour event (pounds/year)	Benefits Analysis > Estimate Load Reductions
Total Nitrogen reduction at catchment (2 yr event), %	BMP results table (e.g. 'storage')	C_NQ2_02	Float	Nitrogen reduction at catchment based upon median (Q2) effectiveness @ resource of concern 2 year, 24 hour event (pounds/year)	Benefits Analysis > Estimate Load Reductions
Water treated (10 yr Event), %	BMP results table (e.g. 'storage')	R_10yr24hr	Float	Reduction ratio for 10 year, 24 hour event (must be between 0 - 1)	Benefits Analysis > Reduction Ratio
Water treated (2 yr Event), %	BMP results table (e.g. 'storage')	R_2yr24hr	Float	Reduction ratio for 2 year, 24 hour event (must be between 0 - 1)	Benefits Analysis > Reduction Ratio

6.4 TABLE GENERATOR ATTRIBUTE TABLE

Table Generator Attribute Table					
Attribute Name	Date Type	Description	PTMApp-Desktop Table Name	PTMApp-Desktop Button Attribute is Processed In	Attribute Name in the Interactive Map Feature
OBJECTID	Object ID	Internal feature number	BMP results table (e.g. 'storage')	Benefits Analysis > BMP Suitability	
catch_id	Long Integer	Unique whole number ID for catchment	table_catchment	Catchments and Loading > Generate Catchments	
unq_bmp_id	text	BMP_ID " " catch_id " " grp_code	BMP results table (e.g. 'storage')	Benefits Analysis > BMP Suitability	
grp_code	Short Integer	BMP treatment group code, 1-7 (1=xxx, 2=xxx, 3=xxx, 4=xxx, 5=xxx, 6=xxx, 7=xxx)	BMP results table (e.g. 'storage')	Benefits Analysis > BMP Suitability	
p_res_catch_id	Long Integer	Unique whole number ID for priority resource catchment	BMP results table (e.g. 'storage')	Benefits Analysis > BMP Suitability	
sed_mass_fl_tons	Double	Annual sediment mass (delivered to the catchment outlet) in tons, summed over the catchment	table_catchment	Catchments and Loading > Summarize Catchment Loadings	Sediment delivery to catchment, tons/year
sed_mass_fl_tons_acre	Double	Annual sediment yield (delivered to the catchment outlet) in tons/acre/year, summed over the catchment	table_catchment	Catchments and Loading > Summarize Catchment Loadings	Sediment delivery to catchment, tons/acre/year

Table Generator Attribute Table

Attribute Name	Date Type	Description	PTMApp-Desktop Table Name	PTMApp-Desktop Button Attribute is Processed In	Attribute Name in the Interactive Map Feature
tn_mass_fl_lbs	Double	Annual total nitrogen mass (delivered to the catchment outlet) in pounds, summed over the catchment	table_catchment	Catchments and Loading > Summarize Catchment Loadings	Total Nitrogen delivery to catchment, lbs/year
tn_mass_fl_lbs_acre	Double	Annual total nitrogen yield (delivered to the catchment outlet) in pounds/acre/year, summed over the catchment	table_catchment	Catchments and Loading > Summarize Catchment Loadings	Total Nitrogen delivery to catchment, lbs/acre/year
tp_mass_fl_lbs	Double	Annual total phosphorus mass (delivered to the catchment outlet) in pounds, summed over the catchment	table_catchment	Catchments and Loading > Summarize Catchment Loadings	Total Phosphorus delivery to catchment, lbs/year
tp_mass_fl_lbs_acre	Double	Annual total phosphorus yield (delivered to the catchment outlet) in pounds/acre/year, summed over the catchment	table_catchment	Catchments and Loading > Summarize Catchment Loadings	Total Phosphorus delivery to catchment, lbs/acre/year
pr_sed_mass_tons	Double	Sediment mass in tons delivered from catchment outlet to priority resource catchment outlet	table_p_res_catchment_route	Catchments and Loading > Sediment, TP and TN Channel Routing	Sediment delivery to resource of concern, tons/year

Table Generator Attribute Table

Attribute Name	Date Type	Description	PTMApp-Desktop Table Name	PTMApp-Desktop Button Attribute is Processed In	Attribute Name in the Interactive Map Feature
pr_sed_mass_tons_acre	Double	Sediment yield in tons per acre delivered from catchment outlet to priority resource catchment outlet	table_p_res_catchment_route	Catchments and Loading > Sediment, TP and TN Channel Routing	Sediment delivery to resource of concern, tons/acre/year
pr_tn_mass_lbs	Double	Total nitrogen mass in tons delivered from catchment outlet to priority resource catchment outlet	table_p_res_catchment_route	Catchments and Loading > Sediment, TP and TN Channel Routing	Total Nitrogen delivery to resource of concern, lbs/year
pr_tn_mass_lbs_acre	Double	Total nitrogen yield in tons per acre delivered from catchment outlet to priority resource catchment outlet	table_p_res_catchment_route	Catchments and Loading > Sediment, TP and TN Channel Routing	Total Nitrogen delivery to resource of concern, lbs/acre/year
pr_tp_mass_lbs	Double	Total phosphorus mass in tons delivered from catchment outlet to priority resource catchment outlet	table_p_res_catchment_route	Catchments and Loading > Sediment, TP and TN Channel Routing	Total Phosphorus delivery to resource of concern, lbs/year
pr_tp_mass_lbs_acre	Double	Total phosphorus yield in tons per acre delivered from catchment outlet to priority resource catchment outlet	table_p_res_catchment_route	Catchments and Loading > Sediment, TP and TN Channel Routing	Total Phosphorus delivery to resource of

Table Generator Attribute Table

Attribute Name	Date Type	Description	PTMApp-Desktop Table Name	PTMApp-Desktop Button Attribute is Processed In	Attribute Name in the Interactive Map Feature
					concern, lbs/acre/year
sed_mass_fl_rank	Double	Annual sediment yield (delivered to the catchment outlet) ranking, relative to all catchments	table_r_catchment	Catchments and Loading > Priority Resource Delivery	Sediment delivery to catchment, %
tn_mass_fl_rank	Double	Annual total nitrogen yield (delivered to the catchment outlet) ranking, relative to all catchments	table_r_catchment	Catchments and Loading > Priority Resource Delivery	Total Nitrogen delivery to catchment, %
tp_mass_fl_rank	Double	Annual total phosphorus yield (delivered to the catchment outlet) ranking, relative to all catchments	table_r_catchment	Catchments and Loading > Priority Resource Delivery	Total Phosphorus delivery to catchment, %
wqi_mass_fl	Double	Water quality index ranking based on sediment, total nitrogen, and total phosphorus (delivered to the catchment outlet), relative to all catchments	table_r_catchment	Catchments and Loading > Priority Resource Delivery	WQI delivery to catchment, %
sed_mass_pr_rank	Double	Annual sediment yield (delivered to the priority resource) ranking, relative to priority resource catchment	table_r_p_res_catchment	Catchments and Loading > Priority Resource Delivery	Sediment delivery to resource of concern, %
tn_mass_pr_rank	Double	Annual total nitrogen yield (delivered to the priority resource) ranking, relative to priority resource catchment	table_r_p_res_catchment	Catchments and Loading > Priority Resource Delivery	Total Nitrogen delivery to resource of concern, %

Table Generator Attribute Table

Attribute Name	Date Type	Description	PTMApp-Desktop Table Name	PTMApp-Desktop Button Attribute is Processed In	Attribute Name in the Interactive Map Feature
tp_mass_pr_rank	Double	Annual total phosphorus yield (delivered to the priority resource) ranking, relative to priority resource catchment	table_r_p_res_catchment	Catchments and Loading > Priority Resource Delivery	Total Phosphorus delivery to resource of concern, %
wqi_mass_pr	Double	Water quality index ranking based on sediment, total nitrogen, and total phosphorus (delivered to priority resource outlet), relative to priority resource catchments	table_r_p_res_catchment	Catchments and Loading > Priority Resource Delivery	WQI delivery to resource of concern, %
wtsArea_ft	Float	watershed	BMP results table (e.g. 'storage')	Benefits Analysis > Reduction Ratio	Area, ft2
D_2yr24hr	Float	volume or velocity of water delivered for 2 year, 24 hour precip event (cubic feet or feet/sec)	BMP results table (e.g. 'storage')	Benefits Analysis > Reduction Ratio	Water treated (2 yr Event), ft3 or feet/sec
D_10yr24hr	Float	volume or velocity of water delivered for 10 year, 24 hour precip event (cubic feet or feet/sec)	BMP results table (e.g. 'storage')	Benefits Analysis > Reduction Ratio	Water treated (10 yr Event), ft3 or feet/sec
SedCat_tn	Float	Sediment at the BMP that will be delivered to the catchment outlet, tons	bmp_implementation	Benefits Analysis > Treatment Trains (from user-created BMP shapefile)	Sediment at BMP delivered to catchment, tons/year
tpCat_lbs	Float	Phosphorus at the BMP that will be delivered to a catchment outlet, pounds	bmp_implementation	Benefits Analysis > Treatment Trains	Total Phosphorus at

Table Generator Attribute Table

Attribute Name	Date Type	Description	PTMApp-Desktop Table Name	PTMApp-Desktop Button Attribute is Processed In	Attribute Name in the Interactive Map Feature
				(from user-created BMP shapefile)	BMP delivered to catchment, lbs/year
tnCat_lbs	Float	Nitrogen at the BMP that will be delivered to a catchment outlet, pounds	bmp_implementation	Benefits Analysis > Treatment Trains (from user-created BMP shapefile)	Total Nitrogen at BMP delivered to catchment, lbs/year
SQ2_10	Float	Median (Q2) % reduction in sediment at BMP based upon 10 year, 24 hour event	BMP results table (e.g. 'storage')	Benefits Analysis > Reduction Efficiency	Sediment reduction (10 yr event), %
PQ2_10	Float	Median (Q2) % reduction in Phosphorus at BMP based upon 10 year, 24 hour event	BMP results table (e.g. 'storage')	Benefits Analysis > Reduction Efficiency	Total Phosphorus reduction (10 yr event), %
NQ2_10	Float	Median (Q2) % reduction in Nitrogen at BMP based upon 10 year, 24 hour event	BMP results table (e.g. 'storage')	Benefits Analysis > Reduction Efficiency	Total Nitrogen reduction (10 yr event), %
SQ2_02	Float	Median (Q2) % reduction in sediment at BMP based upon 2 year, 24 hour	BMP results table (e.g. 'storage')	Benefits Analysis > Reduction Efficiency	Sediment reduction (2 yr event), %
PQ2_02	Float	Median (Q2) % reduction in Phosphorus at BMP based upon 2 year, 24 hour	BMP results table (e.g. 'storage')	Benefits Analysis > Reduction Efficiency	Total Phosphorus reduction (2 yr event), %

Table Generator Attribute Table

Attribute Name	Date Type	Description	PTMApp-Desktop Table Name	PTMApp-Desktop Button Attribute is Processed In	Attribute Name in the Interactive Map Feature
NQ2_02	Float	Median (Q2) % reduction in Nitrogen at BMP based upon 2 year, 24 hour	BMP results table (e.g. 'storage')	Benefits Analysis > Reduction Efficiency	Total Nitrogen reduction (2 yr event), %
C_SQ2_10	Float	Sediment reduction at catchment based upon median (Q2) effectiveness @ resource of concern based on 10 year, 24 hour event (tons/year)	BMP results table (e.g. 'storage')	Benefits Analysis > Estimate Load Reductions	Sediment reduction at catchment (10 yr event), tons/year
C_PQ2_10	Float	Phosphorus reduction at catchment based upon median (Q2) effectiveness @ resource of concern 10 year, 24 hour event (pounds/year)	BMP results table (e.g. 'storage')	Benefits Analysis > Estimate Load Reductions	Total Phosphorus reduction at catchment (10 yr event), lbs/year
C_NQ2_10	Float	Nitrogen reduction at catchment based upon median (Q2) effectiveness @ resource of concern 10 year, 24 hour event (pounds/year)	BMP results table (e.g. 'storage')	Benefits Analysis > Estimate Load Reductions	Total Nitrogen reduction at catchment (10 yr event), lbs/year
C_SQ2_02	Float	sediment reduction at catchment based upon median (Q2) effectiveness @ resource of concern based on 2 year, 24 hour event (tons/year)	BMP results table (e.g. 'storage')	Benefits Analysis > Estimate Load Reductions	Sediment reduction at catchment (2 yr event), tons/year
C_PQ2_02	Float	Phosphorus reduction at catchment based upon median (Q2) effectiveness @ resource	BMP results table (e.g. 'storage')	Benefits Analysis > Estimate Load Reductions	Total Phosphorus reduction at

Table Generator Attribute Table

Attribute Name	Date Type	Description	PTMApp-Desktop Table Name	PTMApp-Desktop Button Attribute is Processed In	Attribute Name in the Interactive Map Feature
		of concern 2 year, 24 hour event (pounds/year)			catchment (2 yr event), lbs/year
C_NQ2_02	Float	Nitrogen reduction at catchment based upon median (Q2) effectiveness @ resource of concern 2 year, 24 hour event (pounds/year)	BMP results table (e.g. 'storage')	Benefits Analysis > Estimate Load Reductions	Total Nitrogen reduction at catchment (2 yr event), lbs/year
R_SQ2_10	Float	sediment reduction at resource of concern based upon median (Q2) effectiveness @ resource of concern based on 10 year, 24 hour event (tons/year)	table_ba_load_red	Benefits Analysis > Generate Benefits Tables	Sediment reduction at resource (10 yr event), tons/year
R_PQ2_10	Float	Phosphorus reduction at resource of concern based upon median (Q2) effectiveness @ resource of concern 10 year, 24 hour event (pounds/year)	table_ba_load_red	Benefits Analysis > Generate Benefits Tables	Total Phosphorus reduction at resource (10 yr event), lbs/year
R_NQ2_10	Float	Nitrogen reduction at resource of concern based upon median (Q2) effectiveness @ resource of concern 10 year, 24 hour event (pounds/year)	table_ba_load_red	Benefits Analysis > Generate Benefits Tables	Total Nitrogen reduction at resource (10 yr event), lbs/year
R_SQ2_02	Float	sediment reduction at resource of concern based upon median (Q2) effectiveness @ resource of concern based on 2 year, 24 hour event (tons/year)	table_ba_load_red	Benefits Analysis > Generate Benefits Tables	Sediment reduction at resource (2 yr event), tons/year

Table Generator Attribute Table

Attribute Name	Date Type	Description	PTMApp-Desktop Table Name	PTMApp-Desktop Button Attribute is Processed In	Attribute Name in the Interactive Map Feature
R_PQ2_02	Float	Phosphorus reduction at resource of concern based upon median (Q2) effectiveness @ resource of concern 2 year, 24 hour event (pounds/year)	table_ba_load_red	Benefits Analysis > Generate Benefits Tables	Total Phosphorus reduction at resource (2 yr event), lbs/year
R_NQ2_02	Float	Nitrogen reduction at resource of concern based upon median (Q2) effectiveness @ resource of concern 2 year, 24 hour event (pounds/year)	table_ba_load_red	Benefits Analysis > Generate Benefits Tables	Total Nitrogen reduction at resource (2 yr event), lbs/year
CI_SQ2_10	Float	Sediment cost index (BMP cost/reduction) at resource of concern based upon median (Q2) effectiveness @ resource of concern based on 10 year, 24 hour event	table_ca_bmp_costeff	Cost Analysis	Sediment treatment cost (10 yr event), dollars/ton
CI_PQ2_10	Float	Phosphorus cost index (BMP cost/reduction) at resource of concern based upon median (Q2) effectiveness @ resource of concern 10 year, 24 hour event	table_ca_bmp_costeff	Cost Analysis	Total Phosphorus treatment cost (10 yr event), dollars/lb
CI_NQ2_10	Float	Nitrogen cost index (BMP cost/reduction) at resource of concern based upon median (Q2) effectiveness @ resource of concern 10 year, 24 hour event	table_ca_bmp_costeff	Cost Analysis	Total Nitrogen treatment cost (10 yr event), dollars/lb
CI_SQ2_02	Float	sediment cost index (BMP cost/reduction) at resource of concern based upon median (Q2)	table_ca_bmp_costeff	Cost Analysis	Sediment treatment cost

Table Generator Attribute Table

Attribute Name	Date Type	Description	PTMApp-Desktop Table Name	PTMApp-Desktop Button Attribute is Processed In	Attribute Name in the Interactive Map Feature
		effectiveness @ resource of concern based on 2 year, 24 hour event			(2 yr event), dollars/ton
CI_PQ2_02	Float	Phosphorus cost index (BMP cost/reduction) at resource of concern based upon median (Q2) effectiveness @ resource of concern 2 year, 24 hour event	table_ca_bmp_costeff	Cost Analysis	Total Phosphorus treatment cost (2 yr event), dollars/lb
CI_NQ2_02	Float	Nitrogen cost index (BMP cost/reduction) at resource of concern based upon median (Q2) effectiveness @ resource of concern 2 year, 24 hour event	table_ca_bmp_costeff	Cost Analysis	Total Nitrogen treatment cost (2 yr event), dollars/lb
Lred_C_SQ2_10	Float	sediment reduction at catchment based upon median (Q2) effectiveness @ resource of concern based on 10 year, 24 hour event	table_treat_train_catch	Benefits Analysis > Treatment Trains	
Lred_C_SQ2_02	Float	sediment reduction at catchment based upon median (Q2) effectiveness @ resource of concern based on 2 year, 24 hour event	table_treat_train_catch	Benefits Analysis > Treatment Trains	
Lred_C_PQ2_10	Float	phosphorus reduction at catchment based upon median (Q2) effectiveness @ resource of concern based on 10 year, 24 hour event	table_treat_train_catch	Benefits Analysis > Treatment Trains	
Lred_C_PQ2_02	Float	phosphorus reduction at catchment based upon median (Q2) effectiveness @ resource of concern based on 2 year, 24 hour event	table_treat_train_catch	Benefits Analysis > Treatment Trains	

Table Generator Attribute Table

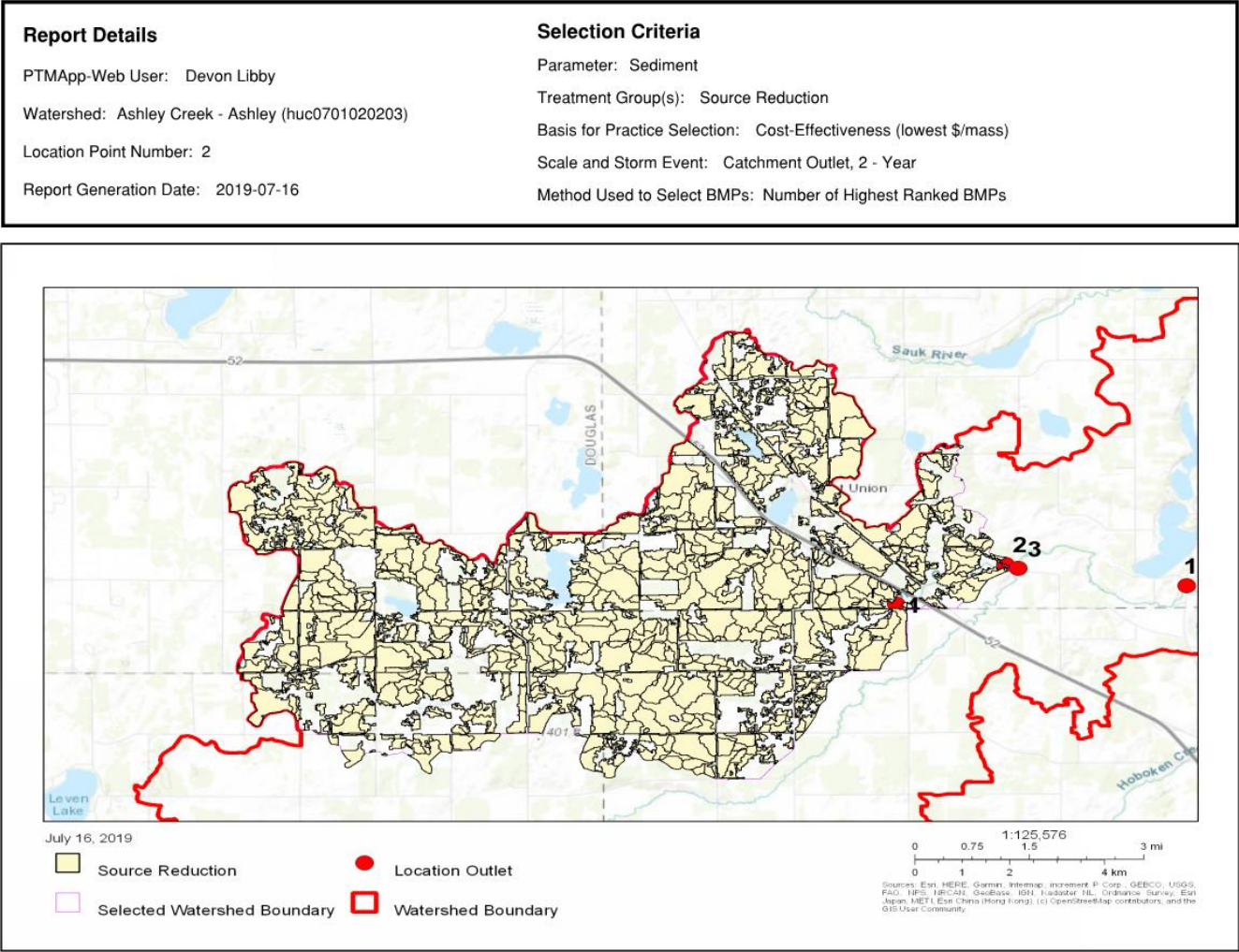
Attribute Name	Date Type	Description	PTMApp-Desktop Table Name	PTMApp-Desktop Button Attribute is Processed In	Attribute Name in the Interactive Map Feature
Lred_C_NQ2_10	Float	nitrogen reduction at catchment based upon median (Q2) effectiveness @ resource of concern based on 10 year, 24 hour event	table_treat_train_catch	Benefits Analysis > Treatment Trains	
Lred_C_NQ2_02	Float	nitrogen reduction at catchment based upon median (Q2) effectiveness @ resource of concern based on 2 year, 24 hour event	table_treat_train_catch	Benefits Analysis > Treatment Trains	
Lred_R_SQ2_10	Float	sediment reduction at resource based upon median (Q2) effectiveness @ resource of concern based on 10 year, 24 hour event	table_treat_train_p_res	Benefits Analysis > Treatment Trains	
Lred_R_SQ2_02	Float	sediment reduction at resource based upon median (Q2) effectiveness @ resource of concern based on 2 year, 24 hour event	table_treat_train_p_res	Benefits Analysis > Treatment Trains	
Lred_R_PQ2_10	Float	phosphorus reduction at resource based upon median (Q2) effectiveness @ resource of concern based on 10 year, 24 hour event	table_treat_train_p_res	Benefits Analysis > Treatment Trains	
Lred_R_PQ2_02	Float	phosphorus reduction at resource based upon median (Q2) effectiveness @ resource of concern based on 2 year, 24 hour event	table_treat_train_p_res	Benefits Analysis > Treatment Trains	
Lred_R_NQ2_10	Float	nitrogen reduction at resource based upon median (Q2) effectiveness @ resource of concern based on 10 year, 24 hour event	table_treat_train_p_res	Benefits Analysis > Treatment Trains	

Table Generator Attribute Table

Attribute Name	Date Type	Description	PTMApp-Desktop Table Name	PTMApp-Desktop Button Attribute is Processed In	Attribute Name in the Interactive Map Feature
Lred_R_NQ2_02	Float	nitrogen reduction at resource based upon median (Q2) effectiveness @ resource of concern based on 2 year, 24 hour event	table_treat_train_p_res	Benefits Analysis > Treatment Trains	
RO_vol_2yr	Double	Catchment runoff volume in cubic feet for 2-year 24-hr rainfall event	table_catchment	Catchments and Loading > Summarize Catchment Loadings	Runoff Volume (2 yr), ft3
RO_vol_10yr	Double	Catchment runoff volume in cubic feet for 10-year 24-hr rainfall event	table_catchment	Catchments and Loading > Summarize Catchment Loadings	Runoff Volume (10 yr), ft3
PeakQ_2yr	Double	Catchment peak discharge in cubic feet per second for 2-year 24-hr rainfall event	table_catchment	Catchments and Loading > Summarize Catchment Loadings	Peak Discharge (2 yr Event), cfs
PeakQ_10yr	Double	Catchment peak discharge in cubic feet per second for 10-year 24-hr rainfall event	table_catchment	Catchments and Loading > Summarize Catchment Loadings	Peak Discharge (10 yr Event), cfs
pivotid		ID used to associate this worksheet to the Pivot worksheet			

6.5 ACTION REPORT EXAMPLE 10

PTMApp-Web Targeted BMP Action Report



Practice Type	BMP ID Number	Drainage Area Treated (sq-ft)	PTMApp Cost (\$)	Estimated Annual Sediment Reduction (tons)	Cost-Effectiveness to Treat Sediment (\$/ton)	Estimated Annual TP Reduction (lbs)	Cost-Effectiveness to Treat TP (\$/lb)	Estimated Annual TN Reduction (lbs)	Cost-Effectiveness to Treat TN (\$/lb)
Source Reduction	1533_2202_6	5,716	\$19.43	0.11	\$178.28	0.072	\$269.61	0.35	\$54.85
Source Reduction	392_500856_6	12,884	\$46.34	0.22	\$207.95	0.176	\$263.45	1.11	\$41.78
Source Reduction	1931_502954_6	329,569	\$21.28	0.10	\$217.28	0.099	\$214.42	0.65	\$32.56
Source Reduction	286_500432_6	8,525	\$5.49	0.02	\$224.04	0.024	\$232.50	0.15	\$35.78
Source Reduction	285_500448_6	5,038	\$3.36	0.01	\$237.47	0.016	\$204.95	0.09	\$35.64
Source Reduction	2908_4392_6	42,141	\$115.68	0.44	\$264.42	0.636	\$181.79	3.70	\$31.25
Source Reduction	1846_502903_6	722,688	\$31.65	0.12	\$268.15	0.151	\$210.12	0.94	\$33.72
Source Reduction	107_417_6	11,325,668	\$94.81	0.35	\$274.14	0.450	\$210.63	2.05	\$46.14
Source Reduction	2887_4356_6	18,659,888	\$12.22	0.04	\$281.54	0.058	\$209.53	0.41	\$29.89
Source Reduction	254_417_6	68,729,396	\$75.24	0.26	\$287.71	0.357	\$210.68	1.63	\$46.15
Source Reduction	882_501244_6	11,238	\$37.42	0.13	\$288.20	0.190	\$196.48	1.10	\$34.14
Source Reduction	999_501244_6	11,722	\$6.18	0.02	\$292.02	0.031	\$196.43	0.18	\$34.13
Source Reduction	954_1560_6	130,200	\$72.70	0.24	\$309.34	0.408	\$178.20	2.86	\$25.42
Source Reduction	2305_503631_6	2,131	\$4.87	0.02	\$318.11	0.023	\$214.13	0.14	\$35.42
Source Reduction	1299_2544_6	5,813	\$3.16	0.01	\$346.09	0.013	\$250.63	0.08	\$39.60

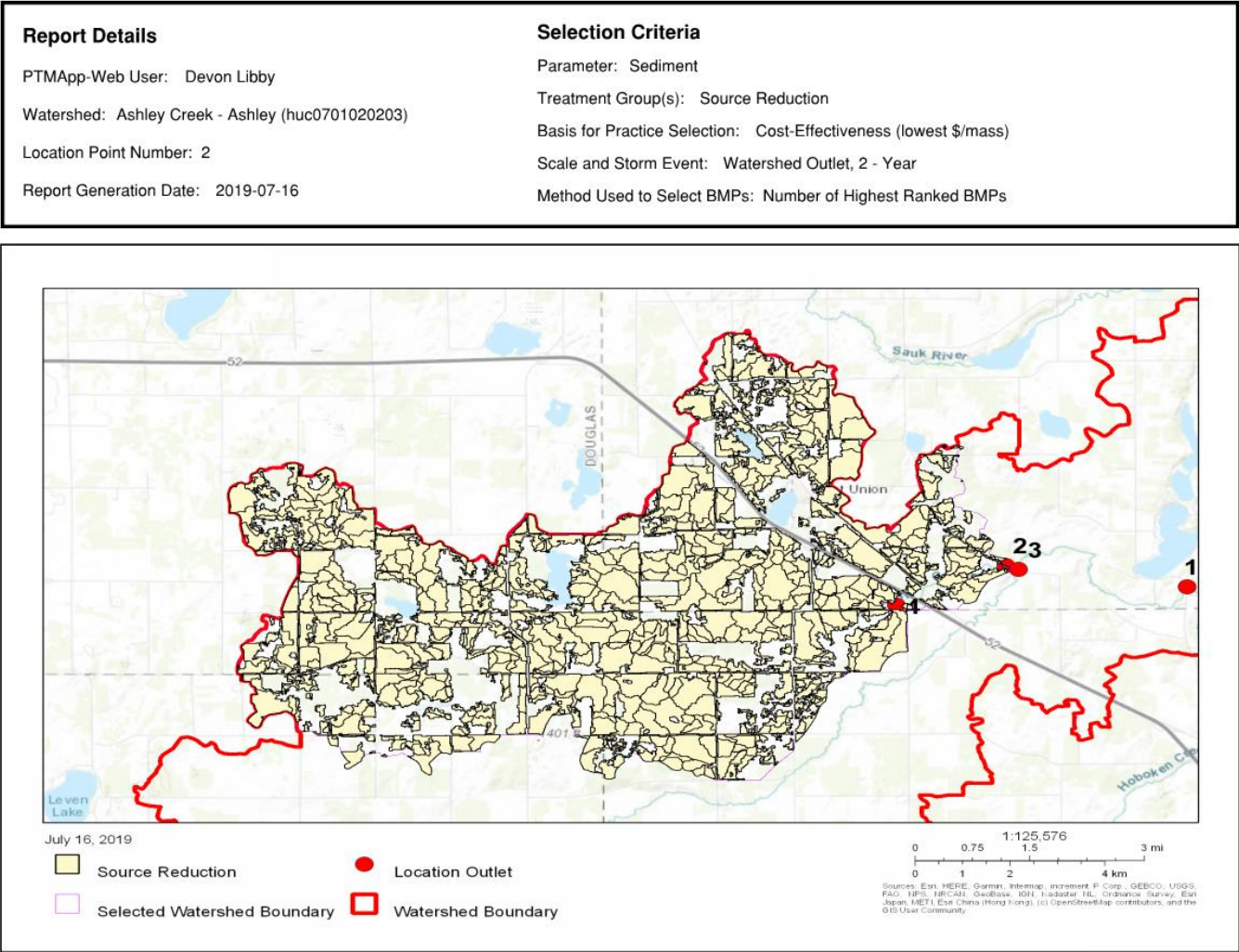
Practice Type	BMP ID Number	Drainage Area Treated (sq-ft)	PTMApp Cost (\$)	Estimated Annual Sediment Reduction (tons)	Cost-Effectiveness to Treat Sediment (\$/ton)	Estimated Annual TP Reduction (lbs)	Cost-Effectiveness to Treat TP (\$/lb)	Estimated Annual TN Reduction (lbs)	Cost-Effectiveness to Treat TN (\$/lb)
Source Reduction	718_501095_6	8,719	\$6.52	0.02	\$345.78	0.032	\$202.30	0.19	\$33.90
Source Reduction	915_501483_6	1,045,960	\$12.56	0.04	\$352.80	0.054	\$232.89	0.32	\$38.98
Source Reduction	2131_503127_6	4,586,358	\$7.41	0.02	\$362.73	0.038	\$193.45	0.22	\$33.45
Source Reduction	968_501533_6	16,081	\$31.65	0.08	\$374.29	0.129	\$246.07	1.15	\$27.44
Source Reduction	2676_3801_6	33,422	\$23.27	0.06	\$374.75	0.107	\$216.70	0.69	\$33.60
Source Reduction	522_500927_6	3,100	\$6.87	0.02	\$388.38	0.033	\$208.43	0.18	\$37.24
Source Reduction	425_500858_6	14,144	\$10.37	0.03	\$409.85	0.053	\$196.91	0.32	\$32.89
Source Reduction	2336_503479_6	3,707,701	\$147.88	0.35	\$420.96	0.815	\$181.41	5.15	\$28.73
Source Reduction	2341_3544_6	130,297	\$13.73	0.03	\$421.54	0.066	\$208.56	0.39	\$35.44
Source Reduction	2339_503487_6	388	\$11.05	0.03	\$421.50	0.053	\$209.86	0.33	\$33.16
Source Reduction	2967_504134_6	3,972	\$9.75	0.02	\$428.83	0.047	\$205.73	0.30	\$32.84
Source Reduction	2077_503062_6	585,610	\$42.84	0.10	\$430.81	0.192	\$223.17	1.33	\$32.32
Source Reduction	1531_2307_6	336,453,132	\$71.33	0.16	\$434.47	0.333	\$214.47	1.76	\$40.53
Source Reduction	1973_502815_6	5,378,699	\$125.29	0.29	\$439.17	0.614	\$204.15	3.84	\$32.61
Source Reduction	2198_502638_6	2,422	\$11.88	0.03	\$462.23	0.062	\$192.69	0.35	\$33.73

Practice Type	BMP ID Number	Drainage Area Treated (sq-ft)	PTMApp Cost (\$)	Estimated Annual Sediment Reduction (tons)	Cost-Effectiveness to Treat Sediment (\$/ton)	Estimated Annual TP Reduction (lbs)	Cost-Effectiveness to Treat TP (\$/lb)	Estimated Annual TN Reduction (lbs)	Cost-Effectiveness to Treat TN (\$/lb)
Source Reduction	1404_1956_6	55,025	\$10.64	0.02	\$466.41	0.054	\$197.58	0.20	\$53.36
Source Reduction	544_500857_6	3,911,526	\$641.29	1.31	\$490.61	2.689	\$238.48	17.15	\$37.39
Source Reduction	1272_2052_6	72,756,591	\$121.58	0.25	\$492.10	0.589	\$206.56	3.94	\$30.85
Source Reduction	1101_1669_6	57,253	\$113.55	0.23	\$494.08	0.534	\$212.77	3.43	\$33.12
Source Reduction	278_500446_6	3,391	\$17.51	0.03	\$501.09	0.080	\$219.35	0.49	\$35.99
Source Reduction	1288_502051_6	194	\$3.09	0.01	\$505.92	0.015	\$209.54	0.09	\$33.85
Source Reduction	3118_504700_6	20,441	\$18.88	0.04	\$507.06	0.100	\$189.51	0.57	\$33.15
Source Reduction	428_500605_6	100,653	\$8.31	0.02	\$507.24	0.037	\$227.26	0.21	\$38.79
Source Reduction	277_961_6	74,123,595	\$35.22	0.07	\$512.35	0.149	\$235.61	0.83	\$42.24
Source Reduction	1574_2300_6	113,925	\$6.87	0.01	\$516.53	0.033	\$209.62	0.21	\$32.12
Grant Total from BMPs in Selection			\$2,059.00	5.34		9.610		59.11	

Disclaimer: Practices shown are from raw results created using PTMApp-Desktop and uploaded to the web. Users should review actual locations for practicability to implement. Cost-Effectiveness values may vary slightly from actual calculation based on number of significant digits shown. The number of practices printed is based on selection criteria but is limited to 40, or up to 3 pages.

6.6 ACTION REPORT EXAMPLE 11

PTMApp-Web Targeted BMP Action Report



Practice Type	BMP ID Number	Drainage Area Treated (sq-ft)	PTMApp Cost (\$)	Estimated Annual Sediment Reduction (tons)	Cost-Effectiveness to Treat Sediment (\$/ton)	Estimated Annual TP Reduction (lbs)	Cost-Effectiveness to Treat TP (\$/lb)	Estimated Annual TN Reduction (lbs)	Cost-Effectiveness to Treat TN (\$/lb)
Source Reduction	1931_502954_6	329,569	\$21.28	0.05	\$443.60	0.082	\$258.80	0.54	\$39.30
Source Reduction	1299_2544_6	5,813	\$3.16	0.01	\$464.52	0.012	\$270.84	0.07	\$42.79
Source Reduction	2131_503127_6	4,586,358	\$7.41	0.02	\$475.40	0.036	\$207.74	0.21	\$35.92
Source Reduction	286_500432_6	8,525	\$5.49	0.01	\$498.24	0.019	\$287.01	0.12	\$44.17
Source Reduction	285_500448_6	5,038	\$3.36	0.01	\$502.99	0.013	\$249.77	0.08	\$43.43
Source Reduction	107_417_6	11,325,668	\$94.81	0.16	\$580.81	0.369	\$256.71	1.69	\$56.24
Source Reduction	1533_2202_6	5,716	\$19.43	0.03	\$601.35	0.052	\$371.43	0.26	\$75.56
Source Reduction	2676_3801_6	33,422	\$23.27	0.04	\$605.21	0.095	\$245.88	0.61	\$38.12
Source Reduction	254_417_6	68,729,396	\$75.24	0.12	\$609.56	0.293	\$256.77	1.34	\$56.25
Source Reduction	1370_1979_6	1,065,785,460	\$68.10	0.10	\$662.08	0.348	\$195.55	2.04	\$33.41
Source Reduction	2908_4392_6	42,141	\$115.68	0.17	\$682.52	0.496	\$233.40	2.88	\$40.12
Source Reduction	915_501483_6	1,045,960	\$12.56	0.02	\$684.82	0.045	\$277.37	0.27	\$46.42
Source Reduction	1232_1916_6	51,731	\$61.24	0.09	\$690.86	0.239	\$255.80	1.62	\$37.81
Source Reduction	1664_2578_6	23,153	\$13.73	0.02	\$697.21	0.040	\$340.95	0.32	\$42.87
Source Reduction	1718_2192_6	123,225	\$5.77	0.01	\$727.48	0.019	\$297.66	0.13	\$42.77

Practice Type	BMP ID Number	Drainage Area Treated (sq-ft)	PTMAApp Cost (\$)	Estimated Annual Sediment Reduction (tons)	Cost-Effectiveness to Treat Sediment (\$/ton)	Estimated Annual TP Reduction (lbs)	Cost-Effectiveness to Treat TP (\$/lb)	Estimated Annual TN Reduction (lbs)	Cost-Effectiveness to Treat TN (\$/lb)
Source Reduction	684_1086_6	13,388,042	\$171.77	0.21	\$809.64	0.774	\$221.82	3.83	\$44.79
Source Reduction	1444_2102_6	181,931	\$145.54	0.18	\$819.36	0.723	\$201.27	4.10	\$35.52
Source Reduction	392_500856_6	12,884	\$46.34	0.05	\$849.61	0.121	\$381.75	0.77	\$60.54
Source Reduction	2481_3299_6	42,244,712	\$8.44	0.01	\$851.54	0.037	\$226.05	0.24	\$34.49
Source Reduction	2741_3801_6	71,688	\$133.26	0.15	\$881.52	0.542	\$246.06	3.49	\$38.15
Source Reduction	1426_1979_6	39,719	\$51.42	0.06	\$887.89	0.263	\$195.54	1.54	\$33.41
Source Reduction	277_961_6	74,123,595	\$35.22	0.04	\$894.69	0.129	\$272.89	0.72	\$48.92
Source Reduction	2244_3299_6	681,041,834	\$460.66	0.51	\$898.01	2.034	\$226.52	13.33	\$34.56
Source Reduction	2627_3801_6	12,688,797	\$8.38	0.01	\$900.07	0.034	\$245.81	0.22	\$38.11
Source Reduction	2227_3129_6	5,509,093	\$206.72	0.23	\$899.91	0.930	\$222.24	4.69	\$44.08
Source Reduction	876_501317_6	17,147	\$6.87	0.01	\$909.28	0.031	\$219.61	0.18	\$37.44
Source Reduction	2927_4142_6	134,656	\$155.91	0.17	\$927.93	0.597	\$261.13	4.04	\$38.56
Source Reduction	1248_501684_6	9,881	\$24.92	0.03	\$959.94	0.099	\$251.90	0.62	\$40.49
Source Reduction	1410_9902_6	8,913	\$33.50	0.03	\$973.40	0.155	\$216.76	0.92	\$36.23
Source Reduction	1286_1916_6	1,841	\$5.08	0.01	\$977.17	0.020	\$256.67	0.13	\$37.94

Practice Type	BMP ID Number	Drainage Area Treated (sq-ft)	PTMApp Cost (\$)	Estimated Annual Sediment Reduction (tons)	Cost-Effectiveness to Treat Sediment (\$/ton)	Estimated Annual TP Reduction (lbs)	Cost-Effectiveness to Treat TP (\$/lb)	Estimated Annual TN Reduction (lbs)	Cost-Effectiveness to Treat TN (\$/lb)
Source Reduction	1846_502903_6	722,688	\$31.65	0.03	\$985.88	0.107	\$296.13	0.67	\$47.52
Source Reduction	1788_2578_6	142,406	\$108.88	0.11	\$989.50	0.319	\$341.06	2.54	\$42.88
Source Reduction	1128_1946_6	5,792,065	\$337.16	0.34	\$989.75	1.370	\$246.02	8.46	\$39.85
Source Reduction	519_883_6	6,103,906	\$3.91	0.00	\$996.20	0.013	\$307.37	0.08	\$49.21
Source Reduction	2567_3801_6	11,528	\$6.87	0.01	\$1,000.76	0.028	\$245.84	0.18	\$38.11
Source Reduction	2320_3463_6	104,334	\$218.94	0.22	\$1,001.33	1.051	\$208.37	7.37	\$29.71
Source Reduction	1787_2598_6	999,115,628	\$83.35	0.08	\$1,007.44	0.389	\$214.54	2.64	\$31.59
Source Reduction	428_500605_6	100,653	\$8.31	0.01	\$1,009.29	0.031	\$272.44	0.18	\$46.50
Source Reduction	1999_2909_6	59,094	\$63.44	0.06	\$1,009.57	0.311	\$203.78	1.86	\$34.03
Source Reduction	3118_504700_6	20,441	\$18.88	0.02	\$1,029.32	0.083	\$228.38	0.47	\$39.95
Grant Total from BMPs in Selection			\$2,906.00	3.43		12.350		75.46	

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6.7 ACTION REPORT EXAMPLE 12

PTMApp-Web Targeted BMP Action Report

Report Details

PTMApp-Web User: Devon Libby

Watershed: Ashley Creek - Ashley (huc0701020203)

Location Point Number: 1

Report Generation Date: 2019-07-16

Selection Criteria

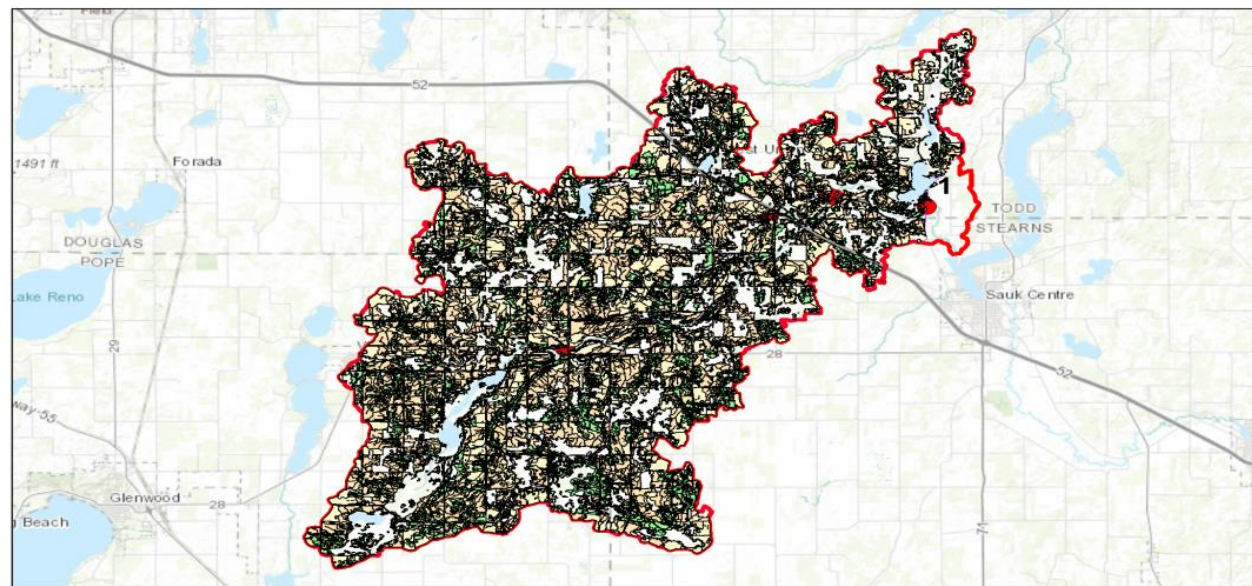
Parameter: Total Phosphorus

Treatment Group(s): Source Reduction, Filtration, Infiltration, Storage, Protection

Basis for Practice Selection: Cost-Effectiveness (lowest \$/mass)

Scale and Storm Event: Watershed Outlet, 2 - Year

Method Used to Select BMPs: Minimum Load Reduction



July 16, 2019

Protection Infiltration Source Reduction
Storage Filtration Selected Watershed Boundary

0 1.5 3 6 mi
0 2.25 4.5 9 km
1:251,151
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, NOAA, NPS, NRCAN, Swisstopo, IGN, Institut NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Practice Type	BMP ID Number	Drainage Area Treated (sq-ft)	PTMApp Cost (\$)	Estimated Annual Sediment Reduction (tons)	Cost-Effectiveness to Treat Sediment (\$/ton)	Estimated Annual TP Reduction (lbs)	Cost-Effectiveness to Treat TP (\$/lb)	Estimated Annual TN Reduction (lbs)	Cost-Effectiveness to Treat TN (\$/lb)
Filtration	18700_504987_2	3,455,632	\$74.86	0.55	\$135.17	20.893	\$3.58	306.42	\$0.24
Filtration	21356_505545_2	1,586,233	\$52.72	0.22	\$242.22	9.292	\$5.67	138.21	\$0.38
Filtration	15945_504204_2	2,041,061	\$64.31	0.28	\$232.99	10.871	\$5.92	146.39	\$0.44
Filtration	26654_6946_2	7,400,289	\$85.40	0.14	\$607.41	14.206	\$6.01	221.99	\$0.38
Filtration	19707_505175_2	1,624,111	\$85.40	0.19	\$445.45	9.139	\$9.35	136.91	\$0.62
Filtration	34059_8812_2	15,848,088	\$207.70	0.54	\$381.17	20.068	\$10.35	342.70	\$0.61
Filtration	10346_503087_2	1,335,133	\$83.29	0.32	\$261.65	8.001	\$10.41	118.55	\$0.70
Filtration	17650_504822_2	1,945,736	\$122.30	0.29	\$425.01	10.217	\$11.97	151.17	\$0.81
Filtration	26702_6946_2	7,641,217	\$181.34	0.14	\$1,255.15	14.442	\$12.56	226.12	\$0.80
Filtration	29804_507751_2	4,001,039	\$93.83	0.18	\$523.00	5.995	\$15.65	104.76	\$0.90
Filtration	16980_504705_2	815,591	\$76.96	0.15	\$526.42	4.724	\$16.29	70.04	\$1.10
Filtration	20867_505458_2	2,424,881	\$238.27	0.31	\$774.82	14.130	\$16.86	211.68	\$1.13
Filtration	22437_505740_2	706,510	\$66.42	0.07	\$933.99	3.777	\$17.59	46.49	\$1.43
Filtration	26306_506862_2	2,955,078	\$70.64	0.11	\$651.30	4.015	\$17.59	74.13	\$0.95
Storage	147091_502944_1	832,448	\$57.91	0.12	\$494.30	3.245	\$17.85	14.65	\$3.95
Filtration	13227_503753_2	553,835	\$76.96	0.12	\$655.76	3.795	\$20.28	51.55	\$1.49

Practice Type	BMP ID Number	Drainage Area Treated (sq-ft)	PTMApp Cost (\$)	Estimated Annual Sediment Reduction (tons)	Cost-Effectiveness to Treat Sediment (\$/ton)	Estimated Annual TP Reduction (lbs)	Cost-Effectiveness to Treat TP (\$/lb)	Estimated Annual TN Reduction (lbs)	Cost-Effectiveness to Treat TN (\$/lb)
Filtration	19855_505189_2	873,523	\$100.16	0.13	\$771.46	4.802	\$20.86	70.63	\$1.42
Storage	117412_502550_1	669,310	\$89.76	0.21	\$429.28	4.295	\$20.90	25.47	\$3.52
Filtration	25984_506684_2	1,030,364	\$122.30	0.12	\$1,041.55	5.765	\$21.21	86.08	\$1.42
Filtration	15455_504285_2	4,754,533	\$172.91	0.21	\$807.50	7.988	\$21.65	143.52	\$1.20
Filtration	6934_502100_2	2,525,340	\$343.70	0.72	\$475.92	15.643	\$21.97	228.43	\$1.50
Filtration	22615_505846_2	5,192,215	\$183.45	0.26	\$698.78	7.929	\$23.14	145.15	\$1.26
Storage	173419_503104_1	4,066,235	\$135.68	1.22	\$110.89	5.856	\$23.17	47.87	\$2.83
Filtration	8962_502680_2	3,778,226	\$280.45	1.00	\$279.79	11.998	\$23.38	226.52	\$1.24
Filtration	21211_505461_2	4,134,726	\$547.19	0.50	\$1,090.61	22.574	\$24.24	336.30	\$1.63
Filtration	10169_503022_2	817,238	\$52.72	0.13	\$397.02	2.174	\$24.25	43.16	\$1.22
Filtration	24987_506417_2	4,855,380	\$180.29	0.25	\$723.02	7.371	\$24.46	134.33	\$1.34
Filtration	6504_502000_2	2,860,044	\$152.87	0.36	\$428.19	6.123	\$24.97	112.79	\$1.36
Infiltration	1109_505423_4	1,369,911	\$76.12	0.24	\$315.49	2.977	\$25.57	137.57	\$0.55
Filtration	8377_502516_2	2,958,566	\$104.38	0.46	\$226.77	4.054	\$25.75	80.42	\$1.30
Storage	128786_502550_1	218,356	\$50.21	0.06	\$908.22	1.822	\$27.56	7.23	\$6.94
Storage	74320_501562_1	894,642	\$70.32	0.38	\$185.70	2.504	\$28.08	16.83	\$4.18
Filtration	9386_502831_2	1,112,611	\$208.75	0.28	\$752.65	7.213	\$28.94	101.18	\$2.06

Practice Type	BMP ID Number	Drainage Area Treated (sq-ft)	PTMApp Cost (\$)	Estimated Annual Sediment Reduction (tons)	Cost-Effectiveness to Treat Sediment (\$/ton)	Estimated Annual TP Reduction (lbs)	Cost-Effectiveness to Treat TP (\$/lb)	Estimated Annual TN Reduction (lbs)	Cost-Effectiveness to Treat TN (\$/lb)
Filtration	25046_506428_2	826,732	\$134.95	0.10	\$1,410.83	4.635	\$29.12	69.17	\$1.95
Filtration	22375_505319_2	328,697	\$52.72	0.02	\$2,636.42	1.799	\$29.31	28.49	\$1.85
Filtration	34577_508970_2	2,371,115	\$90.67	0.07	\$1,301.64	3.033	\$29.90	57.59	\$1.57
Storage	83681_2544_1	407,844	\$51.78	0.01	\$4,379.22	1.732	\$29.90	6.10	\$8.49
Filtration	12419_503660_2	3,220,031	\$243.54	0.35	\$694.99	8.064	\$30.20	151.95	\$1.60
Filtration	26356_506871_2	498,132	\$81.18	0.05	\$1,576.61	2.565	\$31.64	38.49	\$2.11
Filtration	13557_503663_2	553,157	\$105.43	0.10	\$1,011.09	3.327	\$31.69	53.21	\$1.98
Grant Total from BMPs in Selection			\$5,270.00	10.96		303.051		4710.24	

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Practice Type	BMP ID Number	Drainage Area Treated (sq-ft)	PTMApp Cost (\$)	Estimated Annual Sediment Reduction (tons)	Cost-Effectiveness to Treat Sediment (\$/ton)	Estimated Annual TP Reduction (lbs)	Cost-Effectiveness to Treat TP (\$/lb)	Estimated Annual TN Reduction (lbs)	Cost-Effectiveness to Treat TN (\$/lb)
Filtration	27072_6882_2	7,093,873	\$1,882.99	0.41	\$4,634.05	35.613	\$52.87	580.01	\$3.25
Filtration	25053_6361_2	6,106,328	\$11,181.98	0.40	\$27,777.05	34.703	\$322.22	491.51	\$22.75
Filtration	19867_505211_2	5,193,183	\$2,441.78	0.52	\$4,728.78	28.428	\$85.89	408.58	\$5.98
Filtration	34059_8812_2	15,848,088	\$207.70	0.54	\$381.17	20.068	\$10.35	342.70	\$0.61
Filtration	34288_8812_2	15,797,423	\$991.05	0.54	\$1,818.81	20.037	\$49.46	341.81	\$2.90
Filtration	21211_505461_2	4,134,726	\$547.19	0.50	\$1,090.61	22.574	\$24.24	336.30	\$1.63
Filtration	18700_504987_2	3,455,632	\$74.86	0.55	\$135.17	20.893	\$3.58	306.42	\$0.24
Filtration	12800_503663_2	3,851,754	\$2,808.67	0.70	\$4,009.80	20.113	\$139.64	305.60	\$9.19
Filtration	25568_506579_2	3,857,276	\$4,532.47	0.32	\$14,056.12	20.249	\$223.83	285.36	\$15.88
Filtration	3789_1358_2	5,922,750	\$1,032.17	0.51	\$2,005.28	19.926	\$51.80	278.03	\$3.71
Filtration	12802_503517_2	2,730,231	\$729.58	0.63	\$1,158.16	18.684	\$39.05	268.61	\$2.72
Filtration	26909_507008_2	3,202,594	\$7,536.19	0.30	\$25,428.90	16.635	\$453.04	245.15	\$30.74
Filtration	24711_506269_2	2,714,634	\$16,500.96	0.36	\$46,400.92	15.661	\$1,053.62	234.65	\$70.32
Filtration	6934_502100_2	2,525,340	\$343.70	0.72	\$475.92	15.643	\$21.97	228.43	\$1.50
Filtration	8962_502680_2	3,778,226	\$280.45	1.00	\$279.79	11.998	\$23.38	226.52	\$1.24
Filtration	26702_6946_2	7,641,217	\$181.34	0.14	\$1,255.15	14.442	\$12.56	226.12	\$0.80
Filtration	26654_6946_2	7,400,289	\$85.40	0.14	\$607.41	14.206	\$6.01	221.99	\$0.38
Filtration	3745_501178_2	5,269,134	\$11,218.88	0.73	\$15,338.76	13.994	\$801.70	217.88	\$51.49

Practice Type	BMP ID Number	Drainage Area Treated (sq-ft)	PTMApp Cost (\$)	Estimated Annual Sediment Reduction (tons)	Cost-Effectiveness to Treat Sediment (\$/ton)	Estimated Annual TP Reduction (lbs)	Cost-Effectiveness to Treat TP (\$/lb)	Estimated Annual TN Reduction (lbs)	Cost-Effectiveness to Treat TN (\$/lb)
Filtration	20867_505458_2	2,424,881	\$238.27	0.31	\$774.82	14.130	\$16.86	211.68	\$1.13
Filtration	19338_505148_2	2,476,418	\$579.87	0.28	\$2,099.55	13.810	\$41.99	201.24	\$2.88
Filtration	16483_504776_2	3,358,272	\$11,768.18	0.20	\$59,717.77	12.889	\$913.01	191.40	\$61.48
Storage	151593_502988_1	5,283,084	\$1,639.96	1.83	\$898.35	27.820	\$58.95	174.89	\$9.38
Filtration	4972_1750_2	6,007,128	\$1,616.25	3.82	\$422.95	12.868	\$125.61	169.19	\$9.55
Filtration	26790_507068_2	3,891,667	\$7,442.35	0.20	\$37,647.72	12.499	\$595.46	167.83	\$44.34
Storage	193407_503291_1	4,386,698	\$1,343.47	1.66	\$807.31	25.507	\$52.67	166.93	\$8.05
Storage	473330_506815_1	5,077,999	\$6,469.27	0.80	\$8,049.03	23.469	\$275.65	155.01	\$41.74
Source Reduction	2240_503291_6	5,169,643	\$3,622.49	2.01	\$1,798.96	35.162	\$103.02	154.69	\$23.42
Filtration	12419_503660_2	3,220,031	\$243.54	0.35	\$694.99	8.064	\$30.20	151.95	\$1.60
Filtration	5309_501698_2	3,717,582	\$823.41	0.48	\$1,711.60	10.055	\$81.89	151.31	\$5.44
Filtration	17650_504822_2	1,945,736	\$122.30	0.29	\$425.01	10.217	\$11.97	151.17	\$0.81
Filtration	24068_506186_2	1,724,571	\$13,853.60	0.23	\$60,838.80	10.071	\$1,375.55	148.19	\$93.49
Filtration	33527_8673_2	6,065,059	\$404.85	0.16	\$2,572.38	7.972	\$50.79	147.18	\$2.75
Filtration	15945_504204_2	2,041,061	\$64.31	0.28	\$232.99	10.871	\$5.92	146.39	\$0.44
Filtration	22615_505846_2	5,192,215	\$183.45	0.26	\$698.78	7.929	\$23.14	145.15	\$1.26

Practice Type	BMP ID Number	Drainage Area Treated (sq-ft)	PTMApp Cost (\$)	Estimated Annual Sediment Reduction (tons)	Cost-Effectiveness to Treat Sediment (\$/ton)	Estimated Annual TP Reduction (lbs)	Cost-Effectiveness to Treat TP (\$/lb)	Estimated Annual TN Reduction (lbs)	Cost-Effectiveness to Treat TN (\$/lb)
Storage	502776_507169_1	5,120,333	\$2,135.58	0.61	\$3,473.08	21.760	\$98.14	143.93	\$14.84
Filtration	15455_504285_2	4,754,533	\$172.91	0.21	\$807.50	7.988	\$21.65	143.52	\$1.20
Filtration	7168_502045_2	3,253,453	\$3,488.70	0.22	\$15,870.49	8.151	\$428.02	142.40	\$24.50
Filtration	21356_505545_2	1,586,233	\$52.72	0.22	\$242.22	9.292	\$5.67	138.21	\$0.38
Infiltration	1109_505423_4	1,369,911	\$76.12	0.24	\$315.49	2.977	\$25.57	137.57	\$0.55
Filtration	19707_505175_2	1,624,111	\$85.40	0.19	\$445.45	9.139	\$9.35	136.91	\$0.62
Grant Total from BMPs in Selection			\$119,004.00	23.88		666.506		9022.40	

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