

# Estimated Methylmercury in National Parks: Mapping Application User Guide

## General Information

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This mapping application was generated for the National Park Service (NPS) Inventory and Monitoring (I&M) Program by the U.S. Geological Survey (USGS), in conjunction with the NPS Air Resources Division. It shows predicted surface water methylmercury concentrations, as determined by a partial least squares model using inputs of measured surface water pH, sulfate concentration, and total organic carbon concentration, as well as wetland percent contribution. Predicted methylmercury concentrations were determined for 8-digit Hydrologic Units (HUCs) containing sufficient data for all four model input constituents.

Data are constrained to HUCs intersecting I&M Program park units. For the purposes of mapping display, HUC data values for each of the described constituents are organized into five groups by percentile (that is, the five groups are divided at the 20<sup>th</sup>, 40<sup>th</sup>, 60<sup>th</sup> and 80<sup>th</sup> percentiles). The default display shades HUCs by predicted methylmercury values, with progressively darker fills as concentrations increase. HUCs can also be displayed by model-input constituents, whose colors reflect the constituent's general contribution toward predicted methylmercury concentration. (For example, higher total organic carbon concentrations and higher wetland percent values each generally correlate with higher methylmercury concentrations and HUCs for these constituents are therefore formatted progressively darker as values increase.) Some constituent maps may contain HUCs without a colored fill; this indicates that there was not enough supporting data available to determine or model a value for that constituent.

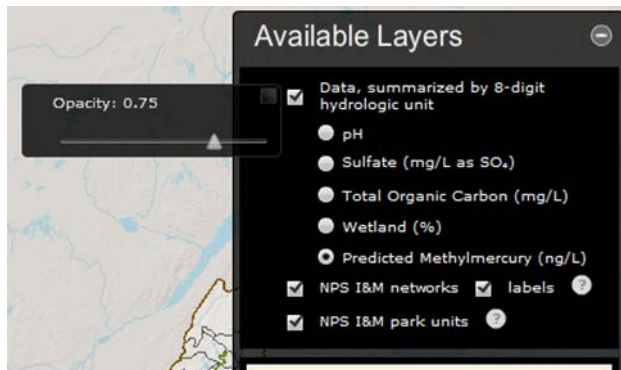
The description given above is a very concise summary of the data within this mapping application; for a comprehensive explanation of the data and context of this tool, please refer to the [launch page](http://wi.water.usgs.gov/mercury/NPSHgMap.html) (<http://wi.water.usgs.gov/mercury/NPSHgMap.html>).

## Customizing your display

### 1. Choosing constituents

By default, the mapping application displays predicted surface-water methylmercury concentrations.

To display a different constituent, use the **Available Layers** window on the right side of the mapping application:



- Click on the radio button in front of the constituent of interest to display the data for that constituent.
- Adjust the opacity of the HUC fill colors by clicking on box to the left of the data check box and sliding the triangle left or right to the desired opacity.

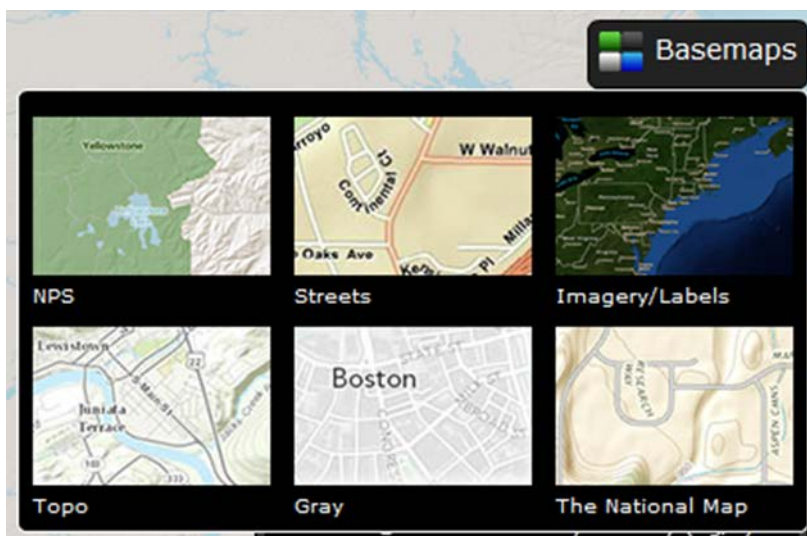
### 2. Displaying boundaries and labels

Also in the **Available Layers** window, use the check boxes to toggle on/off the NPS network labels as well as the network and park unit boundaries.

### 3. Changing your basemap

By default, the mapping application displays the NPS basemap.

To view other options and select a new basemap, click the **Basemaps** button in the upper right corner, and then select your desired basemap.



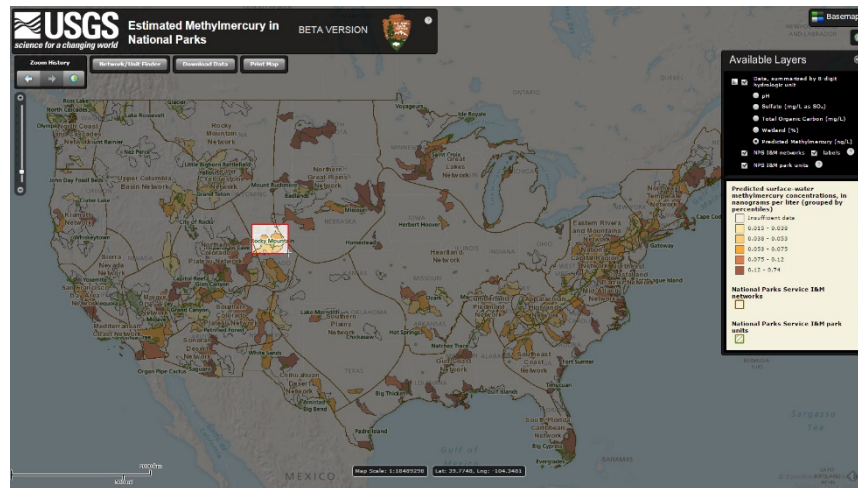
Available basemaps include the NPS basemap (default); ESRI streets, imagery, topographic, and gray basemaps; and the USGS National Map, which is a combined hillshade, street and hydrography basemap.

## Navigating the map

**To pan:** Click and drag your mouse (it should turn into a grabbing hand icon) to move the map around.

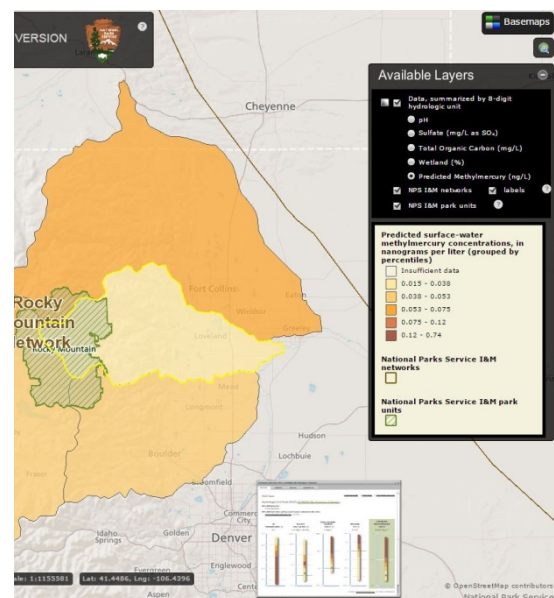
**To zoom:**

- Use the scroll wheel on your mouse
- Use the zoom tool on the left side of the map
- Hold shift down before drawing a zoom-in extent (shown below). Use control-shift before drawing to zoom out.



**To dock the pop-up:** Pop-ups can be accessed by clicking on a HUC. To temporarily dock the pop-up, drag it toward the left, right, or bottom edges of the map. It will minimize, and can be left along any of those edges. To enlarge it, drag it back towards the center of the map.

Pop-ups present detailed information regarding the HUC or park of interest, including what I&M network and park(s) the HUC belongs to, as well as predicted methylmercury and observed model-input values. More details on data for a single HUC or a single park follow.

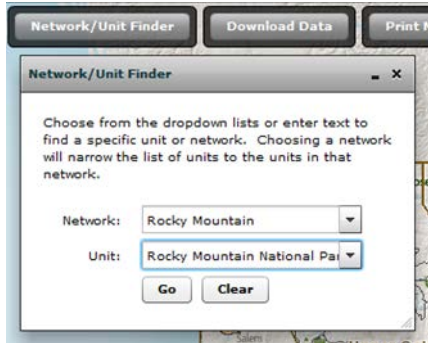


## Find a park unit

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To zoom to your park of interest, do one of the following:

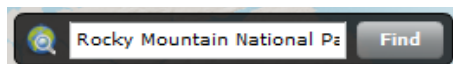
**Option 1:** Use the **Network/Unit Finder** tool in the upper left side.



- Using the dropdowns, select a network and/or park unit. Selecting a network will narrow the unit list to only those units within that network. Hit **Go** to zoom the map to your selected network or unit.

- You can also bypass the dropdown list by typing directly into the network or unit field. The fields will populate automatically as you type.

**Option 2:** Use the **search** tool in the upper right corner:



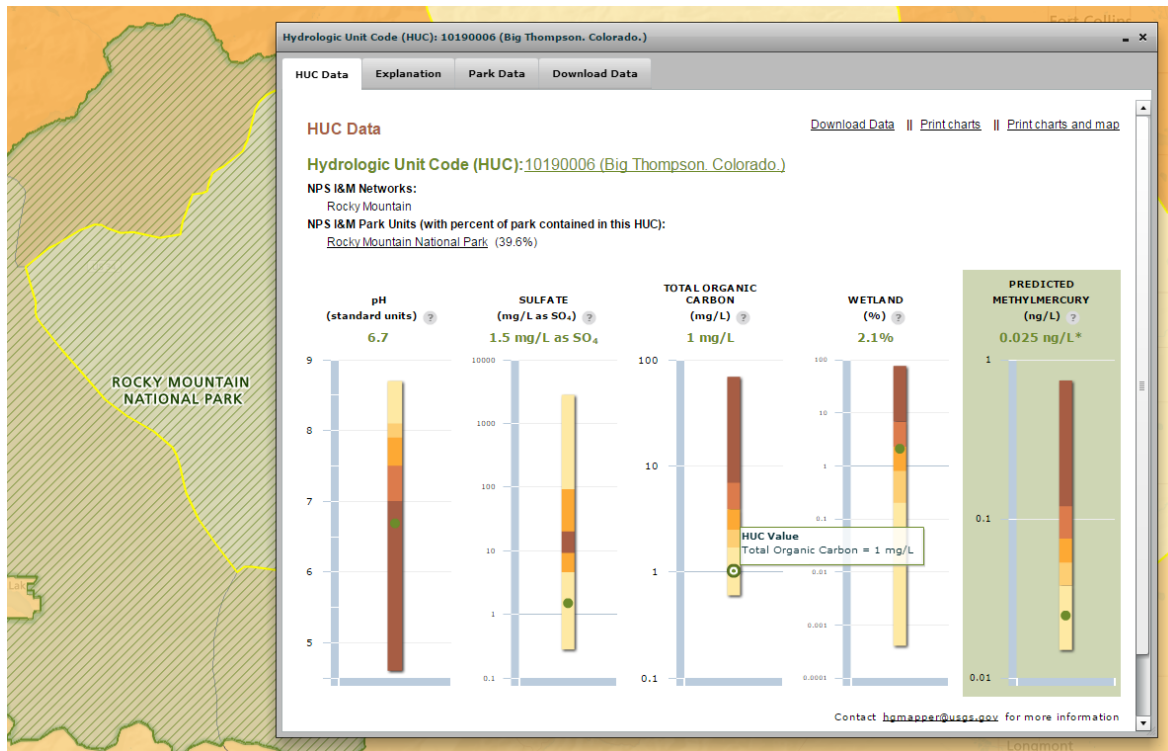
- Click on search icon to expand the search box.

- Then enter the park unit name or NPS unit code and press 'Find'.

## View data for a single HUC

Click on a HUC that overlaps your park of interest. The selected HUC will display a yellow outline, and a pop-up box will open, showing detailed information for that HUC.

The pop-up opens to the **HUC Data** tab.

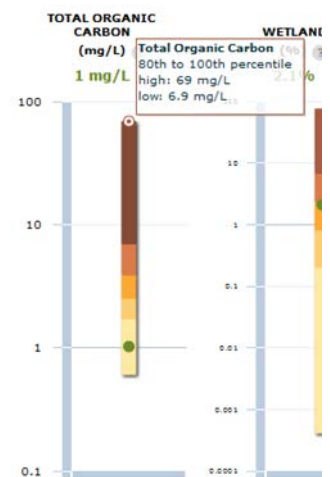


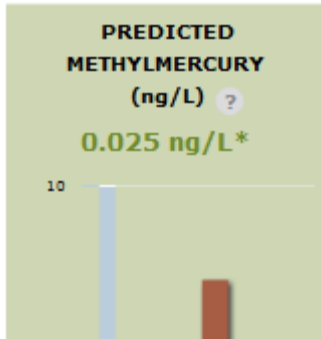
This tab shows the name and number of the HUC, the network, and a list of park units that intersect with this HUC. It also shows what percentage of each park unit area falls within that HUC.

### Constituent charts:

The colored range of the charts show the value distribution for the full dataset (that is, the data for all mapped HUCs). Mousing over the percentile range in any chart will display both the range of percentiles and the range of data values in that grouping.

Displayed on top of that range is a green dot, which represents the value for the selected HUC (the numerical value can also be displayed by mousing over the dot). This allows you to compare the selected individual HUC value to the full dataset.





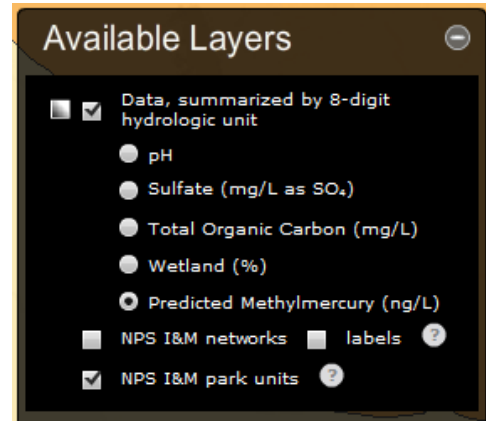
If you would like more information about the charts or constituents, click on any of the question mark icons near the constituent titles on the ***HUC Data*** tab, or click on the ***Explanation*** tab at the top of the pop-up. This tab provides a text description of HUCs, NPS networks and park units, and each of the constituents. It also gives a brief explanation of the structure of the charts.

## View data for all HUCs in a single park

### Option 1: Visually compare the relative concentration for a single constituent using the map.

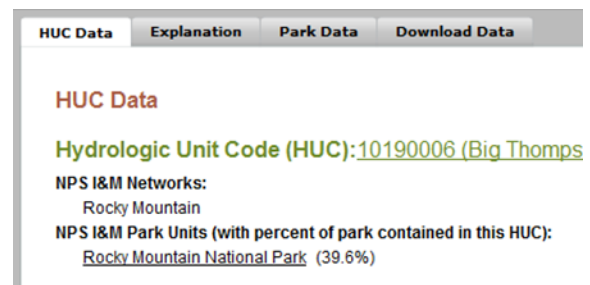
Zoom to the park of interest using one of the methods listed above.

Using **Available Layers** window on the right side of the mapping application, click on the constituent of interest. This will change the HUC fill colors to reflect the corresponding percentile for that constituent.



### Option 2: View tabular data for all HUCs intersecting the park unit.

From the map, click on a HUC that intersects the park, opening a pop-up for that HUC. From the **HUC Data** tab, click on the park unit you want to view. This will switch you to the **Park Data** tab, where data from all HUCs that intersect that park unit will automatically populate in the table. This action will also zoom the map to the selected park. (To zoom map to the selected HUC, return to the **HUC Data** tab and click on the HUC name.)



Alternatively, you can select the **Park Data** tab from any open pop-up and manually select the Network and/or Unit you want to view. This action will also zoom the map to the selected park.

Park Data								
Choose from the dropdown lists or enter text to find a specific unit or network. Choosing a network will narrow the list of units to the units in that network.								
Network:	Rocky Mountain							
Unit:	Rocky Mountain National Park							
Go		Clear		Download Data for All Parks				
PARK UNIT	HUC	HUC NAME	PERCENT OF PARK IN HUC	pH (standard units)	SULFATE (mg/L as SO <sub>4</sub> )	TOTAL ORGANIC CARBON (mg/L)	WETLAND (%)	PREDICTED METHYLMERCURY (ng/L)
Rocky Mountain National Park	10180001	North Platte Headwaters, Colorado.	0.22%	7.5	1.1	3.8	6.6	0.057
Rocky Mountain National Park	10190005	St. Vrain, Colorado.	12.2%	7.6	2.2	2.8	3.6	0.047
Rocky Mountain National Park	10190006	Big Thompson, Colorado.	39.6%	6.7	1.5	1	2.1	0.025*



## Printing maps and charts

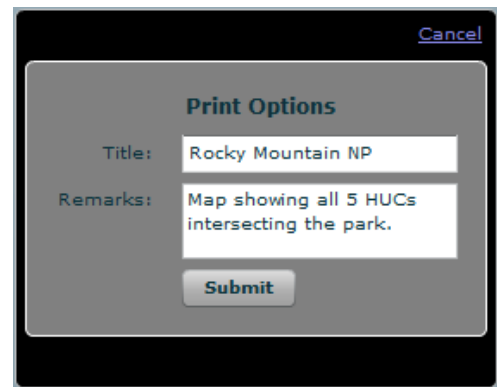
### 1. Printing from the map

To create a map PDF while interacting with the map, click on the **Print Map** button in the upper left.



A dialog box will inform you that you can reposition the print extent by panning and zooming to the desired view.

Once you have the map positioned where you want, you can add a title and comments in the box in the upper right. When you're ready to print, hit **Submit**, and the mapping application will ask you where you want to save your PDF file.

A dialog box titled "Print Options" with a "Cancel" link in the top right. It contains two text input fields: "Title:" with the text "Rocky Mountain NP" and "Remarks:" with the text "Map showing all 5 HUCs intersecting the park." Below the fields is a "Submit" button.

Print Options

Title: Rocky Mountain NP

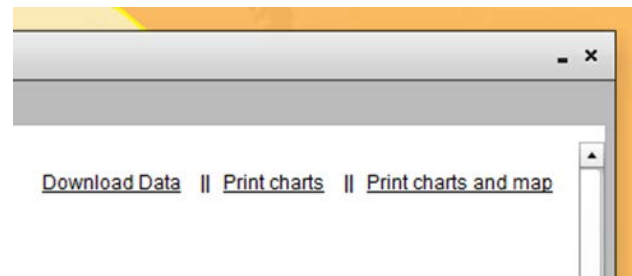
Remarks: Map showing all 5 HUCs intersecting the park.

Submit

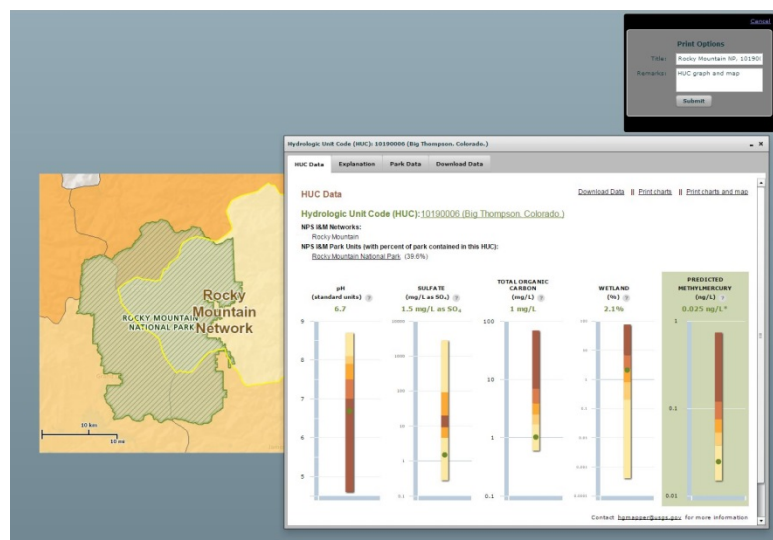
### 2. Printing from the pop-up

The pop-up offers two print options: **print charts** only, or **print charts and maps**.

**Option 1:** To print charts only, click on the **Print charts** option in the upper right corner of the pop-up. This option will only print the charts for the HUC shown in the HUC Data tab.



**Option 2:** To print charts and maps, click on the **Print charts and map** option in the upper right corner of the pop-up. This will ask you to position your map just like the **Print Map** button, and show you the active pop-up (the pop-up may display ghosted or minimized). You are also given the option to add a title and comments. Once you've positioned your map and added any additional content, click **Submit**.





## Downloading HUC data

Data is available for download either as a comma-delimited text file (.csv) or as spatial data (zipped shapefile). Each download option contains the entire dataset for **ALL** parks, not just the HUCs or park selected in the pop-up. The same data is contained in both formats, except the shapefile also includes HUC spatial data.

You can access the downloadable data in four places:

1. The **Download Data** button in the map (upper left)
2. The **HUC Data** pop-up tab, in the upper right near the print options
3. The **Park Data** pop-up tab, from the **Download Data for All Parks** button on the right
4. The **Download Data** pop-up tab

Each option will allow you to select which format you want to download then ask you where you want to save the file.

The screenshot shows a web application interface with a tabbed menu at the top: 'HUC Data', 'Explanation', 'Park Data', and 'Download Data'. The 'Download Data' tab is active, displaying the title 'Download Data' and 'Download Data for All Hydrologic Units (HUCs)'. Below this is a table with three columns: 'FILE FORMAT', 'FILE SIZE', and 'DESCRIPTION'. The first row shows 'Download Table' (a button), 'Comma-delimited text', '23KB', and a description of tabular data with attributes: pH, sulfate, total organic carbon, wetland, and predicted methylmercury. The second row shows 'Download Spatial Data' (a button), 'Shapefile', '4.27MB', and a description of the USGS 1:2M HUC layer with the same attributes. A footnote at the bottom states: '\* Layer has been modified slightly from its original form. See associated metadata for details regarding changes.' and provides contact information: 'Contact [hgmapper@usgs.gov](mailto:hgmapper@usgs.gov) for more information.'

	FILE FORMAT	FILE SIZE	DESCRIPTION
<a href="#">Download Table</a>	Comma-delimited text	23KB	Tabular data saved as a comma-delimited text file. It contains <u>pH</u> , <u>sulfate</u> , <u>total organic carbon</u> , <u>wetland</u> , and <u>predicted methylmercury</u> data. Associated metadata is included in download.
<a href="#">Download Spatial Data</a>	Shapefile	4.27MB	The USGS 1:2M HUC layer* attributed with <u>pH</u> , <u>sulfate</u> , <u>total organic carbon</u> , <u>wetland</u> , and <u>predicted methylmercury</u> data. Associated metadata is included in download.

\* Layer has been modified slightly from its original form. See associated metadata for details regarding changes.

Contact [hgmapper@usgs.gov](mailto:hgmapper@usgs.gov) for more information

**NOTE:** As of February 2015, the mapping application contains provisional data and therefore data is not yet available for download. Contact [hgmapper@usgs.gov](mailto:hgmapper@usgs.gov) for more information.