HydroGIS User Manual

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This manual was created and updated by members of the Oak Ridge National Laboratory (ORNL) National Hydropower Asset Assessment (NHAAP) Team. The NHAAP is sponsored by the U.S. Department of Energy (DOE) Office of Energy Efficiency and Renewable Energy (EERE).

To provide feedback or obtain more information, please contact the ORNL NHAAP Team at: webmaster@nhaap.ornl.gov.

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Introduction

The HydroGIS application is a geographic information system (GIS) web service that allows registered users to view, explore, and download key information from various datasets developed through the Oak Ridge National Laboratory (ORNL) National Hydropower Asset Assessment Program (NHAAP). Data layers in HydroGIS display the spatial distribution of various hydropower resources and environmental concerns associated with hydropower development and infrastructure enhancements. Key functionalities available to registered users of the HydroGIS application include advanced querying and the ability to download tabular data. The ORNL NHAAP Team is continuously working to improve the HydroGIS system and documentation. Please contact the ORNL NHAAP Team at webmaster@nhaap.ornl.gov if you experience any technical issues or would like to offer your valuable feedback and suggestions.

Becoming a HydroGIS User

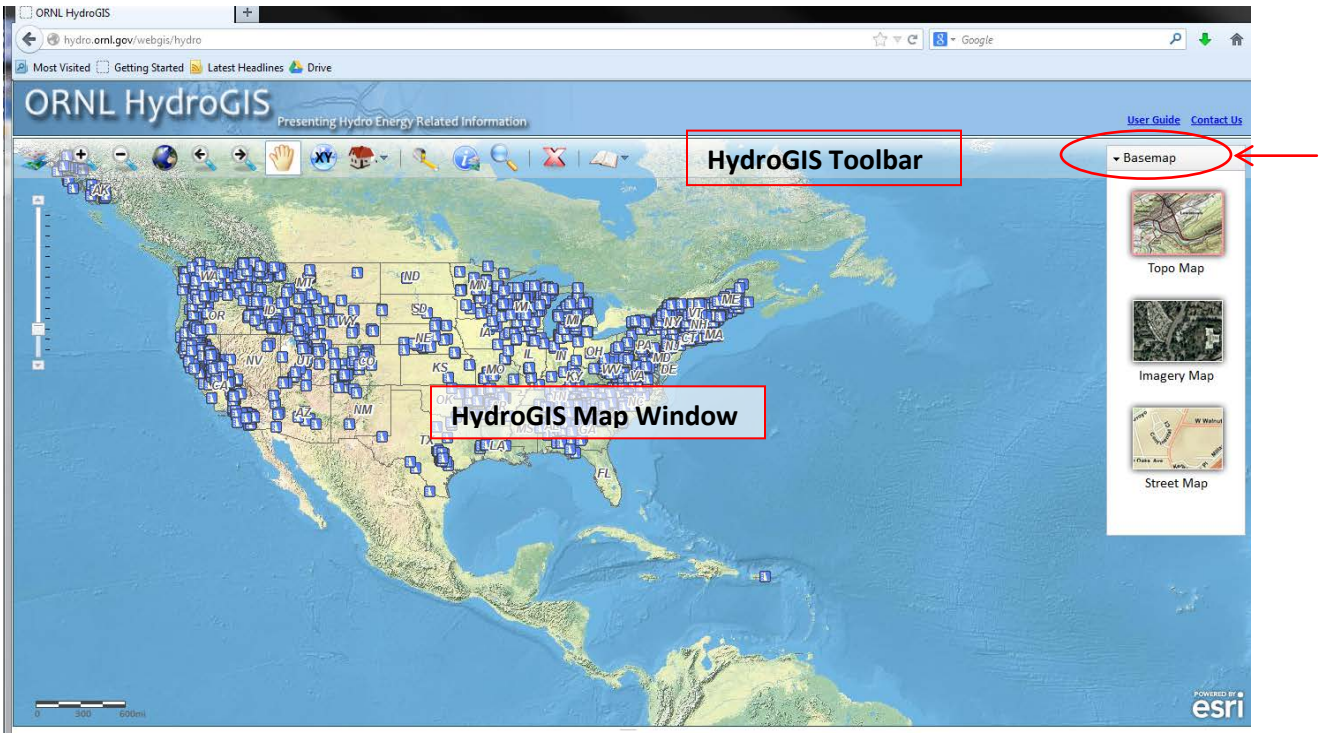
Attaining access to use the HydroGIS application is a short and simple process. First, individuals must read and agree to the HydroGIS application user terms and conditions http://nhaap.ornl.gov/content/terms-and-conditions. After agreeing to the terms and conditions, a HydroGIS account may be requested for access to the HydroGIS application. Once the NHAAP Team has reviewed and approved the user account request, a new user account is created and an e-mail containing instructions for logging in to use the HydroGIS application is sent to the new user.

Note: Requesting an account requires individuals to provide their full first and last name, a valid organization e-mail address, and a valid purpose for requesting to use the application.

HydroGIS Interface & Tools

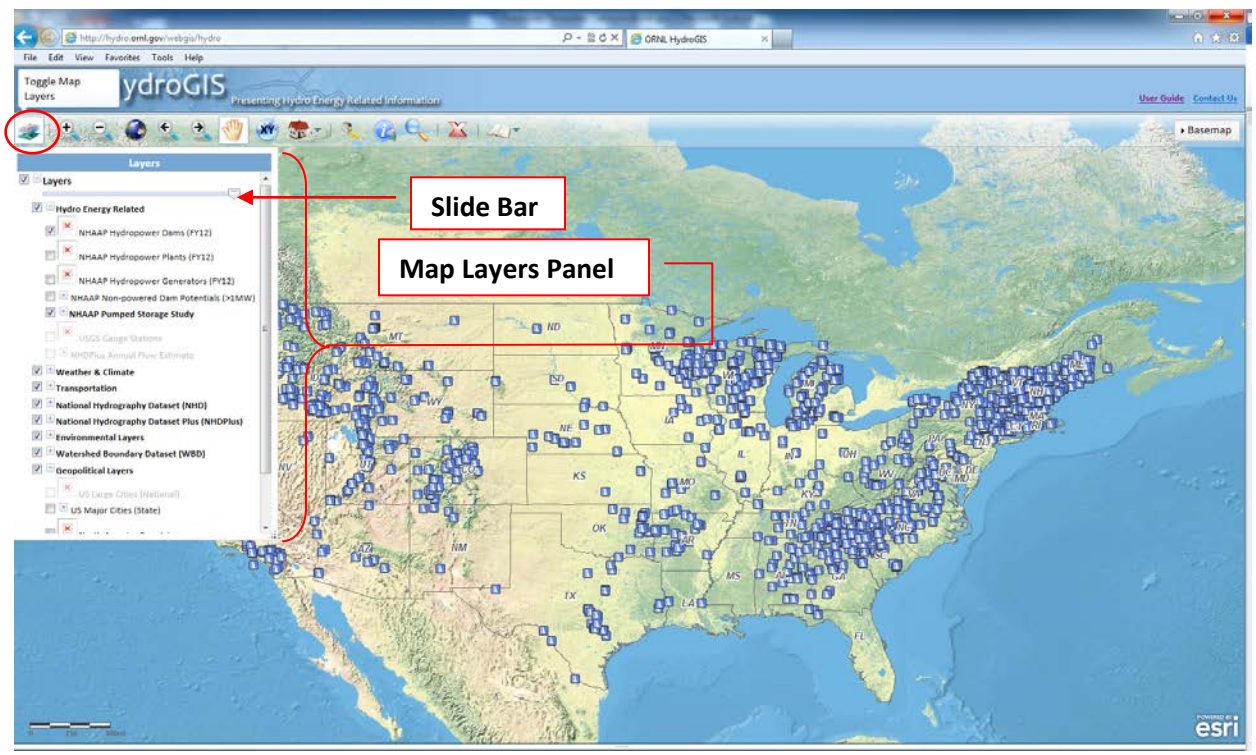
User Interface

The default map view displays the location of the most current NHAAP hydropower dams within the conterminous United States over a topo basemap in the '***HydroGIS map window***.' Use the '***basemap***' menu on the right side of the '***HydroGIS toolbar***' to select a background for the HydroGIS map window. The Basemap menu provides the option to select a Topo Map, Imagery Map, or Street Map background in the map window.



Layers

Click the '***layers***' button on the HydroGIS toolbar to turn the '***map layers panel***' on or off. In the map layers panel, individual layers are grouped by themes and the '+' symbol next to each theme can be clicked to expand layers within a group (click '-' to contract grouped layers). Expanded layers can be turned on or off (activated or deactivated) individually by checking and unchecking the boxes next to the layers. Layers in the '***map layers panel***' that are turned on can be explored and/or downloaded in tabular form (*See page 10 for instructions.*). Another feature of the map layers panel is the '***slide bar***'. The slide bar can be used to control the transparency of activated layers shown in the map window. Sliding the bar to the right decreases the transparency of activated layers and sliding it to the left increases transparency of activated layers.

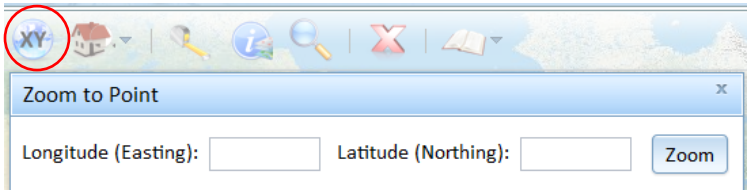


Navigation Tools

The navigation tools can be accessed from the HydroGIS toolbar to easily view and explore features displayed in the HydroGIS map window. From left to right, the navigation tools allow users to '***zoom in***,' '***zoom out***,' '***zoom to full extent***,' '***pan left***,' ***pan right***,' and '***pan***' by clicking and dragging the map.

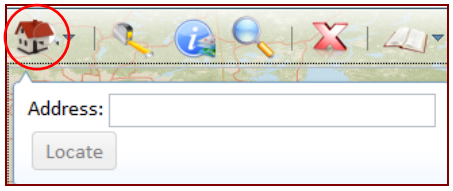
Zoom to Point

The '***zoom to point***' tool can be accessed from the HydroGIS toolbar and used to zoom to a specific geographic location and display it in the HydroGIS map by entering Latitude and Longitude coordinates in decimal degrees.



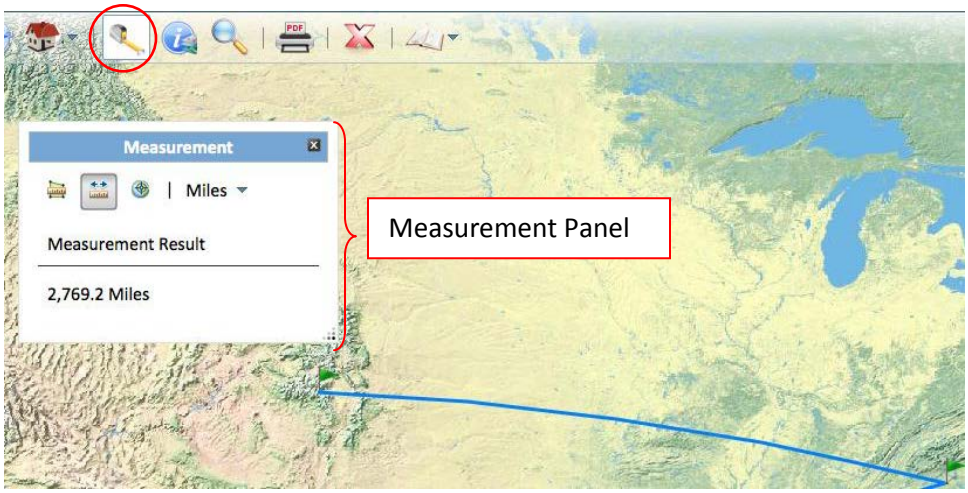
Locate

Zoom to a specific location by clicking the '***locate***' tool on the HydroGIS toolbar and entering an address on the menu.



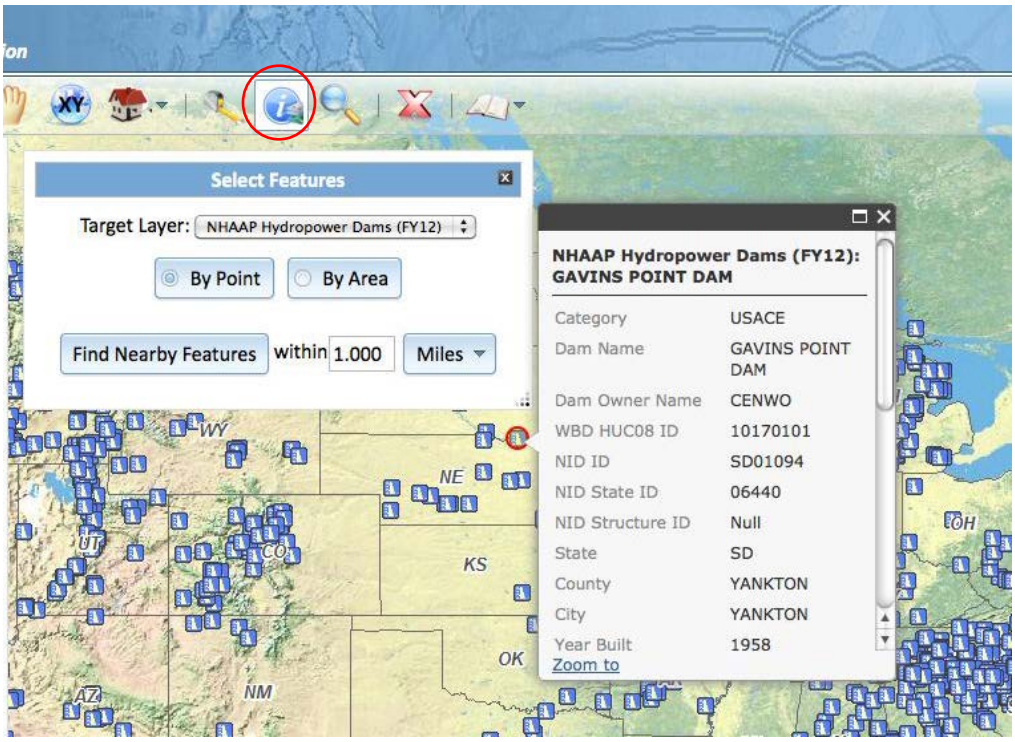
Measure Map

Use the '***measure map***' tool on the HydroGIS toolbar to measure a polygon area, linear distance between two points, or to select a location on the map and return its geographic coordinates. To measure a polygon area, select the 'Area' button on the 'Measurement Panel' and draw a polygon on the map. Measurement results are displayed in the window in the units (i.e. miles, kilometers, feet, meters, or yards) specified on the menu by the user. To measure the linear distance between two points, select the 'Distance' button on the Measurement Panel and click once at the beginning and double click at the end of the line to complete. Measurement results are displayed in a new window. The 'Location' button on the Measurement Panel provides the coordinates at the selected location in either decimal degrees or degrees/minutes/seconds.



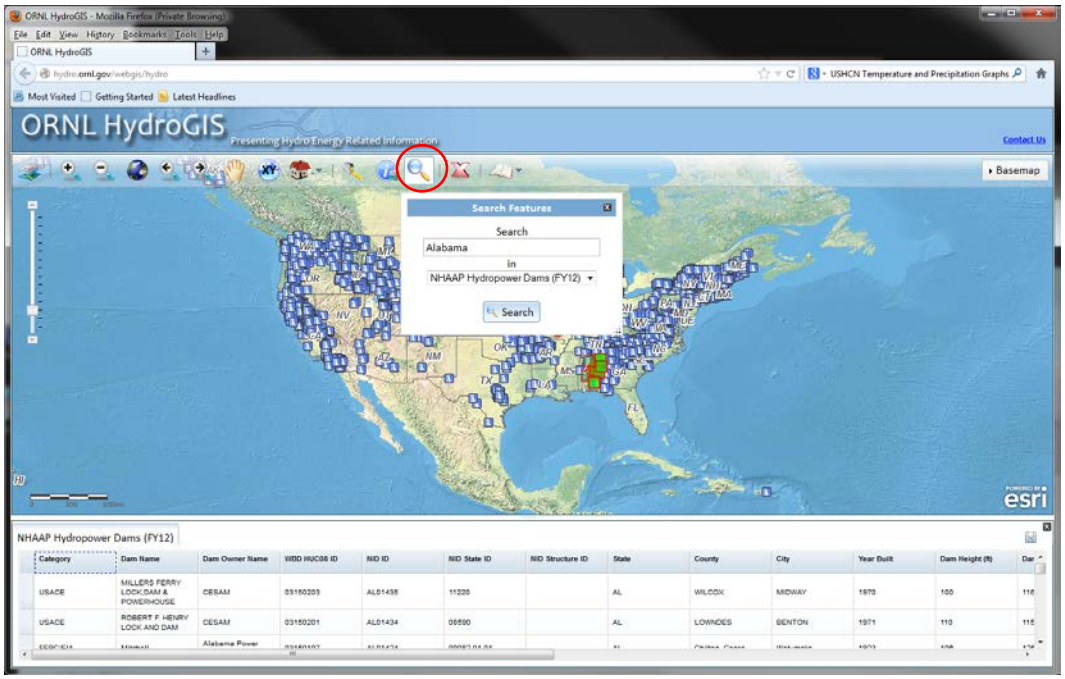
Identify

Attribute information for features is available using the '***identify***' tool on the HydroGIS toolbar. By selecting the identify tool, users can view attributes for features within a specific target layer that is active on the map or for all visible layers on the map. Users can also choose to view information for features by clicking a feature shown in the map window directly, or by drawing a polygon on the map to view attributes for of features within the polygon. Users can also identify features by selecting a feature on the map and specifying a buffer distance using the 'find nearby features' identify menu option. Nearby features can include features from any feature layer active on the map.



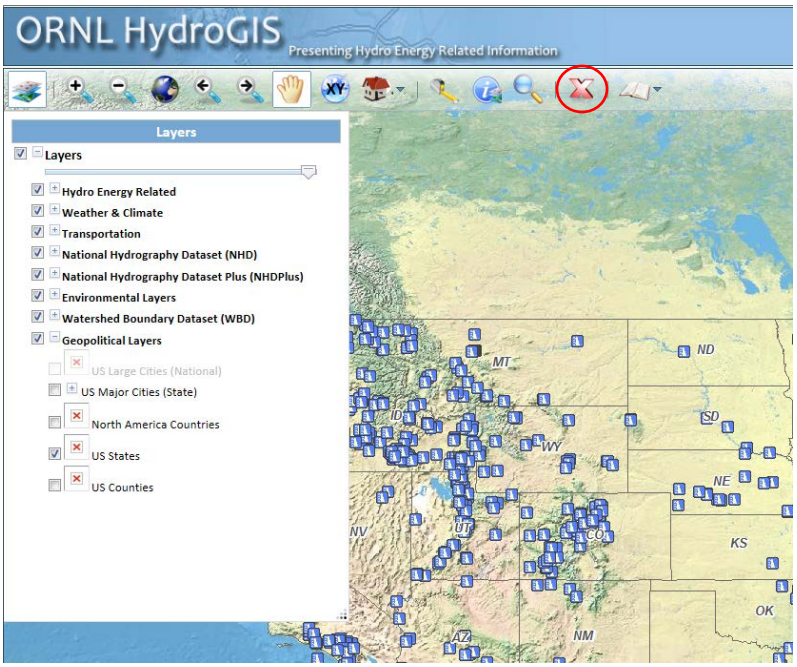
Search Features

Use the '***search features***' tool on the HydroGIS toolbar to query data by entering keywords on the menu. Query results are displayed in the map window and attributes of selected features are shown at the bottom of the screen.



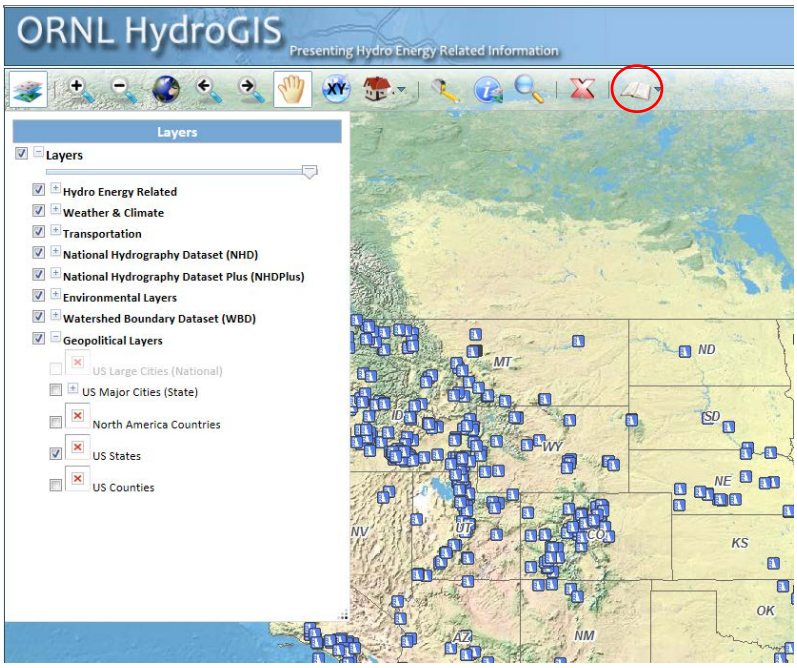
Clear Graphics

Use the '***clear graphics***' button on the HydroGIS toolbar to clear the current data selection.



Hydropower Resources

Please refer to the 'Hydropower Resources' menu tab on the NHAAP website (http://nhaap.ornl.gov/) or click the '***additional resources***' icon on the HydroGIS toolbar to define queries for producing graphs of monthly and annual power generation, monthly USGS streamflow plots, and USHCN monthly and yearly average temperature and precipitation at hydropower facility locations.



Downloading Data

Use either of the following methods to download data from HydroGIS in Comma Separated Values (CSV) file format:

1. Use the *search features* tool (Introduced on page 7.) to search for a keyword within all active layers in the map. Results appear in tabular format at the bottom of the screen and can be saved to a CSV file.

2. Download data for an area using the following steps :
    a. Turn on the layer of interest in the *map layers panel* (Introduced on page 3.)
    b. Use the *identify tool* (Introduced on page 6.) to identify/highlight a feature. The *select features* window will pop up.
    c. Select the target layer and click find nearby features with the buffer set to 0.
    d. Results will appear in a table at the bottom of the screen and can be saved as a CSV file.