SOUTH ATLANTIC FISHERY MANAGEMENT COUNCIL

SAFMC Habitat and Ecosystem Viewer

Integrating Management Resources

This document provides an overview of the SAFMC Habitat and Ecosystem Viewer data sources and map tools. Please direct any questions to roger.pugliese@safmc.net or tina.udouj@myfwc.com

Data Sources

This application was developed for the South Atlantic Fishery Management Council (SAFMC) with ArcGIS Viewer for Flex. The SAFMC Habitat and Ecosystem Viewer is a comprehensive site to view a variety of map services supporting fishery management issues in the South Atlantic Bight.

Essential Fish Habitat (EFH) – displays EFH and EFH-HAPCS for SAFMC managed species and NOAA Fisheries Highly Migratory Species.

Fisheries - displays Marine Resources Monitoring, Assessment, and Prediction (MARMAP) and Southeast Area Monitoring and Assessment Program (SEAMAP) data.

Managed Areas- displays a variety of regulatory boundaries (SAFMC and Federal) or management boundaries within SAFMC's jurisdiction.

Habitat – displays habitat data collected by SEADESC, Harbor Branch Oceanographic Institute (HBOI) and Ocean Exploration dives, as well as the SEAMAP shallow and ESDIM deepwater bottom mapping projects, multibeam imagery, and scientific cruise data.

Multibeam Bathymetry - displays a variety of multibeam data sources and scanned bathymetry charts

Nautical Charts – displays coastal, general, and overview nautical charts for the SAFMC's jurisdictional area

The SAFMC Habitat and Ecosystem Viewer also includes options to view map services hosted by the NOAA Coastal Services Center:

South Carolina Wind Energy - displays many of the data layers being used by the South Carolina Renewable Energy Task Force in their decision making process.

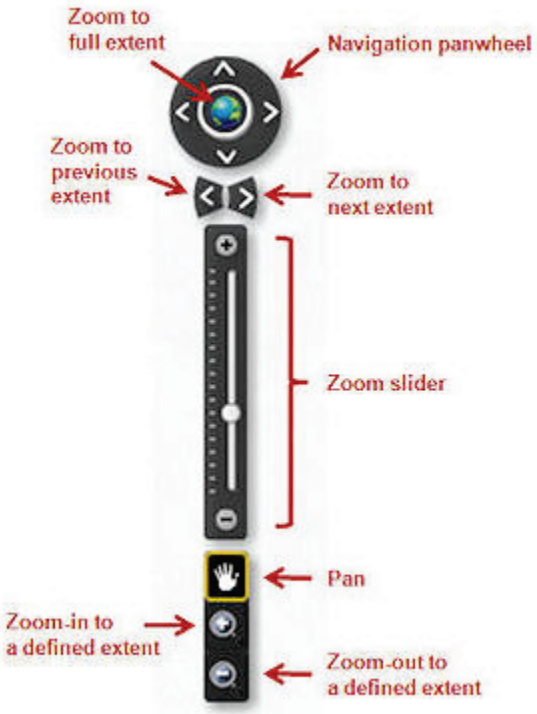
Estuarine Bathymetry – displays bathymetry and shaded relief rasters for many estuaries of the South Atlantic Bight

Map Tools

In general, the map tools and widgets provide functionality that allows you to change what the cursor does when you click on the map. Below is an explanation of each map tool.

Navigation

The Navigation widget provides a comprehensive set of map navigation controls in the Viewer. It gives end users a better map navigation user experience over the default map zoom slider. It includes all the standard navigation tools that end users expect from a Web mapping application. It is located on the upper left side of the Viewer and appears on top of the map display. It becomes transparent when the cursor is not hovering over a navigation control.



Navigation widget

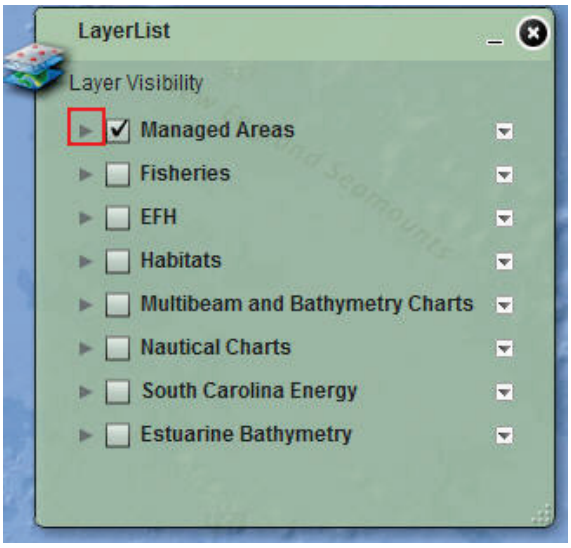
- The **Navigation Panwheel** provides options to move up, left, right, or down from the current map extent. Users may click on the globe in the middle of the Navigation Panwheel to zoom to the full extent of the map
- The two arrows located directly below the **Navigation Panwheel**, allow users to zoom to previous or next extents of the map.
- The **Zoom Slider** offers users the ability to zoom to predefined scales. As you move the indicator bar up the slider the map will zoom in. As you move down the slider, the map will zoom out.
- Another set of navigation tools are provided below the **Zoom Slider**. The **Pan** tool indicated by the "hand icon", will allow users to move around the map by dragging the mouse cursor. The **Zoom-In** or **Zoom-Out** tools indicated by the plus or minus magnifying glass icons can be used to zoom in or out to a defined extent.

Another easy and perhaps preferred method of navigating the map is the ability to use the scroll wheel of their computer mouse to zoom in and out of the map viewer.

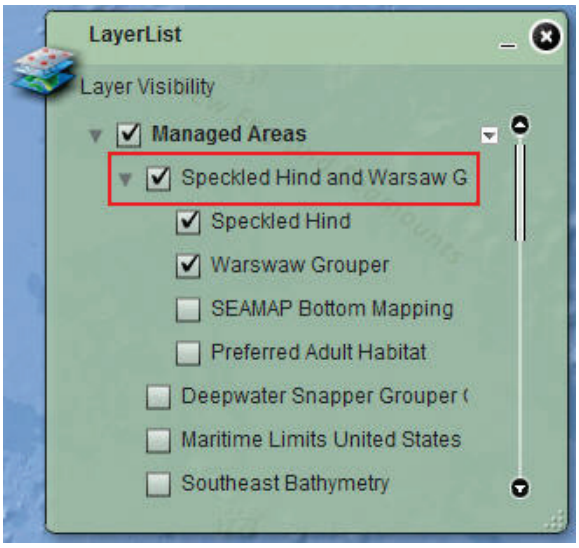
- Sliding the scroll wheel up will zoom in to the map
- Sliding the scroll wheel down will zoom out of the map

Layer List

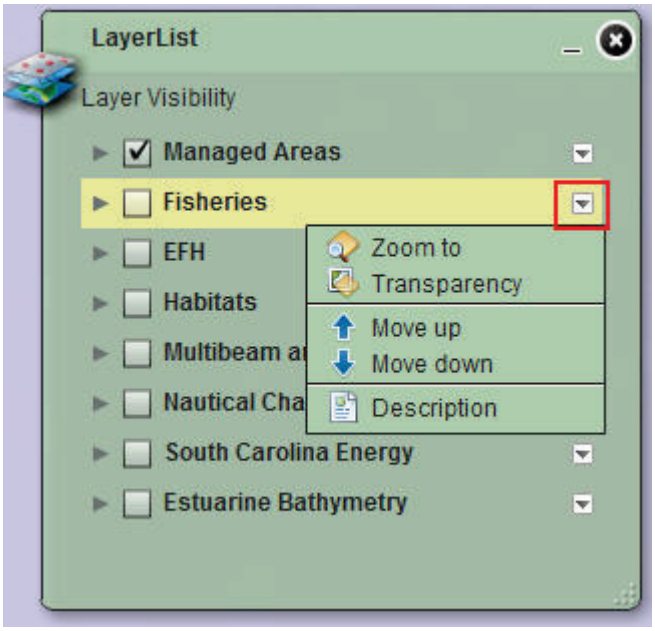
The Layer List widget provides Viewer application end users with the ability to turn map services (and their layers) on and off. Each layer has a checkbox that allows end users to easily turn their visibility on or off.



If a layer title has an arrow next to the checkbox, this indicates a group of layers which can be expanded.



The figure above displays the layers in the Speckled Hind and Warsaw Grouper Management group.



To open or remove the dropdown menu options of a service, simply click on the down arrow (indicated by the red box in the above graphic).

If the item of the layer list is a map service, there will will a small box with a down arrow . Clicking on this will give users the following options:

- Zoom to – zooms to the full extent of the map servie
- Transparency – gives users an option to adjust the transparency of the service

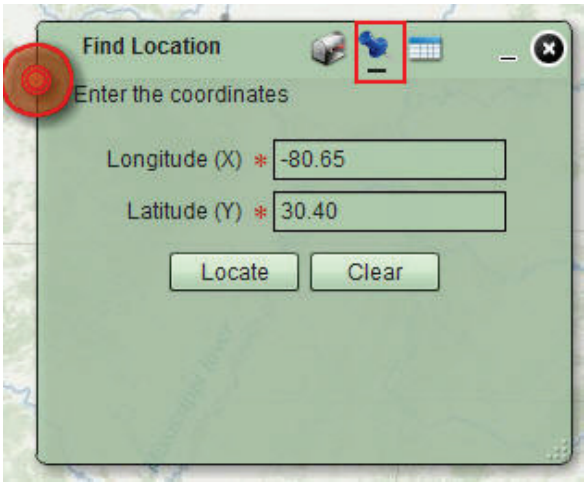
- Move up – will move the service up within the layer list
- Move down - will move the service down within the layer list
- Description – will provide a descripton of the service

Bookmarks

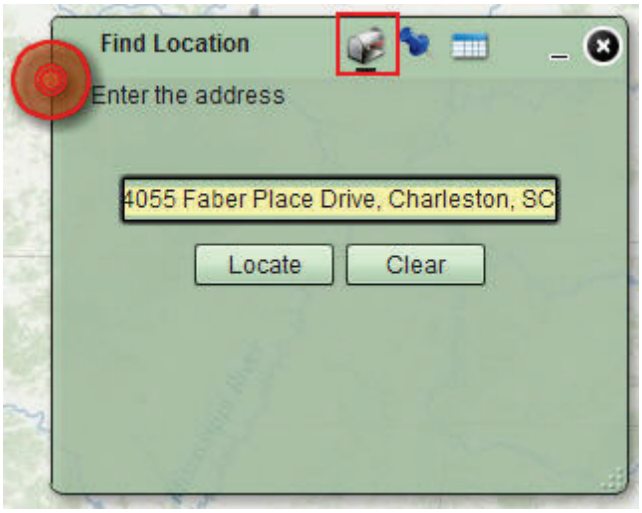
The bookmark widget stores a collection of map view extents (i.e., spatial bookmarks) of the data contents displayed in the Viewer application.

Find Location

The Find Location widget enables users to find a location on the displayed map content in the Viewer. The widget provides two ways to find a location: entering an address or specifying longitude/latitude coordinate values.



For the South Atlantic Bight region, use negative values for longitude.

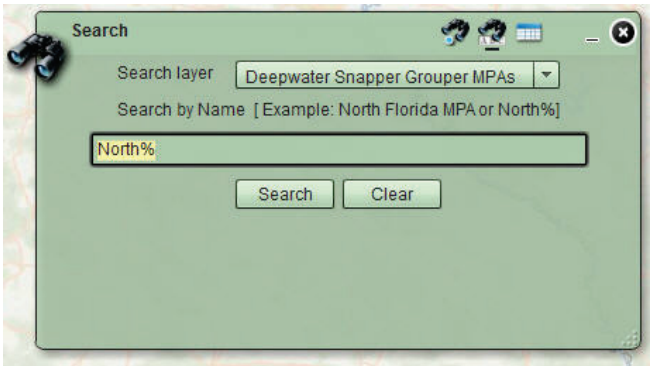


Be sure to enter the city name and state for your address. Or you can use a zip code if known.

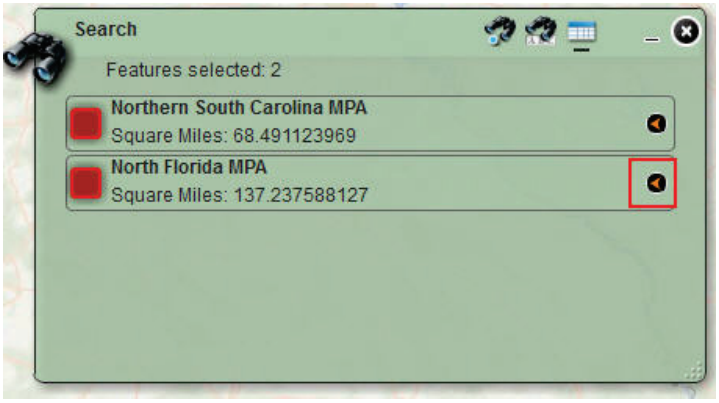
Search

The Search widget enables end users to search for features of the Deepwater Snapper Grouper MPAs, Special Management Zones, and Marine Protected Areas of the SAFMC Managed Areas Viewer. The widget provides two options to perform a search: spatially (using a graphical search tool) or by attribute (text search) as shown in the following images.

There are several options to search for features spatially with the graphical search tool. Users can draw a point, line, freehand line, rectangle, circle, polygon, or freehand polygon.



Users may also search for features by attributes with a text search. In the example above, the "Deepwater Snapper Grouper MPAs" layer could be searched by entering a MPA name such as North Florida or North%. The % sign functions as a wild card for this search widget.

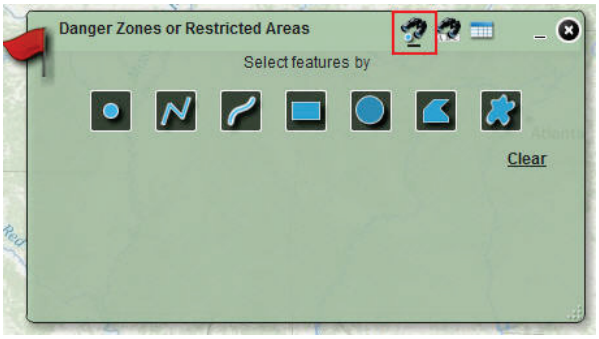


The figure above shows the results of the "North%" search of Deepwater Snapper Grouper MPAs. The Orange arrow to the right of the table results (indicated by red box), will open an image in a new browser tab.

This image of the North Florida MPA benthic habitat was taken during a submersible dive.

Danger Zones or Restricted Areas

The Danger Zones or Restricted Areas widget enables end users to search for areas that are restricted or considered to be danger zones. The widget provides two options to perform a search: spatially (using a graphical search tool) or by attribute (text search) as shown in the following images.

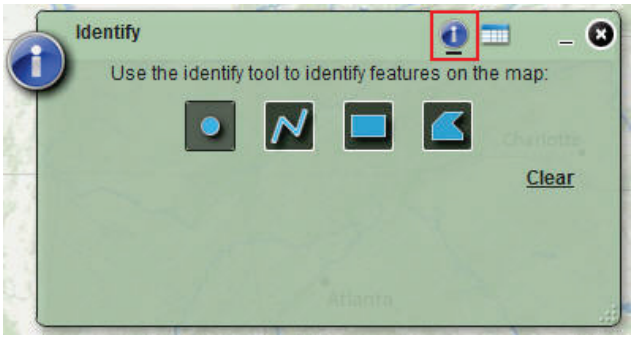


There are seven options to search for features spatially with the graphical search tool. Users can draw a point, line, freehand line, rectangle, circle, polygon, or freehand polygon.

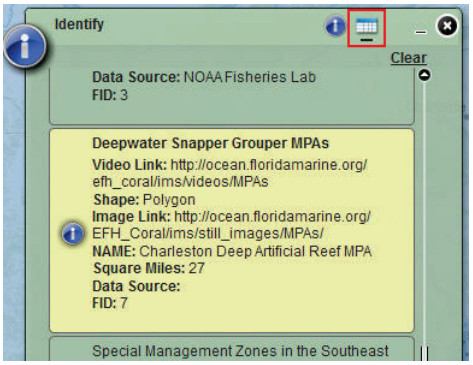
Users may also search for by attributes with a text search. In the example above, the "Danger Zones or Restricted Areas" layer could be searched for by "Danger%" or "Restricted%".

Identify

The identify widget allows you to identify features of the visible layers of the map viewer.



There are four options to identify features. Users can draw a point, line, rectangle or polygon.

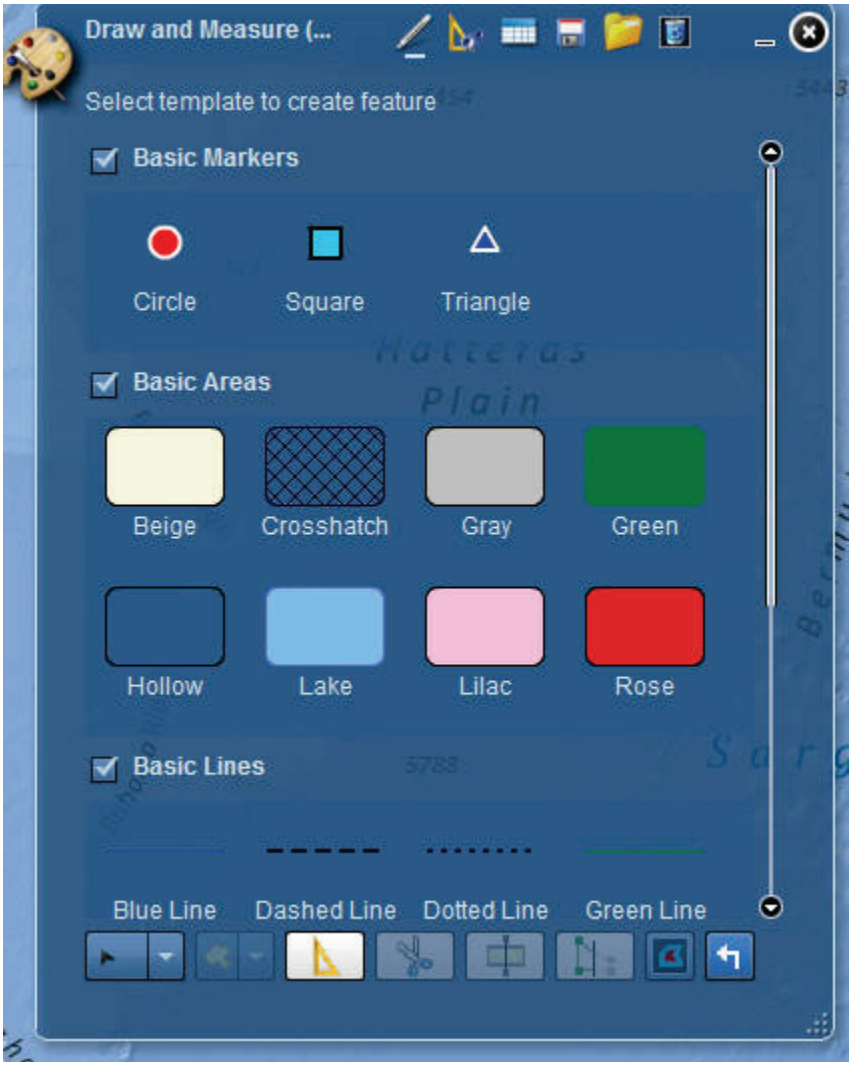


The identify tool provides a table of all results. Clicking on a result in the table will zoom to that particular feature.

Draw and Measure - Advanced

The Drawing and Measurement Advanced widget provides users the ability to annotate maps made in the ArcGIS Viewer for Flex with graphics and text. It contains functionality that extends that available in the standard Drawing widget that comes as part of the Viewer framework. It utilizes a template picker component to allow the user to select the type of graphic they wish to produce. Drawn graphics are stored on the map in a self-contained graphics layer tied to the widget.

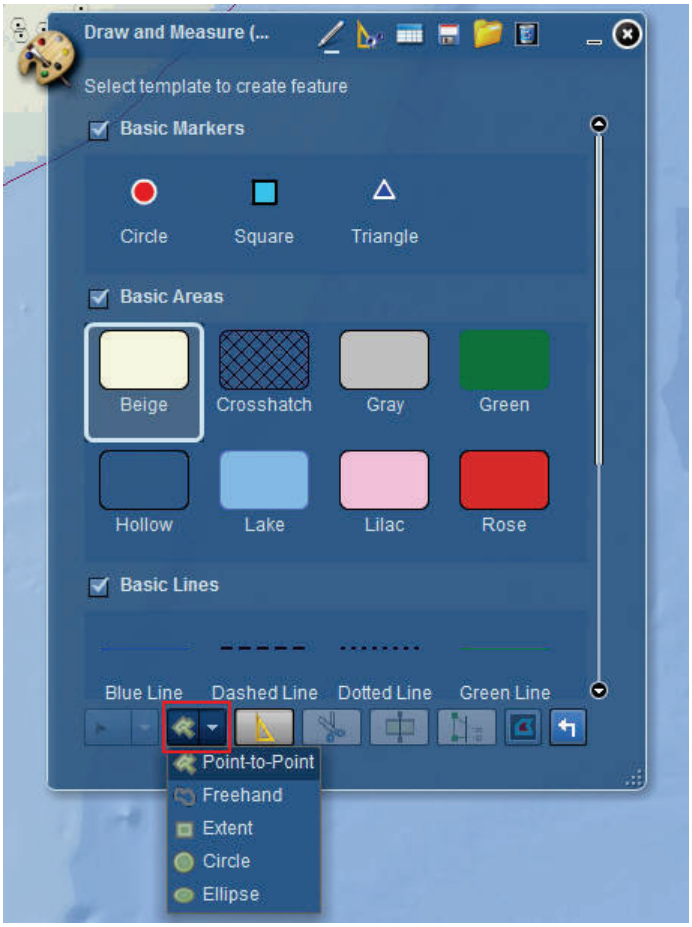
Note: This widget was written by a developer in New Zealand. The code has many spelling differences (colour, metre, etc) due to the use of the Queen's English in its design.



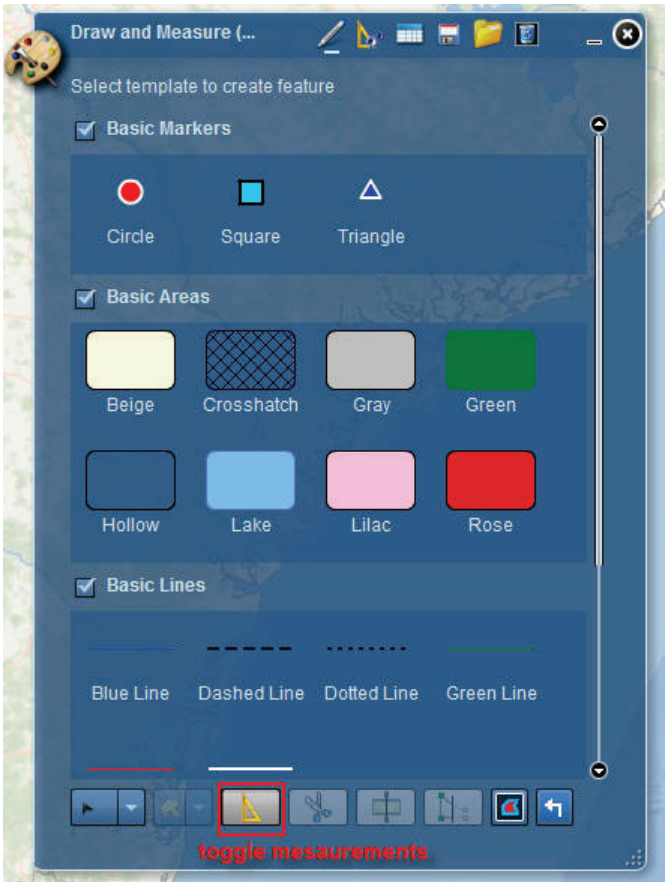
Users can interactively create a basic marker, area, or line shapes with symbology and settings based on graphic templates.

The widget also offers the following functionality:

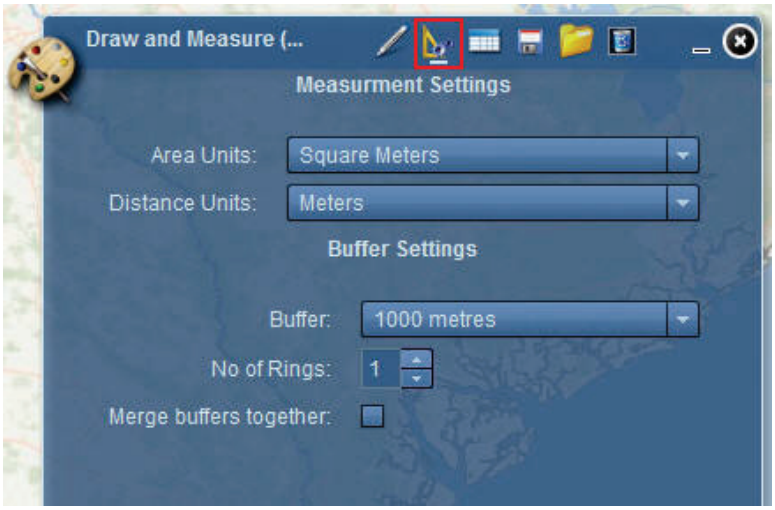
- Users can interactively create and place text labels on the map
- When constructing line and polygon graphics with the draw tools, interactive segment and total line length measurements are displayed as a mouse tip (these measurements are approximate only).
- Users can snap a node to a node of another feature while drawing or modifying a feature by pressing down the Control key.



Users can change the current drawing tool being utilized by selecting a tool from the tool dropdown (see example to the left to see how the circle, ellipse, rectangle, polygon, and freehand polygon tools are available when drawing a basic area graphic).

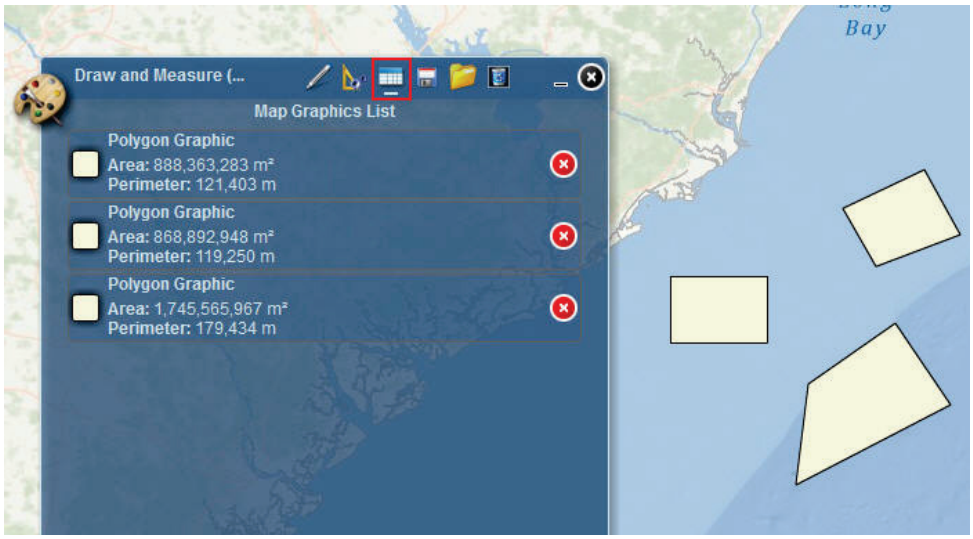


Users can toggle functionality to display the measurements for a graphic (i.e. line length polygon area, point coordinates) when it is created. These measurements are displayed as text graphics which position themselves based on the features geometry. These labels will move if the base graphic is moves, and the contents will automatically update if the geometry is modified (i.e. the geometry is moved or reshaped).

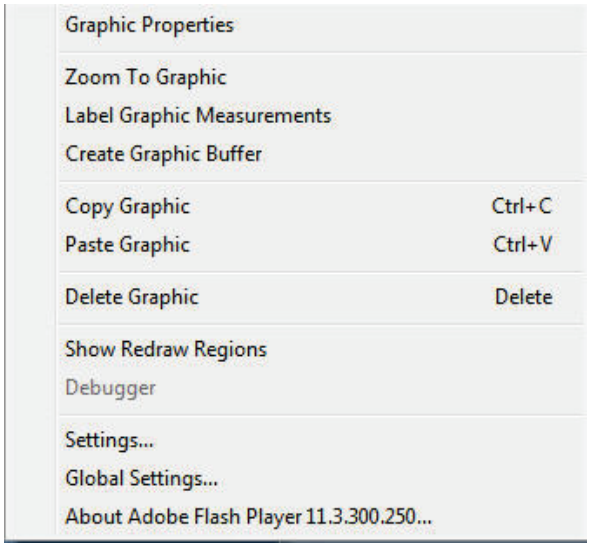


The measurement units utilized can be set by the user from a list of pre-configured choices.

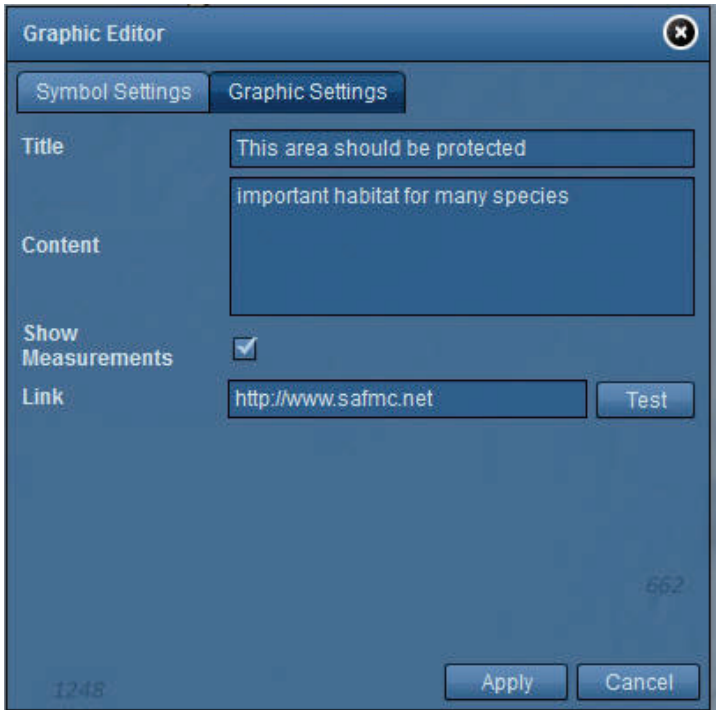
Users can toggle functionality to create multiple buffer regions around graphics as they are created. The number of buffer regions, and the buffer distance can be set by the user prior the graphic being created. The buffer distance can be chosen from a list of pre-configured buffer distances, or can be set to a custom distance determined by the user.



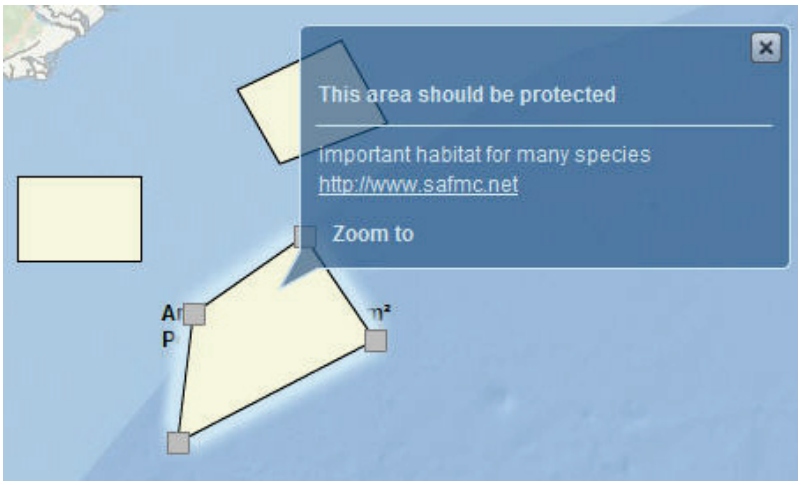
Users can review a list of all the graphics currently on the map. The image above shows an example of 3 polygon graphics that have been added to the map. The Map Graphics List contains summary details about the type and geometry properties of the graphic (length/perimeter/area/XY position/label text).



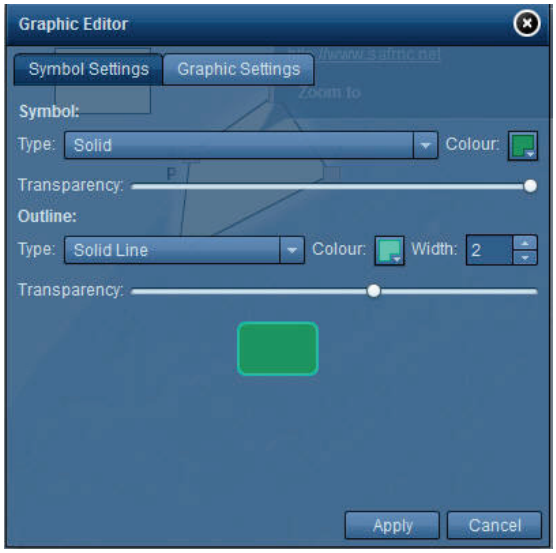
When the mouse pointer hovers over an item in the list, the associated graphic on the map is highlighted. Users can remove a graphic by clicking the Delete icon on the item in the list for that graphic. Users can also generate measurement labels for existing graphics by right clicking on the graphic and choosing the Label Graphic Measurements option. There are also several options to modify, zoom to, add buffer, copy, paste, or delete features (see image left).



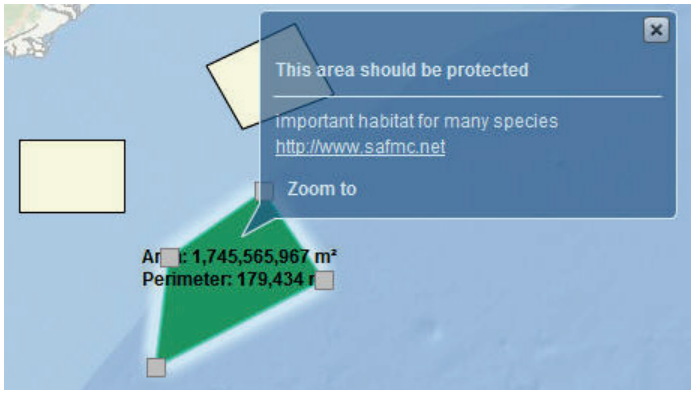
By right clicking on a graphic in the Map Graphics List, users may add attributes to individual drawn graphics, including a title, user defined content, and a hyperlink to a web location.



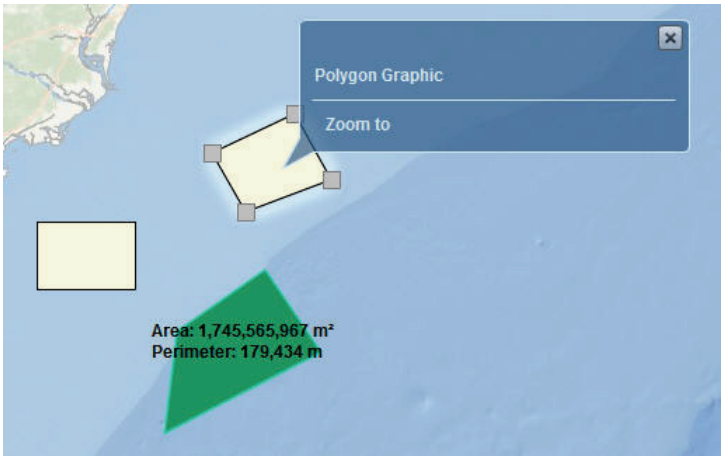
These details are displayed in a popup when the user clicks the graphic.



Users can change the symbology properties of an existing graphic by double clicking on it with the mouse or right-clicking it and choosing the properties option from the popup menu. The properties are changed in a popup dialog with properties appropriate for that graphic i.e. a point graphic will show a point symbology dialog.

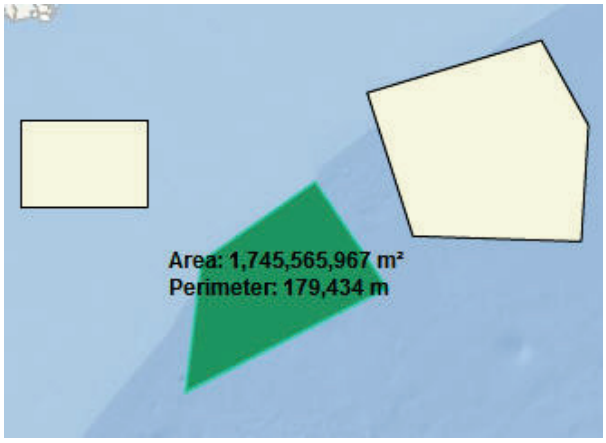


The polygon's symbology is updated with a dark green fill and lighter green outline.

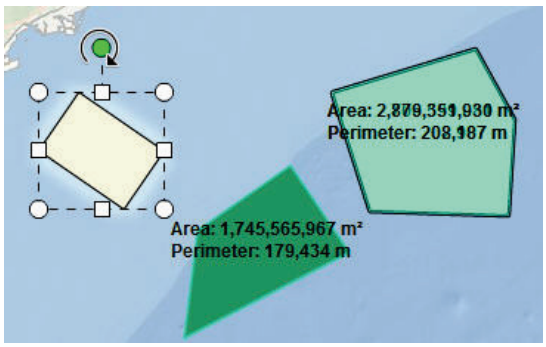


Users can interactively move, scale, and rotate an existing graphic with the mouse by clicking and dragging it.

Users can also edit the geometry of polyline and polygon graphics using interactive tools that become available when the graphics is clicked with the mouse.

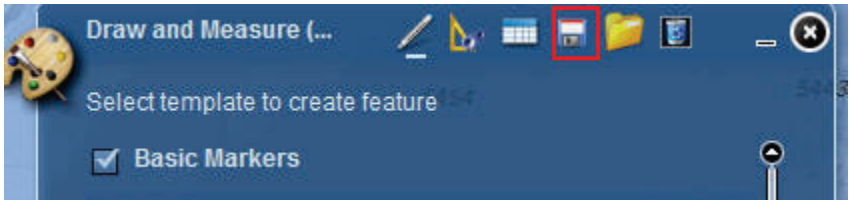


The graphic has now moved locations and has an extra vertex. The polygon is also larger than the previous version.

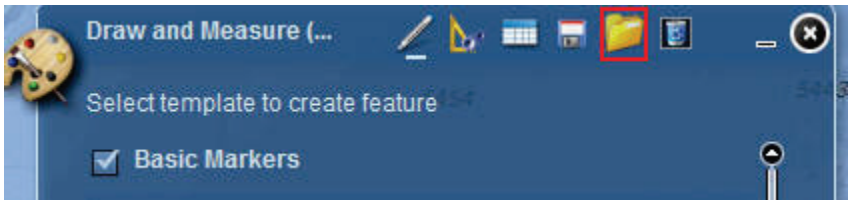


Users can also change the orientation of a polygon by double clicking on the graphic and using the green vertex to shift the polygon's orientation.

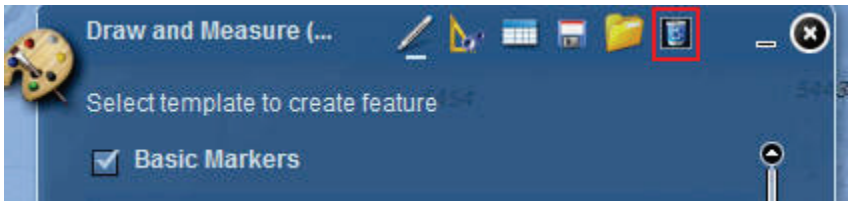
More details for the Draw and Measure Toolbar



Users can save the graphics including font and symbology settings to a file for later reuse. This includes any attribute settings, such as the title, content, hyperlink and whether the measurement label is displayed.



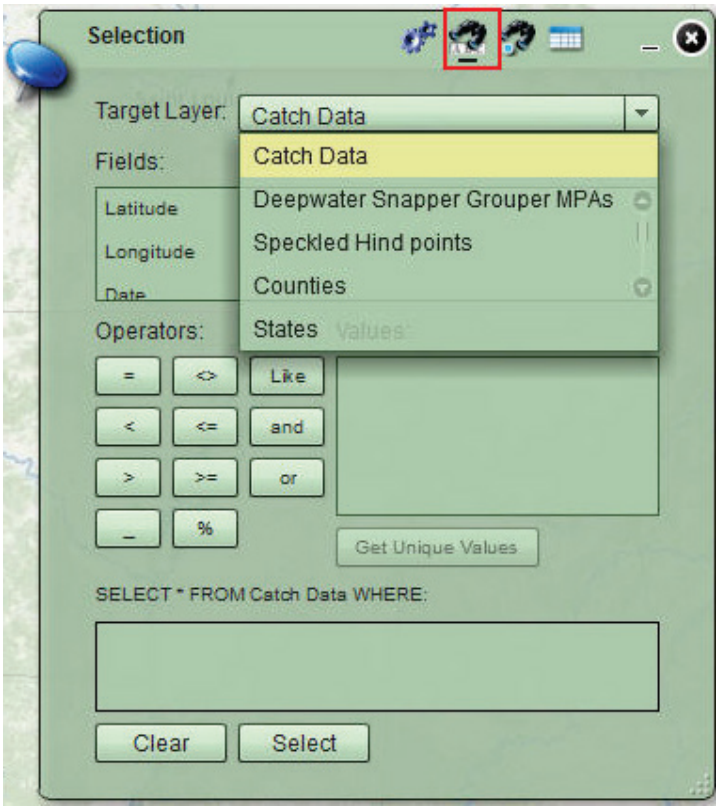
Users can import previously saved graphics files back into a map.



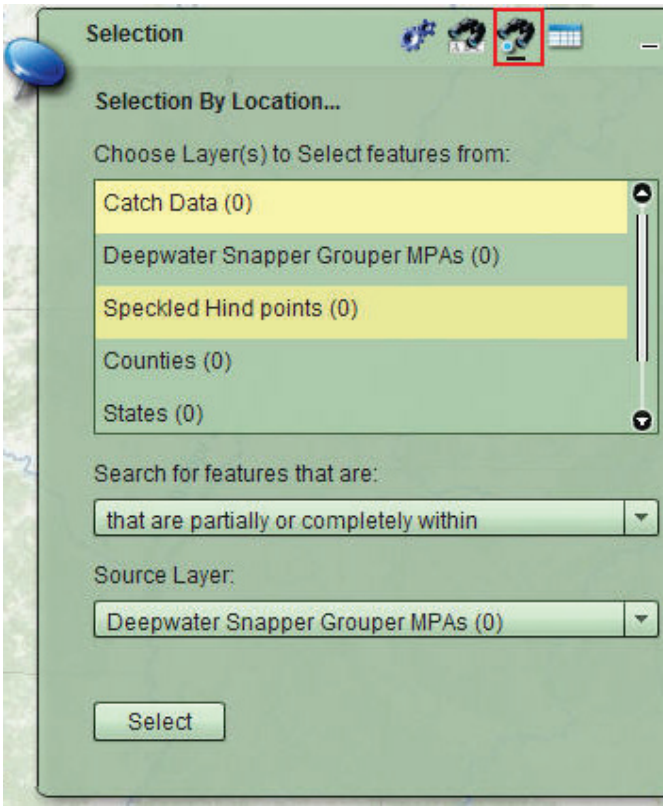
Users can delete all graphics by clicking on the clear graphics button in the widget highlighted above.

Selection

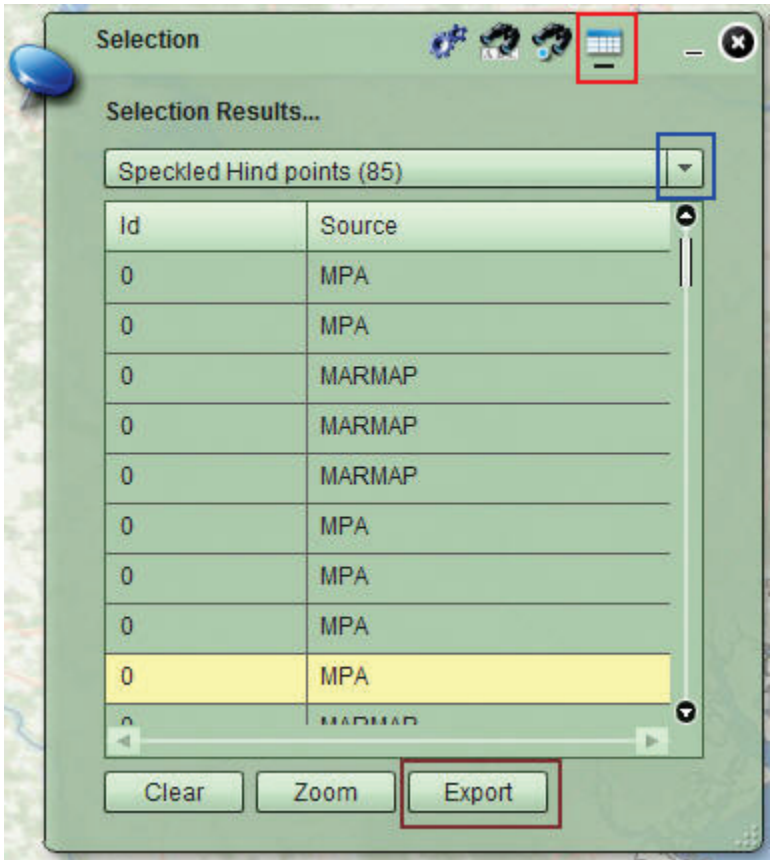
The Selection widget contains options to "Select By Attributes" or "Select by Location" for several different layers of the SAFMC Habitat and Ecosystem Viewer. Currently, users have options to select features from the following layers: Catch Data, Deepwater Snapper Grouper MPAs, Speckled Hind points, Counties, and States.



The image above shows the interface to select features based on their attributes.



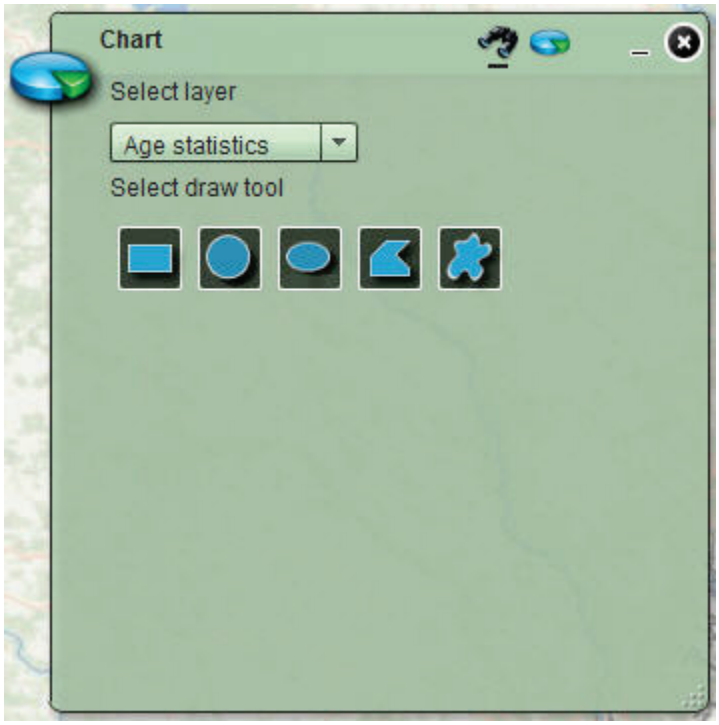
The image above shows the interface to select features based on their location.



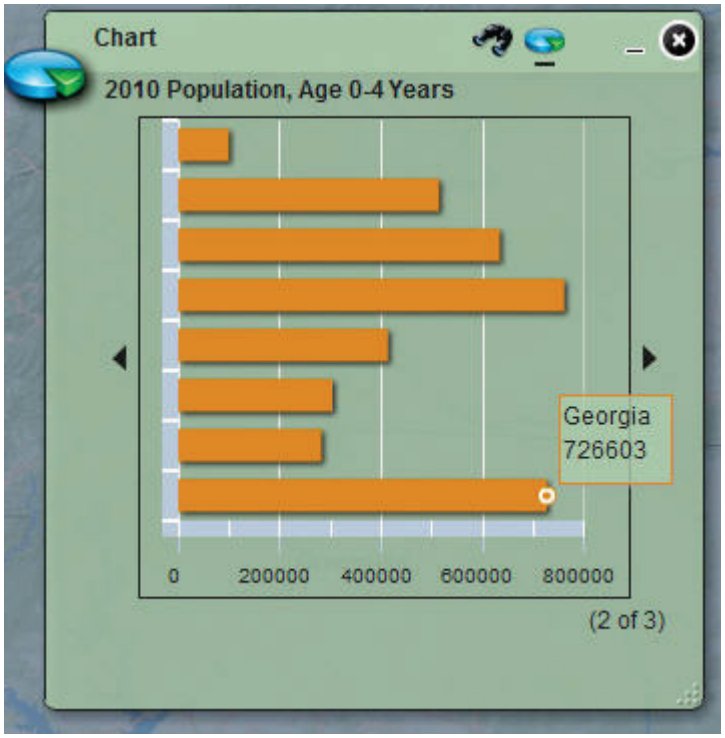
- The selection results are added to a data grid table.
- Switch between data grids for each Feature Layer by changing the dropdown list (blue box).
- Mouse over item data grid to display an information window on the map feature.
- Click an item in the data grid to zoom to feature.
- The user has the option to export results to a tab delimited .txt file (brown box)

Chart

The Chart widget displays quantitative attributes from a map layer as a graphical representation of data. It is designed to make it easy for end users to observe possible patterns and trends in quantitative attribute data, as charts can usually be read more quickly than the raw data that they are produced from.



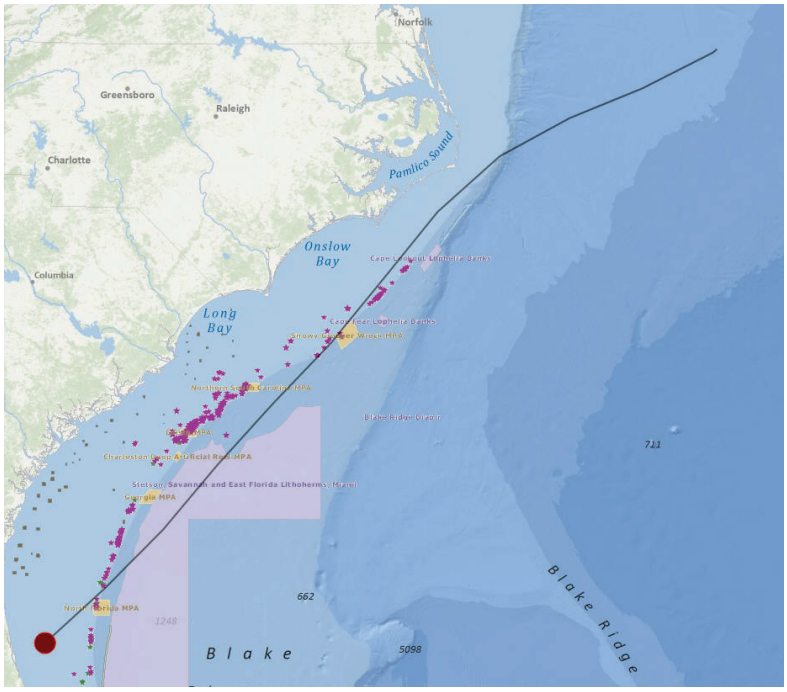
1. Select the data layer from which to retrieve the data from, and
2. Select a graphical spatial search tool. There are five options: rectangle, circle, ellipse, polygon, and freehand polygon
3. Provide an input selection on the map display



Clicking the pie chart icon will display the widget results. In this case a bar chart shows each selected state's 2010 population values for 0-4 year olds. Hovering the cursor over each individual bar will display the state name and value.

Message in a Bottle

The "message in a Bottle" widget calculates the path a bottle would follow given a user defined point and the number of days the bottle travels. This geoprocessing task will only work with points defined within the world's oceans. Points with coordinates on land masses will not work.

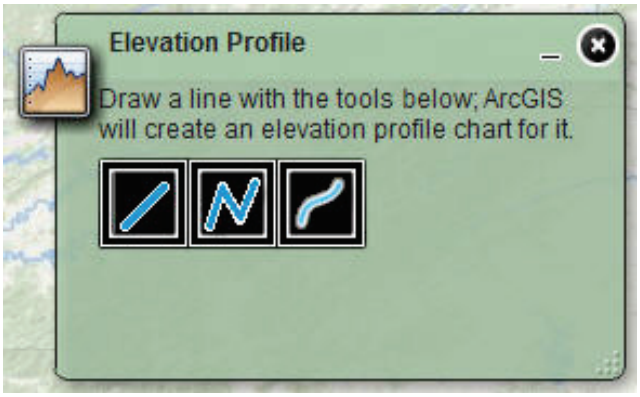


The point at which the bottle starts its trip. This point must be within the world's oceans.
The amount of time (in days) the bottle travels from its starting point.

The image above shows the results of how far the bottle will travel in 18 days from the starting point (large red circle).

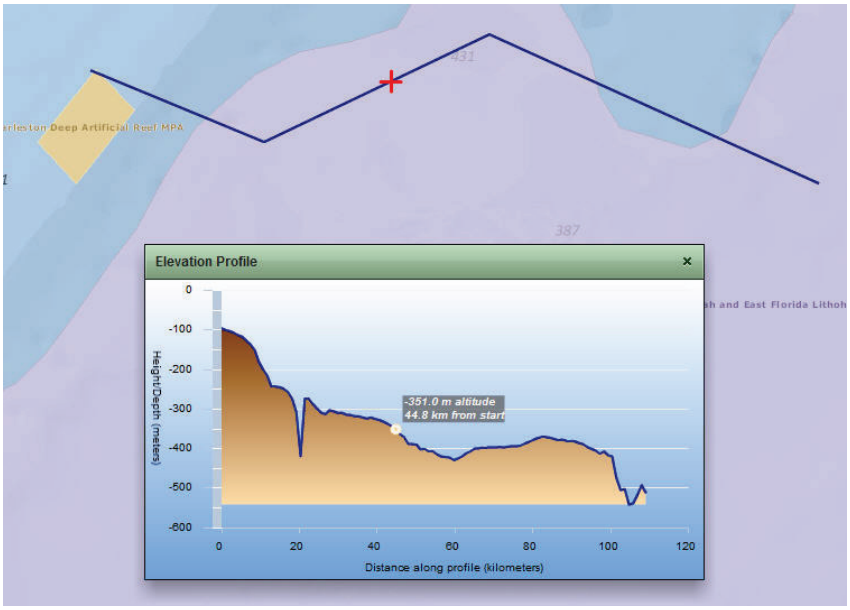
Elevation Profile

Users can generate an elevation profile using this widget. The widget uses an Elevations Server Object Extension to access the elevation values of single band raster datasets being served through an ESRI Map Service < http://sampleserver4.arcgisonline.com/ArcGIS/rest/services/Elevation/ESRI_Elevation_World/MapServer>



Users have three options to draw lines with the widget:

- Drag and release
- Point to point for each click, double click to end the line
- Free hand



The elevation profile results of the blue line drawn on the map are provided in a pop-up window.

Users can hover their mouse over the pop-up window to get elevation information and see the corresponding position on the map (red cross).

Print

The Print widget enables end-users to print what you see is what you get (WYSIWYG) output. All map display content that is currently visible will be printed. This includes the Navigation widget, the scale bar, and the Powered by Esri attribution logo. End-users can specify a custom title and subtitle for the output document.

On the generated output, underneath the printed map displays a reference to the date and time the printed output was created is also added.

Legend

A legend conveys the meaning of the symbols used to represent features on the map to a map reader. Legends consist of example map symbols with labels containing explanatory text. The Legend widget provides a dynamic legend for this viewer application.

Example image for the Managed Areas map service. The name and the symbology of the layers are displayed.