Virginia Environmental Geographic Information Systems

VEGIS Data Viewer Public User Guide

Version 0-4

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OVERVIEW

The VEGIS Data Viewer is a robust GIS mapping application that probides several mapping services created expressly for DEQ. It consists of streamlined and intuitive controls that can be operated by non-GIS personnel with a minimum of training. In addition to viewing, several map services provide GIS editing that allow single feature class points, lines, or polygons to be assigned to data rows in existing data tables.

The VEGIS Data Viewer is compatible with Internet Explorer 6.0 or later versions; no additional software needs to be installed in order to access or use the VEGIS Data Viewer. It is located at http://www.deq.virginia.gov/mapper_ext/.

The major components and controls of the VEGIS Data Viewer are shown in Figure 1. They consist of:

- the Address Search Control;
- the Map Layers, Results, and Active Tools Sidebar; and
- the Map Viewing Pane.

The Map Viewing Pane contains the components and controls listed below.

- Map Coordinates Display and Menu
- VGIN Imagery Menu
- Viewing Pane Toolbar
- Zoom Slider-Control

The details of these components and controls are described in the reminder of this User Guide.

The amount of space on the screen allocated to the Sidebar and the Map Viewing Pane can be adjusted. The Sidebar can be expanded (+) or collapsed (-) by using the control on the Sidebar heading. The relative width of the Sidebar and the Map Viewing Pane can be adjusted by dragging the Pane Adjustment left or right.

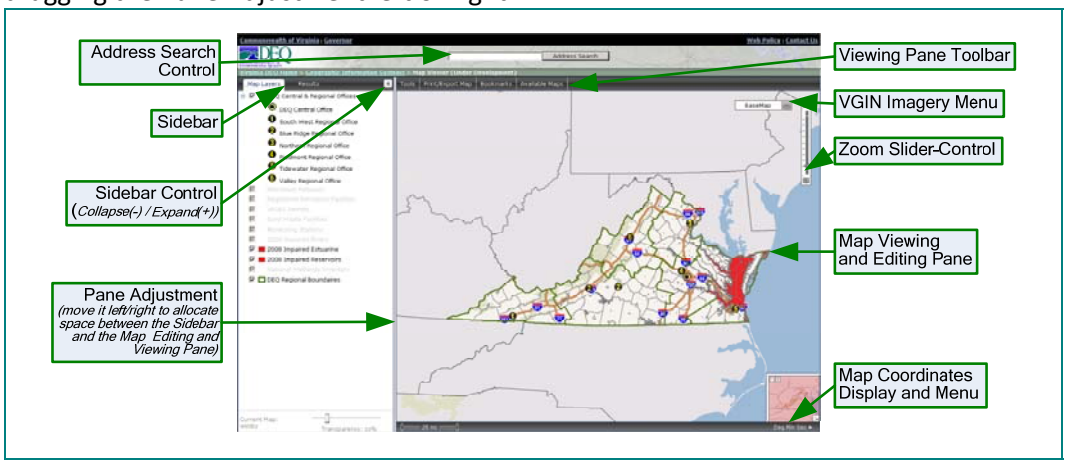


Figure 1 – Screen Components and Controls

ADDRESS SEARCH CONTROL

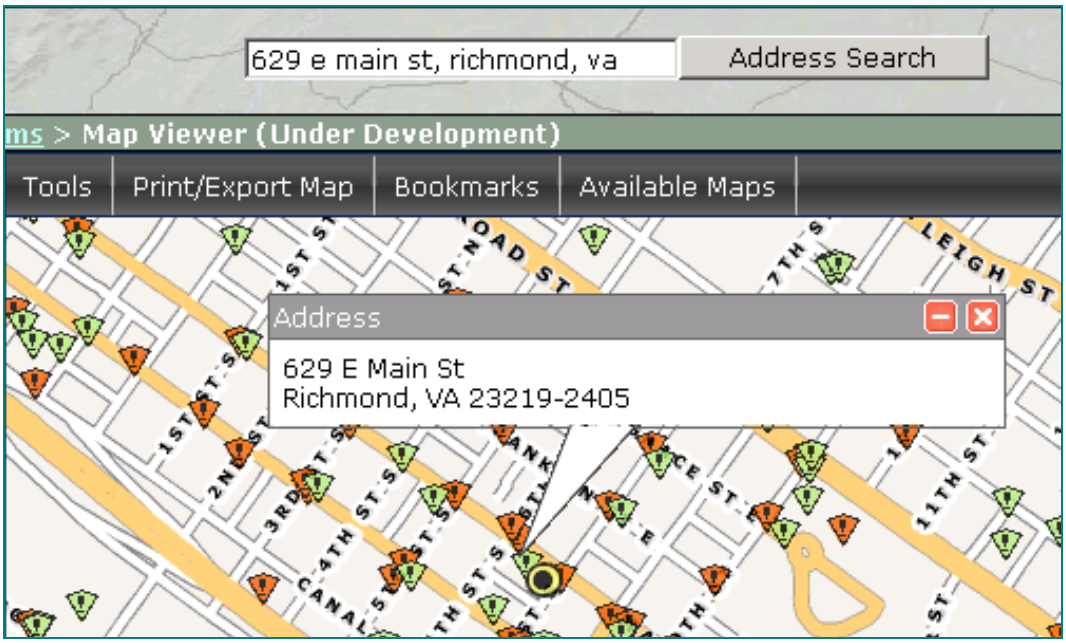


Figure 2 - Address Search

As shown in Figure 1, the Address Search box is located at the top of the screen. Entering an address into the field and clicking the Address Search Button causes the map pane to display the requested location regardless of what is currently being displayed (see Figure 2). These results are based on a geocoding service provided VGIN.

MAP LAYERS SIDEBAR

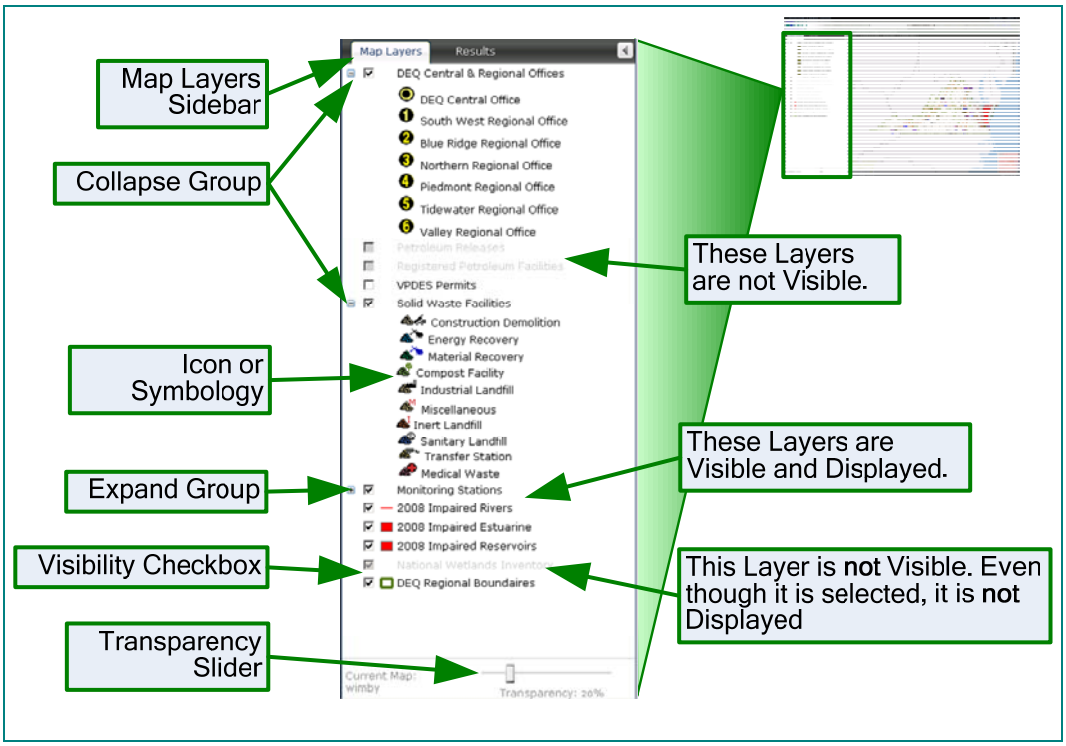


Figure 3 - Map Layer Sidebar

The Sidebar, on the left side of the Data Viewer, contains a Map Layers Tab. Clicking the Tab diplays the various map layers available on the map. Each map layer may consist of points, lines, or polygons representing various features depicted on the map. Some of the map layers may be within groups that can be extended or collapsed. This is accomplished by using the plus (+) or minus (-) sign on the left side of the map layer grouping; clicking the plus (+) sign extends the group while clicking the minus (-) sign collapses it. Depending on the view extent of the map, some of these map layers may not be visible. When this occurs, the map layer's description is a light gray color. In most cases, adjusting to a smaller view extent (or zooming in) will activate that particular map layer. In addition, each map layer has an associated visibility checkbox that can be used to turn on or turn off that map layer. It is important to note that map layers that are not viewable at the current extent (displayed in light gray) are not displayed even if the checkbox is checked. In order to selectively display or hide such a map layer, zoom in until that map layer is displayed in normal colored text.

Each feature represented by a map layer has a graphic icons or symbology. Features on a map plane are represented by one of these icons. If a map layer is checked (turned on) and the view extent is appropriate for that map layer, these icons will always appear on top of the selected imagery set in the map pane. In certain situations, a view extent may contain a large number of features that obscures the view of the underlying imagery. While this can be resolved by simply turning off that map layer through the visibility checkbox, it can also be resolved by using the transparency slider adjustment that appears at the bottom of the Map Layers sidebar. This control adjusts the transparency of the feature symbols on the map pane thereby enabling

the imagery to be seen through the feature symbols without having to remove them completely from the map pane.

RESULTS SIDEBAR

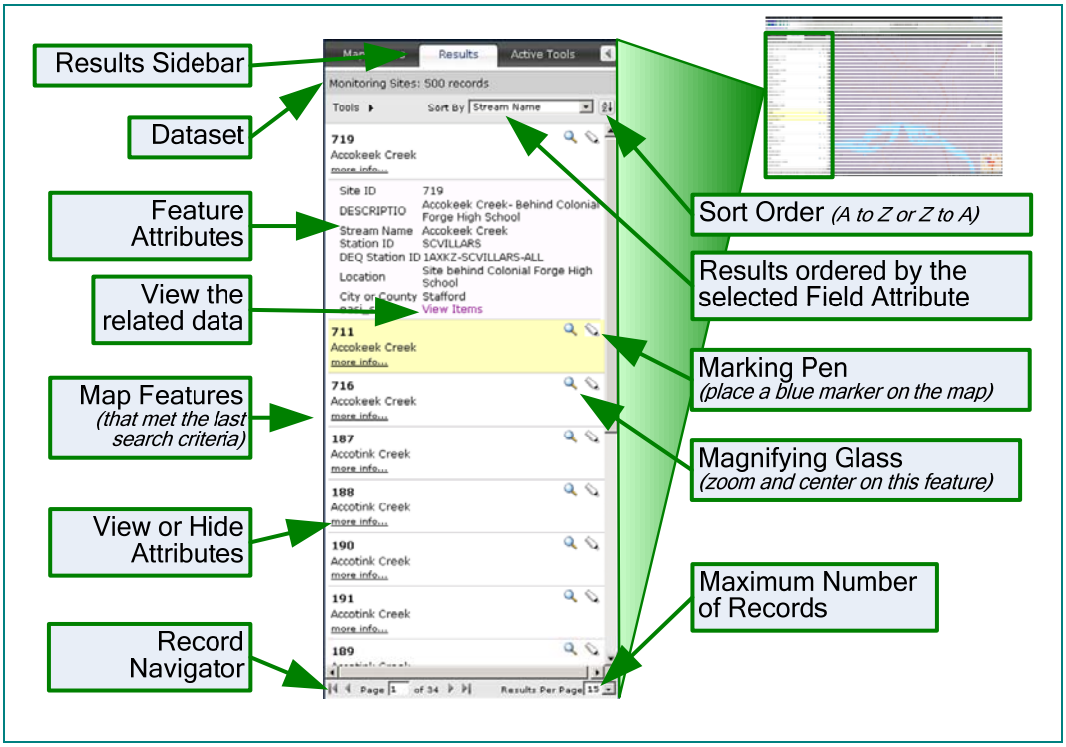


Figure 4 - Results Sidebar

The Results Sidebar shows the datasets that result from performing one of various available searches on the map. Most of the features depicted on the map have attributes associated with them. A variety of methods can be used to query for these feature attributes. The simplest search method is invoked by left clicking an area of the map. This updates the Results Sidebar with the attributes associated with the feature(s) in that area. It is also important to note that the Results Sidebar displays attributes for features matching the search (in this case, all features occupying the selected area) in all visible map layers.

Search results may be filtered by using the Map Layers Sidebar to turn off map layers that are not of interest. The individual datasets can be expanded and collapsed within the Results Sidebar to organize the data as needed. The dataset for each map layer can be sorted by selecting the attribute from the Sort By drop-down list at the top of the dataset.

At the bottom of the Results Sidebar is a record navigator that permits the selection of the number of records to return on a given search; it contains a set of arrow buttons to navigate to the first, last, next or previous record.

Related Data

Some returned data sets might have other data associated with it. When this other related data is available, the initially returned dataset will include a View Items link. Clicking this View Items link will show the other related data. This feature is not present on all returned attribute

data. Only those data sets with a View Items link within the initially returned set of attribute data utilize this feature.

MAP VIEWING PANE

The commands and controls of the Map Viewing Pane are similar to those in use by commercial web-mapping applications such as Google maps and Microsoft Virtual Earth. While easy to learn and use, a more robust set of features and capabilities are provided, which are only surpassed by dedicated desktop applications such as ArcGIS Desktop. Descriptions of these commands and controls are below.

Navigation

Panning

Move the map within the Viewing Pane by clicking the left mouse-button, holding the button down, and then moving the mouse. This allows the cursor to grab the map and move it up, down, left, or right.

Zooming

There are four methods to change the magnification: using the mouse-wheel, using the zoom slider control, selecting an area on the map, or selecting a point on the map.

Mouse-Wheel

Using the mouse wheel will change the magnification. Roll the mouse-wheel forward to increase (zoom in) the magnification. Roll the mouse wheel backwards to decrease (zoom out) the magnification.

Zoom Slider Control

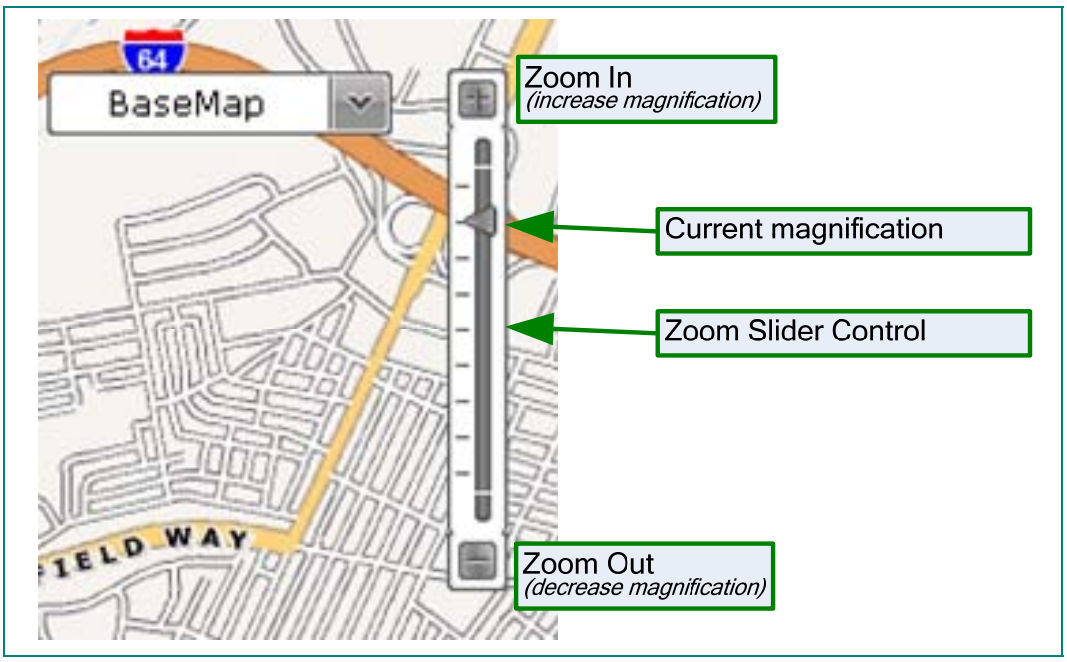


Figure 5 – Zoom Slider Control

Moving the slider on the zoom slider control, located in the upper right-hand side of the Viewing and Editing Pane, adjusts the magnification. Move the slider up, towards the plus (+) sign, to increase (zoom in) the magnification. Move the slider down towards the minus (-) sign, to decrease (zoom out) the magnification.

Selecting an Area

In order to zoom to a selected area, position the mouse in one corner of the desired area, then hold down the shift key, and click the left mouse-button. While holding the shift key and the mouse-button down, move the mouse in any diagonal direction until the blue-zoom rectangle encloses the desired area. Finally, release the shift key and mouse-button and the pane will be zoomed to the selected area.

Selecting a Point

To zoom to a specific point displayed in the map, position the mouse on the desired point and double-click the left mouse-button.

Coordinate System Display

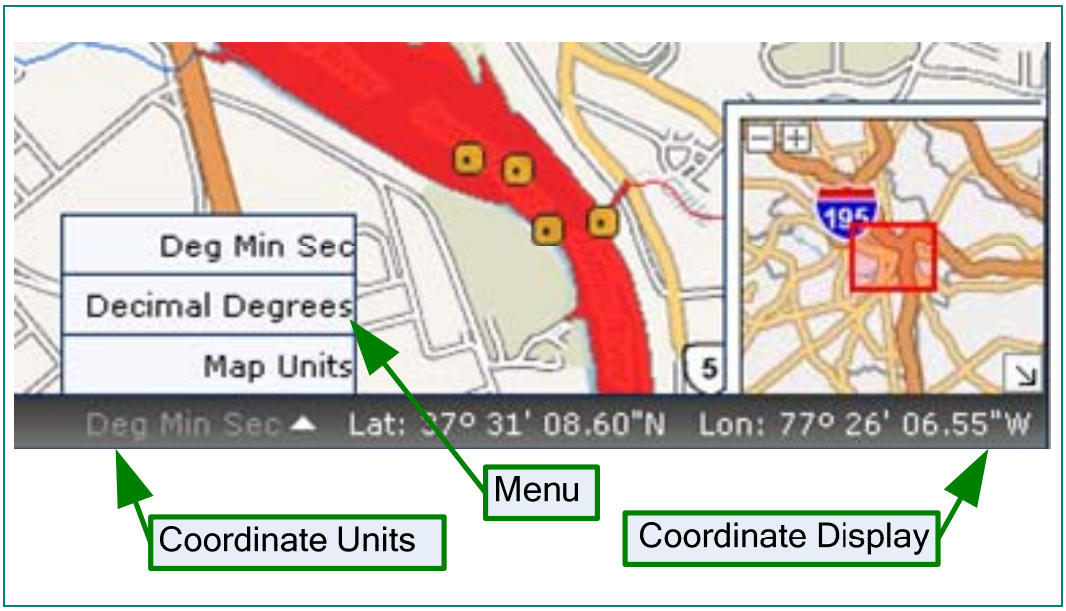


Figure 6 – Coordinates Display

In the lower right-hand side of the Viewing and Editing Pane is a coordinate display that reflects the current coordinates of the position of the mouse on the map. To change the coordinate system, place the mouse cursor on the displayed coordinate units on the bottom of the screen. This will cause a menu to appear above displayed coordinates. Finally, select the desired coordinate units from the menu (degrees, minutes, and seconds; decimal degrees; or map units) and the coordinates will be updated and displayed in the selected units.

Map Viewing Pane Toolbar

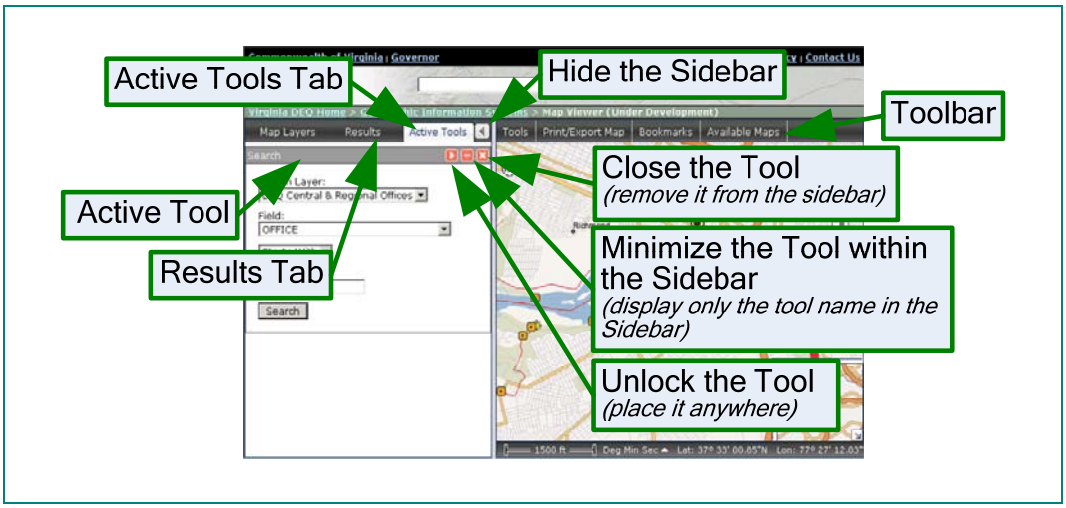


Figure 7 - Map Viewing Pane Toolbar

Along the top of the Viewing and Editing Pane is a tool bar (see Figure 7) from which advanced features and functionality are accessed. A submenu of available tools and functionality extends when the mouse is placed over any of the items in the Toolbar. Each of these features is described below.

Tools

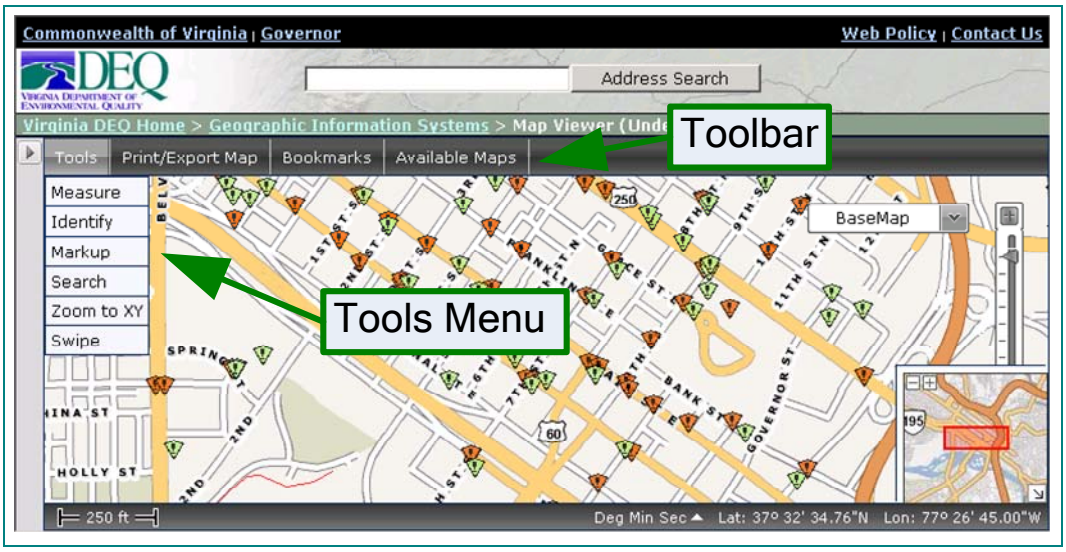


Figure 8 – Tools Menu

The Tools Menu is shown by placing the mouse on the Tools item of the Viewing and Editing Pane Toolbar. To select a specific tool, place the mouse on the desired menu item, and press the left mouse-button. The tool is displayed in the Active Tools tab of the sidebar. Information about each tool is below.

Measure

Figure 9 – Measure Tool Sidebar

Once this tool is selected, the Active Tools tab is opened in the Sidebar with the Measure Tool. This tool provides two calculations within the current map: linear distance and area measurements.

Linear Distance

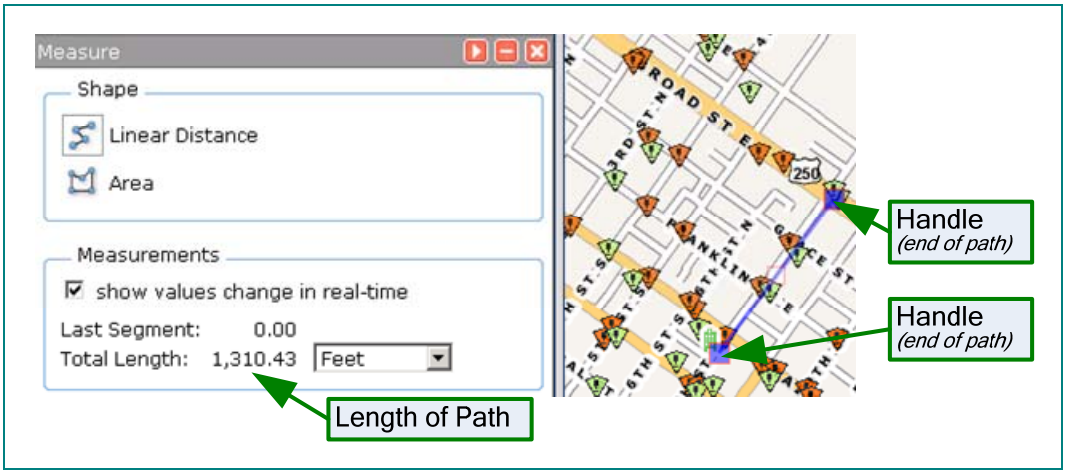


Figure 10 – Measuring a Linear Distance

Linear measurements can be made along a single straight line or a path of connected straight lines. To begin the measurement of a single line, position the mouse at the starting point and click the left mouse-button. Next, position the mouse at the ending point and double-click the left mouse-button.

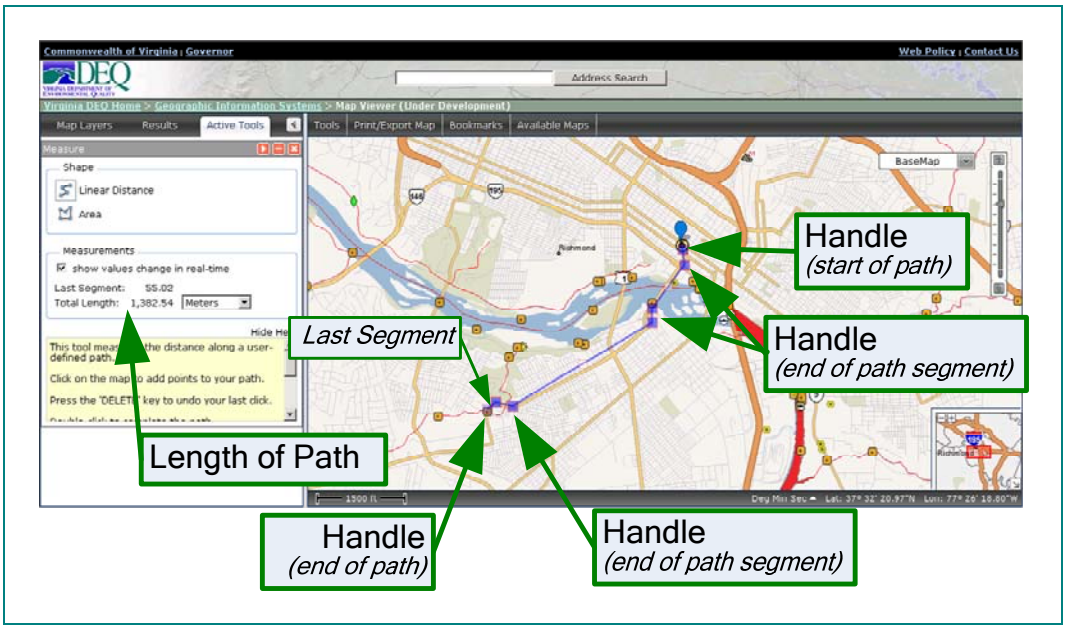


Figure 11 – Measuring a Path

Measuring a path is similar to a single line. To begin measuring a path, position the mouse at the starting point of the path and click the left mouse-button. Next, position the mouse at the end of the path segment and click the left mouse-button. Continue clicking on the end of each path segment until reaching the end of the path; at this point, double-click the left mouse-button to end the measurement. The measurement line can be adjusted. To make adjustments, position the mouse on a box on the measurement line (known as handles), click the left mouse-button and hold it down, drag the handle to the desired position, and release the mouse-button. In the Measure Active Tools box, real time measurements of the total length and last segment are shown. Units of measurement can be feet, miles, meters, and kilometers.

Area Measurement

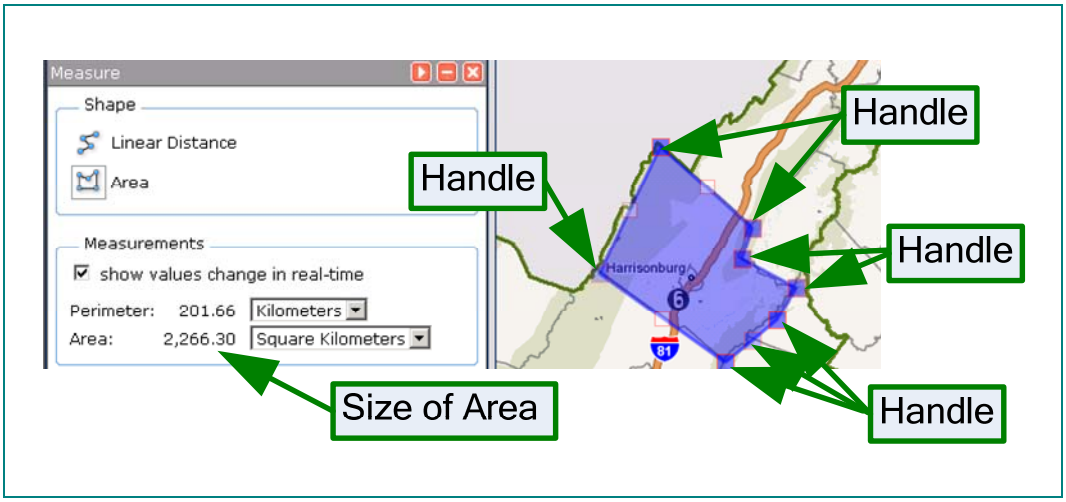


Figure 12 – Measuring an Area

Select the Area option to measure the area and perimeter of a polygon drawn on the map. Draw the polygon on the map in the same manner as a linear path; however, the end of the path is the same as its start. After double-clicking the end-point, handles will appear around the perimeter of the polygon. Similar to adjusting a linear path, the polygon can be adjusted by moving the handles to the needed position. Select the measurement units from the menu. Perimeter measurement units can be feet, miles, meters, and kilometers. Area measurement units can be acres, square feet, square miles, square meters, or square kilometers.

Identify

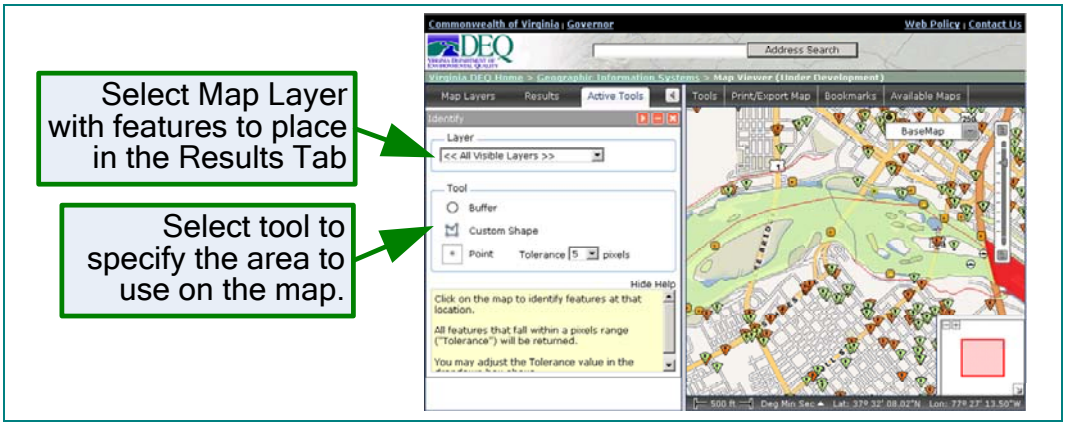


Figure 13 – Identify Tool Sidebar

Once this tool is selected, the Active Tools tab is opened in the Sidebar with the Identify Tool. This tool is used to retrieve attribute data associated with features on the map. The features can be associated with a point, buffer, or custom shape. In addition, specific data layers can be specified - including an option to use All Visible Layers.

All records matching the spatial identify search are found on the Results Tab of the Sidebar. Each record is accompanied by a more info link to display detailed attribute data for that record as well as by a magnifying glass and marker pen icon. Clicking the magnifying glass icon causes the map pane to center and zoom on that point while clicking the marker pen icon places a blue marker over the point associated with that particular data record.

Point

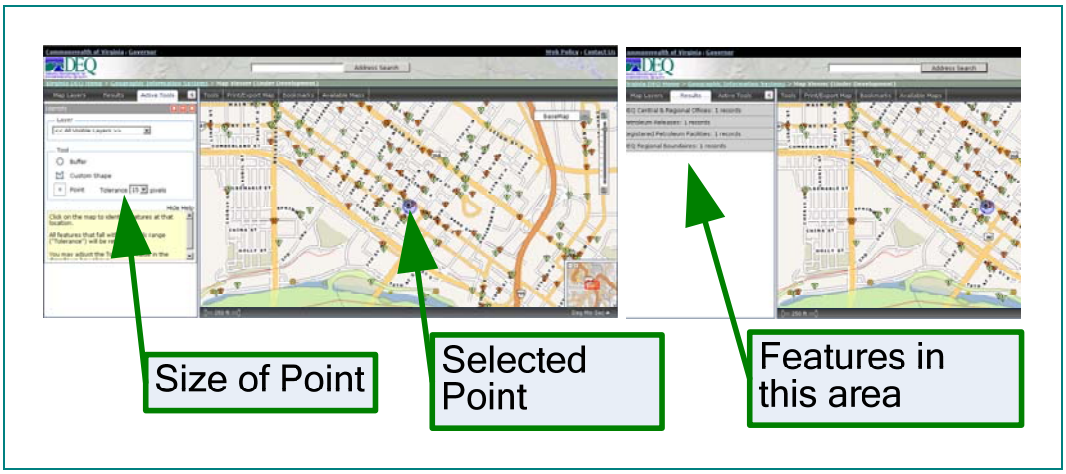


Figure 14 – Identifying Features by a Point

In order to retrieve attribute data for all features associated with a specific point on the map, position the mouse at that point and click the left mouse-button. By default, this selects information within a five-pixel radius of the selected point. However, this can be adjusted through various increments to twenty-pixels.

Buffer

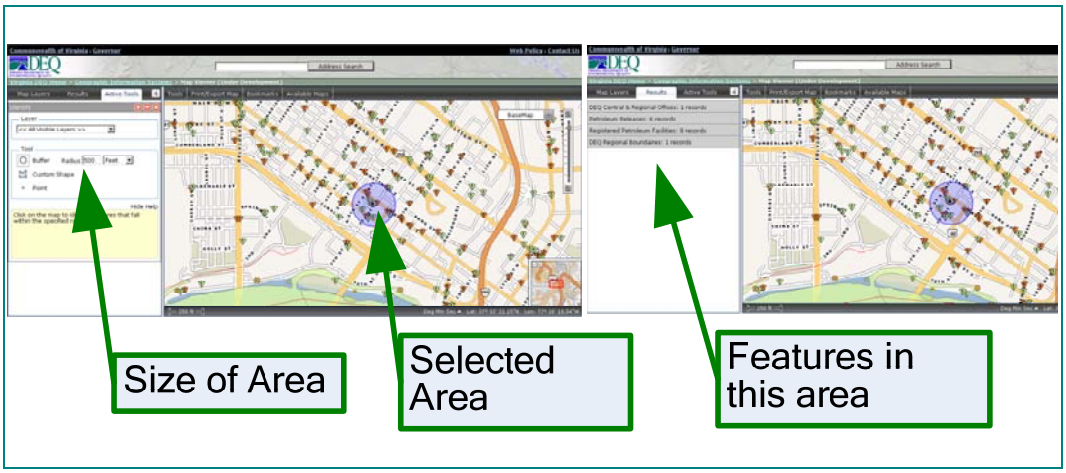


Figure 15 – Identifying Features within a Circular Area

In order to retrieve attribute data for all features within a specific circular area on the map, position the mouse at that center of the area and click the left mouse-button. The

selected area is set to the specified radius at the selected unit of measurement (feet, meters, or miles).

Custom Shape

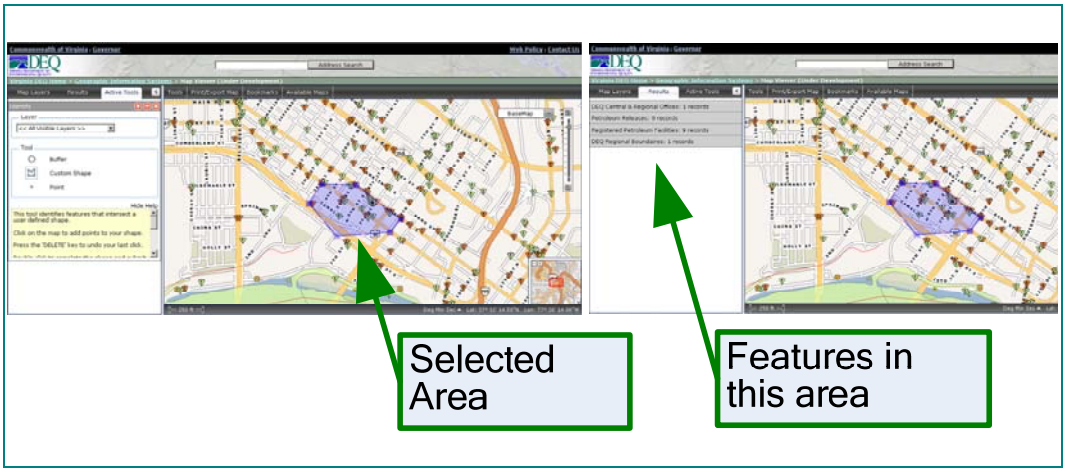


Figure 16 – Identifying Features within an Area

Attribute data can be retrieved for all features within a polygon area on the map. To begin drawing the polygon, position the mouse at one corner of the polygon and click the left mouse-button. Next, position the mouse at the next corner and click the left mouse-button. Continue clicking on each corner of the polygon until reaching the first corner; at this point, double-click the left mouse-button to complete the polygon. The polygon can be adjusted. To make adjustments, position the mouse on a handle on the polygon line, click the left mouse-button and hold it down, drag the handle to the desired position, and release the mouse-button.

Markup

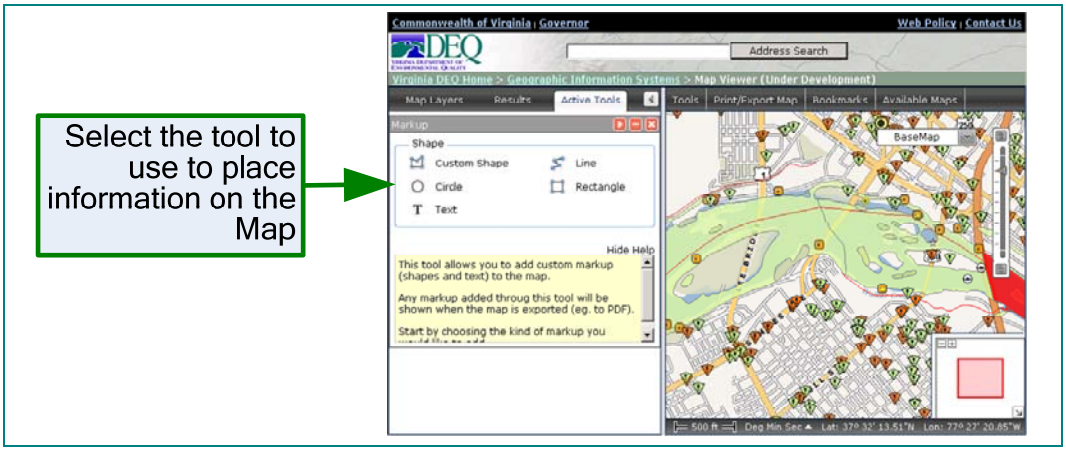


Figure 17 – Markup Tool Sidebar

Once this tool is selected, the Active Tools tab is opened in the Sidebar with the Markup Tool. The tool provides a quick way to add graphic or text annotation to a particular map

extent; these markups do not alter or change the underlying map features and are not saved for future use. The markups are included when the map is printed or saved as a graphic. By using the mouse, the map pane can be annotated with a circle, multi-part line, custom shape, or text. In addition, the color, fill, line width, and transparency can be specified. Finally, a name can be associated with each markup entity manually or by using the Auto Generate feature. Automatically generated markup names are numbered custom_0, custom_1, etc.

Search

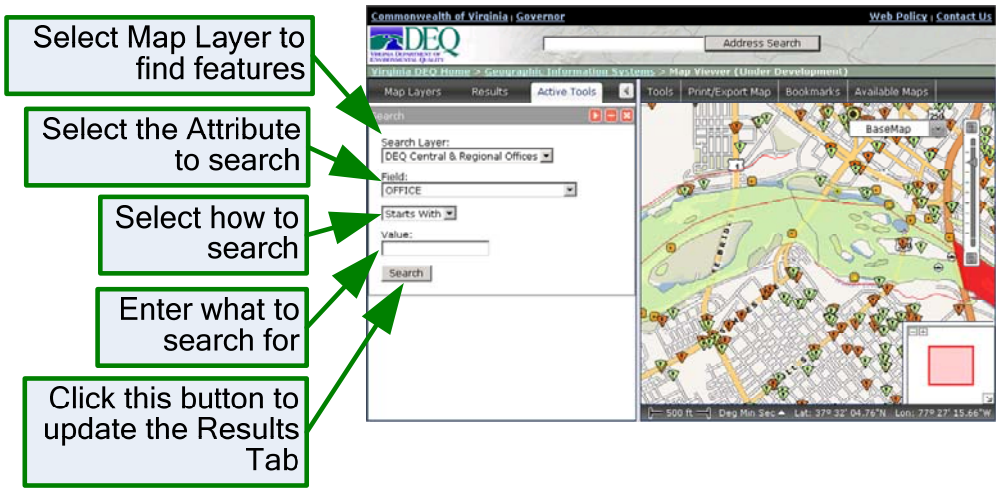


Figure 18 – Search Tool Sidebar

Once this tool is selected, the Active Tools tab is opened in the Sidebar with the Search Tool. This feature searches a specific data layer for specific information in a data column. First, select the data layer to search; this causes the Field drop-down menu to populate with all searchable columns within that data layer. Next, select the column to search and enter the search value. Then use the drop-down menu to choose the type of search to perform ('Starts with', 'Ends with', or 'Contains'). Attribute data matching the search criteria are found on the Results Tab of the Sidebar.

Zoom to XY

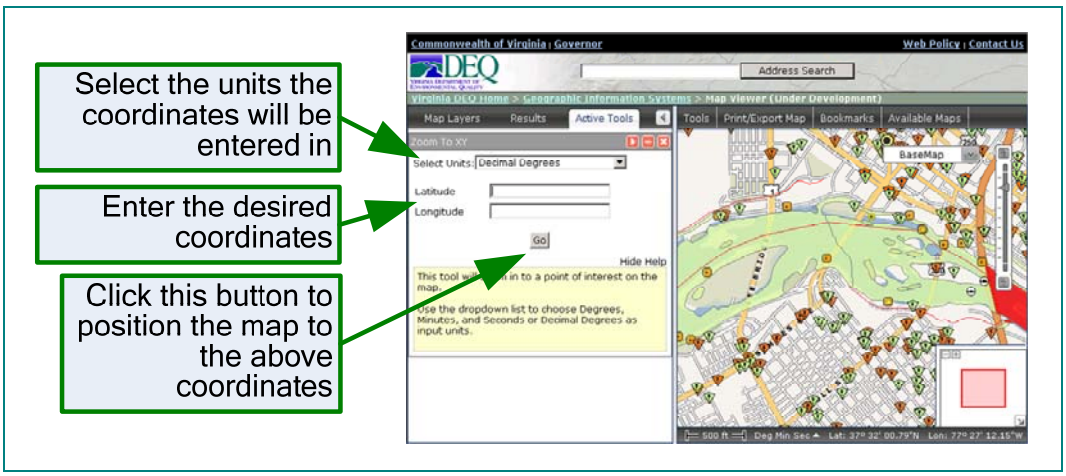


Figure 19 – Zoom to XY Tool Sidebar

Once this tool is selected, the Active Tools tab is opened in Sidebar with the Zoom to XY Tool. This very simple tool centers and zooms in on any set of coordinates. The coordinate system is selected from the Select Units drop-down menu. The coordinate system can be decimal degrees, degrees-minutes-seconds, or map units. Once selected, enter the values for the latitude and longitude and then click the Go button. The map-viewing pane automatically zooms to the nearest extent possible (depending on which imagery layers are visible) and places a blue marker over the point represented by the entered coordinates.

Swipe

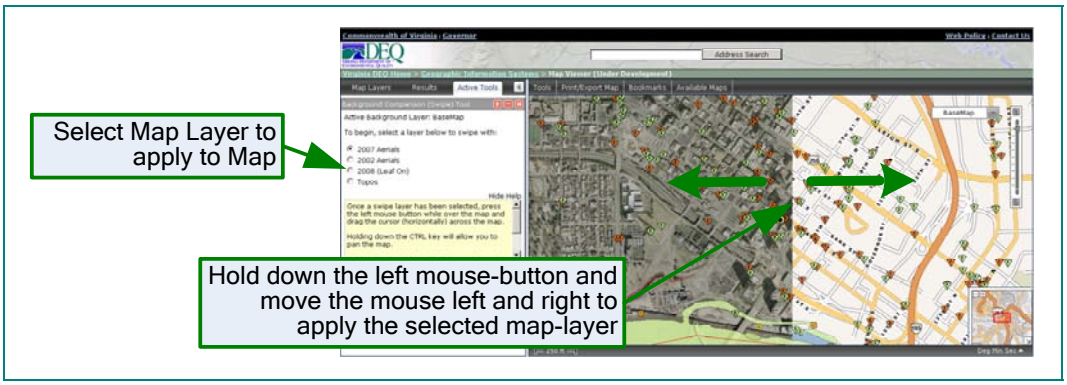


Figure 20 – Swipe Tool Sidebar

Once this tool is selected, the Active Tools tab is opened in the Sidebar with the Swipe Tool. This tool compares two separate cached imagery layers by moving the mouse from side to side. Any of the cached imagery sets (other than the currently selected cached layer) may be used with the swipe feature. While the swipe tool is active, the view extent (zoom) and portion of the map navigation (panning) commands are changed to not conflict with the swipe tool. In order to change the view extent (zoom), roll the mouse wheel, and draw a zoom box with the mouse while holding down a Shift key; zooming by double-clicking the left

mouse-button is disabled. Panning is accomplished by holding down the CTRL key and left clicking an area of the map-viewing pane and dragging it to the appropriate area.

Export

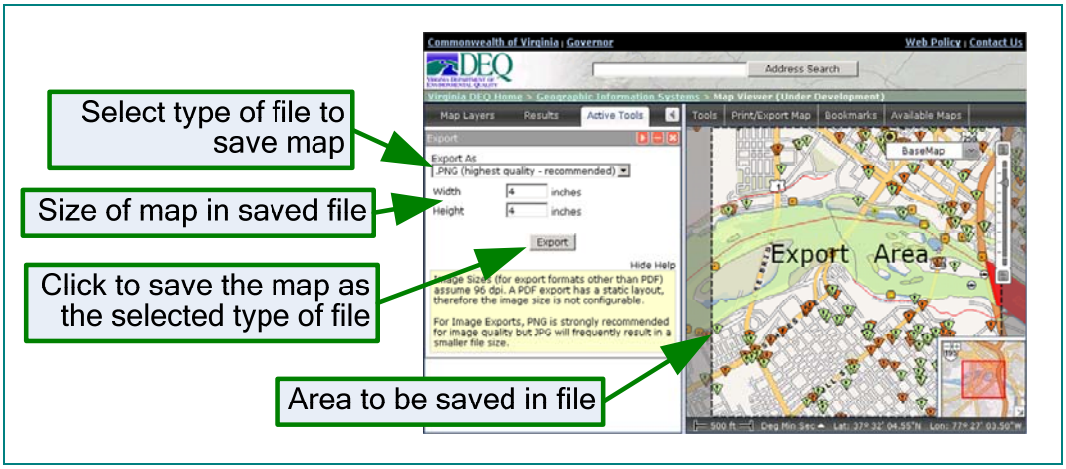


Figure 21 – Export Tool Sidebar

The Export Tool Sidebar is shown by placing the mouse on the Print/Export Map item of the Viewing and Editing Pane Toolbar. The current map view may be exported as an Adobe PDF file or a graphic file that can be used by other applications. To export the map, first position the mouse on the map-viewer pane, click the right mouse-button, and then click the Export Current Map View link. This opens a new tab called Active Tools in the Map Layers and Results sidebar. Use the Export panel to select a width and height of the exported map (in inches) and one of the following formats:

- *.PNG – Highest quality graphic file format; the file size is larger*
- *.JPG – Moderate quality graphic file format; the file size is smaller*
- *.GIF – Moderate quality; older graphic file format*
- *.PDF – Adobe Acrobat PDF format*

Available Maps

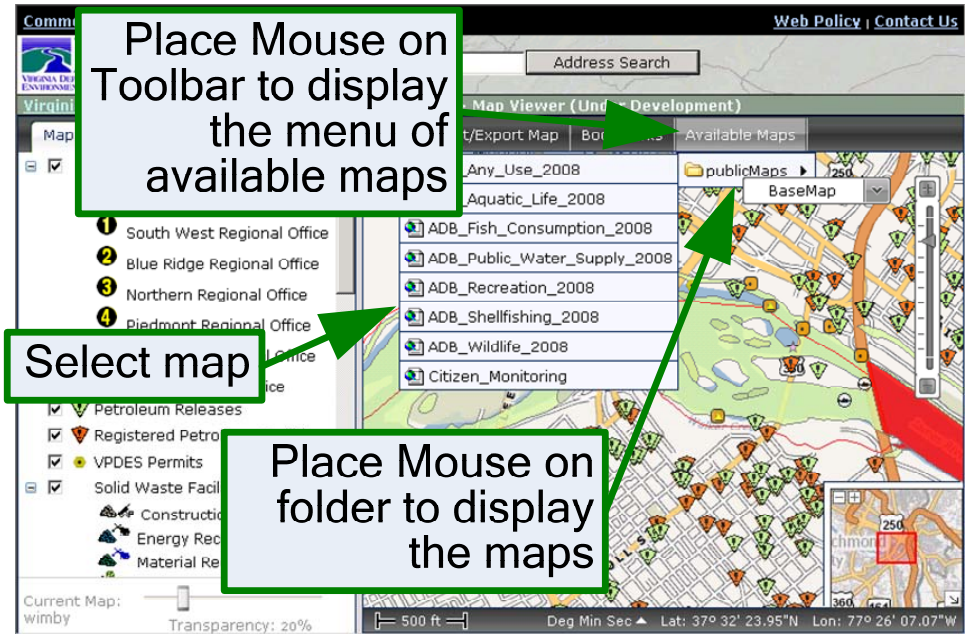


Figure 22 - Available Maps

The list of available maps is displayed by placing the mouse on the Available Maps item of the Viewing and Editing Pane Toolbar. Most of these maps are read only; therefore, the underlying spatial data cannot be changed. However, maps in the Editing subfolder do allow spatial editing. The ability to edit these maps is based on role-based security, which is assigned as needed to each user. Users without the appropriate permissions are not provided access to the screens necessary to edit that maps spatial data.

Edit

This feature allows authorized users to add spatial data (as a point, line, or polygon) to an existing data table. Prior to using this feature, the business needs to work with the GIS team to appropriately configure the screen and determine security roles.

To use this feature, left-click the Edit button in the Map-viewer Pane toolbar. This opens another browser window titled Spatial Enabler. Use the drop-down menu to select the appropriate editing application, which opens the data table. The table can be sorted by clicking any of the column headers; the entire data table is sorted based on the information in that column.

The data table is broken into several pages based on the total number of records within that table. Navigate to other records by clicking the left mouse-button on any of the page numbers at the bottom of the data table grid (see figure 11 below).

Virginia Geographic Information Network (VGIN) Imagery Menu

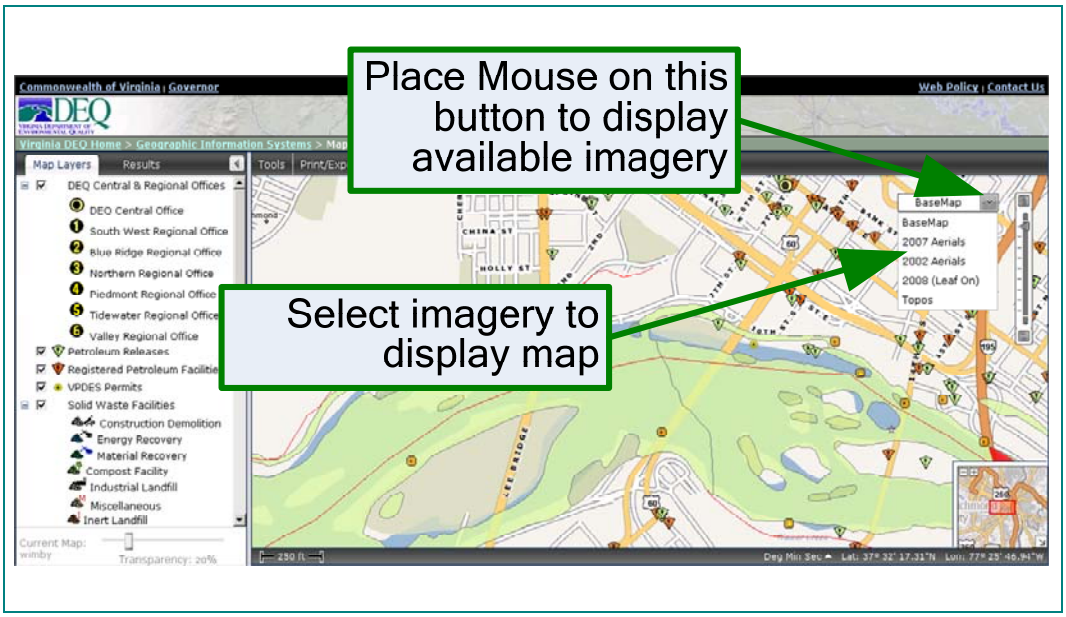


Figure 23 – Map Imagery Selection

A drop down menu in the upper right corner within the map-viewing pane allows the selection of imagery provided by the Virginia Geographic Information Network. These are large data sets of various types of imagery, which are shared by state agencies. Currently available imagery sets are described below.

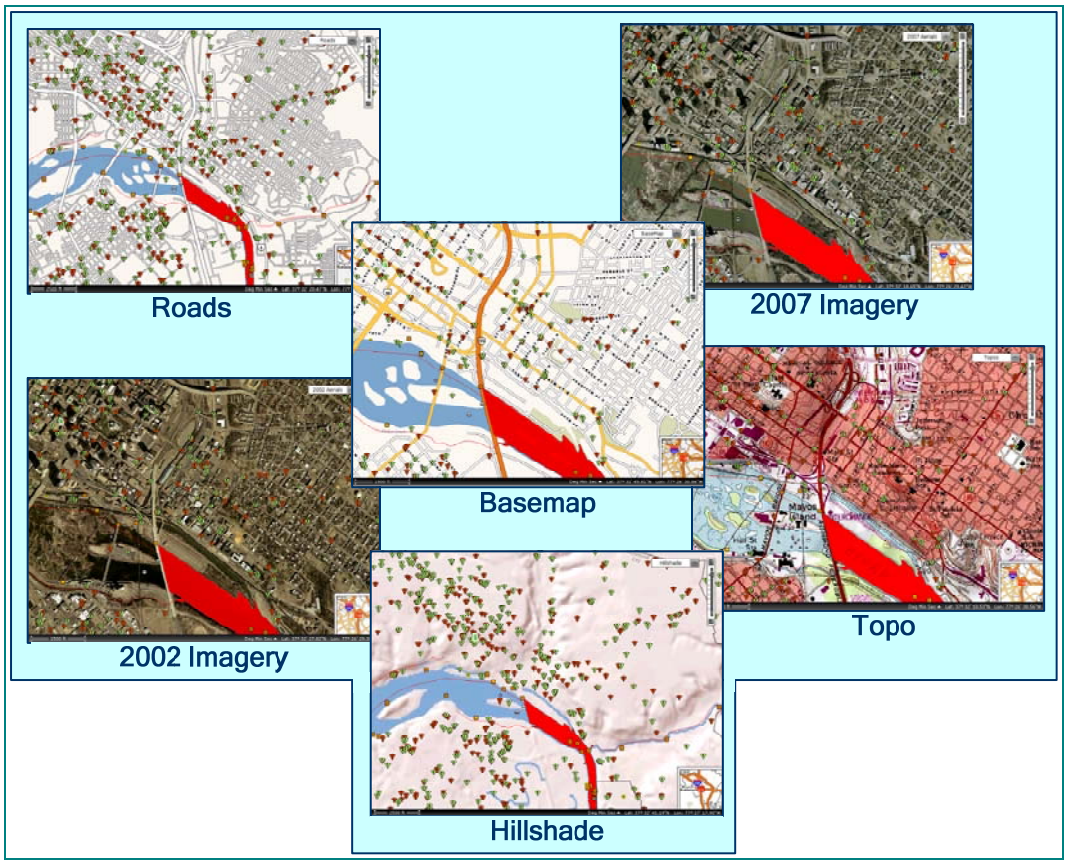
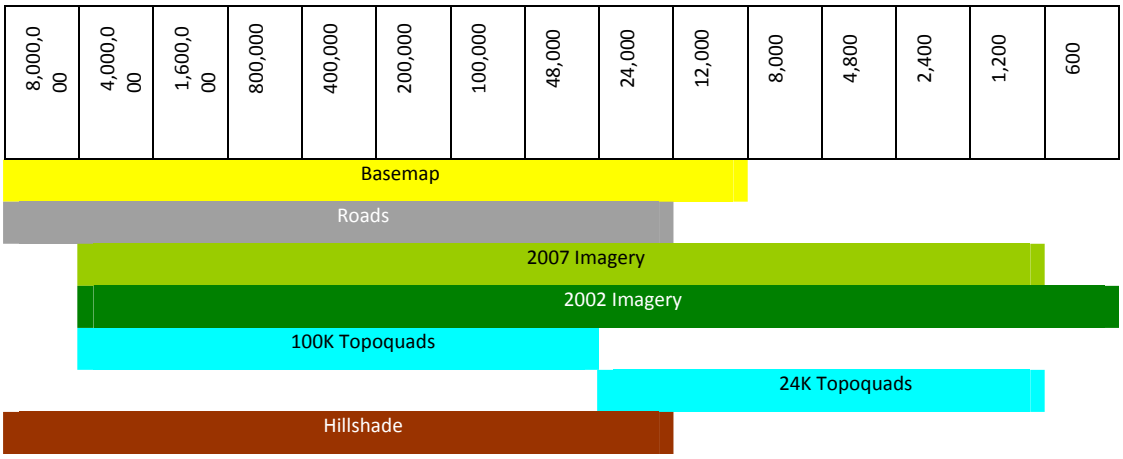


Figure 24 - Imagery Sets Comparison

- **Basemap** – includes generalized roads, county and city boundaries, and generalized lakes, rivers, and reservoirs.
- **Hillshade** – A raster data set that provides an alternate method for viewing topographical features.
- **Roads** – includes the VDOT road centerline data.
- **Topo** – includes both the 100K and 24K resolution National Geographic Topoquads.
- **2002 Imagery** – contains VBMP photographic imagery flown during the 2002 season.
- **2007 Imagery** – contains VBMP photographic imagery flown during the 2006 and 2007 seasons.

As the view extent (zooming in and out) of the map pane is changed, it snaps to preset resolutions dictated by the VGIN imagery cache. These are various graduations from 1:8,000,000 to 1:600. Not all of the imagery sets are available at all of the resolutions. The following chart demonstrates the availability of different VGIN imagery sets at various resolutions.

Imagery Availability by Resolution



However, not all of the imagery within the 2002 or 2007 raster sets is uniform. These imagery sets are primarily funded by localities, which have different resolution needs. While some rural areas have no need (or funding) for high-resolution imagery, some highly developed areas need high-resolution imagery.

GLOSSARY

CURSOR	A cursor is a pointer that indicates where information will be placed; or an action will occur. The pointer is moved by using the computer's mouse.
DATASET	A logical grouping of related data points, lines, or poltgons and their associated attribute data.
DOUBLE-CLICK	Double clicking refers to using the button on the mouse - usually to select an item. To perform a double click, the mouse button must be quickly pressed twice; usually both clicks must occur within a half a second.
DRAGGING	Dragging is the procedure to move items on the computer's screen from one location to another. In order to drag an item, the mouse cursor is positioned on the item and the left mouse-button is pressed. Whilst keeping the mouse-button pressed the item is moved to the desired screen location by moving the mouse; releasing the mouse-button, places the item at its current position.
VBMP	Virginia Base Mapping Program
GIS	GIS is an acronym for Geographical Information System. Any system that captures, stores, analyzes, manages, and presents data that is linked to a location.
HANDLE	A handle is represented by a box on a geometric shape that permits a portion of the shape to be moved.
ICON	An Icon is a small graphic image that represents a program feature. Usually, left clicking an Icon will activate the feature.
IMAGERY	Photographic pictures sets captured at high altitude for use in mapping.
LEFT-CLICK	Once the mouse cursor is positioned to the desired location on the computer's monitor, the left-most mouse button is pressed.
LINE	A geometric figure formed by a point moving in s fixed direction.
LINK	A link is text, an icon, or other information that when clicked moves to another area of the screen, opens information, or brings up an entirely new screen.
MAP LAYERS	Map layers are groups of related features that can be added to a map and then manipulated to display a particular set of features or theme.
MAP SERVICES	A map within this application that has different groupings of data layers specific to a media, theme, or purpose.
PAN	Panning causes the map to move within the Map Viewing Pane.
POINT	A specific location or spot on a map.
POLYGON	A polygon is a geometric figure that consists of three of more vertices. Each vertex is connected by a line segment, which is called a side or edge, that is connected to another vertex.
RASTER	A map that is stored as a regular array of cells.
RENDER	The process of generating an image; in the GIS Data Viewer, the image shown in the map viewing pane is rendered from selected GIS information.
RIGHT-CLICK	Once the mouse cursor is positioned to the desired location on the computer's monitor, the right-most mouse button is pressed.
SINGLE FEATURE CLASS	A Single Feature class is the assignment of a single point, line, or polygon to an existing data row. This application is not designed for multiple feature class assignments to existing data rows. It will not accept more than one point, line, or polygon for any one data row.
SPATIAL DATA	Is the graphical geometry that defines a point, path, or outline of a feature.
TOPOQUADS	A map that shows topographic features, usually by means of contour lines.

URL	URL is an acronym for Uniform Resource Locator; it is the address of information on the Internet.
VDOT	The Commonwealth of Virginia Department of Transportation
VERTICES	A vertex is the point at which two sides of a triangle or polygon met. Vertices are two or more vertex.
VGIN	The Commonwealth of Virginia Geographic Information Network
VIEW EXTENT	View Extent refers to the current scale at which the map is viewed. This is sometimes referred to as zoom or magnification.
ZOOM	Zooming causes the map to appear larger or smaller in the Map Viewing Pane.