MarylandViewer User Guide

Overview

MarylandViewer is a Web mapping application that provides useful and freely available geospatial data to the public. MarylandViewer was developed by the Geospatial Research and Education Laboratory at Towson University. Funding for developing this Web mapping application was provided by grants from the AmericaView Consortium and the Maryland Space Grant Consortium. MarylandViewer was built using ArcGIS API for Flex (Environmental Systems Research Institute).

Prior to a description of MarylandViewer's various buttons, layer list, tools, and links, the following is a brief explanation of MarylandViewer's Internet “real estate.” MarylandViewer includes a top bar (A), a Data Layers list (B), the map display (C), navigation buttons and zoom slider bar (D), and a bottom bar (E).

Figure 1 – MarylandViewer’s buttons, layer list, tools, and links

Top Bar (A)

The top bar includes the following drop down buttons:
Figure 2 – Top bar

These buttons are easily identified by means of the down arrow on the right side of each button. The functionality of the drop down buttons will be described below. In addition to the drop down buttons, the top bar includes a “Search Maps” tool. This tool provides the user with the means to find an address or place of interest.

Data Layers List (B)

The Data Layers list is the Windows Explorer-like list of maps on the left hand side of the screen. Please note that the Data Layers list has categories of different map layers. These categories of layers are opened and closed by the plus and minus symbol, respectively.

Figure 3 - Data Layers List

Map Display (C)

The map display displays the current map (see Figure 1). On start up, MarylandViewer displays a Bing Roads base map for the entire State of Maryland. Please note that the map display will change as the user navigates around the map, requests the display of additional map layers, and shows the results of various Tools requests.

Navigation Buttons and Zoom Slider Bar (D)

The map display also includes several navigation tools along its left hand side. The navigation tools include a zoom slider bar, as well as “Zoom In” and “Zoom to Full
Extent” buttons. The latter buttons are located immediately below the zoom slider bar. Once either of these two buttons is clicked, it will be highlighted with a green border indicating that the tool has been activated.

Figure 4 – Navigation tools (note that the “Zoom In” button is highlighted in green indicating it is an active tool).

Bottom Bar (E)

Finally, the bottom bar displays Latitude/Longitude Coordinates and U.S. National Grid Coordinates. Both types of coordinates are displayed continuously as long as the cursor is positioned over the map display. The Latitude/Longitude Coordinates follow the convention of displaying North latitude as a positive coordinate and West longitude as a negative coordinate. The U.S. National Grid expands the utility of topographic and other large-scale maps by adding several powerful features: 1) it provides a grid reference system that is seamless across jurisdictional boundaries; 2) it provides the foundation for a universal map index; and 3) it enables user-friendly position referencing on certain gridded paper and digital maps. Additional information about the U.S. National Grid can be found at:


The bottom bar also includes links for a user to Contact the Office (send feedback about the application), or to view the Accessibility, Privacy Notice, and Terms of Use statements for MarylandViewer.

Figure 5 – Bottom bar

Running MarylandViewer – Displaying Map Data

Displaying a variety of map data with MarylandViewer is a simple 2 step process:
Step 1. Select the type of base map you would like to use as a background for your map(s). If you click the “Base Map” button on the top bar (or the down arrow), a drop down menu will appear offering you several base map options. These include:

Figure 6 – Base Maps button

Bing Roads
Bing Aerial
Bing Hybrid – a combination of Bing Roads and Bing Aerial
Shaded Relief – world shaded relief maps from the ArcGIS Online standard map service (Environmental Systems Research Institute)
Topographic – U.S. Geological Survey topographic maps from the ArcGIS Online standard map service (Environmental Systems Research Institute)

Click on any one of these options to change the base map.

Step 2. Select and display maps from the Data Layers list. The user can overlay a variety of map layers on a base map. The Data Layers list uses a Windows Explorer-like collapsible list of maps that have been grouped into the following categories:

**Boundaries**
- Counties
- Municipalities

**Water Features**
- Streams
- Q3 FEMA Flood Plains
- Watersheds

**NOAA Buoy Observations**

**Tide Stations**

**USGS Stream Gauges**

- Stream Flow Stations
- RAWS – remote automated weather stations
Federal Lands

**USGS Raster Datasets**

USGS Ortho Imagery
USGS Land Cover
USGS Impervious Surfaces
USGS Tree Canopy

**Weather – Nexrad Radar**

Weather – Nexrad Radar

To display any or all of these map layers, open one of the categories by clicking on the plus symbol. Click on the box of the map(s) you want to display. Finally, click on the box next to the plus or minus symbol. After you do, the layer(s) you selected will appear on the map display. To remove the map layer(s) that you displayed, click on the box next to the plus or minus symbol (or next to the map layer assuming you have opened up the group list).

![Data Layers](image)

Figure 7 – Expanded Data Layers list
One of the most important features of a geographic information system is that it provides for the storage of maps and map attributes (information about the features on a map). A user can click on any selected Data Layer features in the map display. A screen will then pop up on the map display showing any additional information (attributes) that has been recorded for the map features. For example, if a user displays Tide Stations, a click on a particular tide station will result in a pop up that lists the Station ID and Station Type. Some of the Data Layers provide links to real-time data. The Stream Flow Stations layer under the USGS Gauge Stations group provides a Web link (URL) to the near real-time data available for a station. The link can be easily identified by means of the blue, underlined number. If a user clicks on this link, a screen will pop up displaying the data for the station from the Web. The Weather – Nexrad Radar layer provides a real-time display of precipitation and atmospheric conditions.
Running **MarylandViewer** – Navigating the Map

**MarylandViewer** provides the user with a number of ways to navigate the map display. The top bar includes two navigation tools. The first one is the “Select a County” button. If you click this button (or the down arrow), a drop down menu will appear displaying a list of Maryland counties: When you click on the name of a county, **MarylandViewer** will zoom in to that county and center the map display on the center of the county. This button can also be used to zoom out to the entire State of Maryland.

![Select County button](image)

**Figure 10 – Select a County button**

The other navigation tool on the top bar is “Search Map” tool. This tool allows a user to search for an address or place of interest. An address can include:

- a street number, street name, city, state, and zip (example: “100 State Circle Annapolis MD 21401”); or

- a street intersection (example, “York Road and Burke Avenue Towson MD”); or

- the name of a place (example: “Ocean City MD”); or

- latitude/longitude coordinates (example: “39.2633N 76.5799W” or “39.2633 -76.5799”)
In order to use this tool, the user must enter an address in the white box in the top bar that says “Find an address or place of interest” and then click the “Search Map” button. In general, the more information a user supplies, the better the MarylandViewer geocoder will be at locating the address or place requested. Once MarylandViewer finds the address or place of interest, it will redisplay the map with the address or place of interest centered in the screen (and with the map zoomed in to show additional detail in the vicinity of the address or place of interest.). The address or place of interest will be identified on the map with a red transparent dot. MarylandViewer’s “Search Map” tool uses Bing Maps’ robust geocoder.

MarylandViewer includes several additional navigation tools (see Figure 4). The map display follows standard Google Maps practice. In other words, double clicking on the map display will cause the map to zoom in. Clicking and holding down the left mouse button will allow you to pan the map display (corresponding to what some describe as the “slippy map” pioneered by Google). Finally, you can use your mouse’s scroll wheel to zoom in and zoom out the map display.
On the left hand side of the map display is a zoom slider. Left click the plus symbol at the top of the slider to zoom in; left click the minus symbol at the bottom of the zoom slider to zoom out. If you click on the left arrow slider bar and continue holding onto the arrow, a tool tip will appear showing the map scale (representative fraction) at that level of zoom. The left slider bar can be moved up and down to change the scale (zoom in or zoom out) of the map display.

Finally, there are two navigation buttons below the zoom slider. The top button is “Zoom In” and the bottom button is “Zoom to Full Extent.” Click on a tool to activate it. Once a user clicks a button, the button will be activated (an active button has a green border). These navigation buttons perform different navigation functions. The “Zoom In” button zooms in to a small geographic area that the user defines by clicking and holding the left mouse button and dragging the mouse to the right and below. Once the user releases the left mouse button, the map displays zooms to the new geographic area (the area identified by the user) and redispays any data on the map display to a larger (more detailed) scale. The “Zoom to Full Extent” button returns the map display to show the entire State of Maryland (the same geographic area that displays when MarylandViewer starts up).

Running MarylandViewer – Using the Tools

The top bar of MarylandViewer has a “Tools” drop down button. The “Tools” button includes more advanced functions the user can perform on the data in safeMAP. If you click the “Emergency Type” button on the top bar (or the down arrow), a drop down menu will appear offering you several tool options. These include:

- Adjust Layer Transparency
- Clear Map Markups
- Driving Directions
- Measure Distance
- Print
- Reverse Geocode
- Show/Hide Live Weather

Figure 13 – Tools button
The “Adjust Layer Transparency” tool allows the user to lighten or darken selected map overlays. When the user clicks on this tool, a screen will pop up on the map display. The screen lists all maps overlays for which layer transparency can be adjusted and provides a slider bar for adjusting the transparency. Moving the slider to the left for a layer lightens the layer (makes the colors on the map layer more transparent). Moving the slider to the right darkens the layer (makes the colors on the map layer more opaque). Map layers for which transparency can be adjusted include:

- Boundaries (all layers)
- NOAA Buoy Observations
- USGS Stream Gauges
- USGS Raster Datasets
- Water Features (all layers)
- Weather – NEXRAD Radar

![Figure 14 – Result of Adjust Layer Transparency tool (NEXRAD radar layer made darker)](image)

The “Clear Maps Markup” tool removes selected information from the map display. Certain tools, notably the “Search Map” tool places a red transparent circle on the map for an identified address or place of interest. The “Clear Maps Markup” tool will remove these symbols from the map display.

The “Driving Directions” tool provides driving directions given a “from address” and “to address.” When a user clicks on the “Driving Directions” tool, a screen will pop up on the map display. Once the user enters from and to addresses, and clicks the “Get
Directions” button, **MarylandViewer** will determine the fastest route between the two points. The route will be shown on the map display and turn by turn directions will be listed on the pop up.

**Figure 15 – Result of Driving Directions tool (from “8000 York Road, Towson, MD 21252” to “100 State Circle, Annapolis, MD, 21401”)**

The “Measure Distance” tool allows the user to measure linear distance on the map display. After clicking the tool, the user positions the cursor on the map display, clicks and holds the left mouse button, and traces a line on the map (displayed in purple). When the user releases the left mouse button, a screen will pop up on the map display showing the length (distance) of the line in miles and kilometers.
The “Print” tool allows a user to print the map display. The “Print” tool can be used at any time by the user and include any number of map overlays for any geographic area. After clicking the tool, a screen will pop up on the map display showing the map to be printed. The user can enter a title for a map and then send a copy of the map to a printer, or to any other print driver or device installed on the computer, such as a print to PDF driver.

The “Reverse Geocode” tool allows a user to determine a street address from a mouse click. Once this tool is activated, the user can click on the map to determine the nearest street address. A screen will pop up on the map display showing the street address, including city, state, and zip code. To use this tool, it is recommended that a user zoom in to the area of interest, activate the tool (by clicking on the “Reverse
Geocode” code under the Tools drop down button), and then click on the map. The user may also want to change from the Bing Roads to Bing Aerial base map to display structures to ensure that the correct street address for a location is identified.

![Reverse Geocode](image)

**Figure 18 – Result of Reverse Geocode tool**

The “Show/Hide Live Weather” tool allows a user to display weather station observations from Weather Underground (http://www.wunderground.com/). When a user activates this tool, a screen will pop up on the map display. The user needs to enter a “zip code,” or a “city, state,” or an “airport code.” Examples include 21201, Towson, MD, and BWI, respectively. The user can also control whether to display personal weather station observations and the current temperature at locations. Wunderground's network of weather stations includes National Weather Service stations as well as the weather stations of government agencies, businesses, and individuals. After the user enters a location (“zip code,” or “city, state”, or “airport code”), weather stations will appear on the map display for the area around the user-requested location and a screen will pop up on the map display showing current weather data for all of the weather stations. When the user mouses over one of the stations, a screen will pop up on the map display showing the current weather data for the station. If the user clicks on the right arrow on the display for a station, MarylandViewer will open up another window and link to the station information on Wunderground. This enables a user to access forecast data, as well as climate data for the station.

![Show/Hide Live Weather](image)

**Figure 19 – Show/Hide Live Weather tool**
The top bar also includes an “About” button. If you click this button, or the down arrow, a drop down menu will appear offering you several tool options. These include:

About
Help

Clicking the “About” button provides basic information about MarylandViewer including information about how to contact the developers of the Web mapping application at Towson University. The “Help” button provides a current copy of this document. A MarylandViewer tutorial is currently being developed. A “Tutorial” button will be added to MarylandViewer as soon as it is available.
Figure 22 – About tool

**Maryland Viewer** is developed by the following members of the Geospatial Research and Education (GRE) Laboratory of the Department of Geography and Environmental Planning at Towson University during the 2009-2010 academic year:

- John M. Morgan, III, Ph.D., Professor and GRE Laboratory Director (project director)
- Sharad Gang, Graduate Student (programmer)
- Phillip L. Reese, M.A., GRE Laboratory Manager (data manager and programmer)
- Erica Cress, Graduate Student (GIS data specialist)