Map Viewer User Guide
Sea Level Scenario Sketch Planning Tool

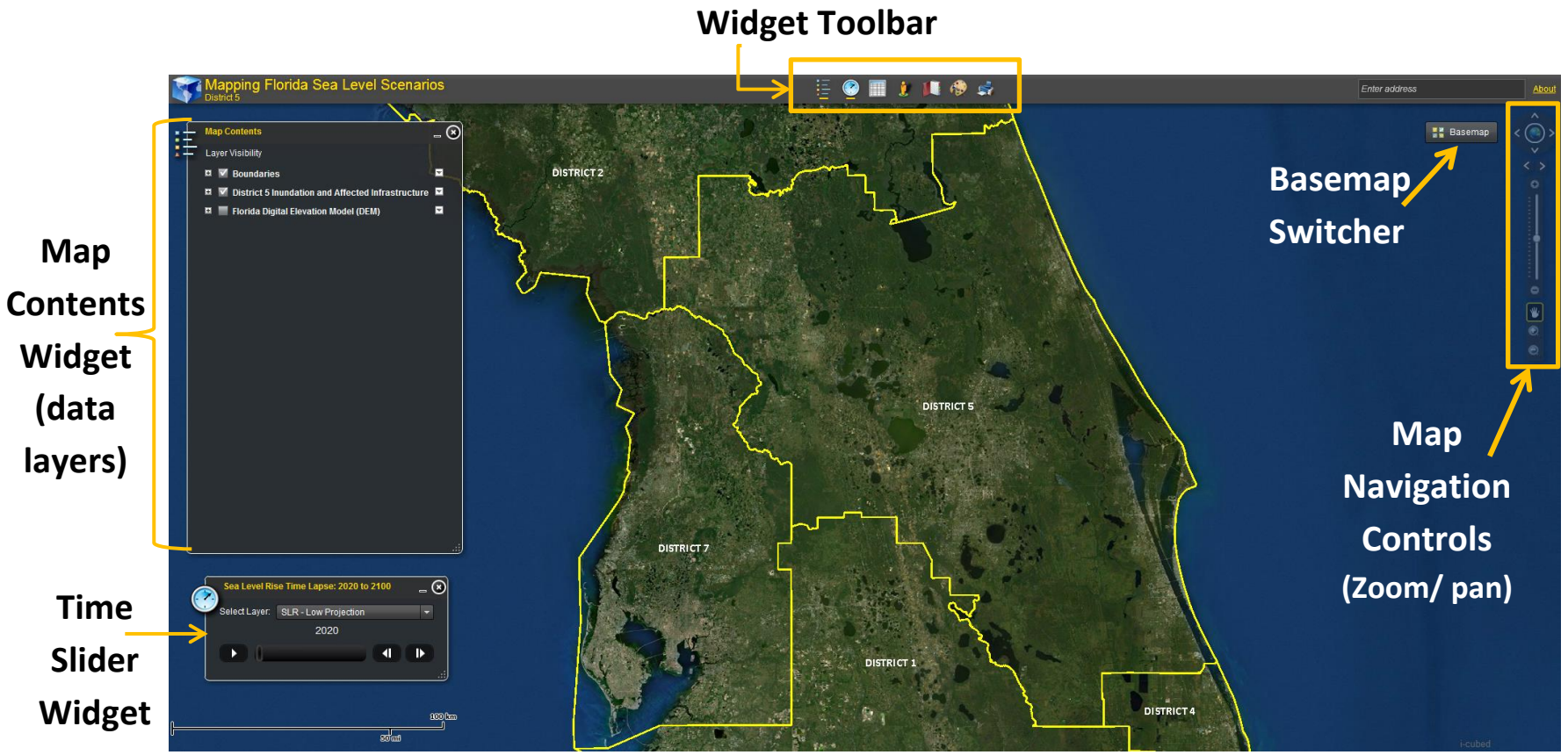
With funding from the Florida Department of Transportation (FDOT), the University of Florida GeoPlan Center developed the Florida Sea Level Scenario Sketch Planning Tool to facilitate the identification of transportation infrastructure potentially at risk from projected sea level changes. The Sketch Planning Tool includes a set of three tools (1) Florida Sea Level Scenarios Map Viewer, (2) GIS Data Layers (SLR Inundation surfaces and affected infrastructure layers), and (3) Sea Level Change Inundation Surface Calculator for ArcMap.

The purpose of this document is to guide users on how to use the **Sea Level Scenario Sketch Planning Tool Map Viewer**. The map viewer visualizes various sea level scenarios at future time periods (2040, 2060, 2080, and 2100) in an effort to inform transportation planners and highlight infrastructure for potential avoidance, minimization, or mitigation. Users can view areas of projected inundation and potentially affected infrastructure. The inundation layers (called "inundation surfaces") were generated using three rates of SLR from the U.S. Army Corp of Engineers (USACE) sea level change methods: Low (Historic rate), Medium (Intermediate Curve), and High (High curve) and Florida tide gauge data from the National Oceanic and Atmospheric Administration (NOAA). Projected inundation was mapped at five tidal datums, but only two are displayed in the map viewer: Mean Higher High Water (MHHW) and Mean Sea Level (MSL).

The map viewers are accessible from the project website: http://sls.geoplan.ufl.edu. From the website, click on the "View Maps" tab at the top of the page to access the map viewers. The map viewers are organized by FDOT District (1-7). District 2 was split into east and west regions to more accurately capture sea level and tidal differences between the Atlantic Ocean and Gulf of Mexico. To get started, click on your District of interest.

Map Viewer – Overview

This is the default view of the Map Viewer (FDOT District 5 example). This User Guide will explain how to use this map viewer and the highlighted features below in detail. Many of the map tools are called "widgets". The Map Viewer is best viewed in Mozilla Firefox or Internet Explorer.



Map Navigation Controls

The Map Navigation Controls allow you to explore the map with tools such as pan, zoom in and zoom out.

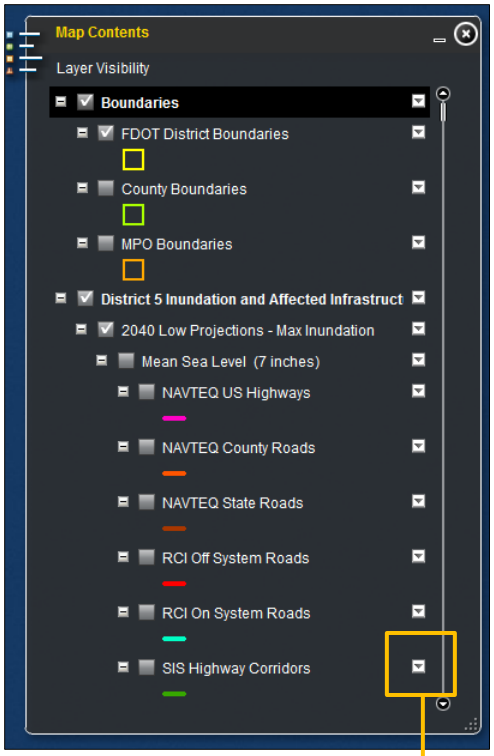
The Map controls are located in the top right corner of the map viewer.

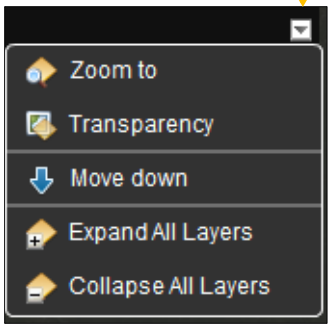
In order to use one of the map controls, you must first click on the tool to enable it.

If you have a scroll wheel on your mouse or keyboard, that will allow you to zoom in or out on the map, regardless of the map control selected.

The Previous Extent and Next Extent tools are very helpful for jumping to and from previous map extents. In addition, if you accidentally pan or zoom in/out on the map, the Last Extent tool will jump you back to your last view of the map.

Map Contents (Widget Toolbar)





The Map Contents widget lists the data layers that are displayed in the map viewer. There are three main folders which organize the data:

- **Boundaries**: Contains boundaries for FDOT Districts, Counties & MPOs.
- **District Inundation and Affected Infrastructure:** Contains SLR inundation surfaces and affected infrastructure layers.
- **Florida Digital Elevation Model (DEM):** Contains the DEM Mosaic compiled for and used in this project.

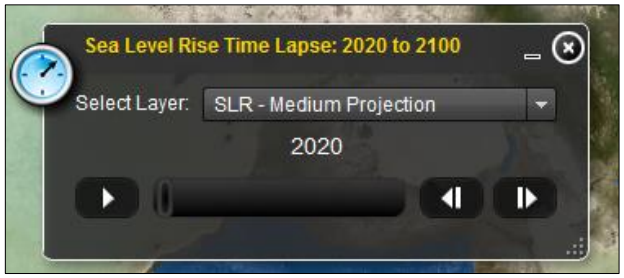
The Map Contents widget is open by default.

If the widget is closed, it can be reopened using this icon:

The Map Contents folders and legends can be expanded by clicking the plus symbol to the left of each folder and layer.

To view more layer functions, click the down arrow symbol to the right of each folder and data layer. These commands allow you to zoom to layers, adjust transparency (if available), move layers within the TOC, and expand or collapse all layers.

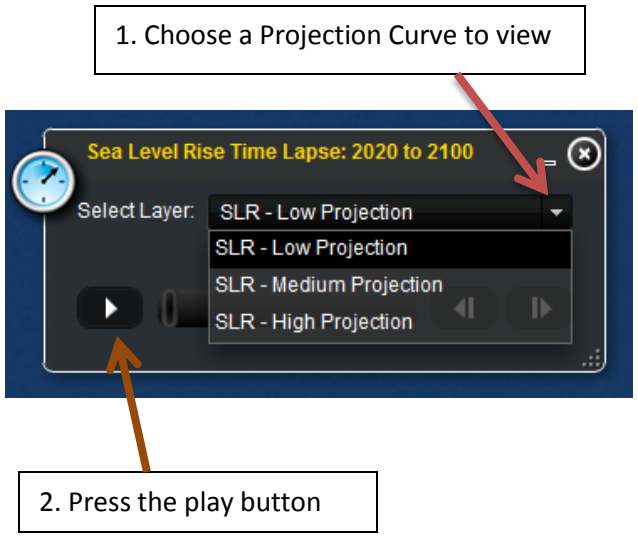
Time Slider (Widget Toolbar)



The time slider widget allows you to run an animation showing sea level change inundation at high, medium, or low levels (each at Mean Sea Level). The slider starts at the year 2020 (no inundation) and changes are displayed for the years 2040, 2060, 2080, and 2100.

The time slider widget is open by default, and looks like the window to the left.

If the widget closed it can be reopened using this icon: 



To play the time slider animation, first choose a Projection Curve from the drop-down menu.

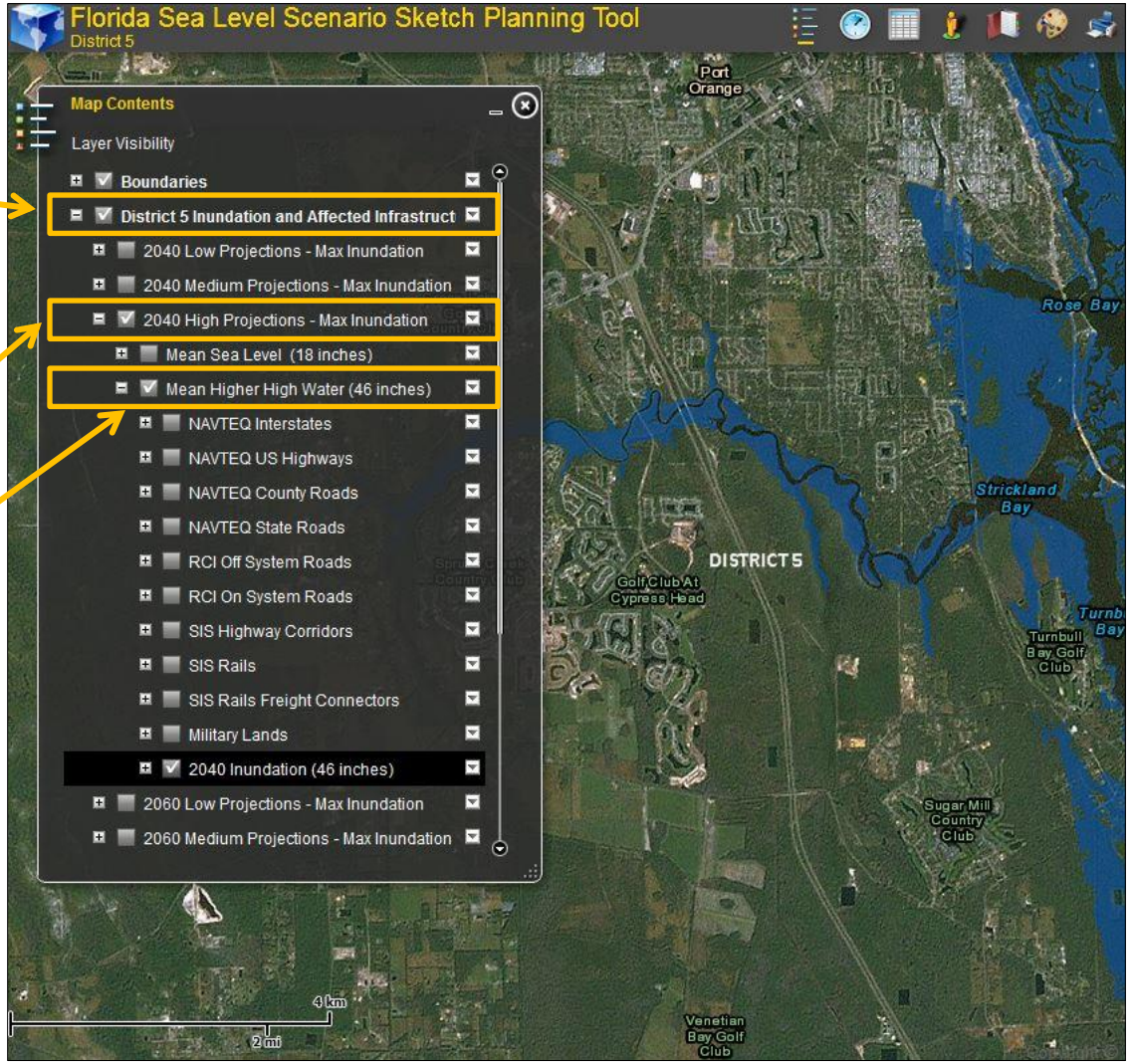
Press the play button  to start the inundation animation. Click the play button again to stop, or use the forward and back buttons  to move through the animation manually.

Please note: some areas were not inundated enough at low levels to create surfaces so some Districts may not include a low or medium projection animation.

Map Contents: Viewing Inundation Surfaces

1. **Expand folder:** "District 5 Inundation and Affected Infrastructure" **by clicking the plus sign on the left**.
2. Choose a decade (2040, 2060, 2080 or 2100) and Projection Curve (Low, Medium, or High). **Expand the chosen folder by clicking the plus sign on left.** *Example: 2040 High Projection*
3. **Choose a Tidal Datum by checking the box to the left**. **Next, expand/ open the folder by clicking the plus sign on left.** *Example: Mean Higher High Water (MHHW) chosen.*

Example map to the right displays District 5 inundation (in blue) for 2040, using the USACE high curve at MHHW, which is approximately 46 inches of inundation.



View Attributes of Affected Infrastructure (Widget Toolbar)

With this widget, users can explore attributes of infrastructure features potentially at risk to sea level change inundation and view the approximate miles or acres of the feature inundated under various sea level scenarios. In addition, the attribute records can be exported to a comma-separated file (.csv) which can then be used in Microsoft Excel.

This widget is not open by default. Click the table icon in the widget toolbar to open the view attributes widget. **This widget will only display attributes of layers currently turned on and visible in your map extent. As you zoom in and out, records in the table will update based on the map extent.**

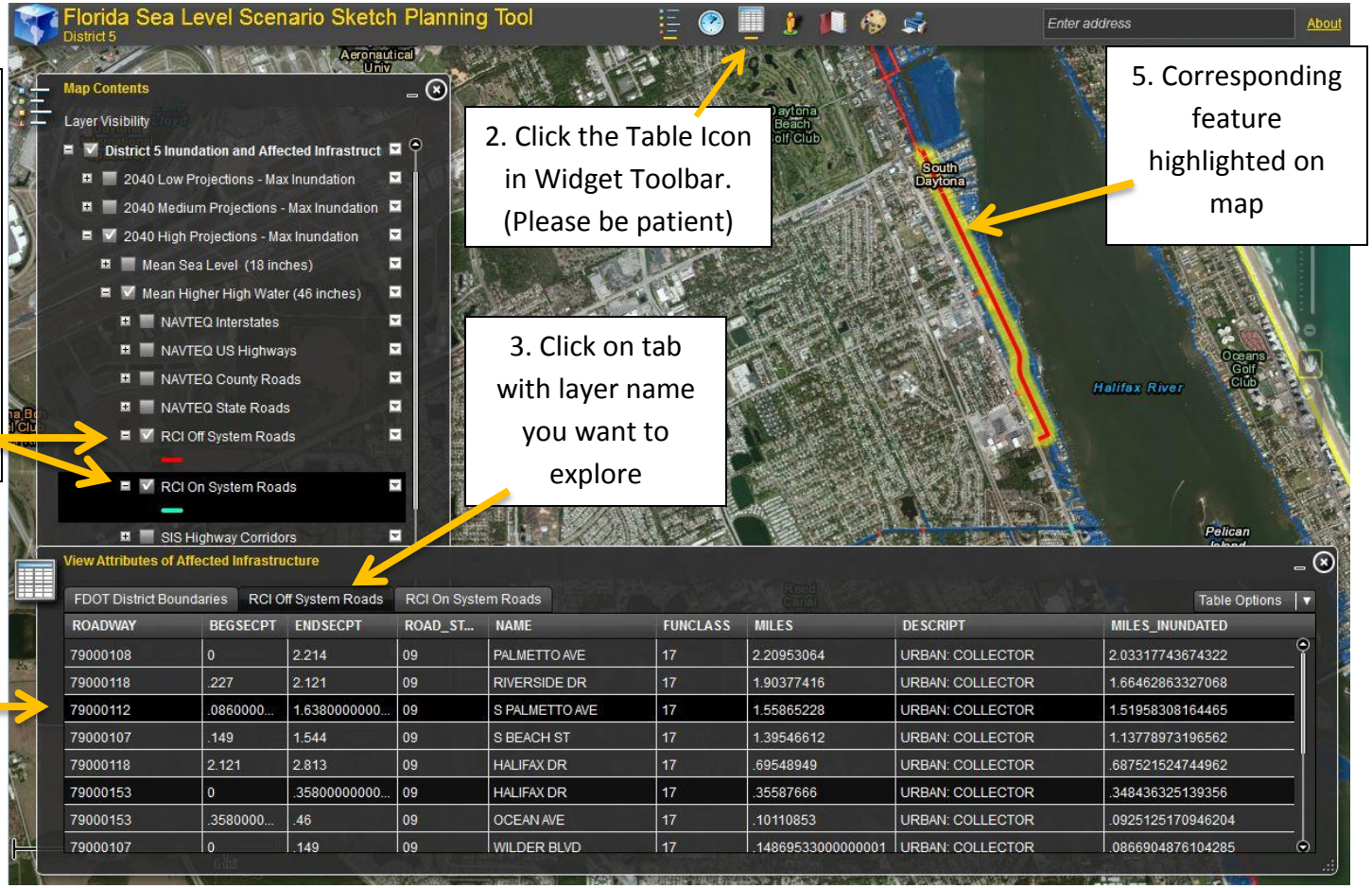
PLEASE NOTE: This tool may take a few moments to load, as it searches through many layers and records. If it is taking a long time to load, try turning off (unchecking) some layers, or zooming in to a smaller map extent.

Each layers' table is returned as a tab in the widget as seen below. All fields are sortable.

ROADWAY	BEGSECPT	ENDSECPT	ROAD_STATU	NAME	FUNCLASS	MILES	DESCRIPT	MILES_INUNDATED
79000339	0	.066	09	SAUL ST	19	.0658645	URBAN: LOCAL	.0075982501150113
79000338	0	.11	09	LANTERN DR	19	.109656650000000...	URBAN: LOCAL	.00675539999499953
79525000	2.692	4.609	12	S WILLIAMSON BLV...	14	1.91924966	URBAN: PRINCIPAL ARTE...	.0392948159427408
79000153	.358000000...	.46	09	OCEAN AVE	17	.10110853	URBAN: COLLECTOR	.0925125170946204

View Attributes of Affected Infrastructure

Follow the steps below to see attribute information for infrastructure layers. In the example below, attributes for RCI Off-System Roads are displayed in the table widget. Highlighted on the map is a segment of S. Palmetto Ave, which has approximately 1.519 miles inundated.



1. In the Map Contents, **turn on the layers** for which you want to view attributes (check the box on left)

2. Click the Table Icon in Widget Toolbar. (Please be patient)

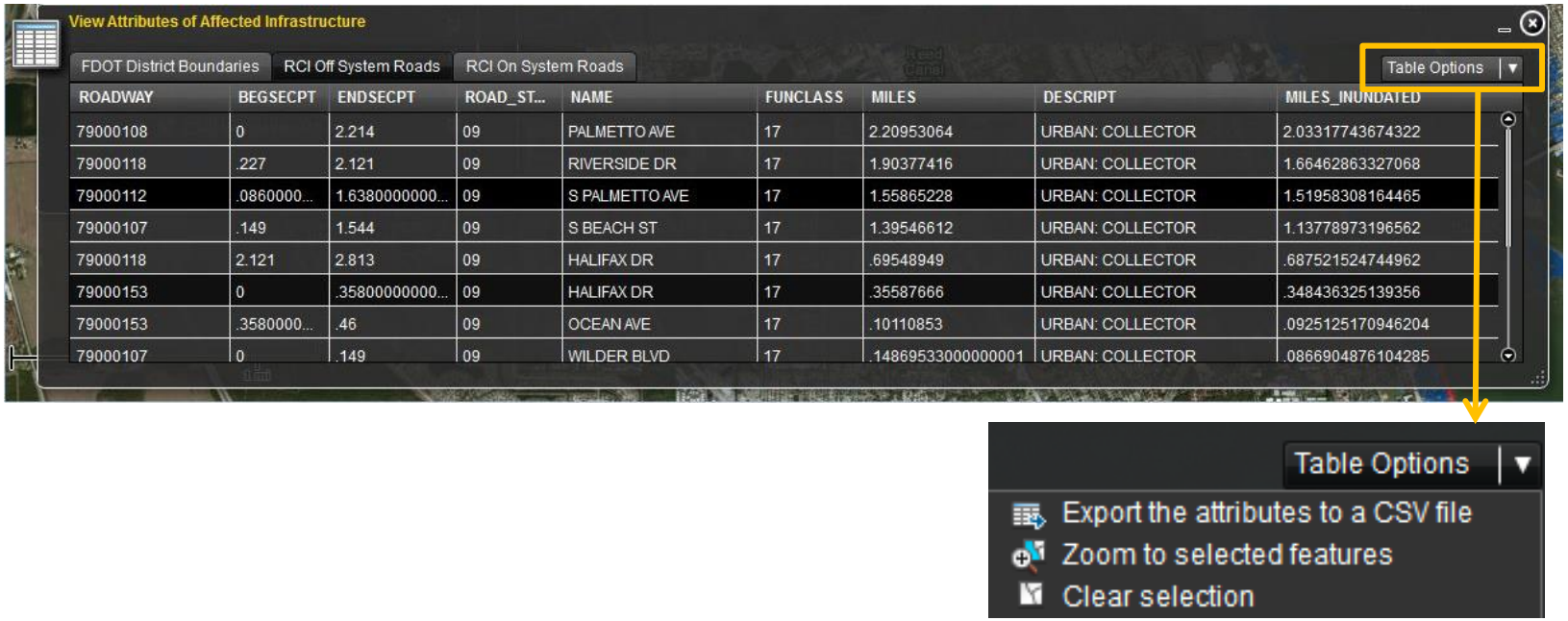
3. Click on tab with layer name you want to explore

4. Click on record in table

5. Corresponding feature highlighted on map

View Attributes of Affected Infrastructure: More Functions

On the right side of the attribute table, more table functions can be accessed from the "**Table Options**" drop-down menu. These commands allow you to export the selected attribute table to a comma-separated file (.csv), zoom to a selected feature, and clear all your selections. The csv file can be used in Microsoft Excel and other spreadsheet programs to create a custom report of potentially affected infrastructure for your area of interest. Only the attributes for one layer at time (the highlighted tab) will be exported. Additional layers must be exported individually.



Google Street View (Widget Toolbar)

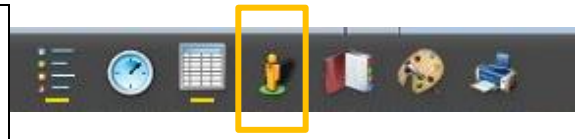
The Google Street View widget allows you to view Google Street View Panoramas in a popup window. This tool is useful for exploring road conditions where potential inundation is expected to occur.

This widget is equipped with a browser popup blocker detector to warn the user if they have a popup blocker enabled. **If popups are blocked this widget will not work.**

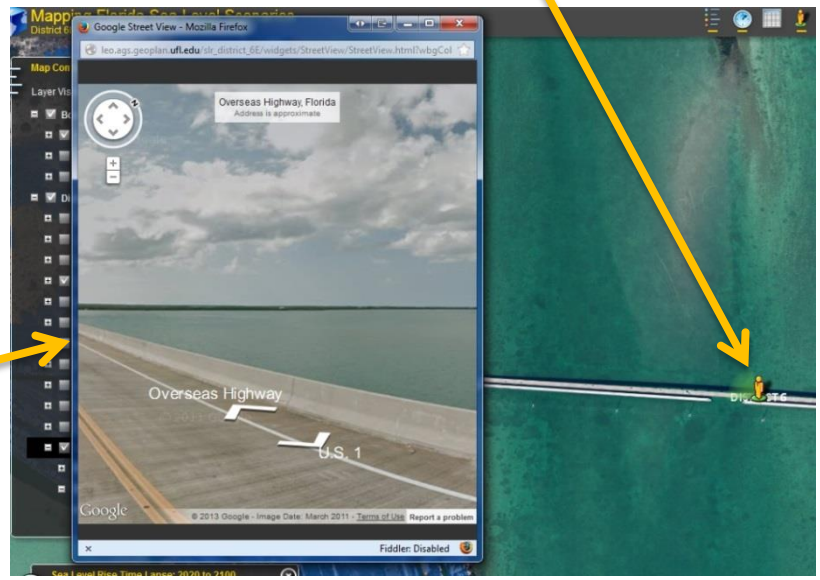
This widget is not open by default. Click on the peg man icon in the widget toolbar to activate. When the widget opens you will see the Google Street View window.

Drag the peg man to the road you would like to view. Peg man must be on the actual road for your images to appear. Panoramas will be displayed in a separate pop up window.

1. Click on peg man icon in toolbar to activate. Window below will open.



2. Drag peg man to street on map. Peg man must be on actual road



3. Panorama Street View Pop-up window opens. You can rotate view 360 degrees by dragging the screen.

Bookmarks (Widget Toolbar)

The bookmarks widget allows the user to “bookmark” a specific geographic area (map extent), so they can easily zoom to that area.

This widget is not open by default. Click the Book icon in the Widget Toolbar to open the bookmarks widget. There is a bookmark pre-set for each county within the FDOT District that is being viewed and one for the entire FDOT District itself.

You can add your own bookmarks using this icon from within the widget. A dialog will open up that will ask you to add a name for your bookmark, set the map extent, and add your bookmark.

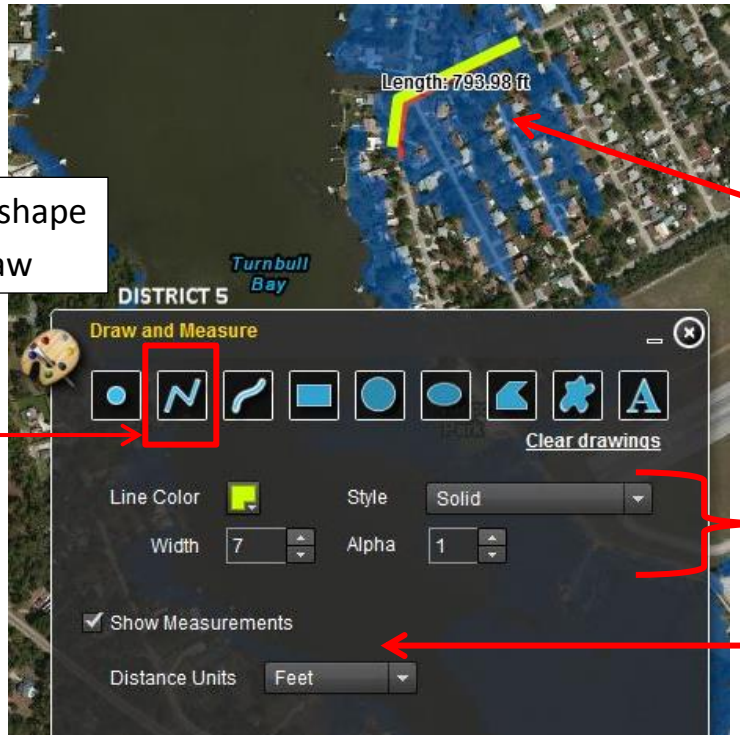
Your newly created bookmarks are stored within your browser, so if you use a different browser or clear your browsers cache they will no longer persist. They can be deleted directly from the widget using the red X icon:

Draw and Measure (Widget Toolbar)

The Draw and Measure Widget allows you to draw lines, shapes, and comments directly on the map, and also allows you to measure features on the map. This widget is not open by default. Click the easel icon in the Widget Toolbar to open the draw and measure widget. There are numerous drawing tools, each of which can be personalized by changing line color, fill color, width, font, etc.

1. Click on easel icon in toolbar to activate.

How to: Measure a Line with the Draw and Measure Widget



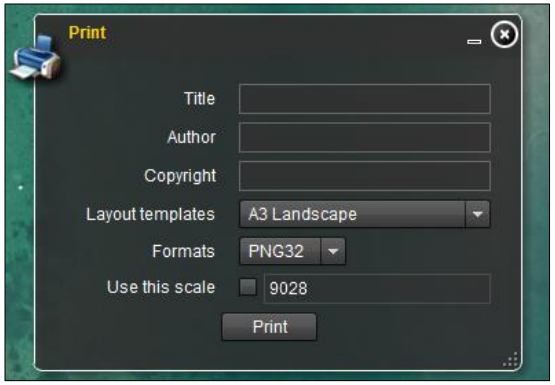
2. Select shape to draw

5. Draw desired shape on map. Distance units will display near drawing.

3. Select color and other shape attributes (if desired)

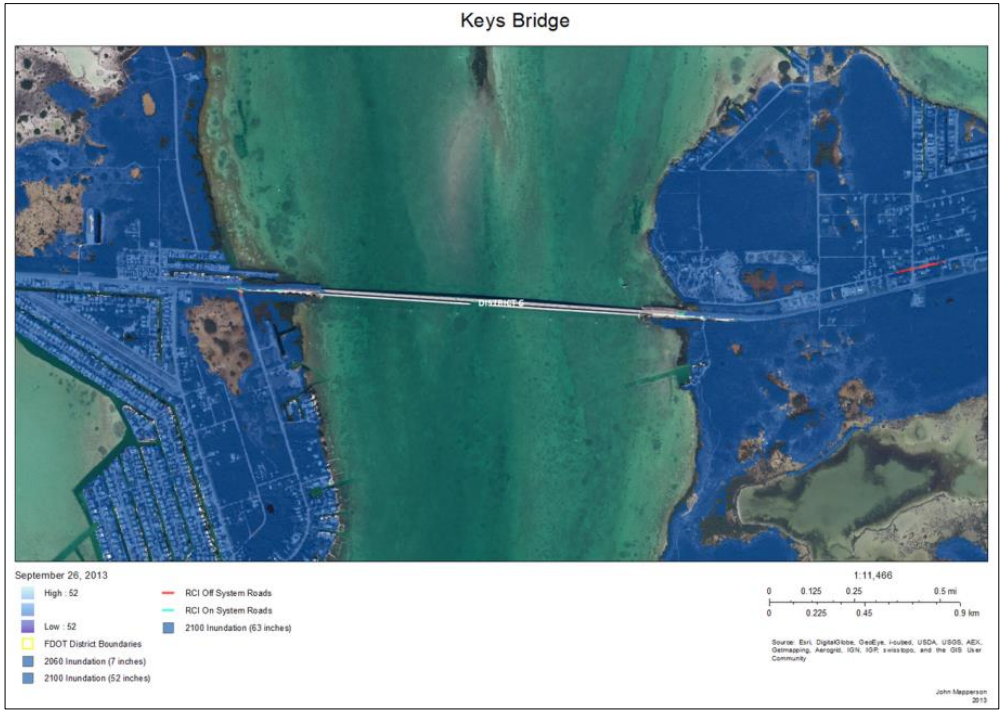
4. Check box “Show Measurements” and Choose measurement units

Print (Widget Toolbar)

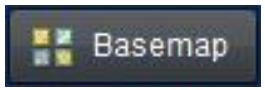


The print widget allows you to create a map of the current map view. This widget is not open by default. Click the print icon on the Widget Toolbar to open the print widget (shown at left).

From the widget window you can add a title, author, and copyright information. You may also choose the layout template, format, and scale.



After you press the “print” button, a new browser window will be opened with a print ready map, including all of your information added. See example to the left.

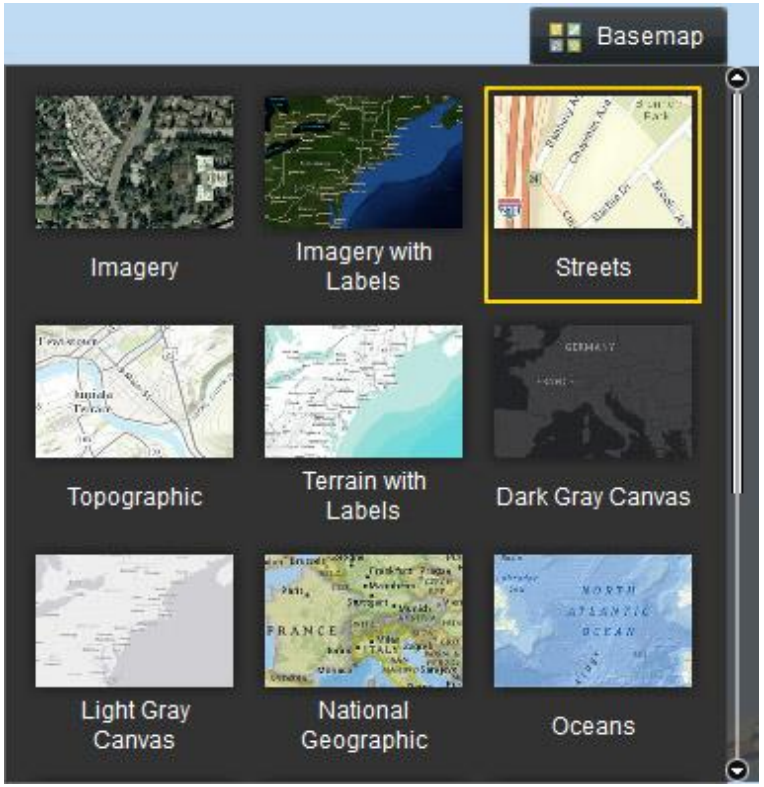


Basemap Switcher

The basemap switcher allows you to change the basemap that is displayed in the map viewer. By default, Imagery is the default basemap displayed.

To change the basemap, simply mouse over the basemap icon, and click the basemap image you would like to use. The map will be refreshed with your new basemap.

Other basemap choices include, Imagery with Labels, Bing Roads, ESRI Streets, Topographic, Terrain with Labels, Light Gray Canvas, National Geographic, Oceans, and Open Street Map. To the right is an image of the basemap widget expanded.



Address Locator

The address locator is located in the top right corner of the map viewer, to the right of the Widget Toolbar. Enter a valid address into the input box and hit enter, and the map will zoom to that address. The input box will auto-complete with known addresses.