Map Viewer User Guide

Sea Level Scenario Sketch Planning Tool

Version 4, December 2025

University of Florida GeoPlan Center

Introduction

This user guide describes how to use the Sea Level Scenario Sketch Planning Tool Map Viewer (Version 4, updated December 20205). The map viewer visualizes transportation assets and their exposure to **current flood risk** (100-year and 500-year floodplains and hurricane storm surge zones) and **future flood risk** using sea level rise (SLR) scenarios from the National Oceanic and Atmospheric Administration (NOAA) 2022 Technical Report (Sweet et al., 2022).

The SLS Sketch Planning Tool was created by the University of Florida GeoPlan Center with funding from the Florida Department of Transportation. SLR scenarios and transportation analyses were updated in 2025 with updated input data. The SLS Sketch Planning tool can assist in understanding how and when future sea level rise (SLR) may impact the transportation system.

The SLS Sketch Planning Tool includes: (1) Online map viewer for visualizing current and future flood risk under SLR scenarios and potentially affected transportation infrastructure and (2) GIS data layers of SLR inundation and affected transportation.

Accessing the Map & Supported Browsers

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 Viewer is best viewed in Google Chrome or Mozilla Firefox.

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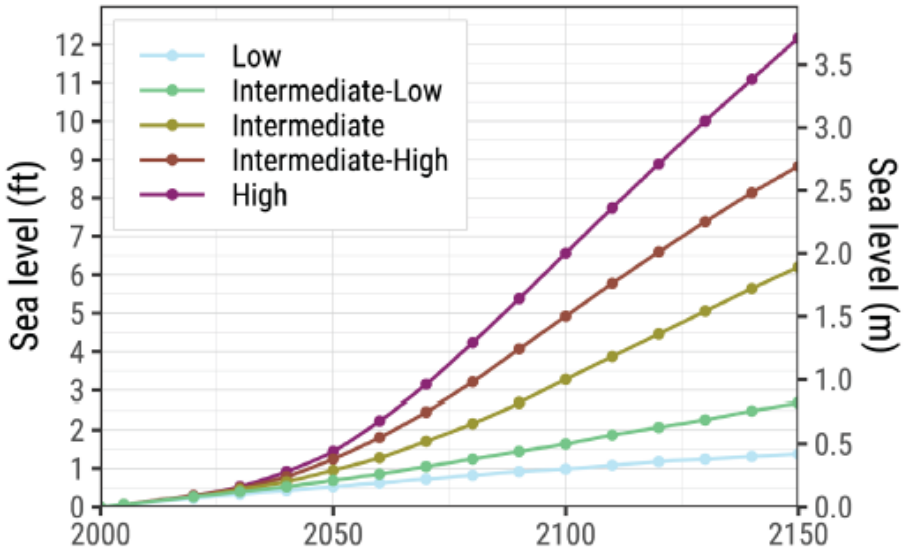
SLR Projections Available

Users can explore areas of projected inundation (flooding) and potentially affected infrastructure for scenarios from 0.5 feet to 10 feet of SLR above mean higher high water (MHHW). Users can also select one of the five NOAA 2022 SLR scenarios (Low, Intermediate-Low, Intermediate, Intermediate-High, and High) for a decade between 2040 – 2150. The Sketch Planning Tool uses SLR inundation depth grids from NOAA's Office of Coastal Management.

The closest ½ foot SLR layer was associated with the NOAA 2022 scenarios. Relative SLR values by tide station in Florida were downloaded from NOAA. For each scenario and decade (from 2040 – 2150), we gathered the range (minimum and maximum) and median of relative SLR values for all Florida stations. We then matched the maximum relative SLR value to the closest ½ foot.

NOAA 2022 Global and Regional Sea Level Rise Scenarios for the United States (Sweet et al, 2022).



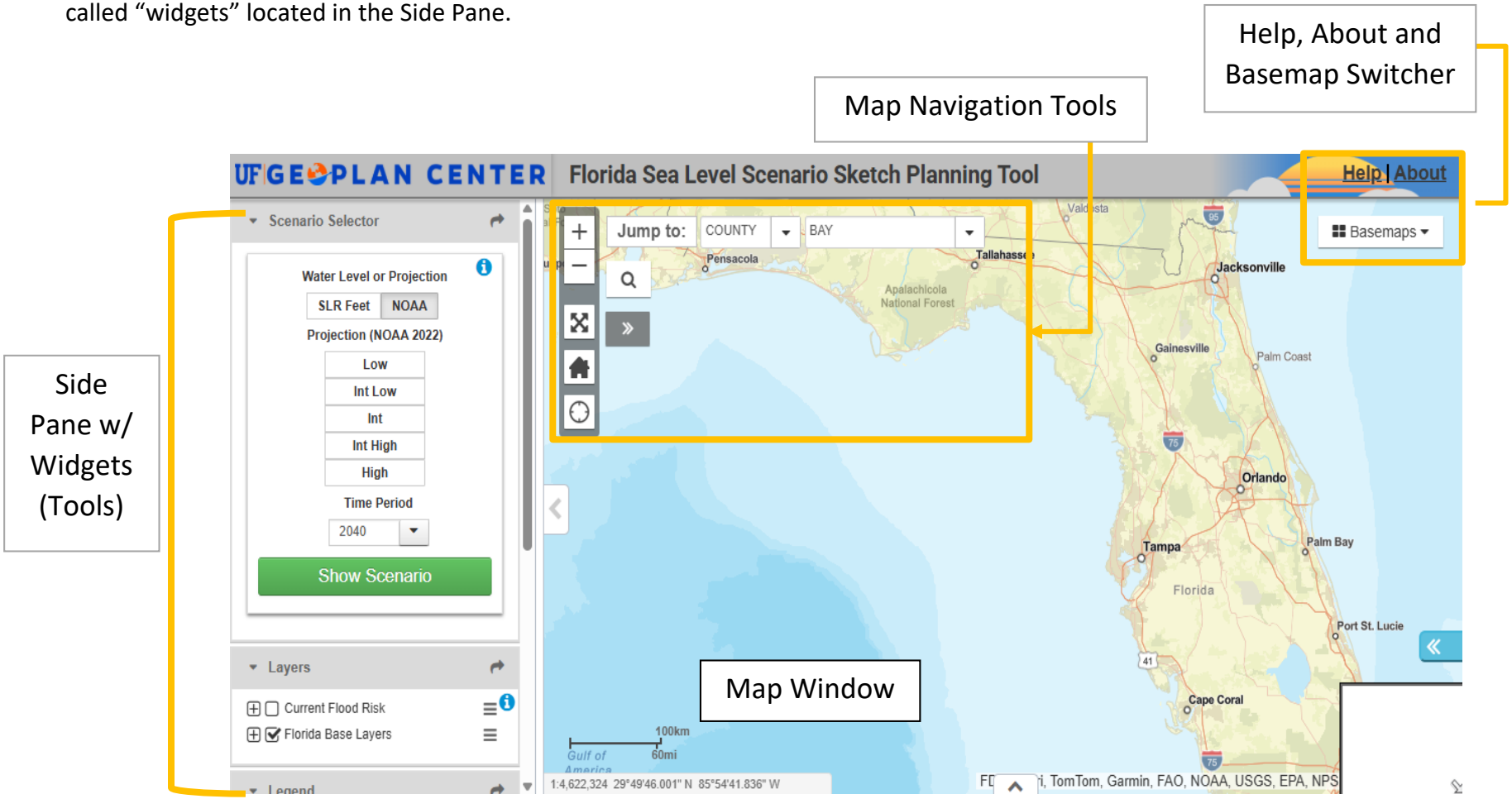
	Year		
Scenario	**2050**	**2100**	**2150**
Low	0.5	1.0	1.4
Intermediate-Low	0.7	1.6	2.7
Intermediate	1.0	3.3	6.2
Intermediate-High	1.2	4.9	8.8
High	1.4	6.6	12.2

Units in feet relative to year 2000

Sweet, W.V., B.D. Hamlington, R.E. Kopp, C.P. Weaver, P.L. Barnard, D. Bekaert, W. Brooks, M. Craghan, G. Dusek, T. Frederikse, G. Garner, A.S. Genz, J.P. Krasting, E. Larour, D. Marcy, J.J. Marra, J. Obeysekera, M. Osler, M. Pendleton, D. Roman, L. Schmied, W. Veatch, K.D. White, and C. Zuzak, 2022: Global and Regional Sea Level Rise Scenarios for the United States: Updated Mean Projections and Extreme Water Level Probabilities Along U.S. Coastlines. NOAA Technical Report NOS 01. National Oceanic and Atmospheric Administration, National Ocean Service, Silver Spring, MD, 111 pp. https://oceanservice.noaa.gov/hazards/sealevelrise/noaa-nostechrpt01-global-regional-SLR-scenarios-US.pdf

Map Viewer – Overview

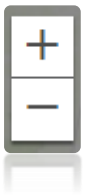
This is the default view of the Map Viewer. This User Guide will explain how to use the map navigation tools and additional tools, called “widgets” located in the Side Pane.



Map Navigation Controls

The Map controls are in the top left corner of the map. On opening the map viewer, the default map control is pan. Left-click and drag the mouse to pan on the map.

Vertical Navigation Bar

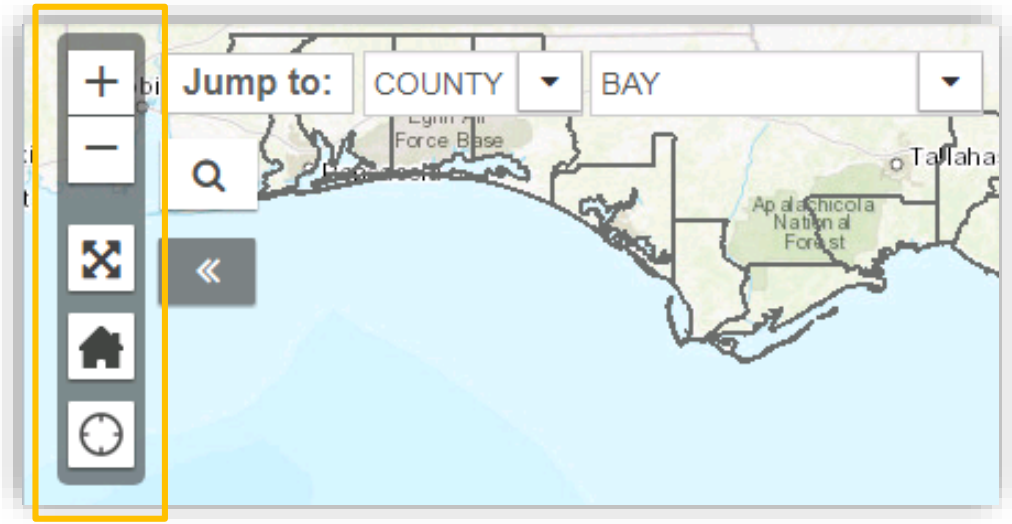


Fixed Zoom In/ Zoom Out:
Zooms in and out of the map. If you have a scroll wheel on your mouse or keyboard, then you can zoom in or out on the map, regardless of the map control selected.

Full Screen: Expands the browser to the full extent of your computer screen. To get out of full screen, simply hit the Esc button.

Home: Zooms to the default extent of the map, which is the State of Florida.

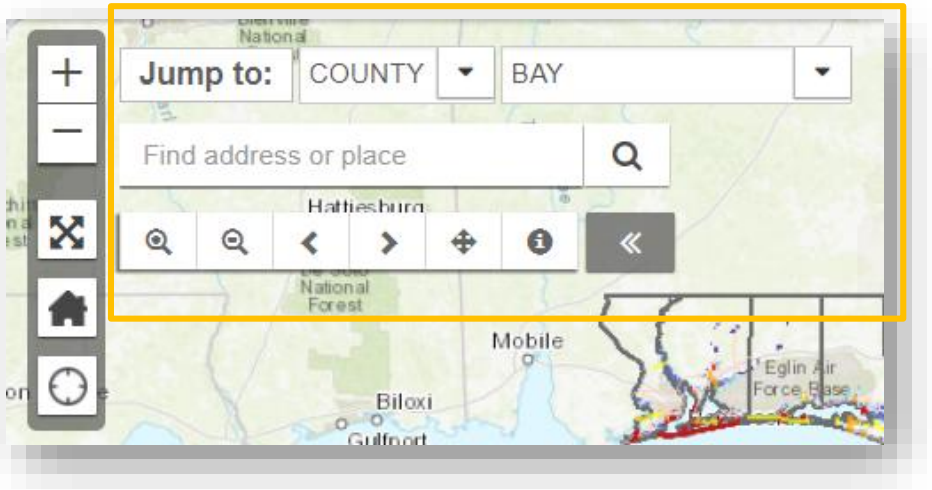
Locate Me: Zooms the map to your current physical location (level of accuracy depends on your location). You first need to allow the map to access your location.



After clicking the Locate Me button, the compass icon will change to a square stop icon and on the map, there will be a blue dot with a blue circle around it. Remember to click on the Stop button to close the Locate Me. Your map will stay in the same place.

Jump to

Zooms to predefined regions. First, choose a region type (County, FDOT District, MPO or State). Then select a region from the list.



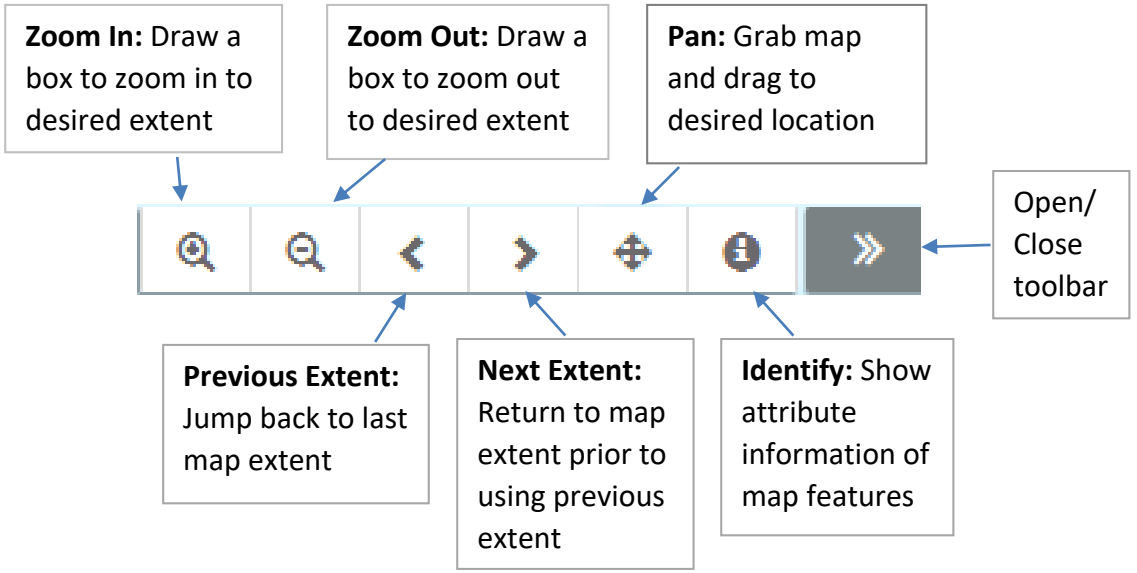
Address Locator

Zooms to an address. First, click on the magnifying glass to open the tool. Then enter a valid address in the input box and hit enter. The map will zoom to that address. The input box will auto-complete with known addresses.

To minimize the address locator, first click **in** the box (where it says "Find address or place") and then click anywhere on the map.

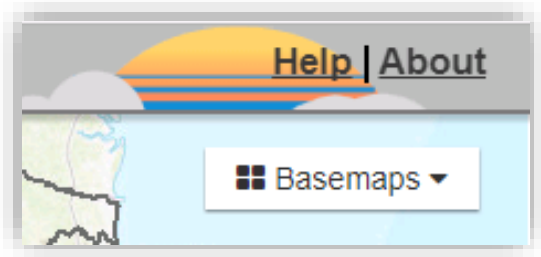
Additional Map Navigation Toolbar

Toolbar with additional map navigation tools. By default, the toolbar is closed. Click the double arrows to open the tool bar.



Help

The Help link opens a pop-up window that contains introductory information about the map viewer, a list of map navigation short cuts for the mouse and keyboard, and links to User Guides. This is the same pop-up window that appears on the first load of the website.



About

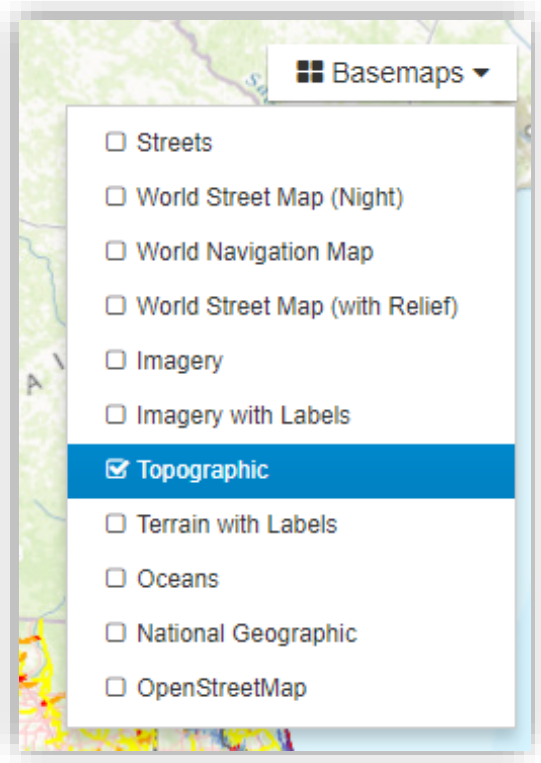
The About link will open the Sea Level Scenario Sketch Planning Tool main website in another browser tab or window. The website contains more information about this project.

Basemap Switcher

The widget allows you to change the basemap of your map. The topographic basemap is displayed by default.

To change the basemap, first click on the basemap menu to see the available maps. Then check the basemap you would like to use and the map will be refreshed with your choice.

These basemaps are pulled from ArcGIS online, and periodically, they are unavailable. If the basemap you chose does not display, then choose another one.

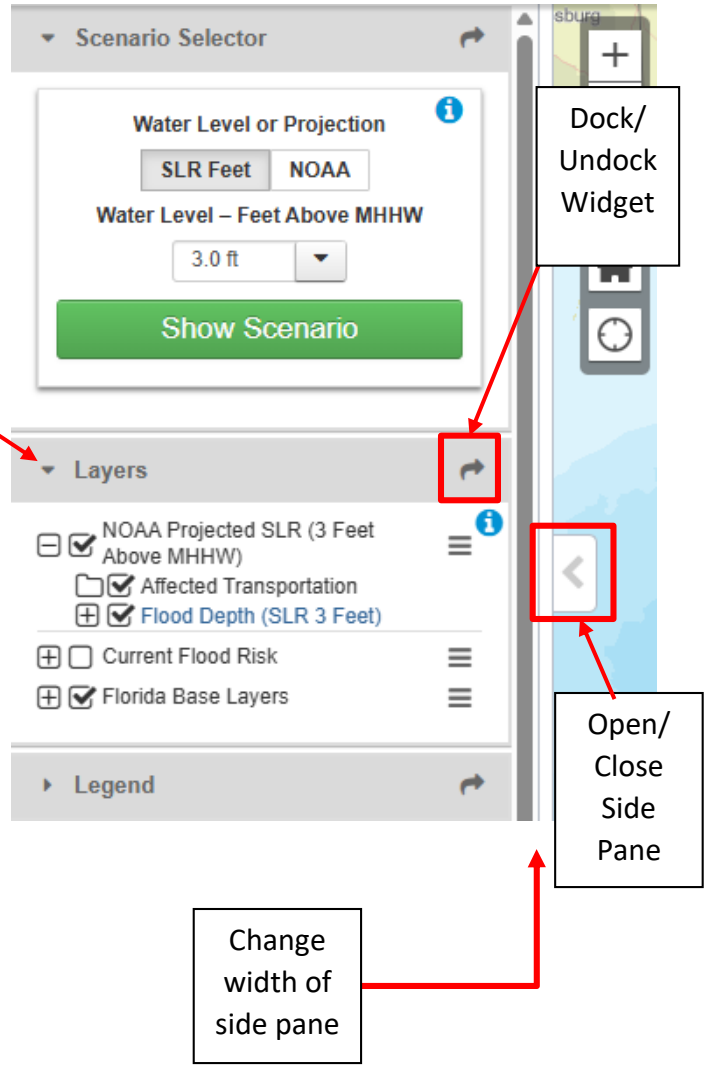


Widget Controls

Widgets are tools that allow you to interact with the map and data. The widgets are in the side pane (left side of map viewer) and each widget is represented by a gray bar.

The widgets are designed to open and close. You can open the widget to see more detail and close the widget to save space and reduce visual clutter. Some widgets are open by default, including the Scenario Selector, Layers and Legend widgets.

Additionally, the widgets are designed to "dock" and "undock" from the left side pane to give you flexibility on where you want to place the tools.



Open/ Close Widgets

To open a widget, click on the gray bar near the widget name. Closed widgets have an arrow pointing to the right, while open widgets have an arrow pointing down.

Dock/ Undock Widget

Undocking allows you to move the widget outside of the side pane. To undock, drag and pull from the grey bar. The left pointing arrow indicates the widget is undocked.

To dock the widget back to the side pane, click on the left pointing arrow. The right pointing arrow indicates the widget is docked.

Open/ Close Side Pane

Click the left pointing arrow to close the side pane. The map will now expand to the full extent of the browser. Click on the right pointing arrow to open the side pane.

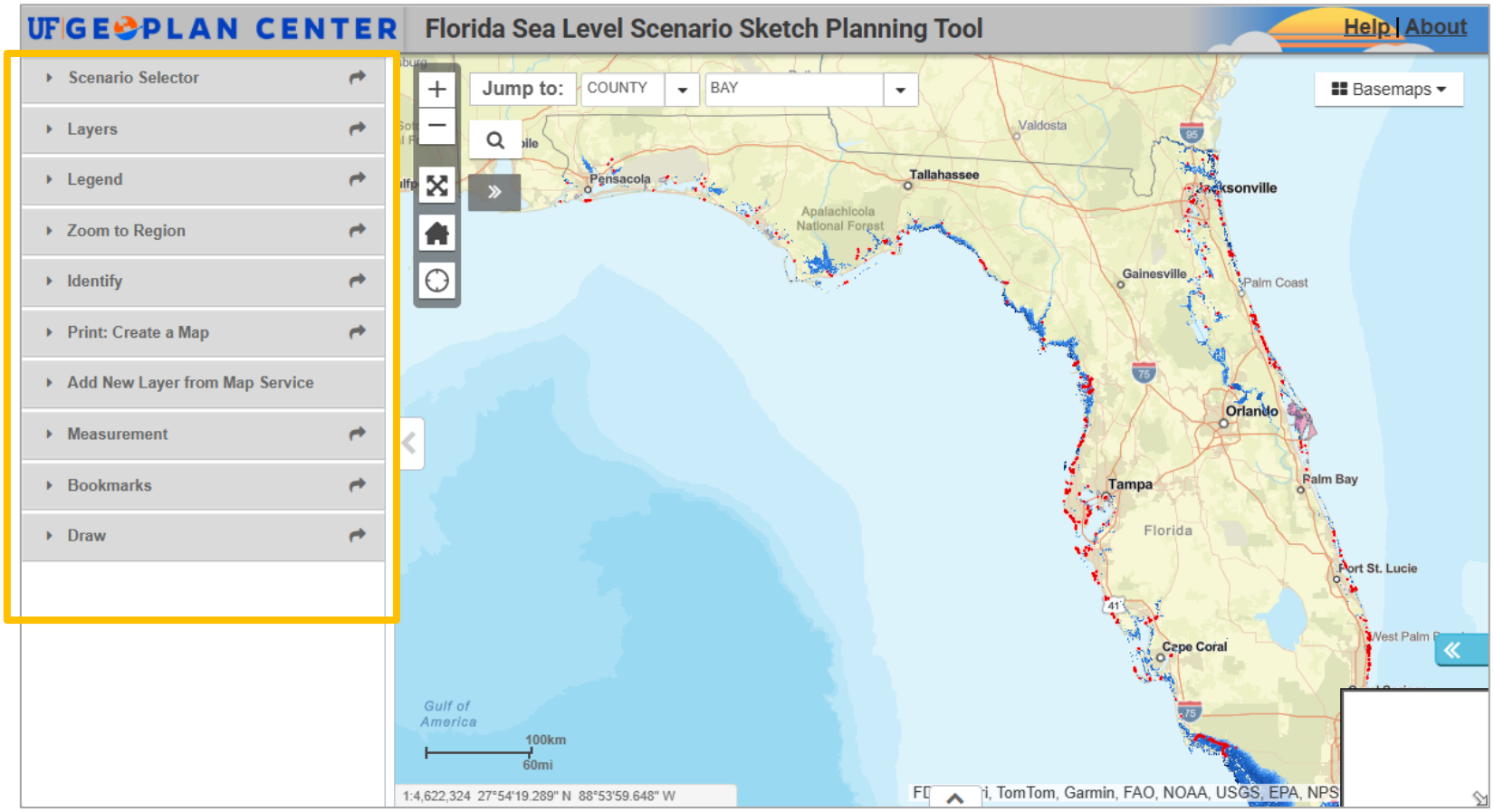
Change Width of Side Pane

To change the width of the side pane, mouse over the right border of the pane until you see the double arrows, then drag to the desired width.

Tools aka “Widgets”

The widgets are located in the side pane on the left side of the map viewer. Below is a view of the map with all widgets closed. If you have not read the prior page on Widget Controls, you should do that now.

The following pages will go into detail on each widget. We will first discuss the Layers Widget, then the Scenario Selector Widget, and then the other widgets in the order they are shown below. Since the Scenario Selector adds layers to the Layers widget, it is important to discuss the Layers Widget first.

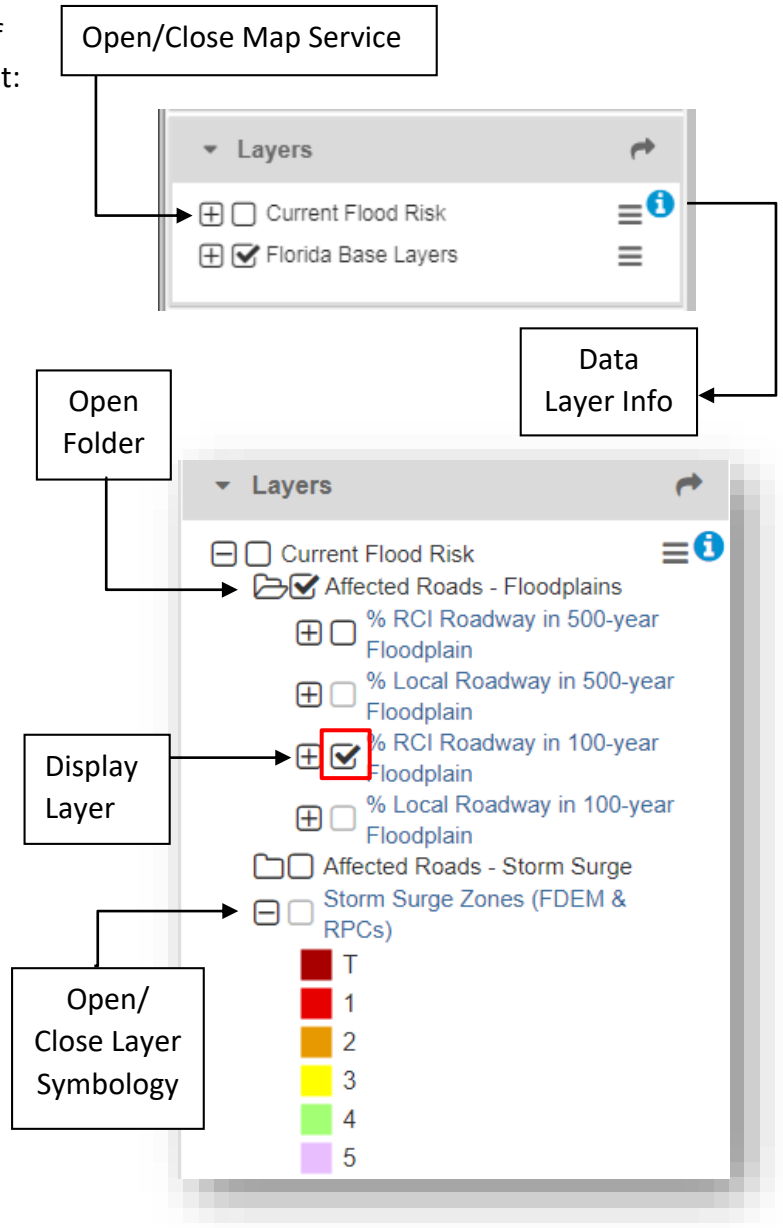


Layers

The Layers widget includes the map layers available for display. Each group of layers is a map service. By default, two map services are included in the widget: **Current Flood Risk & Florida Base Layers.**

- **Current Flood Risk** incudes current floodplain and storm surge layers and roadways exposed to current flood risks.
- **Florida Base Layers** contains base roads data, a polygon layer representing areas mapped, and elevation data.
- SLR Scenario data layers must be added by the user through the Scenario Selector.

Please see the information icon for more information about the data layers.



Working with Layers

Open/ Close Map Service

To open the map service, click on the plus + sign to the left of the name. To close the map service, click on the minus – sign to the left of the name.

Open/Close Folders

Click on the closed folder icon to open that folder and see the individual layers. To close the folder, click on the open folder icon.

Turning on Visibility of Layers

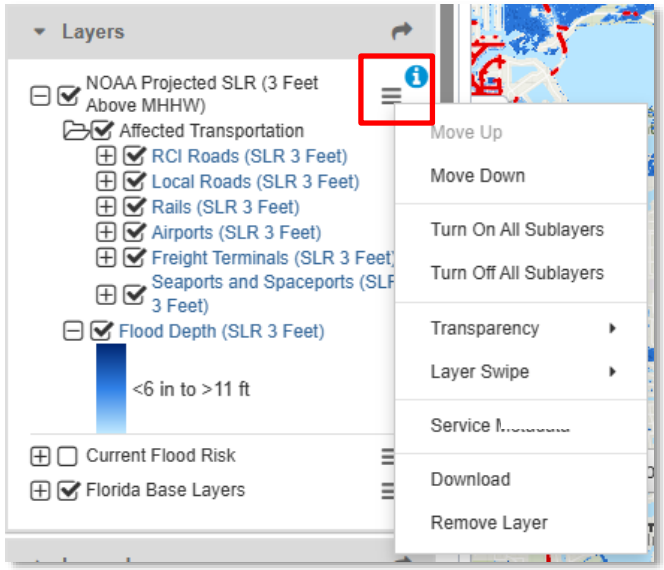
To “turn on” or display a layer on the map, check the empty box next to the layer name. Layers that are visible in the map will already have a check box.

Show/ Hide Symbology

The plus signs next to individual layers control whether show/ hide legend

Layer Controls:

On the right side of each map service, there is a menu with additional layer settings.



Move Up/ Move Down

Allows you to re-order the map services in the Layers Widget. Move up will move the map service up and Move Down will move the map service down. The option will be greyed out if that operation is not available.

Turn On All Sublayers/ Turn Off All Sublayers

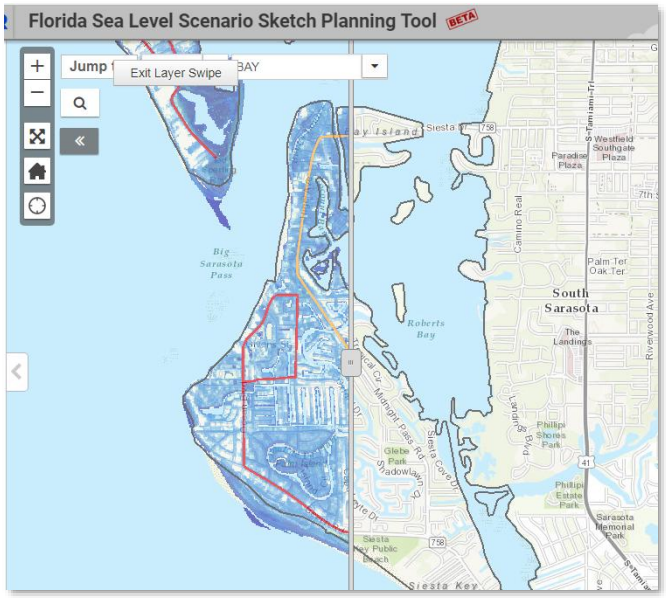
Controls layer visibility. Turns on or off all the layers in that map service.

Transparency

Allows you to change the transparency of the map layers. A slider bar allows you to change the map layer transparency from 0 to 100%, where 0% is opaque and 100% makes the map layers completely transparent/ invisible. The transparency setting controls all the layers in the map service.

Layer Swipe

Allows you to pull or swipe one map service on and off over the map. You can do a vertical or horizontal swipe. The example to the right shows a vertical swipe, with SLR layers. **Tip**: ***When using Layer Swipe with two SLR scenarios, start the swipe from the scenario with more SLR***.



Remove Layer

Removes SLR Scenario map services from the Layers Widget. We recommend looking at no more than 3 scenarios at a time. The maximum number of scenarios that can be added is 6.

Download

Download the data as a map package.

Scenario Selector

The Scenario Selector is how you add SLR layers to the map.

To view an SLR scenario, start by selecting either a **Water Level** or **Projection**:

- Water Level = Water level representing feet of sea level rise above mean higher high water (MHHW)
- NOAA = National Oceanic and Atmospheric Administration (NOAA) 2022 Technical Report.

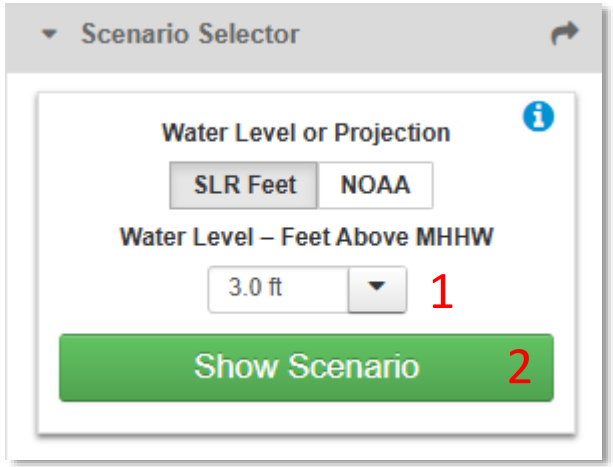
Select by Water Level:

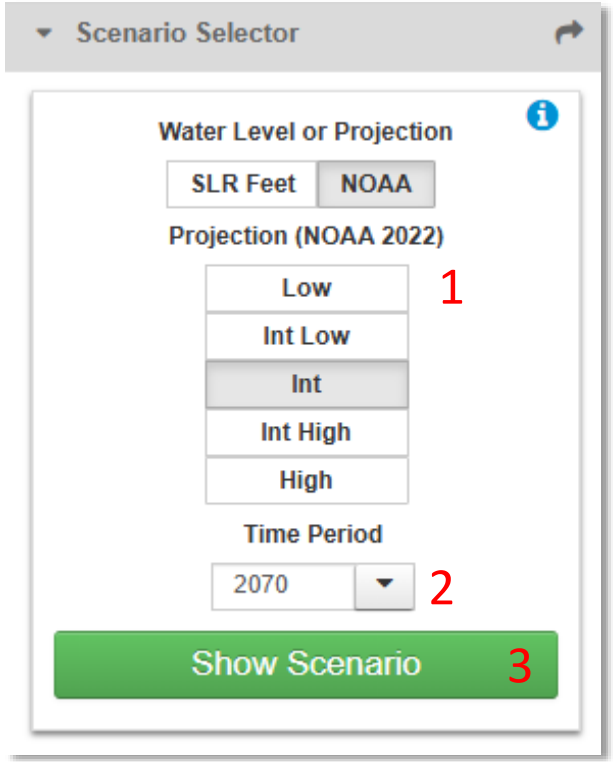
1. Select a water level, from 0.5 feet to 10 feet above mean higher high water (MHHW)
2. Click “Show Scenario”

Select by Projection Curve:

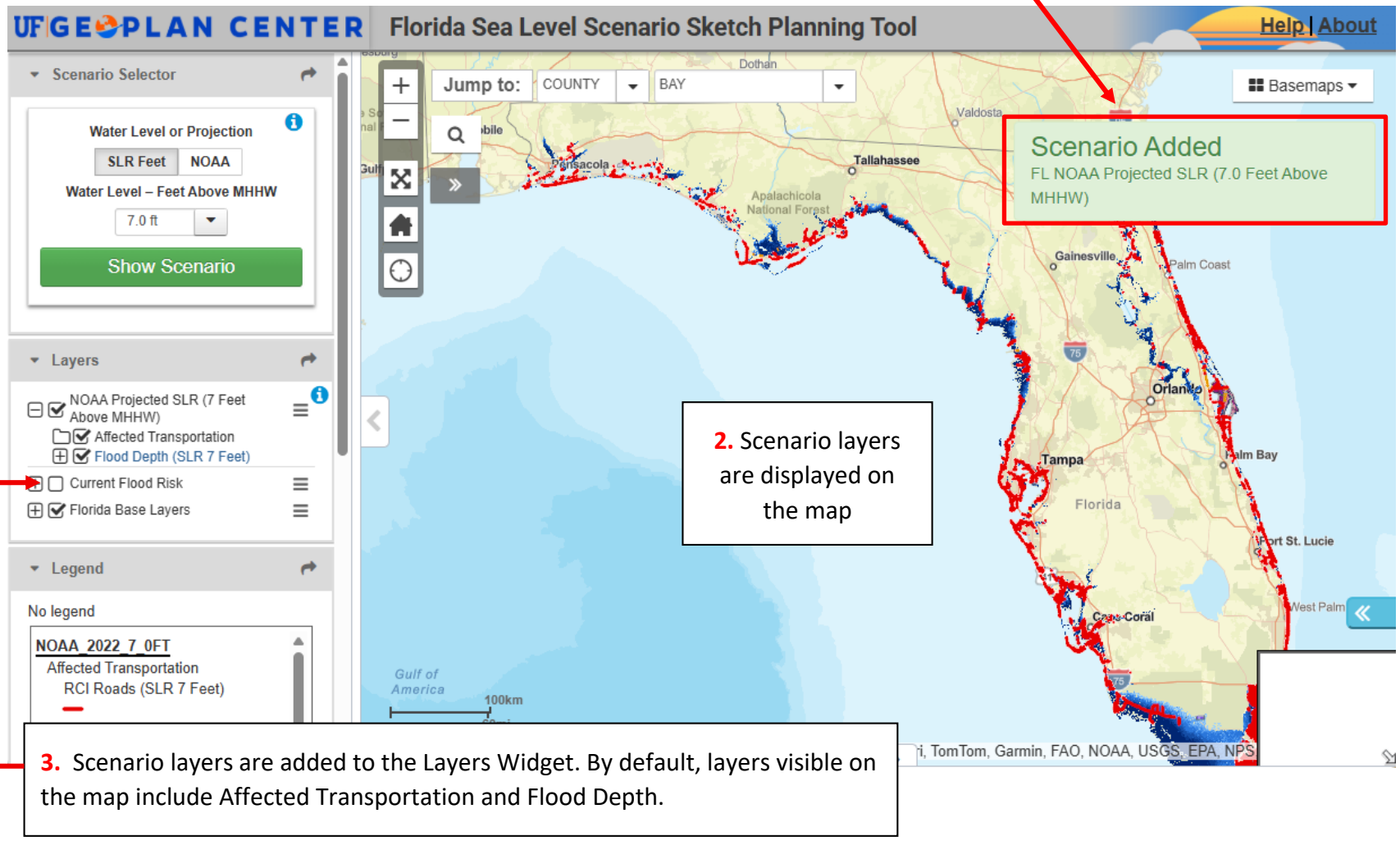
1. Choose one of the five NOAA 2022 projections:
    a. NOAA Low
    b. NOAA Intermediate Low
    c. NOAA Intermediate
    d. NOAA Intermediate High
    e. NOAA High
2. Choose a future decade, from 2040 - 2150
3. Click “Show Scenario”

Scenario results are expressed in terms of feet above MHHW.





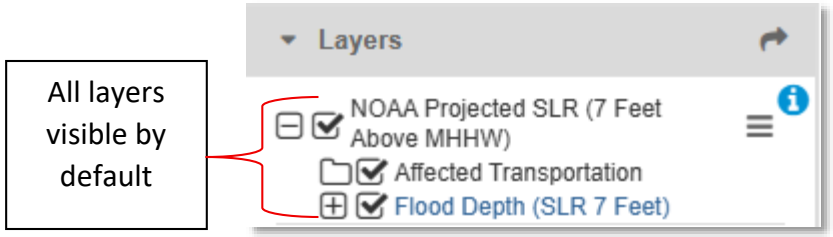
Using the Scenario Selector



Exploring the SLR Scenario Layers

There are seven data layers added with each SLR scenario map service.

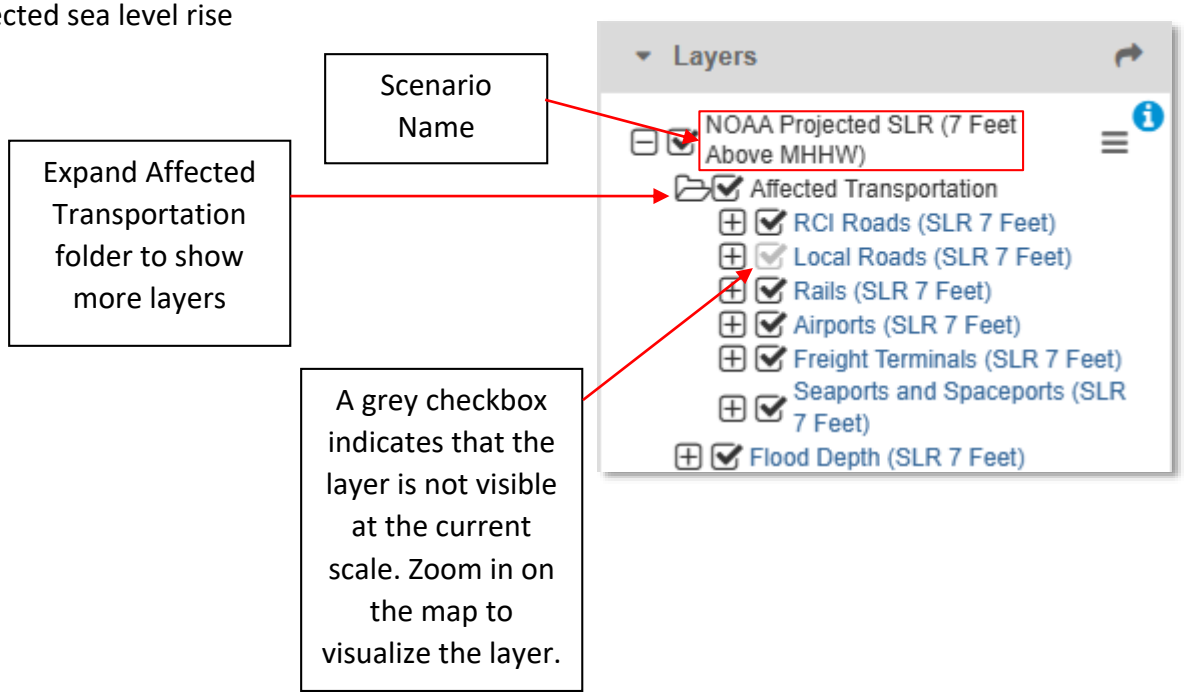
1. **RCI Roads:** RCI Roads affected by SLR scenario
2. **Local Roads**: Local roads affected by SLR scenario
3. **Rails:** Rails affected by SLR scenario
4. **Airports**: Airports affected by SLR scenario
5. **Freight Terminals**: Freight terminals affected by SLR scenario
6. **Seaports and Spaceports**: Seaports and spaceports affected by SLR scenario
7. **SLR Depth Inches:** Extent and depth of flooding in inches



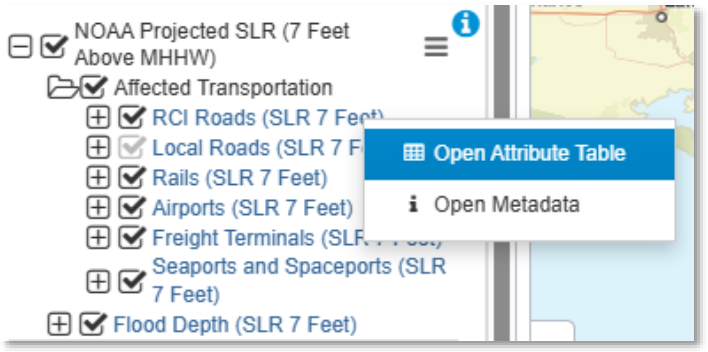
For more information on the individual layers, see the metadata with each layer.

Scenario Naming

The Scenario Name includes the amount of projected sea level rise above MHHW.

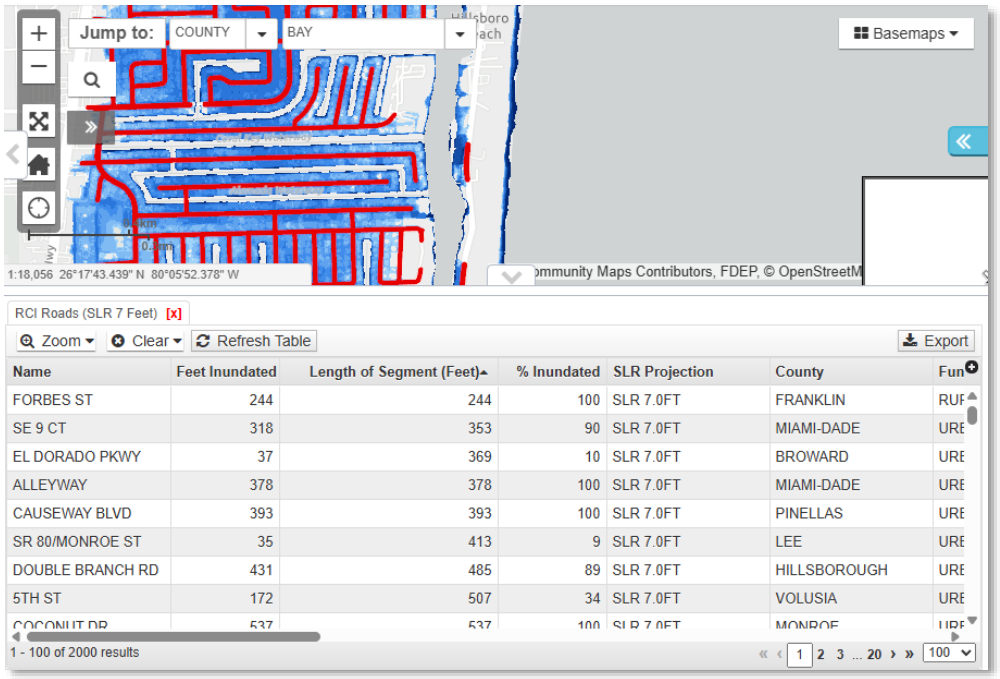


Attribute Table



The Attribute Table is accessed from the Layers Widget. To open the Attribute Table, click on the Layer Name to reveal the "Open Attribute Table" option.

On load of the Attribute Table, only records for the features in the map view/ extent are loaded to the table. The "Extent Box" is the map extent used to fetch records from the data layer. The attribute table does not load records automatically as you zoom in/out/pan on the map. If you zoom in or out or pan, then click "Refresh Table" to reload the records in the map view.



Zoom Menu

Zoom to selected features: Zooms to selected feature(s) on map. First select a feature on the map and then select this option.

Zoom to Extent Box: Zooms to blue Extent Box

Clear Menu:

Clear Selected Records: Clears any selected feature from both the table and map.

Clear Extent Box – Clears the blue extent box from the map. Records are kept in the table.

Clear Table – Clears all records in the table.

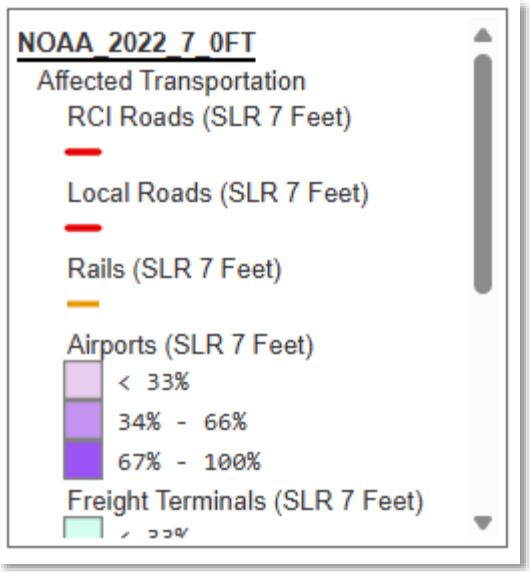
Refresh Table:

Reloads the records in the attribute table based on the current map view extent

Export

Exports the records in the table to either an Excel Spreadsheet (xlsx or xls) or a comma-delimited files (csv).

Legend



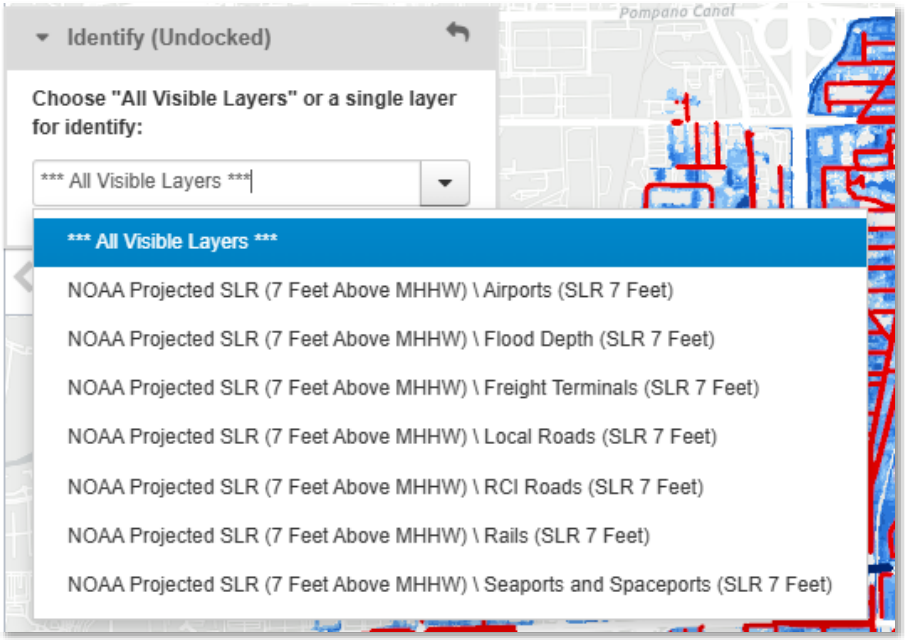
The Legend Widget displays the symbology of the map layers currently displayed in the map. This widget is located under the Layers Widget and by default, this widget is expanded/ open.

The Legend Widget automatically builds a legend for the map layers that are currently visible in the map. If you uncheck a layer (to stop displaying it), then you will need to zoom in or zoom out to refresh the Legend.

Identify

The Identify Widget controls which layers are available for use in the Identify Tool.

The Identify Tool displays attribute values of features on the map. The Identify Tool is located on the map with the map navigation tools, but can also be accessed by a single left-click on the map (no matter what map navigation tool is selected).

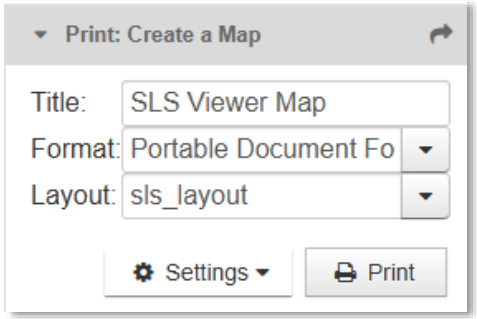


By default, the Identify settings are configured to show attributes from *** All Visible Layers ***, which means all layers that are *currently* visible in the map.

If you want to only see attribute values of a single map layer, then first open the Identify Widget, next click on the dropdown menu, and then select a single layer.

Print: Create a Map

The Print Widget allows you to create a map of the current map view. This widget is not open by default. First, open the widget by clicking on the arrow on the left side of widget. In the widget, there are various settings to configure.



Print Settings:

Title: Map Title. The default is "SLS Viewer Map". Change to desired title.

Format: A variety of file formats are available, including PDF, EPS, GIF, JPG, PNG32, PNG8, SVG, SVGZ, AIX, and TIFF.

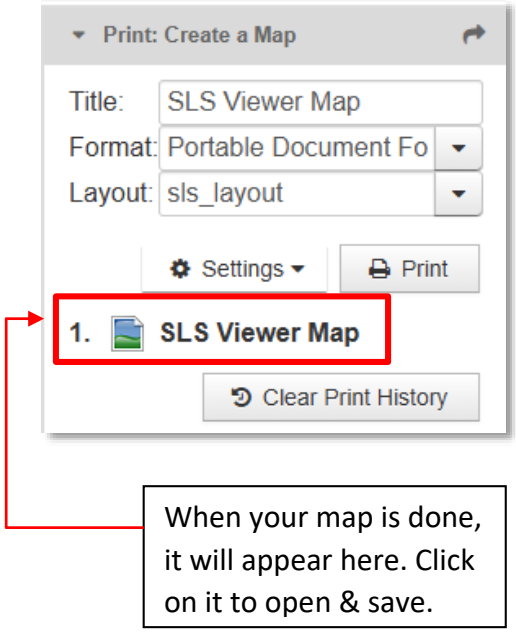
Layout: There are two layout styles available:

- **SLS_LAYOUT**: Includes map, legend, and scale bar.
- **MAP_ONLY**: Includes map, but no legend or scale bar.

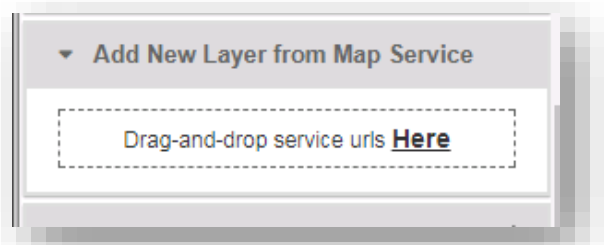
Additional Settings Menu: Additional map settings are accessed through the Settings menu. These settings control the map scale/ extent, scale bar units, legend, print quality, and map only option.

Preserve: Map Scale or Map Extent: When creating the map with the desired layout size, choose whether to preserve map scale or map extent.

After choosing the desired options, click the Print button and wait for your map to be produced.

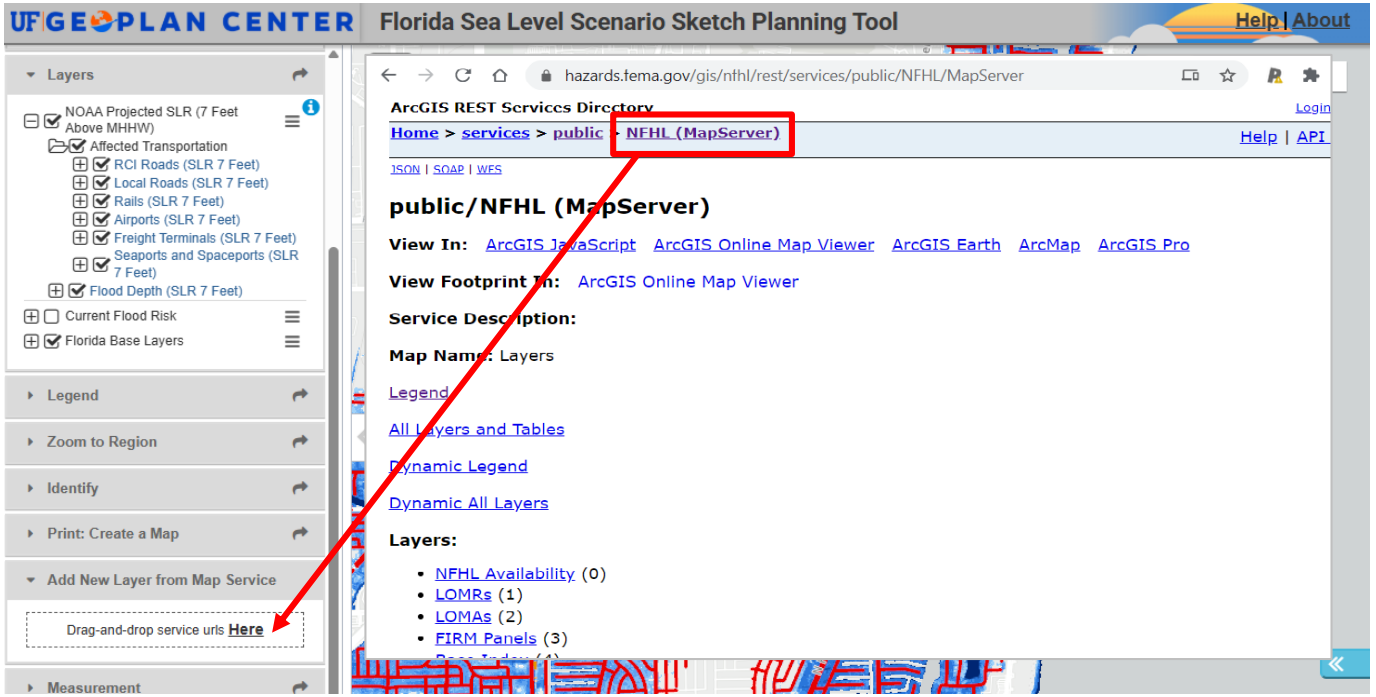


Add New Layer from Map Service



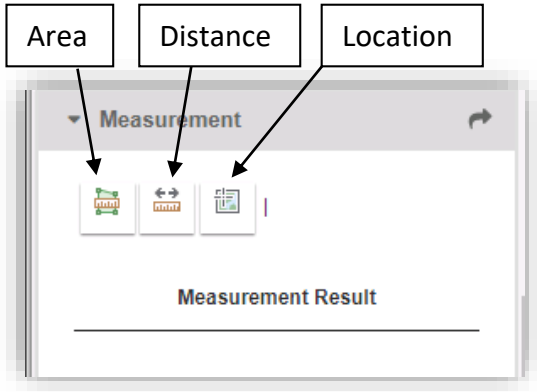
This widget allows you to add some external map service layers to the map viewer. Using the map service's REST endpoint, you can drag and drop the service URL into the widget. Please note, some types of map services (including fused map caches) are not supported. For a working example, follow these steps to connect to FEMA's National Flood Hazard Layer (NFHL) map service:

1. Click on the "Add New Layer from Map Service" widget to open the tool. It will say "Drag-and-drop service urls **Here**".
2. In a separate browser, navigate to: https://hazards.fema.gov/gis/nfhl/rest/services/public/NFHL/MapServer
3. In the blue bar at the top, where it says: Home > services > public> NFHL (MapServer), **click and drag where it says "NFHL (MapServer)** and **pull it over to the map viewer widget** where it says: "Drag-and-drop service urls Here".



Measurement

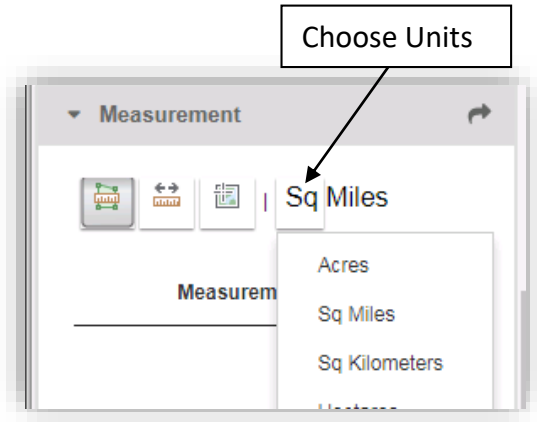
The Measurement Widget includes tools to measure area, distance, and location.



Area and distance measurements:

1. First, choose the type of measurement – area or distance.
2. Next, choose the desired units. The default area unit is Square Miles. The default distance unit is Miles.
3. Next, using single left-clicks, draw a polygon of the area you want to measure or draw a line. Use a double-click to finish the drawing.
4. The measurement will be displayed in the widget under where it says: "Measurement Result". If you want to see the measured amount in a different unit, click the unit dropdown and choose another unit of measurement.

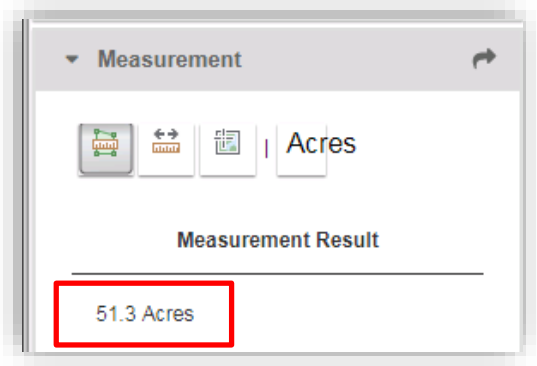
   When you move the map, the measurement result will clear itself. Make sure to write the number down if you need to reference it later.

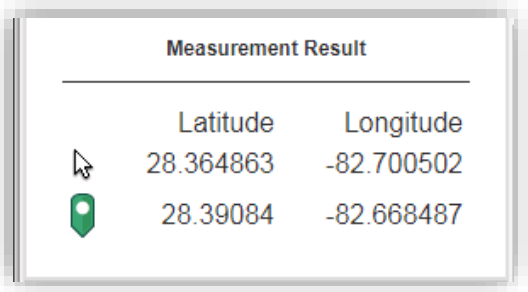


Location Measurement:

The location measurement reveals the latitude and longitude of a location.

First, click the location button. Then choose the units: either Degrees (for decimal degrees) or DMS (for Degrees Minutes Seconds).





Next, click on the map where you want to reveal the latitude and longitude. The latitude and longitude will display in the widget under "Measurement Result".

Bookmarks

The Bookmarks Widget allows you to "bookmark" or save a specific geographic area (map extent), so you can easily zoom to that area.

To add a bookmark, first zoom to the map area that you want to save. Then open the widget (it is closed by default) and click "Add Bookmark". Next, type a name for your bookmark (ex: "Crystal River").

To zoom to your bookmark, simply click on the Bookmark name.

The bookmarks can be renamed by clicking the pencil icon. They can be deleted using the X icon. Your bookmarks are stored within your browser, so if you clear your browser cache, they will no longer persist.

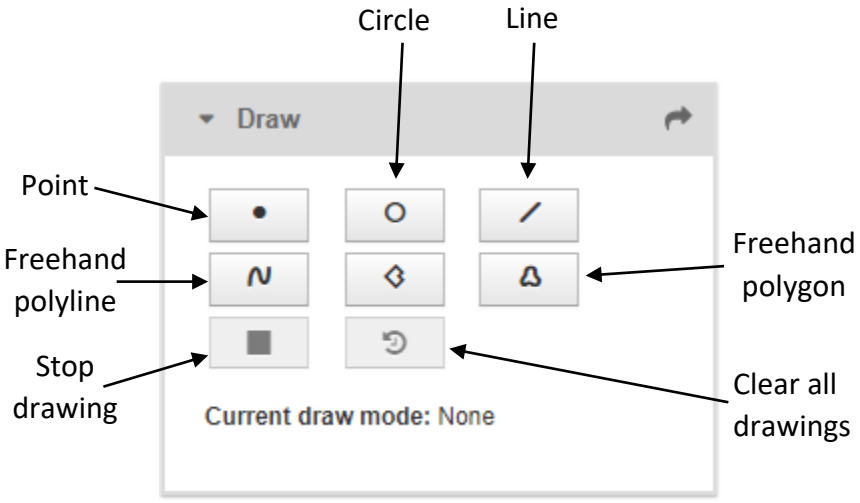
Draw

The Draw Widget allows you to draw lines and shapes directly on the map.

This widget is closed by default.

To draw on the map, first open the Draw widget. Then click on the type of shape you want to draw. Start drawing on the map with a single left-click. You will be prompted on screen with additional instructions on how to continue and/or finish our drawing.

As you zoom in and out on the map, your drawings will persist until you click "Clear All drawings" button or reload your browser.

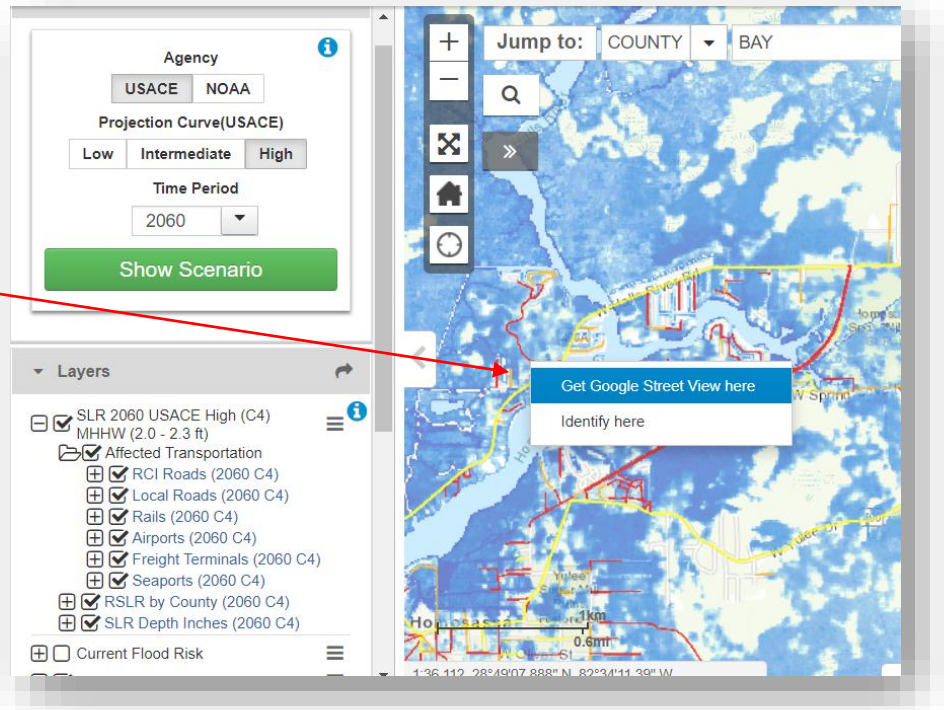


Get Google Street View Here

This function allows you to open Google Street View in another browser window. This tool is useful for exploring road conditions where potential inundation is expected to occur.

To use the Get Google Street View Here:

- In the map, right-click **along a road**. Then click "Get Google Street View here"
- A new window/ tab will open with Google Street View (if it is available for that location).
- If Google Street View is not available for the location selected, then a new window will still open, but the Google Street View screen will be all black. You can simply exit the black screen and return to Google maps by clicking on the left pointing arrow in the top left corner of the screen.



Note: In Version 2 of the Sketch Tool Map Viewer, this was a widget. Due to recent Google Street View licensing fees, this widget was discontinued and replaced with the functionality described above.