Map Viewer Training Exercises:
Sea Level Scenario Sketch Planning Tool

Version 2, 2017

Exercise 1: Getting Started

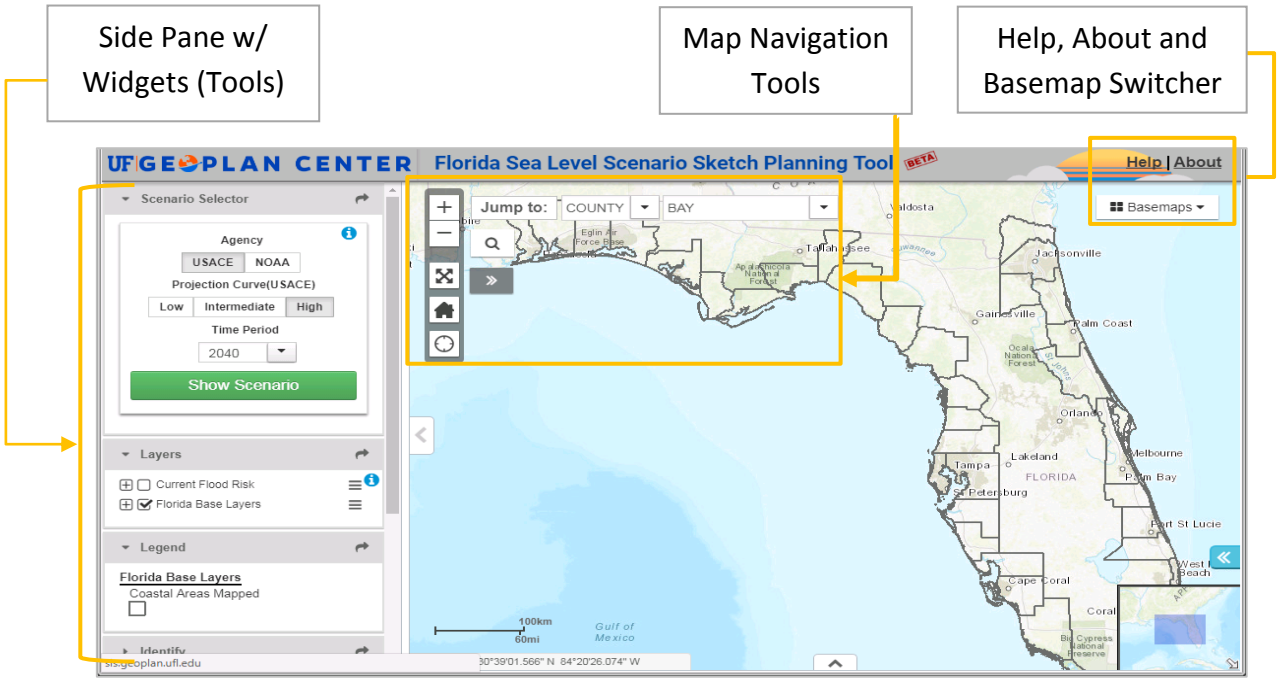
Step 1: Open the Map Viewer

To access the map viewer:

- Open a web browser (Firefox or Chrome preferred).
- Go to https://sls.geoplan.ufl.edu/view-maps
- Click on the image of the map viewer next to "Try Version 2 Map Viewer".
- Give the browser a minute to load the map before moving on.

Step 2: Get Oriented with the Map

Take a few moments to locate the map controls and components listed in the picture below. The county areas outlined in gray are the areas that were mapped for this project.

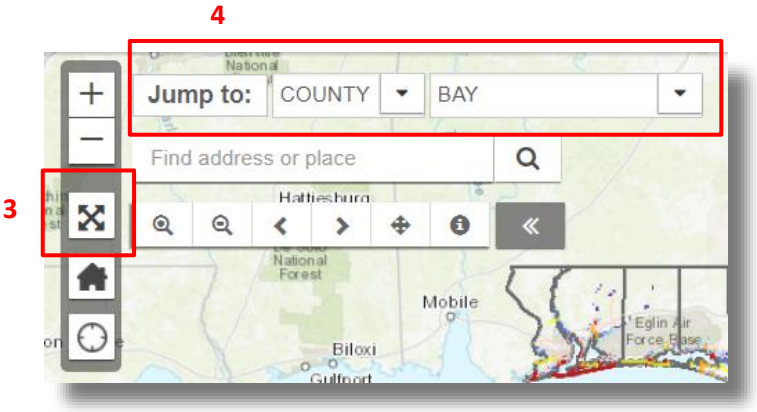


Step 3: Enable Full Screen Mode

Click on the X icon to enable full screen mode. The map viewer will expand to the full extent of your laptop screen.

Step 4: Zoom to Area of Interest

Using the Jump to: tool, choose "County" from the first dropdown menu and then choose a county from the second dropdown menu.



Exercise 2: Explore Current Flood Risk Layers

By default, the current flood risk layers are loaded to the map viewer, but not displayed. In this exercise, we will explore and display these layers, which represent current flood risks including 100-year and 500-year floodplains and storm surge zones.

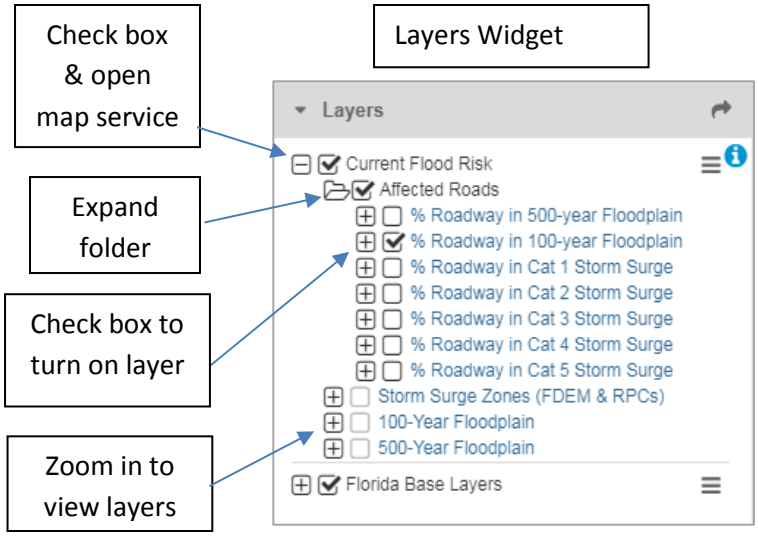
Step 1. Access Layers

In the Layers Widget, check the box next to **"Current Flood Risk".**

This will open the folder and show the contents of the map service. You will see one folder named "Affected Roads" and three layers: Storm Surge, 100-Year Floodplain, and 500-Year Floodplain.

Expand the "Affected Roads" folder to reveal additional layers.

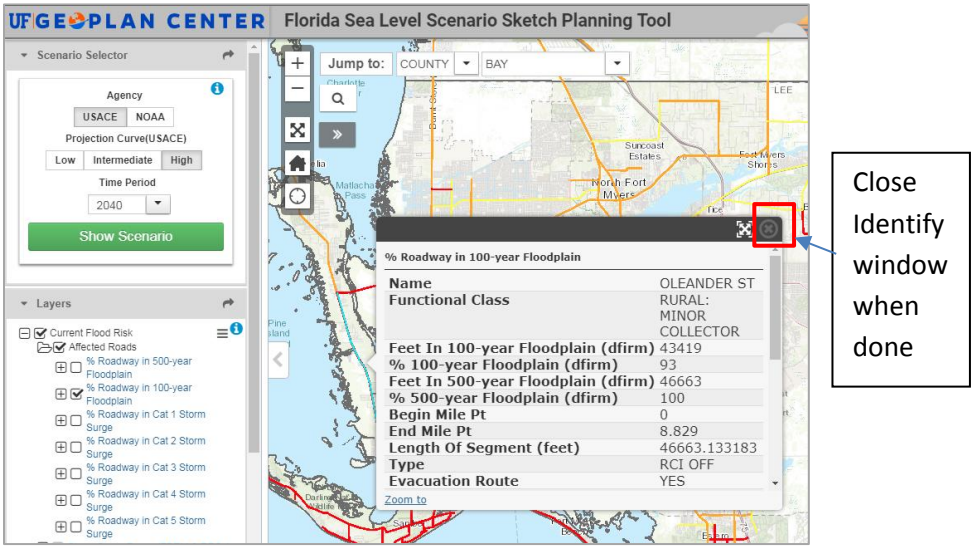
Check the box next to **% Roadway in 100-year Floodplain**



***Note:** If there are gray checkboxes next to data layers, then zoom in closer. These layers are only visible when zoomed into a small extent, as there are too many features to display for a large map area.*

Step 2. Explore the Map Data

After Step 1, the map layer "% Roadway in 100-year Floodplain" should be visible on the map. **Using a left mouse click**, click on a map feature to open the identify window. Scroll through the window and examine the attributes. In the example below, 93% of the selected road segment is in the 100-year floodplain. Click on more road segments to explore the affected areas. When done, close the Identify window by clicking on the smaller x in the upper right corner.



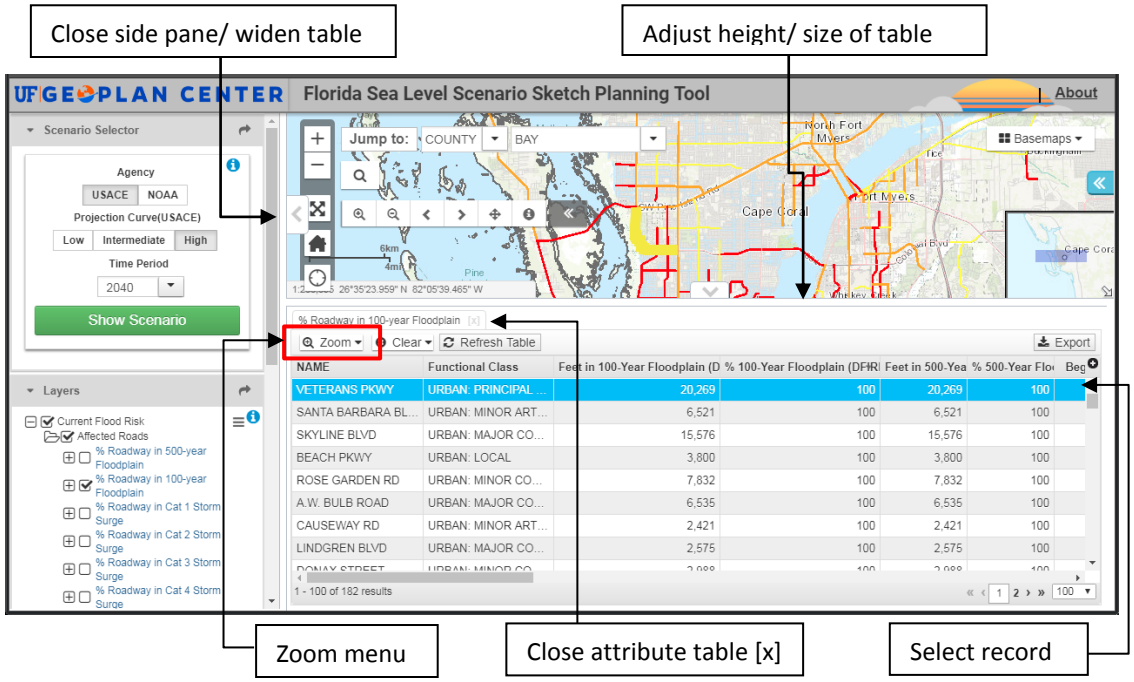
Step 3. Explore the Attribute Table

1. In the Layers Widget, **click on the layer % Roadway in 100-year Floodplain** to reveal the **Open Attribute Table** option. Click on this option to open the attribute table.

   On load of the table, only records for the features in the map view are added. The "Extent Box" is the map extent used to get records from the layer.

2. **Look for the field named % 100-year Floodplain DFIRM**. You may need to expand the width of the field to see it. **Click on the field name twice** to sort the values in descending order. This will show you the road segments with the highest percent in the current 100-year floodplain.

Tip: Close the side pan by clicking the arrow tab between the side pan and map. This will widen the attribute table for better visibility. Adjust the height of the table by dragging the table up/down.



3. After sorting the records in descending order, **select the record at the top with the highest %** (values will be 1% – 100%). The selected record should be highlighted in blue.

4. Zoom to the selected feature. Click **Zoom Menu → "Zoom to Selected Feature(s)".** Pan and Zoom around the map to explore the context of the feature. You may want to change the basemap.

5. Clear the selected feature. Click **Clear menu → "Clear Selected Feature".** Next click **Zoom Menu → "Zoom to Extent Box".** The map will zoom back to the extent when the table was first opened.

6. **Re-open the Side Pane** by clicking on the tab with the right pointing arrow (on the far left side of the map window). **Close the attribute table by clicking on the [x]** next to layer name in the table. In the Layers Widget, uncheck the box "Current Flood Risk" and then click on the name to close.

Note: 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.

Exercise 3: Add SLR Scenarios and Explore Scenario Data

Before you begin:

- Find the printed handout "Map Viewer Data Layers Guide" and take a few minutes to review.
- Turn off visible layers or refresh your map by clicking your browser's refresh page.

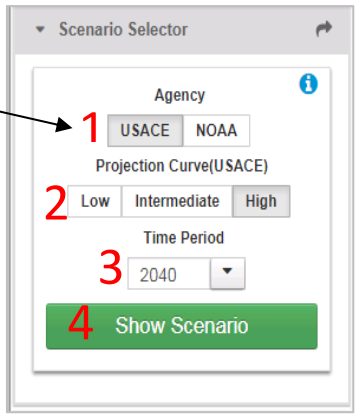
There are 20 total SLR scenarios available to load in the map viewer. They cover four decades (2040, 2060, 2080, 2100) and five projections of SLR. Only 6 scenarios can be loaded at a time. We recommend viewing no more than 3 at a time.

Step 1. Choose the SLR Scenario

1. **Choose an Agency:**
   This is the source agency of the SLR projection.
   USACE = U.S. Army Corps of Engineers
   NOAA = National Oceanic & Atmospheric Administration

   For this exercise, choose USACE

When USACE is selected; 3 curves are shown



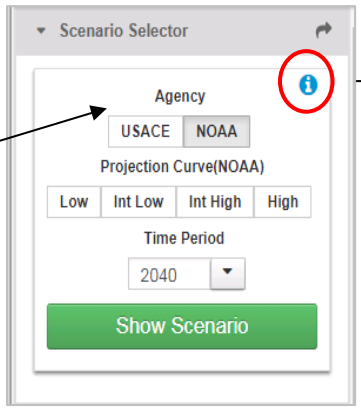
2. **Next, choose a Projection Curve**
   Projection Curve (USACE):
   Low = *About* 8 inches (or 0.2m) SLR by 2100
   Intermediate = *About* 1.6 feet (or 0.5 m) SLR by 2100
   High = *About* 5 feet (or 1.5 m) by 2100

   Projection Curve (NOAA):
   Low = *About* 8 inches (or 0.2m) SLR by 2100
   Int Low = A*bout* 1.6 feet (or 0.5 m) SLR by 2100
   Int High = A*bout* 3.9 feet (or 1.2 m) by 2100
   High = *About* 6.6 feet (or 2.0 m) by 2100

   Please note: there are 3 USACE projections and 4 NOAA projections, but 2 of the projections are the same:
   USACE Low & NOAA Low Rate are the same.
   USACE Intermediate & NOAA Int Low are the same.

   For this exercise, choose the High projection curve

When NOAA is selected; 4 curves are shown



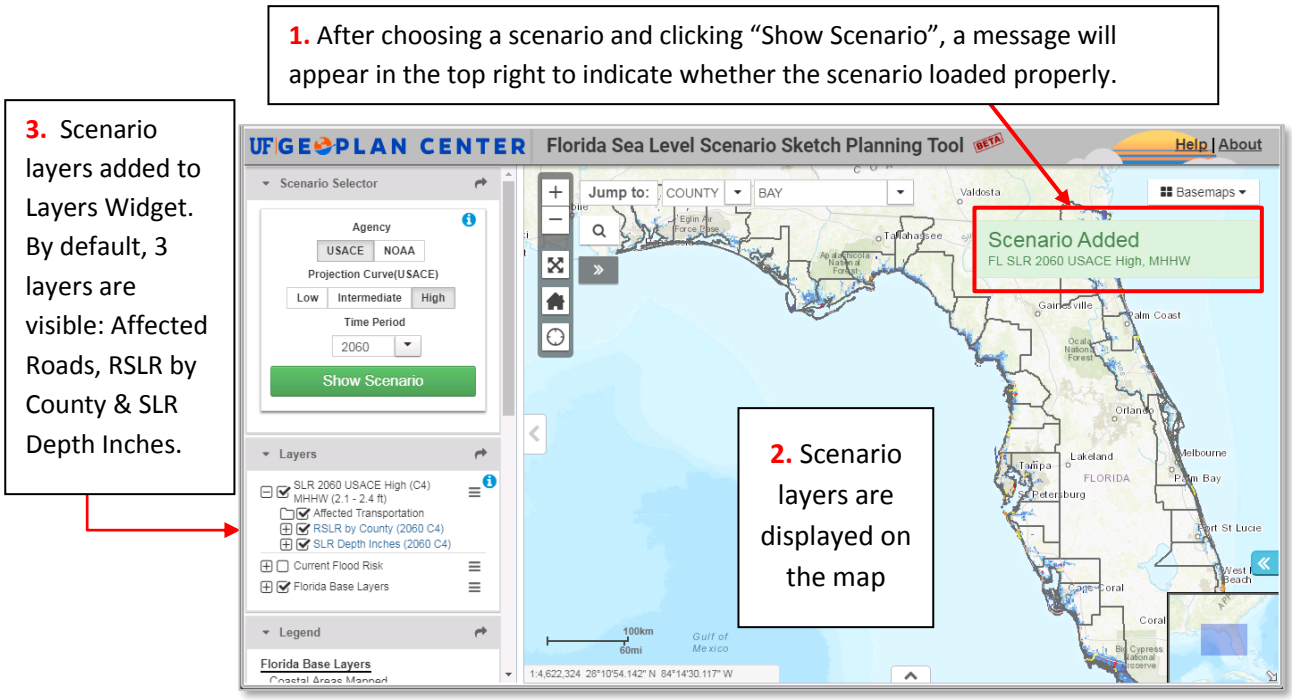
Scenario Selector Pop-up Help

3. **Next, choose a Time Period**
   Decades available: 2040, 2060, 2080, 2100

   For this exercise, choose 2060

4. **Finally click "Show Scenario"**
   The map layers for the scenario selected will be added to the map.

Step 2. Exploring the SLR Scenario Layers



Scenario Data Layers

There are six data layers added with each SLR scenario map service. Three of these layers are visible on the map by default (these are listed in bold):

1. **Roads:** RCI Roads affected by SLR scenario
2. **RSLR by County:** SLR over MHHW amount by county
3. **SLR Depth Inches:** Extent and depth of flooding in inches
4. SIS Highways: SIS Highways affected by SLR scenario
5. SIS Rails: SIS Rails affected by SLR scenario
6. SIS Facilities: SIS Facilities affected by SLR scenario

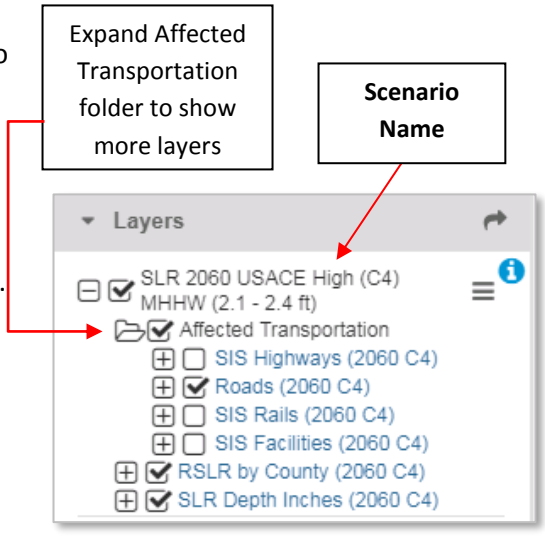
Scenario Name

The **Scenario Name** includes the year and projection curve, and shows the amount of relative SLR above MHHW.

Ex: In the Scenario Selector, we chose USACE, High, 2060.

As a result, the SLR Scenario loaded is:

"SLR 2060 USACE High (C4) MHHW (2.1 – 2.4 ft)"

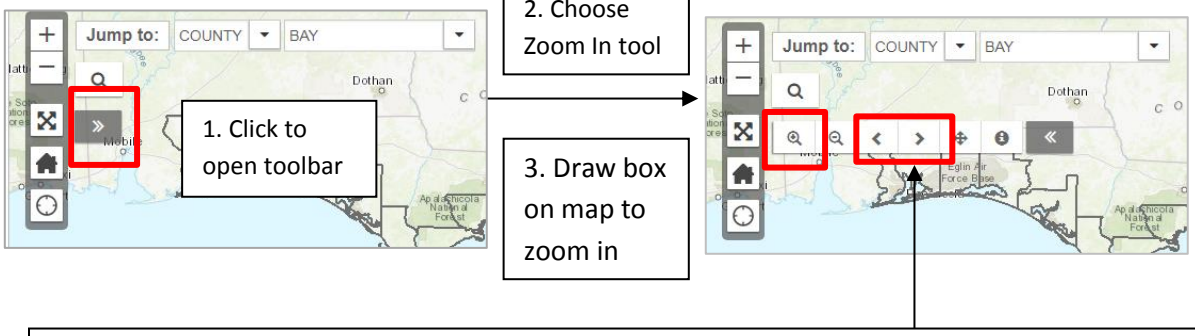


<u>SLR Curve Key (C5 is highest SLR, C1 is lowest SLR)</u>

C5 NOAA High Rate (2012)
C4 USACE High Rate (2013)
C3 NOAA Intermediate High Rate (2012)
C2 USACE Intermediate Rate (2013)/ NOAA Intermediate Low Rate (2012)
C1 USACE Low Rate (2013)/ NOAA Low Rate (2012)

Step 3. Zoom to an Area of Interest

Now that the scenario is loaded, zoom to an area of interest. For this exercise, use the **Zoom in tool** in the Additional Map Navigation toolbar (shown below). Using this zoom tool, draw a box on the map where you want to zoom into.



OPTIONAL: Working with the map tools. Use the Last Extent tool to take you back to the last map extent. Now use the Next Extent tool to jump you to forward. These tools are your friends!

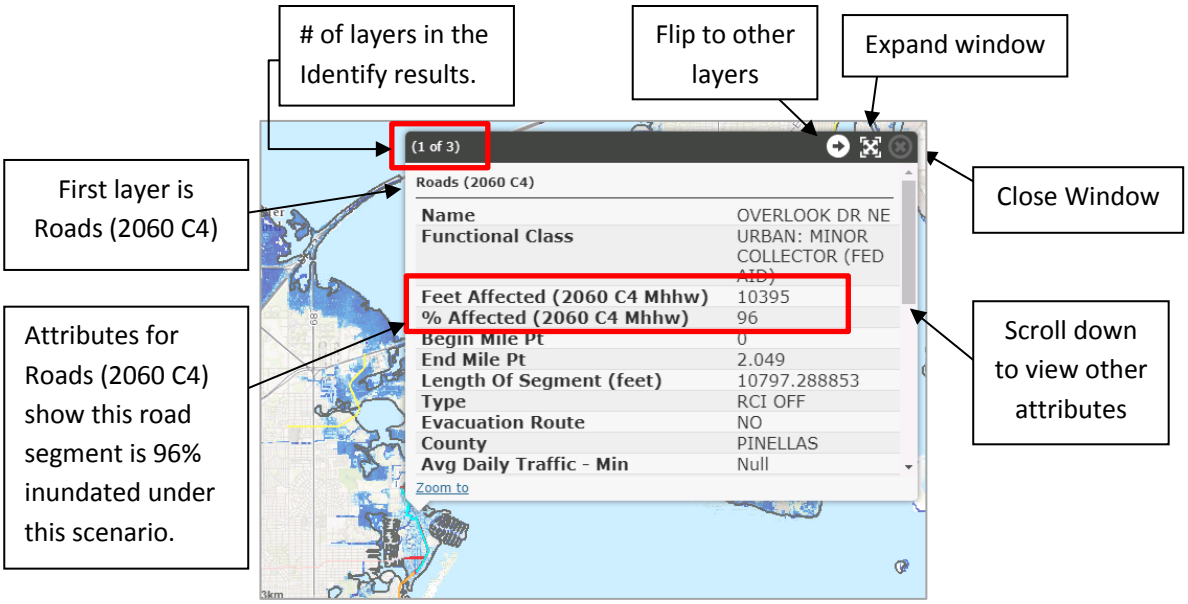
Step 4. Identify Features

Once you've zoomed to an area of interest, look for affected road segments (in red, orange, or yellow). Depending on the scenario, you may need to pan around the map to find these.

Left-click on a colored road segment in the map to open the Identify window.

By default, the identify shows attributes of all layers currently visible in the map. The upper left corner of the Identify window shows how many visible layers. Click the right arrow to flip through the attributes of each layer. If there are features at the location where you clicked, the attributes will be shown.

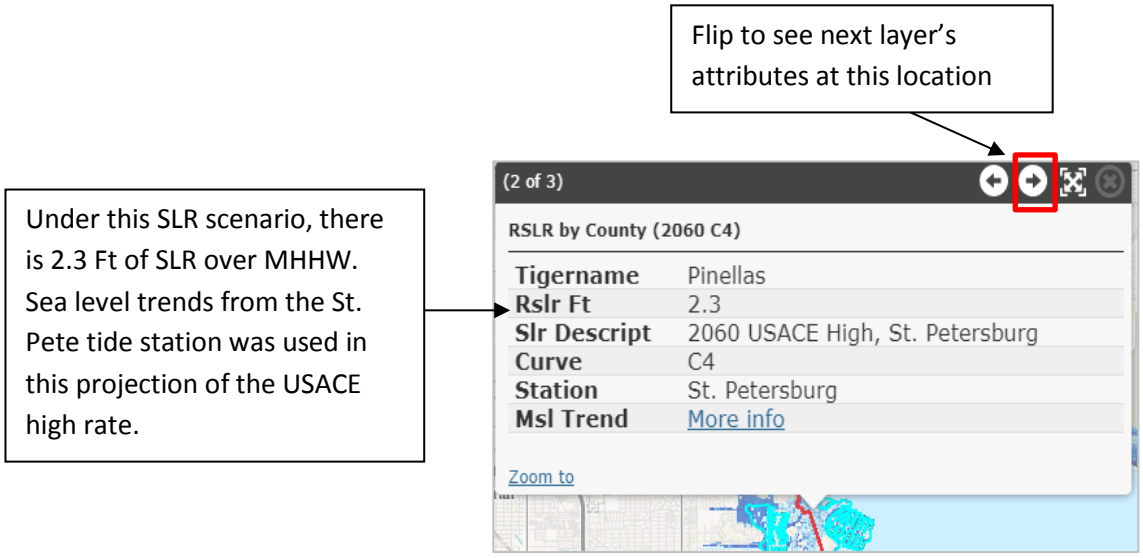
4a. View Attribute for Layer 1: Roads affected under a SLR scenario:



4b. View Attributes for Layer 2: RSLR by County

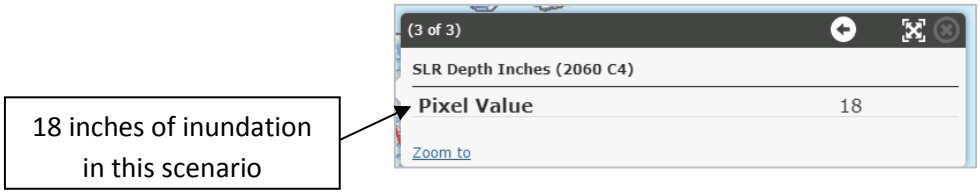
Using the right arrow, flip to the next layer to view its attributes.

The RSLR by County layer indicates the County and SLR projection parameters (tide station, mean sea level trend, decade, and projection curve) used for this area.



4c. View Attributes for Layer 2: SLR Depth Inches

The SLR Depth layer represents the extent and depth (in inches) of flooding under this SLR scenario**. "Pixel Value"** is the depth.



4d. Close out

Close the Identify Window by clicking on the X in the upper right corner of the window.

Exercise 4: Compare Two SLR Scenarios Using the Swipe Tool

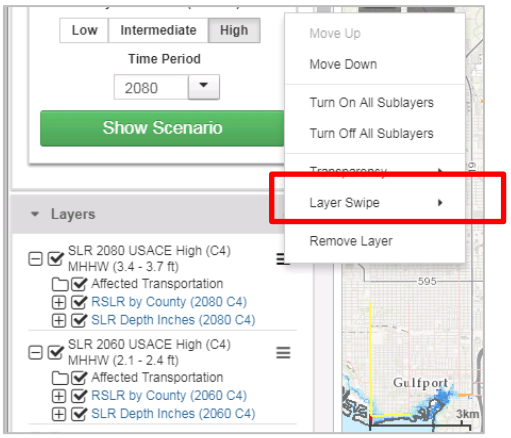
Step 1. Add Another SLR Scenario

You should still have one SLR Scenario in the map: SLR 2060 USACE High (C4) MHHW (2.1 – 2.4 ft)

Using the Scenario Selector, choose the following scenario:

- Agency: **USACE**
- Projection Curve: **High**
- Time Period: **2080**
- Click "**Show Scenario**"

This new scenario will load on top of the previous scenario, both in the Layers widget and in the map.



Step 2. Open the Swipe Tool

- Click on the three lines icon to the right of the **top** scenario.
- Click on "**Layer Swipe**" → then either "Horizontal" or "Vertical
- **You should now see a bar across the map**. If you chose Horizontal, you can slide the bar up and down to "swipe" in between the two visible scenarios. If you chose Vertical, then you can swipe left and right.

For best results, the swipe tool should be opened from the scenario with more SLR.

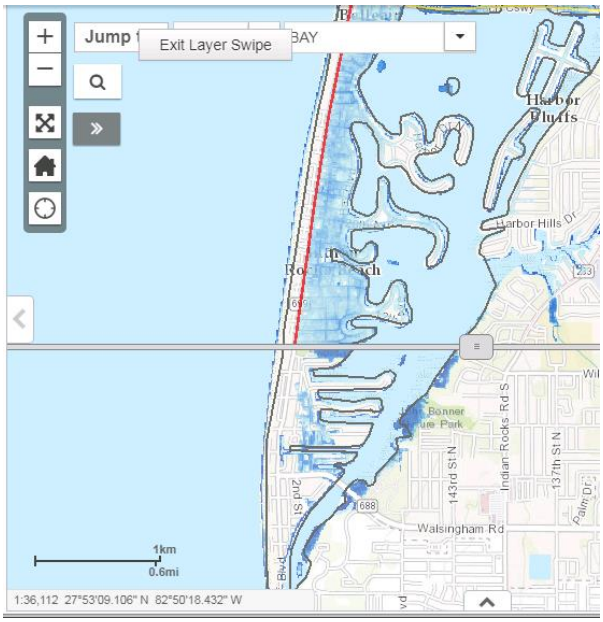
Step 3. Play with the Swipe Tool

When you're in the swipe tool, you can zoom in, zoom out, and pan on the map.

Zoom around and look for areas where you can see differences between the two scenarios.

Try both the vertical and horizontal swipe. To switch from one to the other, first click "Exit Layer Swipe" and then re-open the Swipe tool from the Layers Widget.

When you are finished, close the Swipe Tool by clicking "**Exit Layer Swipe**".



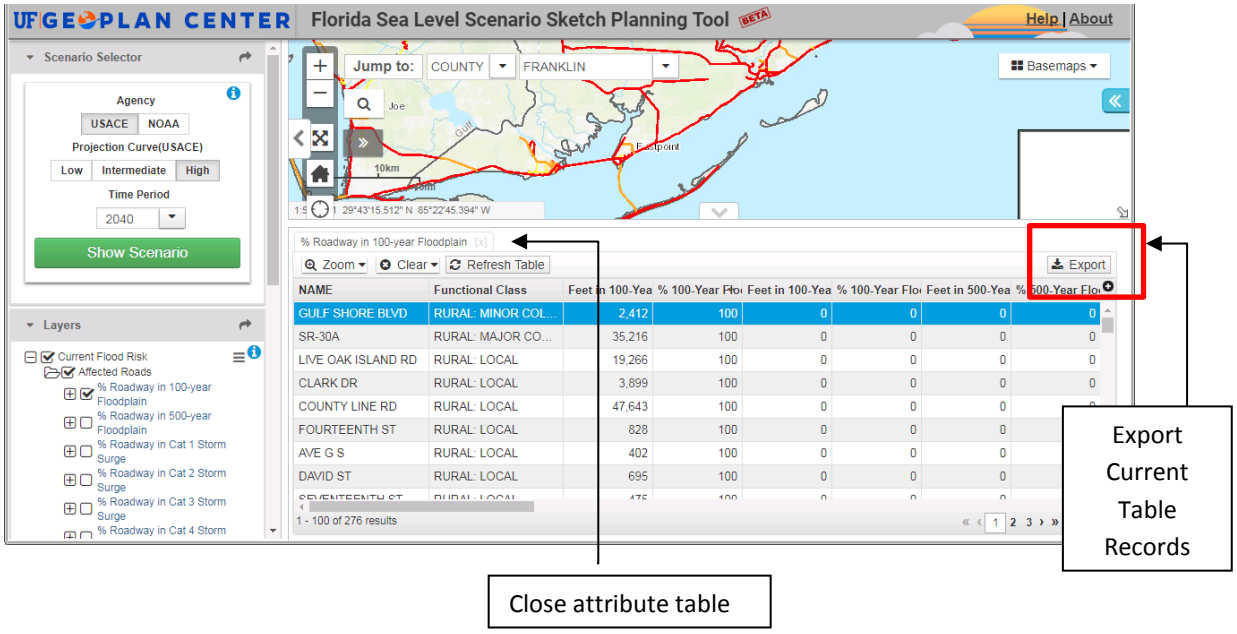
Step 4. Remove one Scenario

To reduce clutter and confusion, remove **one** of the SLR scenarios. Click on the three lines icon to the right of one scenario. Select "Remove Layer". (This is accessed through the same menu used to open the Swipe Tool)

Exercise 5. Export Table of Affected Features

In Exercise 2, we explored the Attribute Table. In this exercise, we'll export a table of affected roads. You should still have a SLR scenario in your Layers widget. If you do not, then add one through the Scenario Selector.

1. **First zoom to an area of interest** that has affected roads.
2. In the Layers Widget, **open the Affected Transportation folder** (under the Scenario Name).
3. **Click on the Roads Layer and then Open Attribute Table**
4. **Click on the 'Export" Button** in the upper right corner of the attribute table. There are three output file formats to choose from: Microsoft Excel (xlsx), Microsoft Excel (xls), and Comma Separated File (csv).
5. The output file will only include records that are currently in the table.
6. Close the attribute table when you are finished.

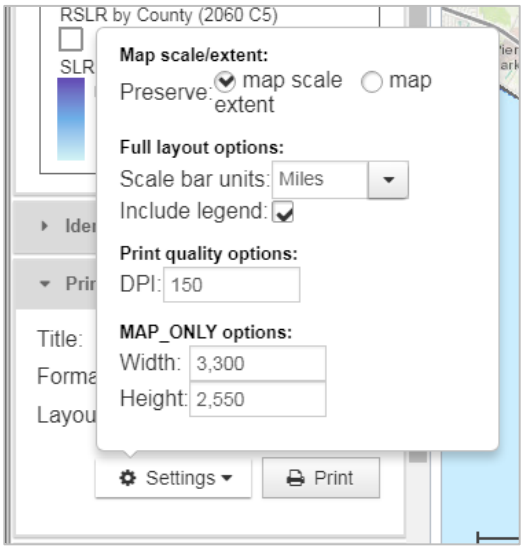


Note: The attribute table does not load records automatically as you zoom in/out/pan on the map. If you zoom in or out or pan, then click "Refresh Table" to reload the records in the map view.

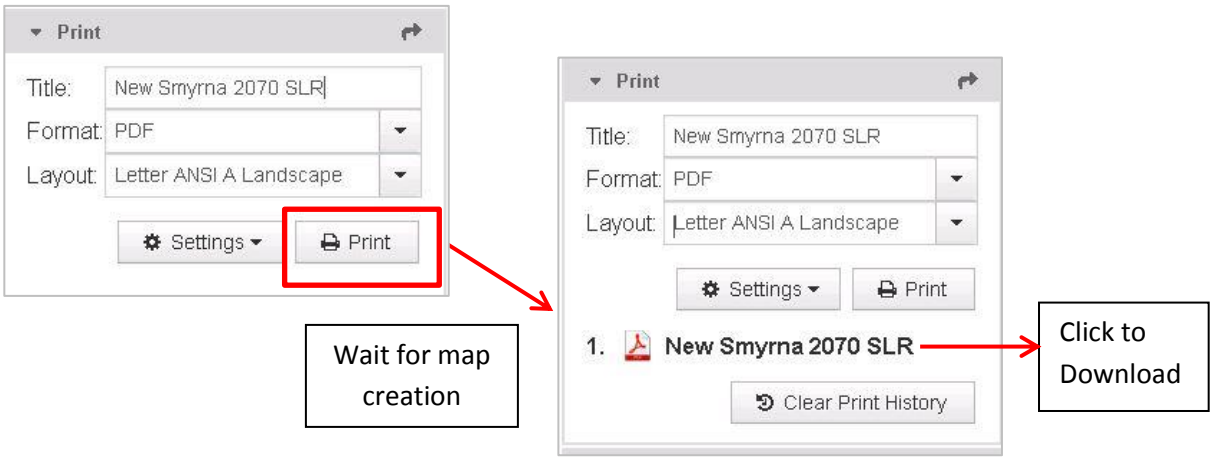
Tip: Close the side pan by clicking the arrow tab between the side pan and map. This will allow the attribute table to widen for better attribute visibility. You can adjust the height of the attribute table by clicking on the arrow tab between the map and the table.

Exercise 6: Create a Map of Affected Roads

1. Using the Scenario Selector, choose a scenario, and hit Show Scenario to load.
2. **Zoom into an area with affected roads**. Position the map so it covers the extent of one or more affected roads.
3. Scroll down to the "Print: Create a Map" widget and click once to open
   a. **Enter a Title for your map**. Suggestions: Include Place, Time, and/or Projection
   b. Choose file format. PDF, image file, etc.
   c. **Choose Layout/ paper size**. If you do not want a legend, title, or scale bar, then choose the MAP_ONLY as the Layout.

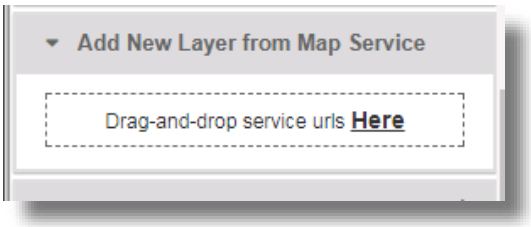


4. Open the Settings Menu.
   a. Review the settings. Most of these you can left default. If you need to print a high-resolution map, you can change the Print quality DPI.
   b. If you want to include a title and scale bar, but no legend, then uncheck the "Include legend" option.
   c. If you are printing with the MAP_ONLY layout, then the Width and Height options are pixel units.
5. Click "Print"
6. When the map is complete, it will display the Map Title in the widget under the Settings and Print buttons. Click on the Map Title to download.
7. Open and review your map.



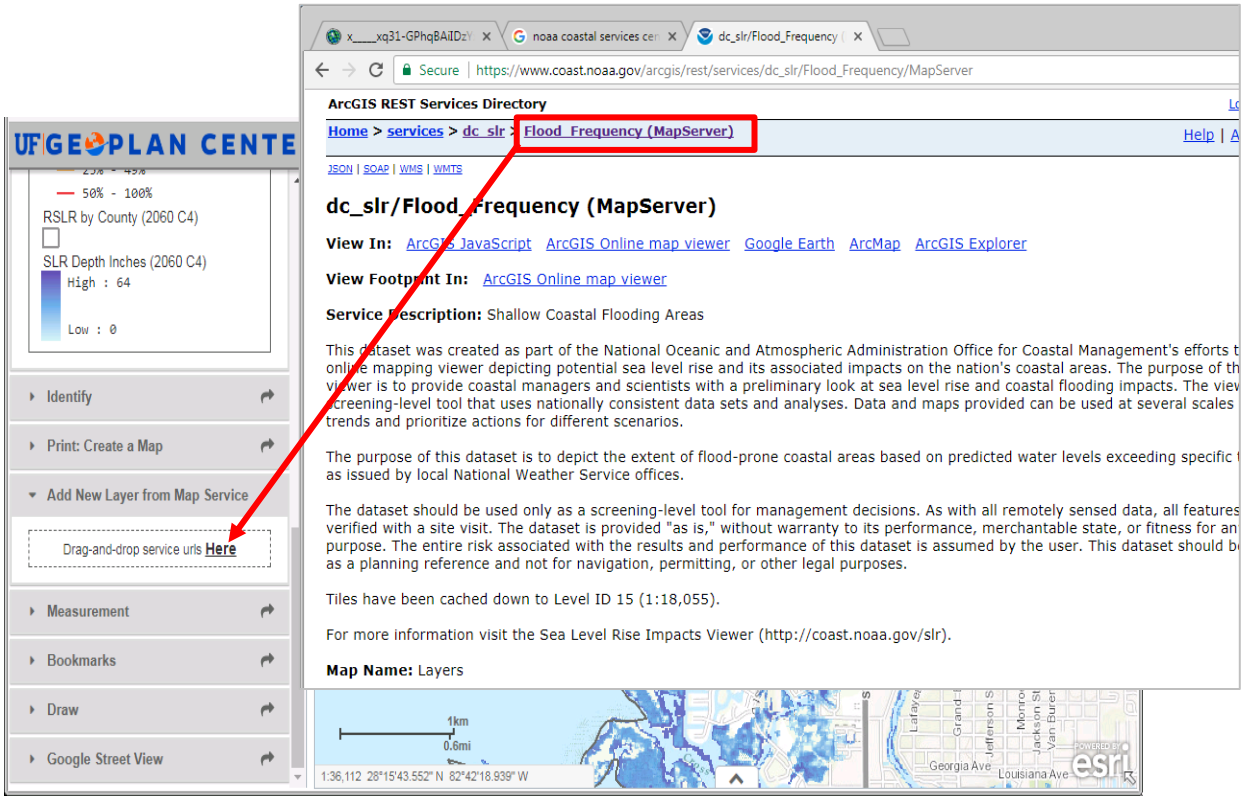
Exercise 7. Add New Layer from Map Service

This widget allows you to add 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.

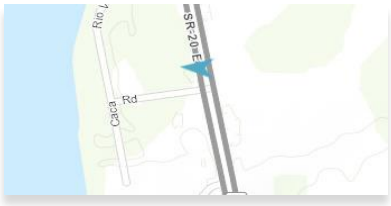


In this example, we will connect to map services available from the NOAA Office for Coastal Management (OCM) and add the layer "Shallow Coastal Flooding Areas".

1. Click on the "Add New Layer from Map Service" widget to open the tool. It will say "Drag-and-drop service urls **Here**". This is where you will drag the service.
2. In a web browser, navigate to the NOAA OCM REST directory: https://www.coast.noaa.gov/arcgis/rest/services/dc_slr
3. Click on the link for "dc_slr/Flood_Frequency"
4. In the top blue bar, where it says: Home > services > dc_slr > Flood_Frequency (MapServer), **click and drag where it says "Flood Frequency (MapServer)** and **pull it over to the map viewer widget** where it says: Drag-and-drop service urls Here.

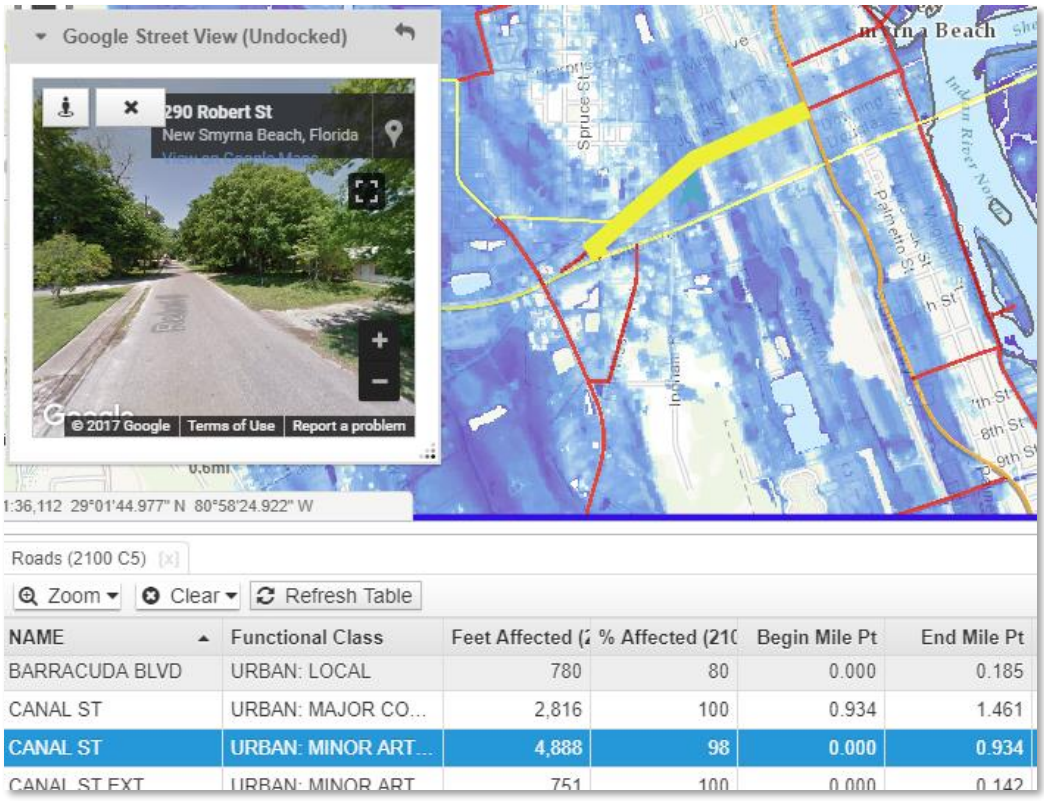


Exercise 8. Using the Google Street View Widget



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

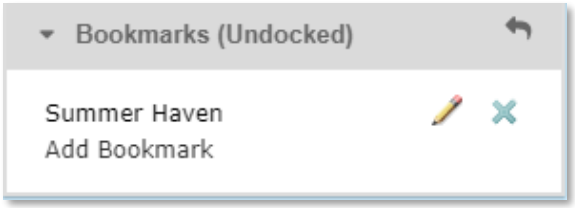
1. Choose a road on the map and Right-click along the road. Click “Google StreetView here”. A blue arrow will appear on the map.
2. In the Side Pane, scroll down to the Google Street View Widget. If Street View panorama is available, then you will see it the displayed in the widget. If imagery is not available, then you will get the following message: “Unfortunately, Google StreetView imagery is not yet available at that location”.
3. In the widget, drag and pull the image to rotate the view. Follow the arrows along the roadways to move the view up or down a street.
4. The StreetView widget is also designed to work interactively with attribute tables. Choose an SLR scenario to add to the map and zoom to an area where affected roads are visible. Next, open the attribute table for the Roads layer. As you click on rows in the attribute table the road will be highlighted on the map, and a StreetView image for that road appears for that road in the widget.



Exercise 9. Additional Features

Bookmarks

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



1. 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").
2. 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.

1. 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.
2. As you zoom in and out on the map, your drawings will persist until you click "Clear All drawings" button or reload your browser.

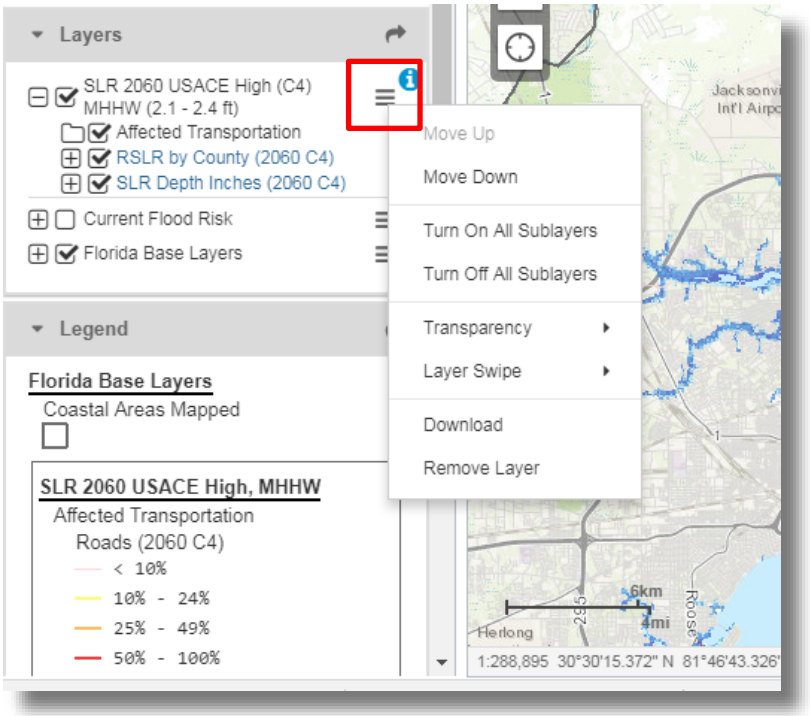
Exercise 10: Downloading Map Packages

The GIS data displayed in the Sea Level Scenario Sketch Planning Tool map viewer can be downloaded as map packages directly from the map viewer. This exercise explains how to download a map package. *If you want to view the data, you will need ArcMap.*

A map packages (.mpk) contains a map document (.mxd) and the data referenced by the layers it contains, packaged into one convenient, portable file. The map packages were created with ArcGIS 10.4x, but should be readable using ArcMap 10.1 through 10.5. Alternatively, the GIS data in ArcGIS file geodatabase 10.4.1 format can be downloaded from the data download page https://sls.geoplan.ufl.edu/download-data/

How to Download Map Packages

1. First, add a scenario to the map using the Scenario Selector. After the scenario has loaded in the layers widget, move on to Step 2.
2. In the Map Viewer, click on the Layer Controls menu (the icon with three horizontal bars).



3. Click on "Download". Save zip file to desired location.
4. Unzip/ extract the downloaded file.
5. Open the map package in ArcMap.
6. For explanation of attributes, please see the metadata included with each data layer.

   To view the layer's metadata in ArcMap: in the Table of Contents:

   Right Click on Layer Name → Data → View Item Description