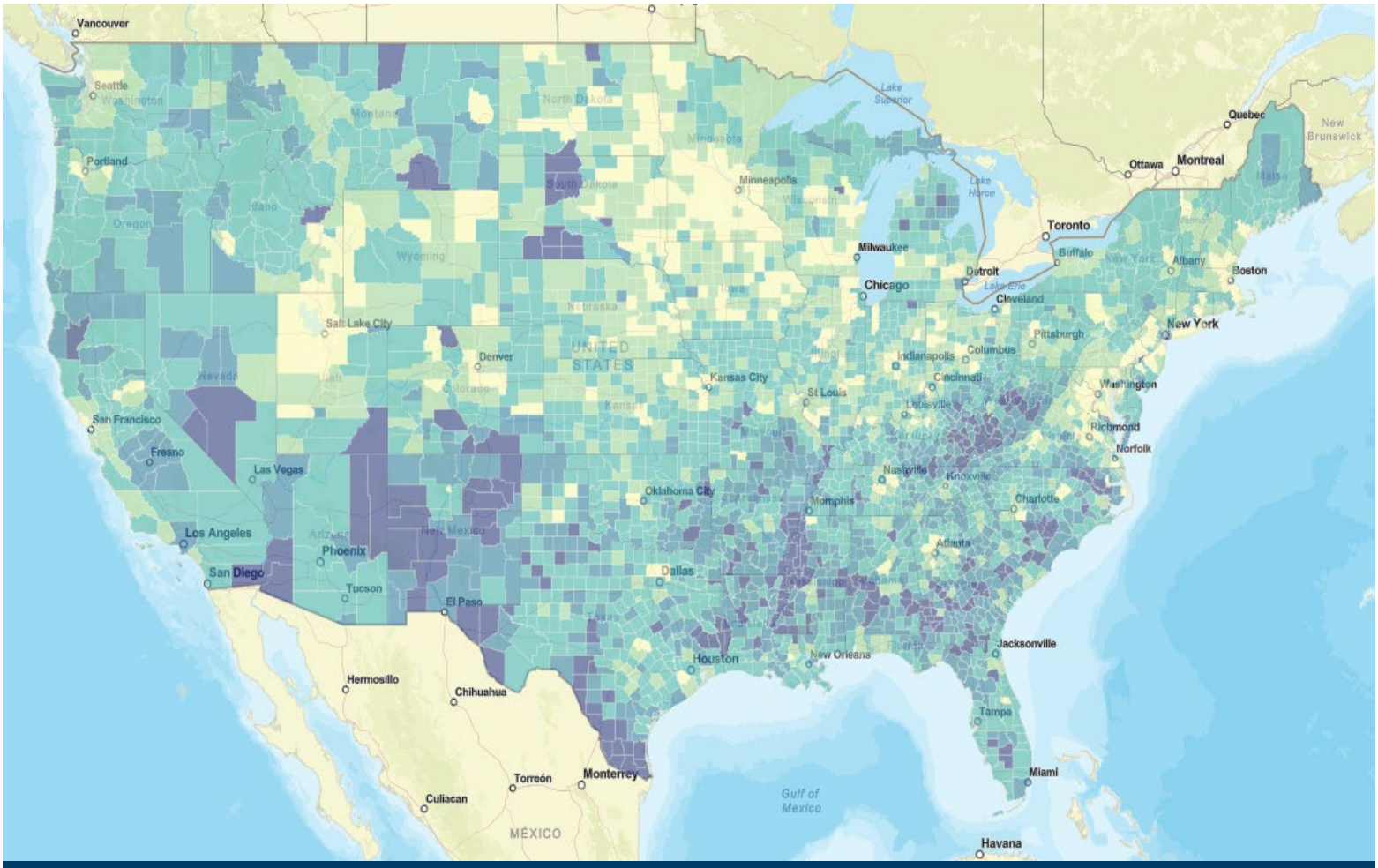

Resilience Analysis and Planning Tool

User Guide

July 2024

FEMA

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1. Introduction

The Resilience Analysis and Planning Tool (RAPT) is a free, publicly available geographic information systems (GIS) tool to help emergency managers and community partners of all GIS skill levels:

- visualize and assess potential challenges to community resilience, and
- make strategic decisions for mitigation, response and recovery.

Definition of Resilience- FEMA defines resilience as the ability to prepare for threats and hazards, adapt to changing conditions and withstand and recover rapidly from disruptions.

This User Guide provides step-by-step instructions on how to use the features and analysis tools in RAPT. There is also a RAPT Instructional Video on the RAPT Resource Center.

Access links to RAPT and the RAPT Resource Center at: https://www.fema.gov/RAPT.

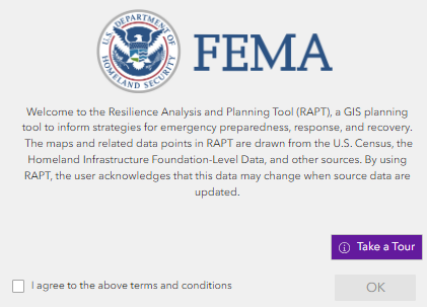
RAPT includes over 100 pre-loaded data layers and the tool's functionality allows users to visualize combinations of these data layers for a specific location. The categories of data layers are:

- **Infrastructure** information drawn from the Homeland Infrastructure Foundation-Level Data (HIFLD)[1] Subcommittee, such as fire station and hospital locations.
- **Hazards,** such as real-time weather layers from the National Oceanic and Atmospheric Administration (NOAA), historic tornado paths and future forecast layers such as sea-level rise.
- **Community Demographics** for counties, census tracts, and Tribal Nations drawn primarily from the U.S. Census Bureau. RAPT includes 27 demographic layers, including 22 community resilience challenges indicators identified from peer-reviewed research, and FEMA's Community Resilience Challenges Index (CRCI) for counties and census tracts, a composite value of all 22 community resilience challenges indicators. The full list of community demographic data layers available in RAPT is provided in section 5.

[1] The HIFLD Open Data Portal contains national foundation-level geospatial critical infrastructure data in the public domain. You can access HIFLD Open at https://hifld-geoplatform.opendata.arcgis.com/.

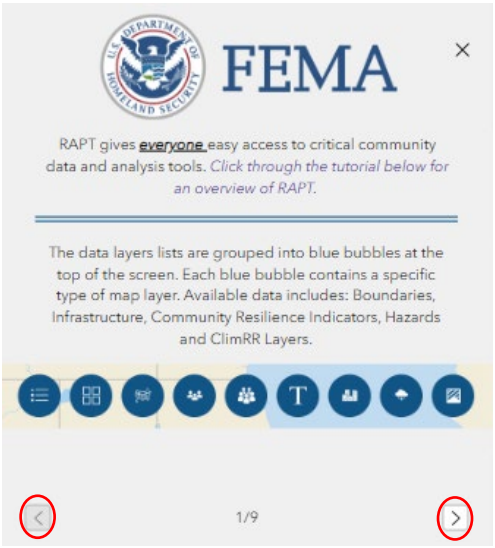
2. Getting Started

2.1. User Agreement



The initial splash page shows a short user agreement and provides an opportunity to take a tour of RAPT. Click the box next to "I agree to the above terms and conditions" and then click the "OK" button each time you open RAPT to gain access.

2.2. Take a Tour of RAPT



Clicking on the "Take a Tour" button will open an information window in the middle of the screen. This virtual tour provides various pages with information on the significant functional and visual changes to RAPT. Click the left or right arrows to cycle through the informational pages. You can close this window by clicking on the "x" in the top right. You can also access the "Take a Tour" overview from the RAPT Header after clicking the splash page user agreement.

3. Navigating the Map

The initial map view shows the continental United States, but you can move to other areas, such as Hawaii, Alaska, or Puerto Rico and you can zoom in to specific locations. Navigate with the following:

- **Mouse:** Use your mouse wheel to zoom in and out on the map. Left click the mouse and hold to move the whole map, or left click on a specific point.
- **Search:** Type the name of a specific address, county, city, or state in the search bar. The Search button is located in the upper right corner.
- **Zoom:** Click the +/- boxes at the top left of the map to zoom in or out on a map location.
- **Home:** Use the home button to bring the map back to the initial view.
- **Previous Extent:** Use the arrows to zoom to a previous extent.
- **My Location:** Use the circular button to center the map on your current location.

The blue circular icons at the top of RAPT have drop-down menus for RAPT data layers and other useful information. You can see the title for each icon by hovering over the icon with your mouse.

3.1. Legend

Displays the legends for all the layers (hazard, infrastructure, indicators) you have toggled on in the map.

3.2. Basemaps

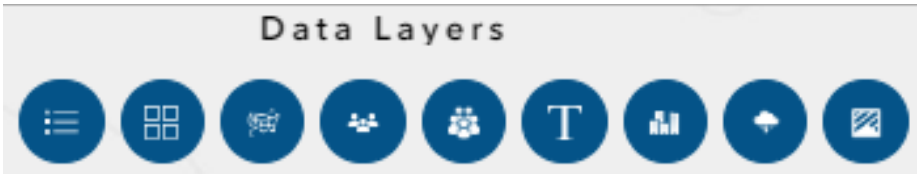
There are various basemap options in RAPT. The default map is the grey Navigation Map, and other options include satellite imagery, streets, topographic and terrain views. The Streets Map view is especially helpful to assess evacuation routes, and the terrain views are useful when looking at hazards such as flood or wildfire.

3.3. Boundaries

The Boundaries list provides various boundary layers for reference and analysis, including Tribal boundaries, municipal boundaries and FEMA's Community Disaster Resilience Zones (CDRZ).

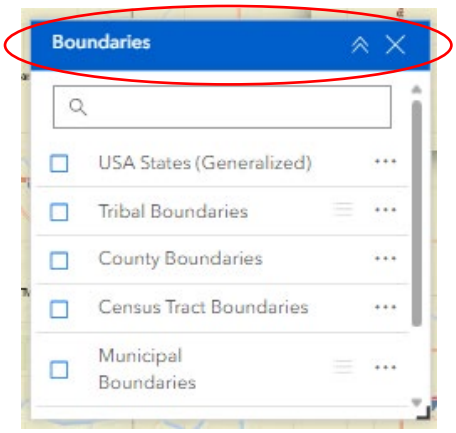
4. Data Layer List and Pop-Up Functionality

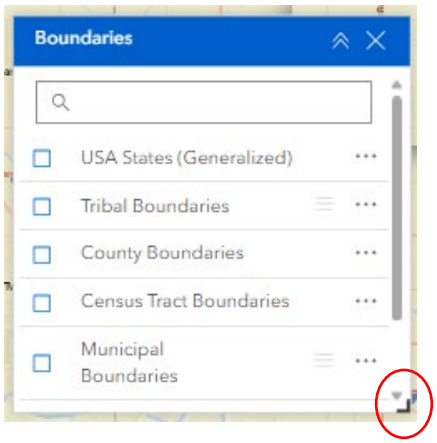
The data layer lists are grouped into blue icons at the top of the screen. Each blue icon contains a specific type of data layer (Infrastructure, Hazards, Community Resilience Indicators etc.). Use your mouse to hover over an icon to see the layer list title and click on the icon to find and view layers in that group.



4.1. Location and Resizing

Data layer lists will open at the upper left of the screen and can be resized and moved anywhere on the map. This allows users to open multiple layer lists and tools at once, resize them and place them wherever they choose. Click and drag the blue header to move layer lists and tools. Click on the lower right corner and drag your mouse to resize layer lists and tools.



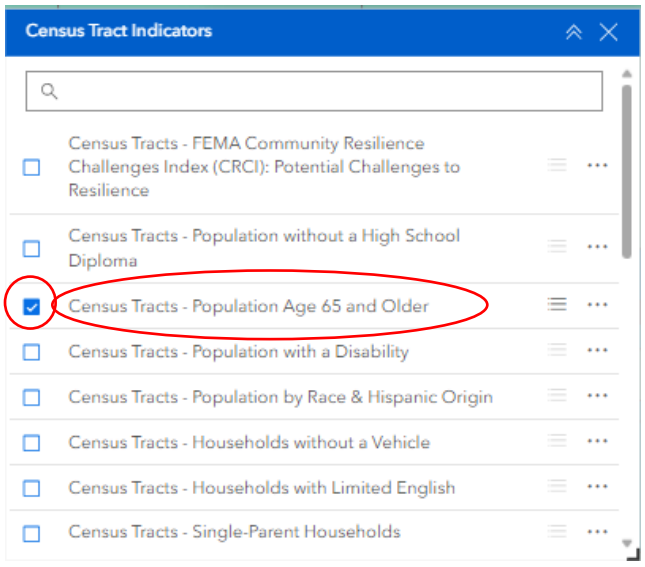


- NOTE: During a user session in RAPT, a re-sized layer list will re-open to the same size and location as they were when closed by the user.

4.2. Toggling Layers On/Off

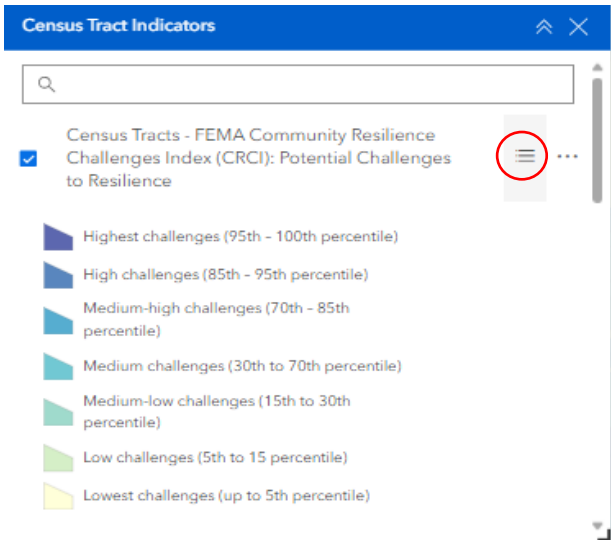
Users have multiple options for toggling on/off data layers. Clicking on the layer name will toggle the data layer on/off. Users can also click on the box next to the layer name. A checkmark will appear in the box and the data will display on the map.

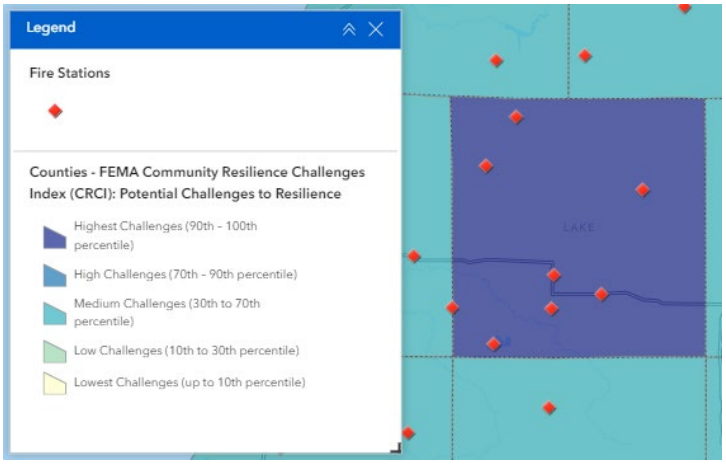
- NOTE: If a data layer name appears grey, you will need to zoom in on the map before this layer is able to populate.



4.3. Legend

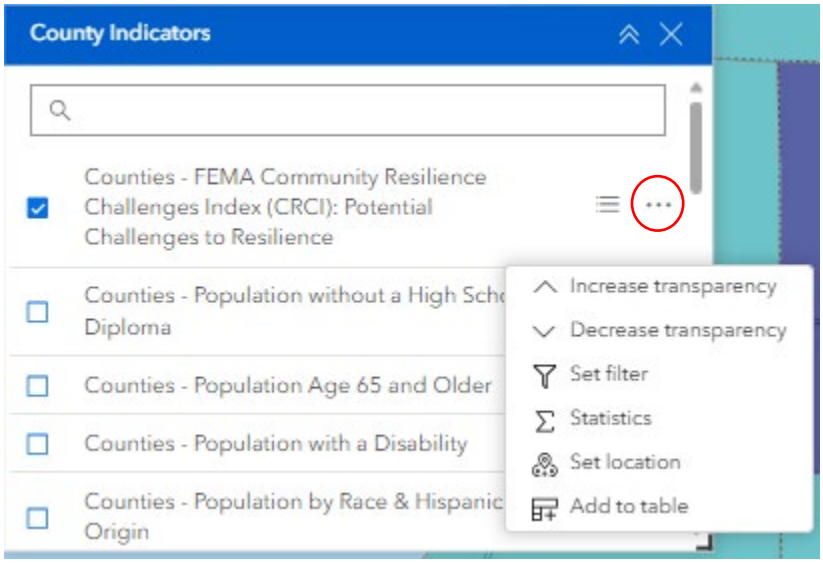
RAPT users can view the data layer legend in the data layer list or in the Legend icon. Clicking on the "Legend" symbol next to the layer name will open the layer legend below the layer title. Users can view layer legends for all layers that are toggled on by clicking the blue "Legend" icon.





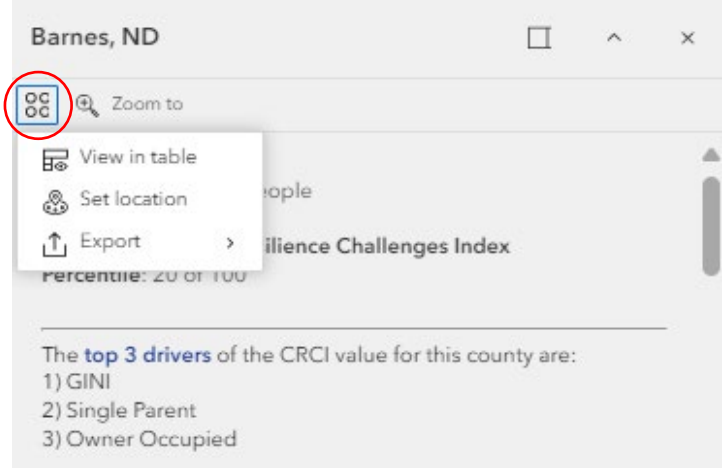
4.4. Options

Each data layer has three dots to the right of the title. Clicking on the three dots gives you additional options for the display, including transparency. Adjusting the transparency of the visual display on the map can be useful when you have multiple data layers toggled on.



4.5. Actions

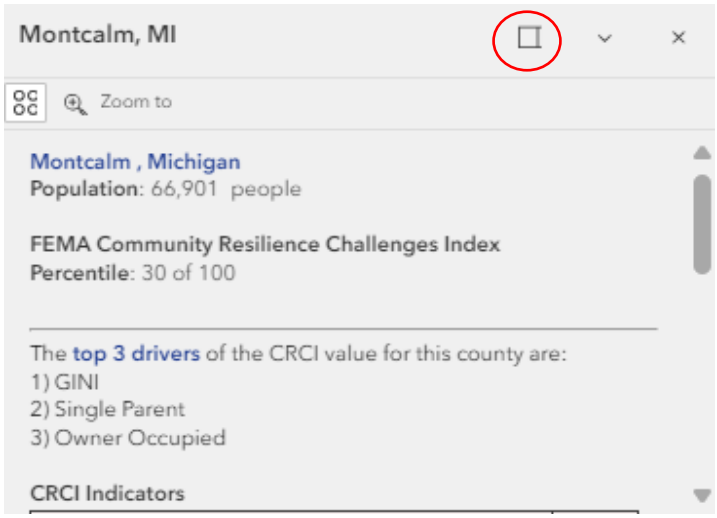
When viewing a pop-up for a data layer, users can click the “actions” button to see various options, including viewing the information in the attribute table, setting the location as input for various analysis tools and exporting the dataset information to an Excel file.



4.6. Docking Pop-ups

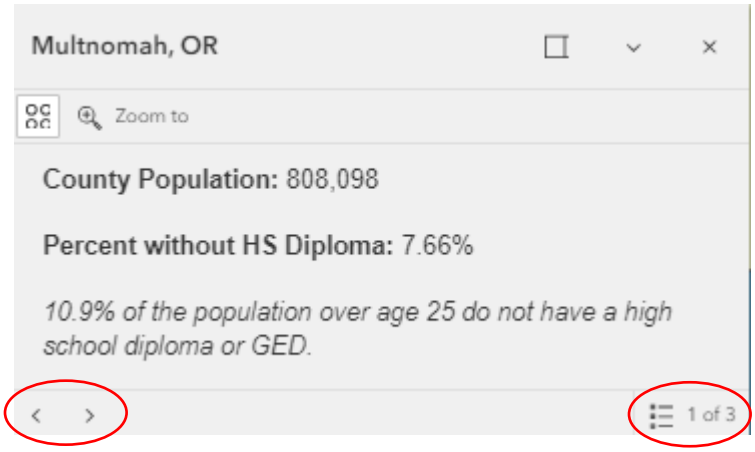
When viewing a pop-up for a data layer, the pop-up will appear on the map with a pointer to the location. Users can dock the pop-up on the right side of the map by clicking the “dock” button. This allows users to see more of the geographic area they are focused on.

- NOTE: Pop-ups will re-open to the same location as they were when closed by the user. Users can re-locate the pop-up to the map location by clicking the “Undock” button.

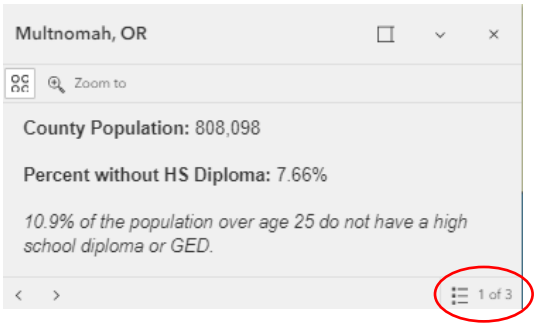


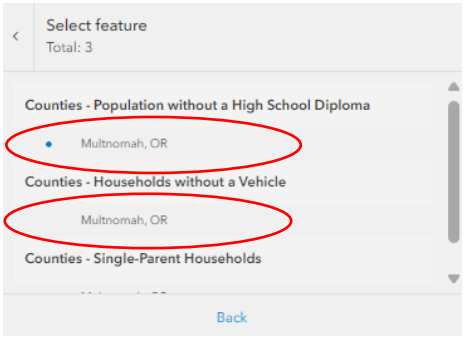
4.7. Multiple Tabs in Pop-Ups

When viewing a pop-up with multiple data layers toggled on, the pop-up will have tabs that correspond to each data layer. The number of tabs will be displayed at the bottom right of the pop-up. Users can cycle through the tabs by clicking the “next” and “previous” arrows at the bottom of the pop-up.



Users can also see a list of all the data layers that are toggled on and go to the tab for a specific layer. Click the list icon in the pop-up to display the list of data layers. Select the layer you want to view in the pop-up and click the location below the layer name. The pop-up will now display the information for the data layer you selected.





5. Community Demographics and Resilience Challenges Indicators

5.1. Community Resilience Challenges Indicators

RAPT includes important demographic information about the people who live in the community.

These community demographic layers are available at the county, census tract and Tribal Nation boundary levels. RAPT includes 27 demographic layers, including 22 community resilience challenges indicators identified from peer-reviewed research and FEMA's CRCI for counties and census tracts.

Not all demographic data layers in RAPT are available at all three levels. Currently, 26 of the 27 layers are available for counties; 21 are available for census tracts; and 17 are available for Tribal Nation boundaries.

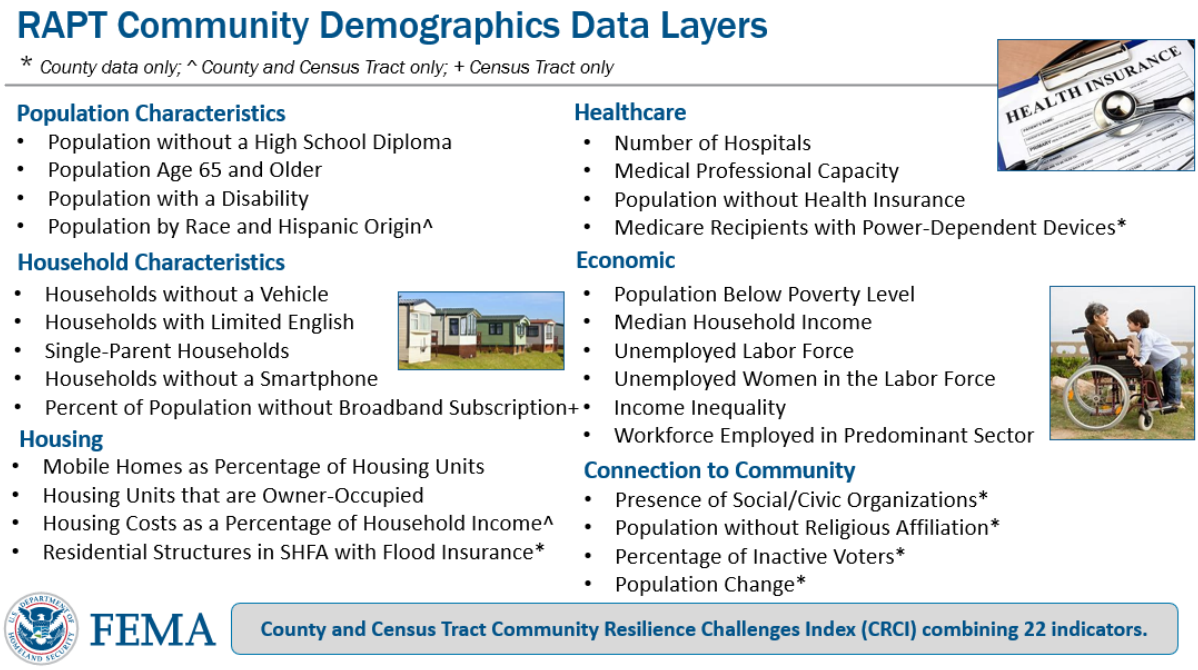


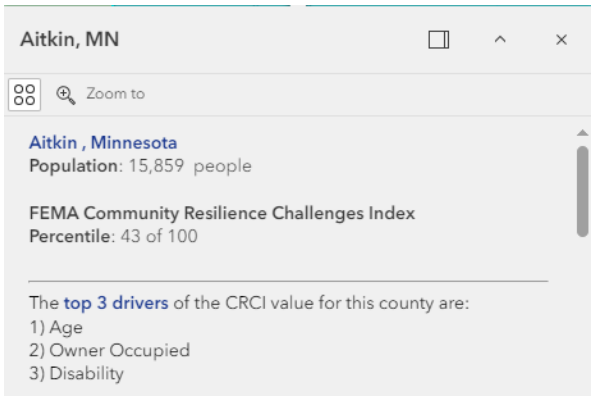
Image above shows all 27 community demographic data layers available in RAPT, including the 22 community resilience challenges indicator layers.

5.2. Community Resilience Challenges Index (CRCI)

The Community Resilience Challenges Index is a composite index comprised of the 22 commonly used indicators identified through an analysis of peer-reviewed research. This index provides a relative composite value by county and by census tract, measured as a percentile relative to all other counties and census tracts, respectively.

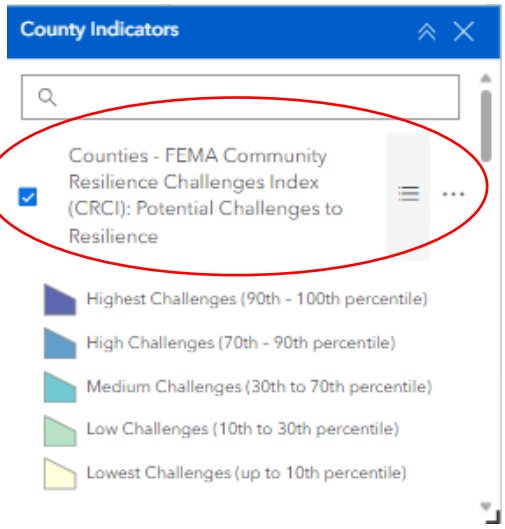
- NOTE: When data for an indicator was not available at the census tract level, the research team imputed the county data for the census tract calculation.
- NOTE: The CRCI value for municipios in Puerto Rico do not include "speaks English less than well" as one of the indicators in the calculation.

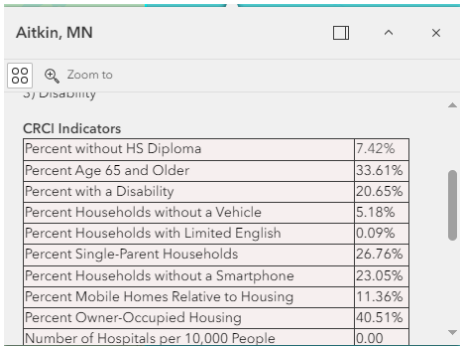
For each county CRCI, the pop-up box will also include the top 3 drivers of the CRCI value for the county. This gives emergency managers and community leaders a quick way to see the top 3 challenges to resilience within the county, based on research-based commonly-used community resilience challenges indicators.



5.3. CRCI Indicator Pop-Ups

The FEMA Community Resilience Challenges Index layer is available for both counties and census tracts. To view the pop-up box that contains the list of indicators and data for the geographic area, toggle the FEMA Community Resilience Challenges Index layer on and click on the county. Scroll down inside the pop-up box to see the full list of indicators with values for each.





5.4. Indicator Data Bins

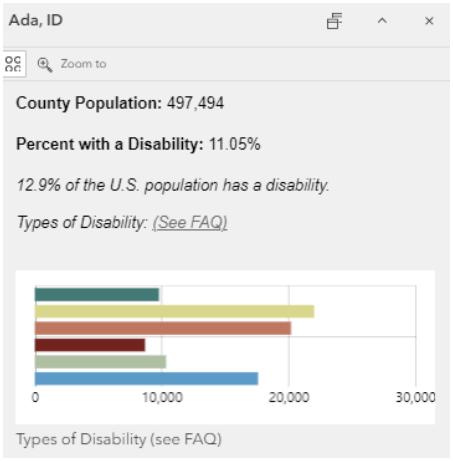
FEMA binned the datasets and assigned consistent color ramps for the bins to provide a visual cue for users to quickly identify ranges for the data. These bins and associated colors provide a more immediate high-level understanding of a geographic area's characteristics. While the color ramp is consistent, the legend of the specific data range represented by the color is specific to each indicator. In addition to the data range color, the specific data point is available in the pop-up box, along with the national average for the indicator.

- If multiple indicators have been selected, each indicator will have a separate tab in the pop-up, with the data point for the geographic area and the national average.
- If multiple layers are toggled on, the map will only display the colored bins for the indicator that is highest on the drop-down list.

5.5. County Indicators

Click on the "County Indicators" icon to see the list of all the layers available with county-level data. Toggle on/off layers to see the different community resilience indicator values for each county.

- With a layer toggled on, click on the "Legend" symbol next to the layer name and a legend will appear below the layer name. The county indicators are organized into five bins, with the darker colors indicating greater potential challenges to resilience.
    - NOTE: While the color bins are the same, the legend or data range associated with each color is different for each indicator.
- Click on a county for a pop-up box of that county's data and the national average for that indicator.
    - NOTE: There will be a tab in the pop-up box for every indicator layer you have toggled on.
- There are 5 county-level indicators that have additional information in the pop-up box. These are Population Age 65 and Older, Population with a Disability, Population by Race & Hispanic Origin, Households with Limited English and Housing Costs as a Percentage of Household Income. When there is a bar chart in the pop-up box, use your mouse to hover over each bar to see the data value for that bar.

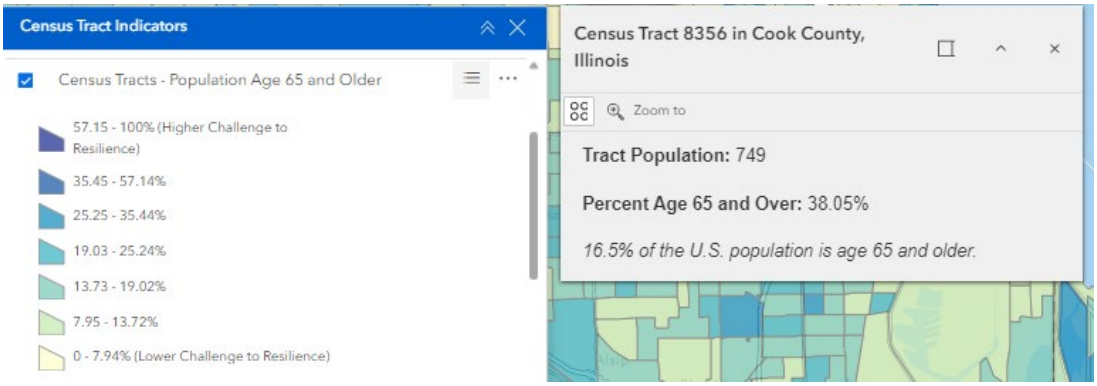


5.6. Census Tract Indicators

Click on the “Census Tract Indicators” icon to see the list of all the layers available with census tract-level data. Toggle on/off layers to see the different community resilience indicator values for each census tract.

- With a layer toggled on, click on the “Legend” symbol next to the layer name and a legend will appear below the layer name. Darker colors denote greater challenges to resilience. Census tract data is grouped into 7 bins to allow greater differentiation across this much larger dataset.

- Click on a census tract for a pop-up box with total population for the census tract, information on the selected indicator data, and the national average.

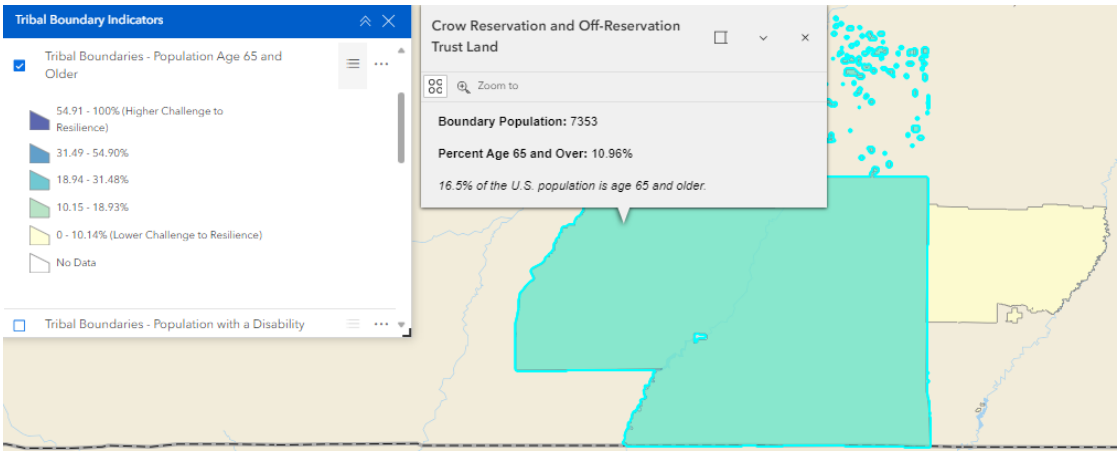


5.7. Tribal Nation Boundary Indicators

Both the Tribal Nation boundaries and the Tribal Nation indicator data are drawn from the U.S. Census Bureau data table DP02. Click on the “Tribal Boundary Indicators” icon to see the list of all

the layers available with Tribal Nation Boundary-level data. Toggle on/off layers to see the different community resilience indicator values for each Tribal Nation Boundary.

- Similar to the county indicators tab, click on the “Legend” symbol next to the layer name to see the legend. Darker colors denote greater challenges to resilience. Tribal Nation boundary indicator data is grouped into 5 bins.
- Click on a Tribal Nation area for a pop-up box with information on the selected indicator data.



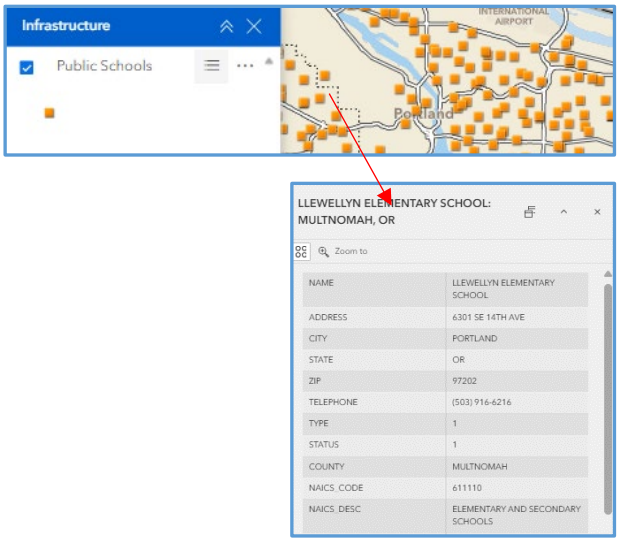
6. Infrastructure, Hazards and Future Climate Data

6.1. Infrastructure

Click on the “Infrastructure” icon to see a drop-down list of all the infrastructure data layers available in RAPT. Most of the infrastructure data in RAPT is pulled from the HIFLD Open.

- Click on the name of the infrastructure layer in the drop-down list to toggle the layer on. Click on the “Legend” symbol next to the layer name to see the legend (the shape and color of the datapoint). This is helpful when you have more than one infrastructure layer displayed. You can also click on the “Legend” icon to see the legends for all the data layers you have toggled on.

- Click on a datapoint and a pop-up box will appear with the information HIFLD Open has available.

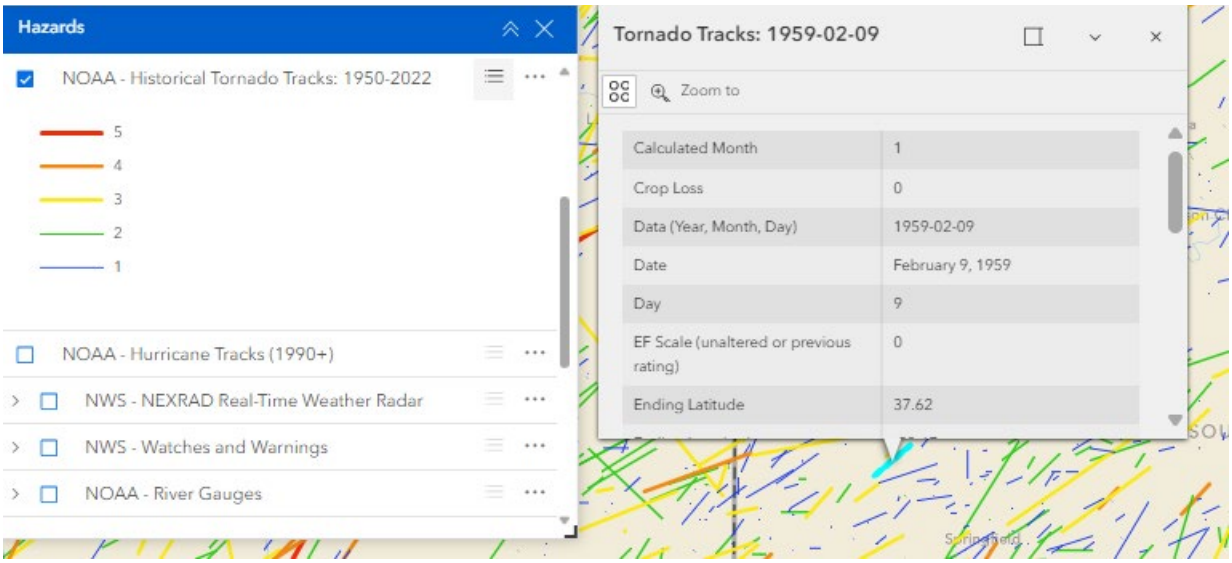


6.2. Hazards

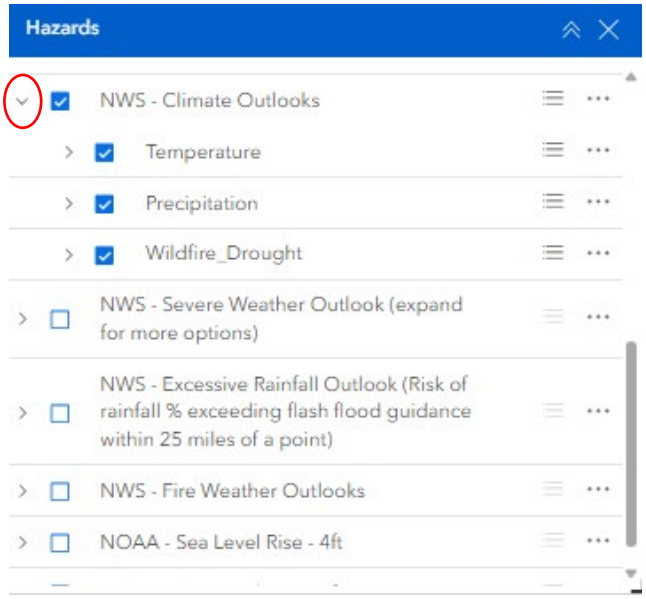
Hazard data in RAPT includes data layers of real-time radar and watch and warning notifications from the National Weather Service (NWS) (severe weather, excessive rainfall, fire weather outlooks, etc.), live stream gauges, current wildfires, historical hazard data for tornadoes and hurricanes, and flood and seismic risk and future forecast layers of 4–6-foot sea-level rise from the U.S. Geological Survey and the National Oceanic and Atmospheric Administration. The Hazard layer list also includes the Expected Annual Losses data from FEMA’s National Risk Index. Hazard layers have additional information about the hazard in pop-up boxes.

- Click on the name of the hazard layer in the drop-down list to toggle the layer on. Click on the “Legend” symbol next to the layer name to see the legend. You can also click on the “Legend” icon to see the legends for all the data layers you have toggled on.

- If the hazard includes datapoints, click on a datapoint to view the pop-up with information.

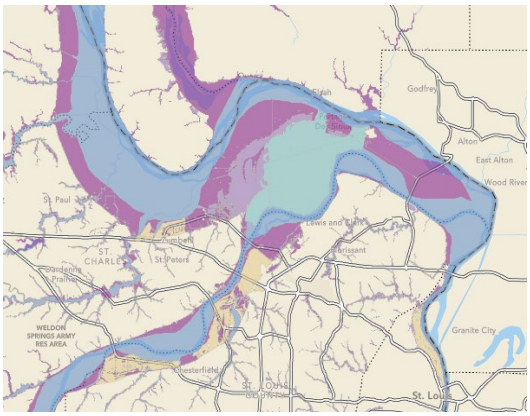


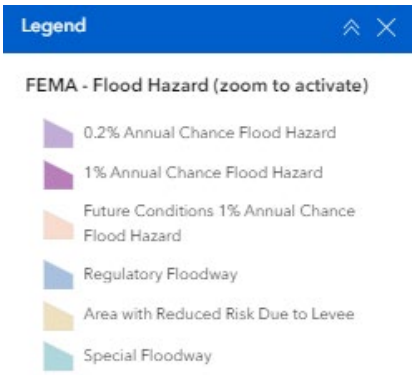
- Some hazard layers have multiple timeframes or sub-categories that users can view. Click on the "expand" arrow to the left of the layer name to see any additional sub-categories or layers that are available.



- NOTE: Users can toggle on/off various sub-categories in the hazards list, but the primary hazard layer must be toggled on to see any sub-layers. In this example, "NWS – Climate Outlooks" must be toggled on in order to see any of the sub-category layers.

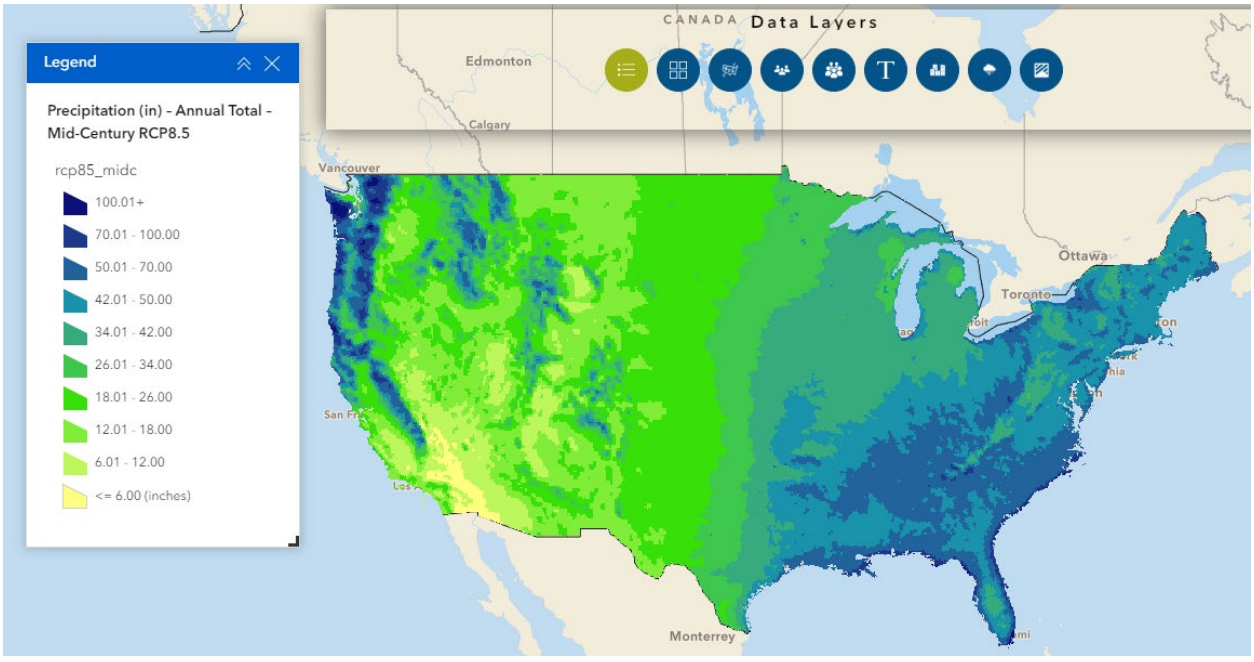
- Because the dataset is so large, FEMA's National Flood Hazard Layer will only populate on the map when the area shown on the screen corresponds to an altitude of 10,000 feet or lower. Flood maps are not available for all areas.





6.3. Future Climate Data

Click on the "Future Climate Projections" icon to see a drop-down list of selected future climate data layers from the Climate Risk and Resilience Portal (ClimRR), https://climrr.anl.gov. ClimRR provides dynamically downscaled data produced from modeling over 60 climate variables until the end of the century for two carbon emission pathways. The ClimRR data is displayed in 12 km grid cells.



Looking at today's community characteristics, including population and infrastructure, in tomorrow's forecasted climate gives communities an opportunity to develop adaptation and investment strategies for the future. There are many more future climate data layers available in ArcGIS Online. Visit the Add Data section to learn how to add additional ClimRR data layers to RAPT.

You can also visit https://climrr.anl.gov to view aggregated climate forecast data for a specific geographic area, a state, county, census tract, Tribal Nation boundary or user drawn shape. A summary report for the user-selected area is also available.

7. The Attribute Table

The Attribute Table gives users the ability to view and download all the data in RAPT in a tabular or spreadsheet format. All of the infrastructure, hazard, and indicator population data in RAPT can be viewed in the Attribute Table.

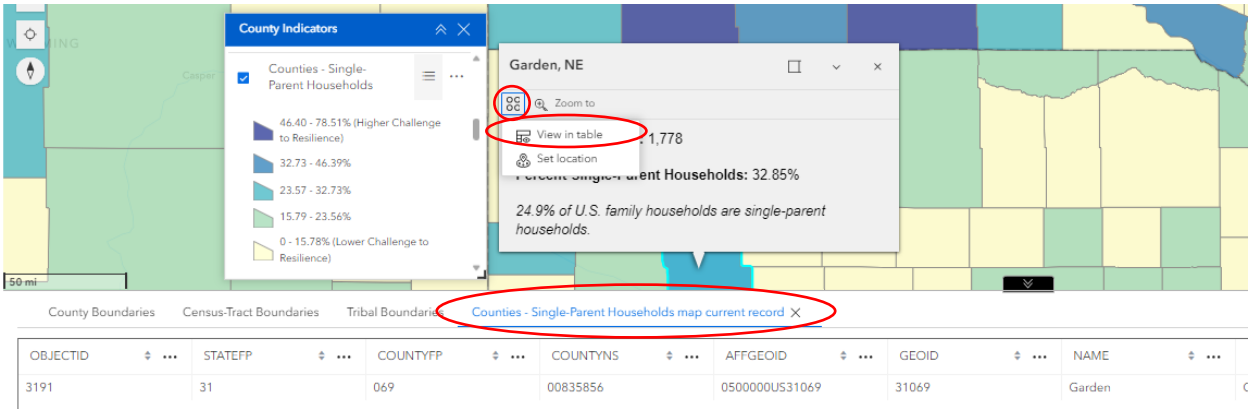
7.1. Attribute Table Tabs

The Attribute Table has 3 default tabs that provide data for counties, census tracts and Tribal boundaries, including the GEOID, population, the CRCI value and all CRCI indicator datapoints. These default tabs will always appear in the Attribute Table.

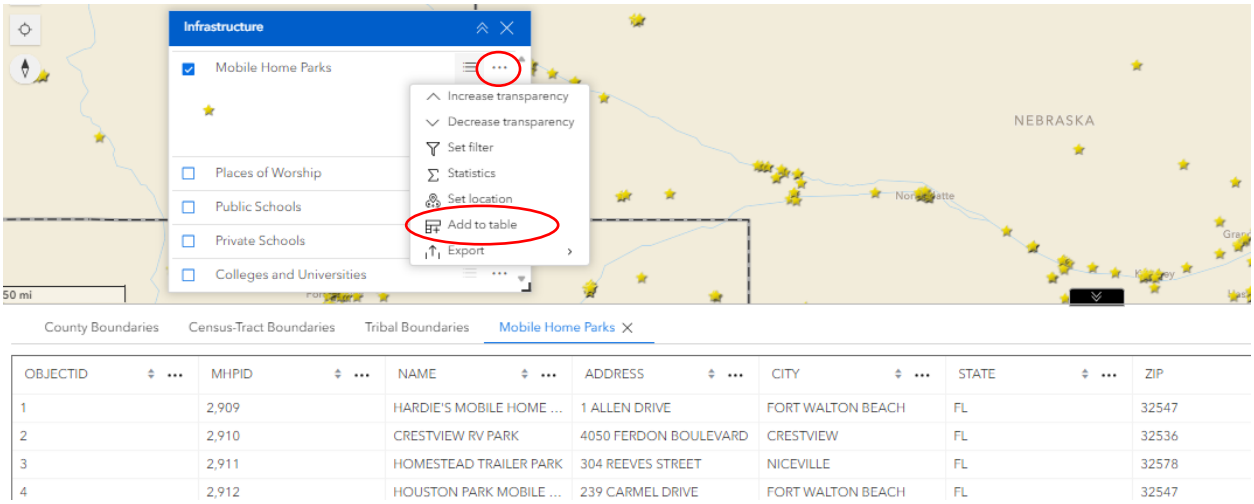
- Click the black tab at the bottom of the web page to open the Attribute Table. A window will pop up showing data in a tabular form. The bar at the bottom of the screen shows the total number of counties, census tracts or Tribal Nation boundaries that are included in the dataset.

GEOID	NAMELSAD	STATE_NAME	Population	Households	FEMA Communi...	Percentage of p...	Percentage of th...
01069	Houston County	Alabama	107,040	41,543	54	12.38	18.17
01023	Choctaw County	Alabama	12,669	5,228	84	17.61	23.29
01005	Barbour County	Alabama	24,877	9,016	93	23.51	19.8
01107	Pickens County	Alabama	18,925	7,083	82	15.05	19.4
01033	Colbert County	Alabama	57,270	23,266	42	13.62	20
04012	La Paz County	Arizona	16,681	8,911	99	17.39	40.45
04001	Apache County	Arizona	66,054	19,786	99	15.99	15.84

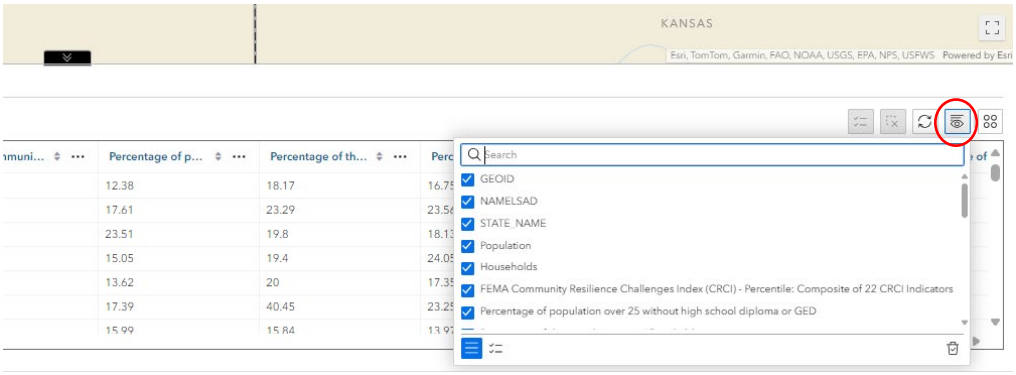
- The Attribute Table can also be opened from pop-ups and layer lists to view specific datapoints or lists of datapoints. To view a specific datapoint in the Attribute Table, click the “Actions” button in the upper left corner of the pop-up and select “View in Table.” Click on the Attribute Table arrow at the bottom of the page. The Attribute Table will now contain a tab with the information from the data layer in the pop-up.



- To view all datapoints from a layer list in the Attribute Table, click on the “Options” icon next to the layer name in the layer list. Select “Add to Table”. Click on the Attribute Table arrow at the bottom of the page. The Attribute Table will now contain a tab with all of the datapoints from that data layer.



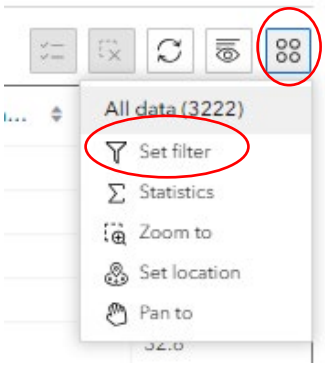
- Users can select which columns of data they wish to view in the Attribute Table. Click on “Show/hide columns” to adjust which columns are displayed for your data layers.

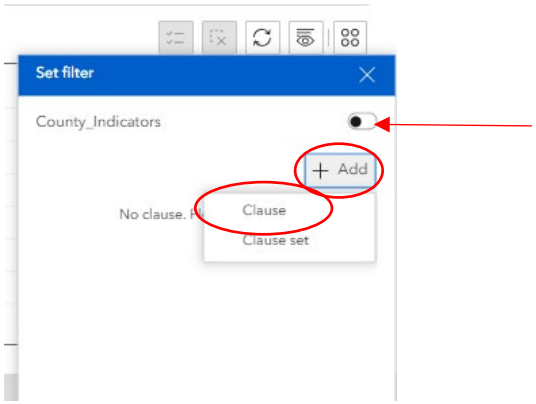


7.2. Filters in the Attribute Table

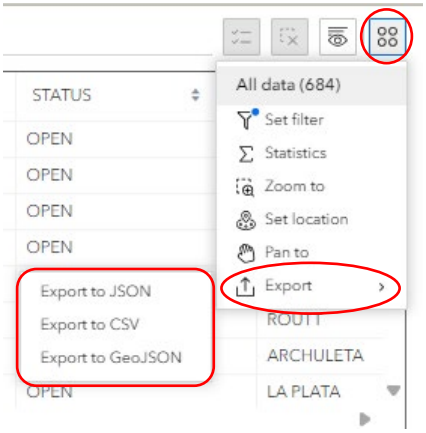
Users can set filters in the Attribute Table to view specific indicator, infrastructure and hazard datasets that fall within desired parameters.

- Click on “Actions” to see various options for filtering and summarizing data in the Attribute Table. Select “Set Filter”, then “Add” and then “Clause” to set parameters and only view datasets within those parameters. You must toggle on the Filter for the Attribute Table to reflect the filtered datasets.





7.3. Downloading Data from the Attribute Table



From the Attribute Table, you can download data into an Excel document, sort by name/title and filter by state, county or other attribute.

- Open your indicator, infrastructure or hazard data in the Attribute Table and set any filters.
- Click “Actions”, select “Export” and choose which file type you’d like to export as.

8. Analysis Tools

The analysis tools are grouped into green icons at the right of the screen. Each green icon contains a specific type of analysis tool (Add Data, Incident Analysis, Filter etc.). Hover over an icon to see the title and click on the icon to open the tool.

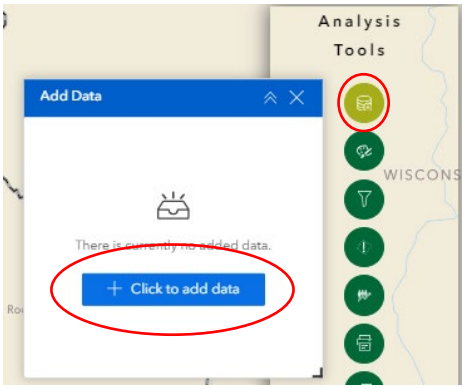
8.1. Add Data

The Add Data tool allows you to add data to the map by searching for layers from online libraries of GIS data layers, pasting URLs of REST Services, and uploading shapefiles or GeoJSONs. Supported file types include zipped shapefile, KML, CSV, GPX, or GeoJSON.

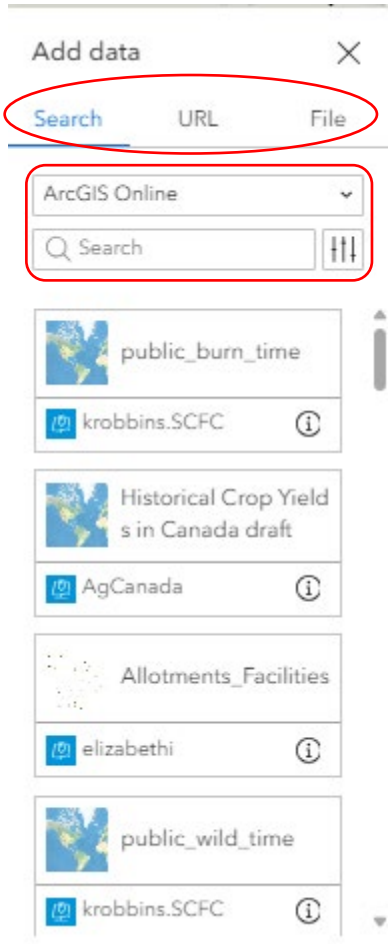
There are three libraries of GIS data in RAPT: ArcGIS Online, the Esri Living Atlas, and a curated list of RAPT Suggested Layers, Note: While all of the RAPT Suggested Layers are available for free, not all data layers from ArcGIS Online or Esri Living Atlas are free. Some of these data layers require a subscription to Esri.

- NOTE: While you can upload additional layers for analysis, **you will not be able to permanently add these layers into RAPT**. As a publicly available tool that does not require a username or password, local layers cannot be permanently saved or embedded. However, added data layers will remain in your Add Data window list until you completely close out your browser.

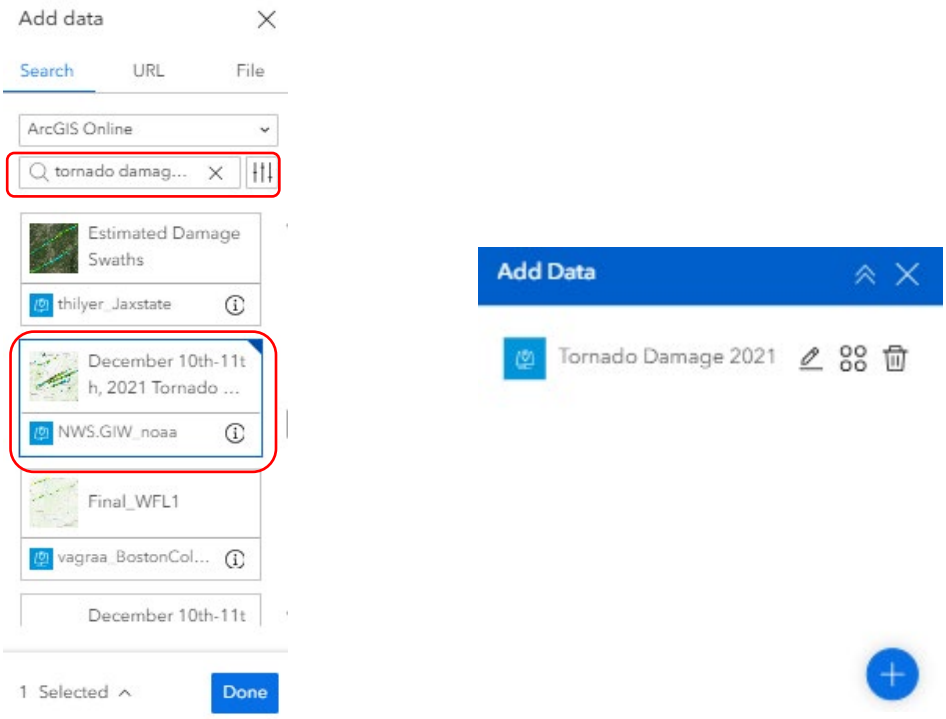
- Click on the “Add Data” icon and the Add Data window will open. Then select “Click to add data”.



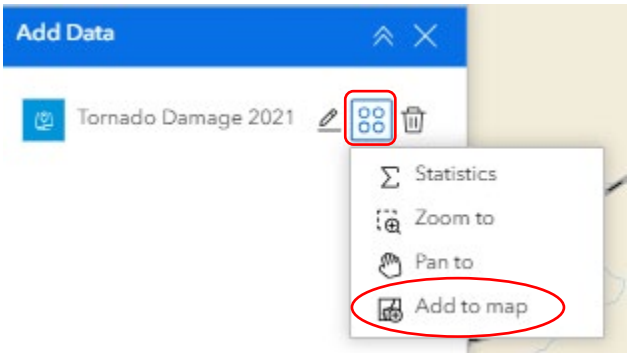
- The Add Data search window will open, and you will see multiple options for searching for and adding data layers to the map. You can add data using the search function, pasting a URL or uploading local files.



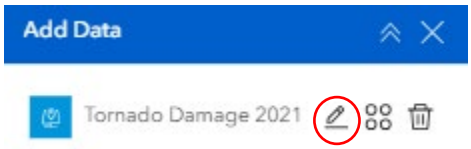
- To search, zoom to the geographic area you want to focus on and type in the data layer you are looking for.
- Once you determine the layer to add, click on the layer title. A blue triangle will appear in the upper right corner of the layer title and the layer will be outlined in blue.
- Click on the details link of the layer to see if that layer requires a subscription (a shield will appear). If you would like access to the subscriber data layers, please contact your organization's lead GIS analyst to obtain the requisite login information.
- Click “Done” and the search window will disappear. You will see the added layer displayed in the Add Data window.



Once the layer is listed in the Add Data window, users need to add it to the map. Click the “Actions” button and select “Add to map”. The layer will now appear on the map.



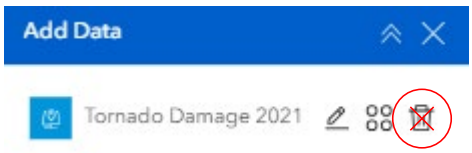
Once the layer has been added to the map, users can rename the added data layer by clicking on the “Rename” button.



- NOTE: Refreshing your browser will remove the added data layer from the map, but the added data layer will remain in the Add Data window. Simply click the “Actions” button and select “Add to map”. The layer will now appear on the map again.

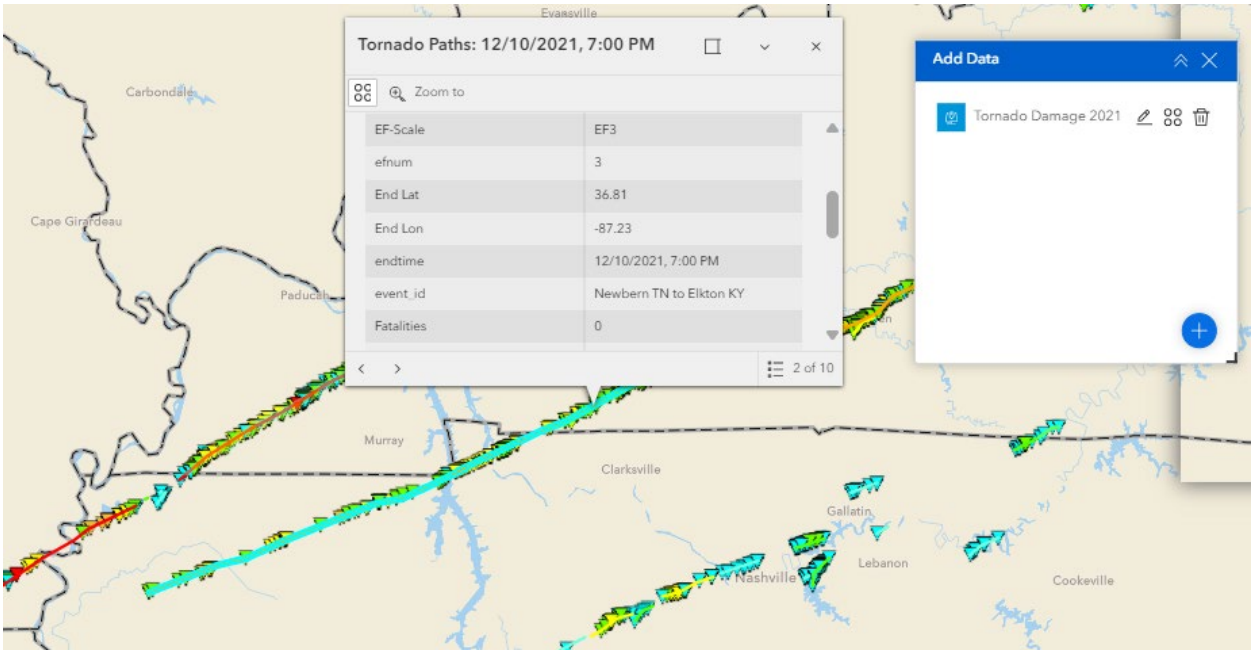
Recommendation: Do not click the “Remove” button in the Add Data window, as this removes the data layer from the Add Data window list but **not** from the map.

- Leave the added data layer in the Add Data window in the event you want to explore other data options or re-add it to the map after refreshing your browser.

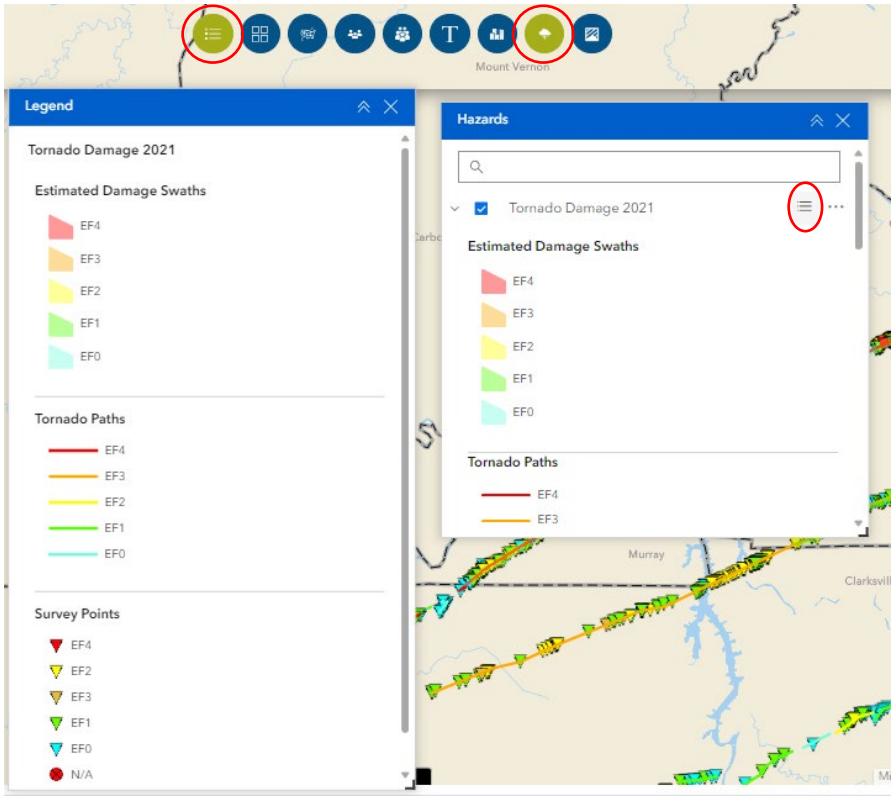


To remove any added data layers, click the “Clear Results” button in the bottom right of the screen, underneath the Analysis Tools, and select the added layer you wish to remove.

For this example, the user zoomed into the Kentucky/Tennessee region, searched “tornado damage 2021” and added a layer that is provided by NOAA. The added data layer displays on the map and includes information about the hazard in the pop-up.

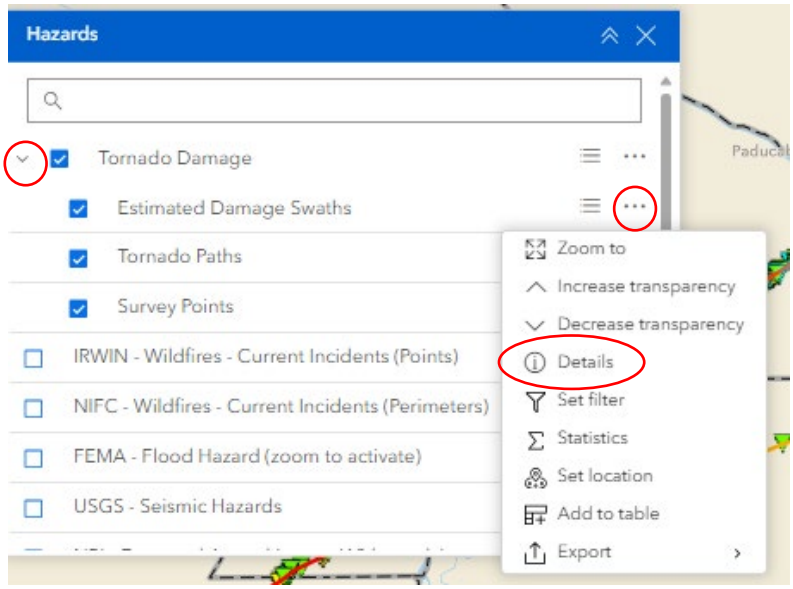


Once a layer has been added, you can see the legend by going to the Hazards tab (or Infrastructure tab) and clicking on the “legend” button. You can also click on the “Legend” icon to see the added layer legend if it is toggled on.



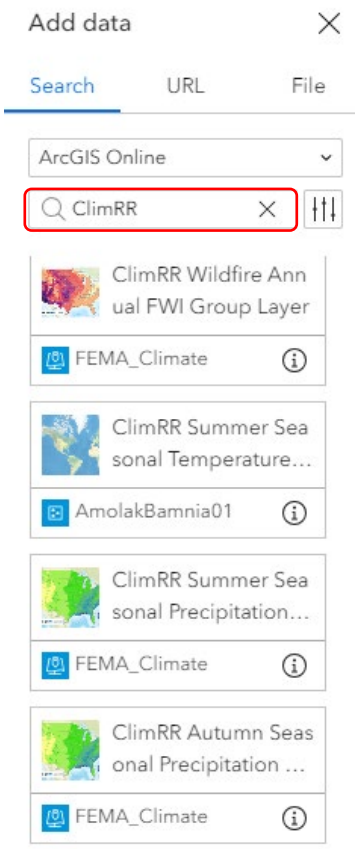
Users can see additional information about the added data layer, adjust transparency, set filters and export information. Once a layer is added, it will display in all of the Data Layer lists (Census Tract, Hazards, Infrastructure etc.). If there are sub-categories available, click the “Expand” button. Click “Options” under one of the sub-categories and you will see a list of options available for that layer.

Select the option you need, like viewing the details page for the added layer. Not all options will be available for all added data layers.



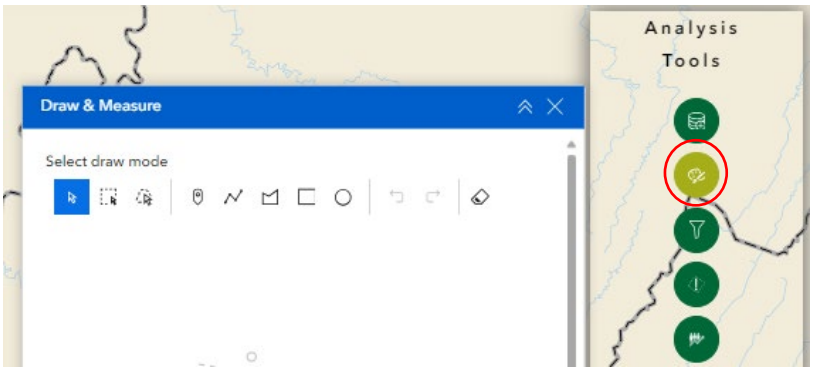
Some of the data layers in the ArcGIS Online database are publicly available and will load automatically when you select them, while other data layers require an ArcGIS login. To check if a subscription is needed for a specific layer, click “Details” and see if the layer is labeled as a “Subscriber” layer.

As mentioned in the ClimRR section, users can search for additional ClimRR layers to add to RAPT. When searching for layers, select ArcGIS Online and type “ClimRR” into the search bar.

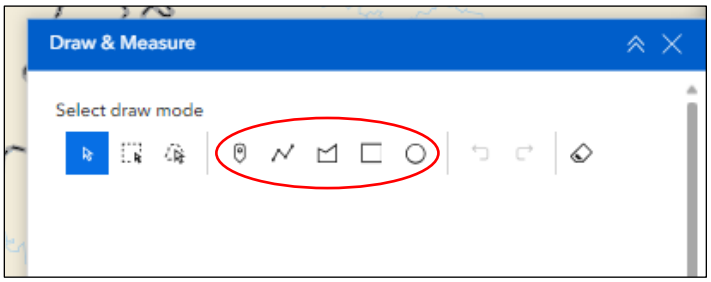


8.2. Draw and Measure

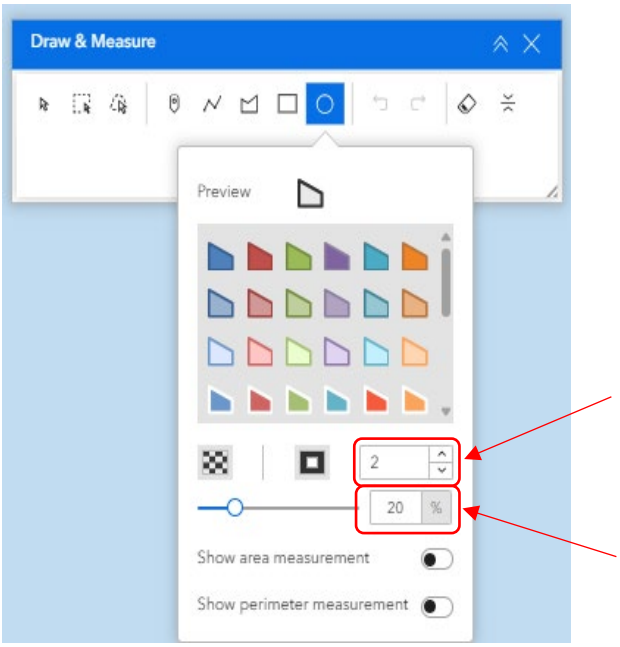
The Draw & Measure tool contains options to help draw and measure customized visualizations that display on the map (single points, lines, polygons, etc.). It can also display measurements for drawn features, such as length, area, and perimeter. Click on the “Draw & Measure” icon to open the tool.



- To draw an object, select the shape of the object you wish to draw from the options in the tool.

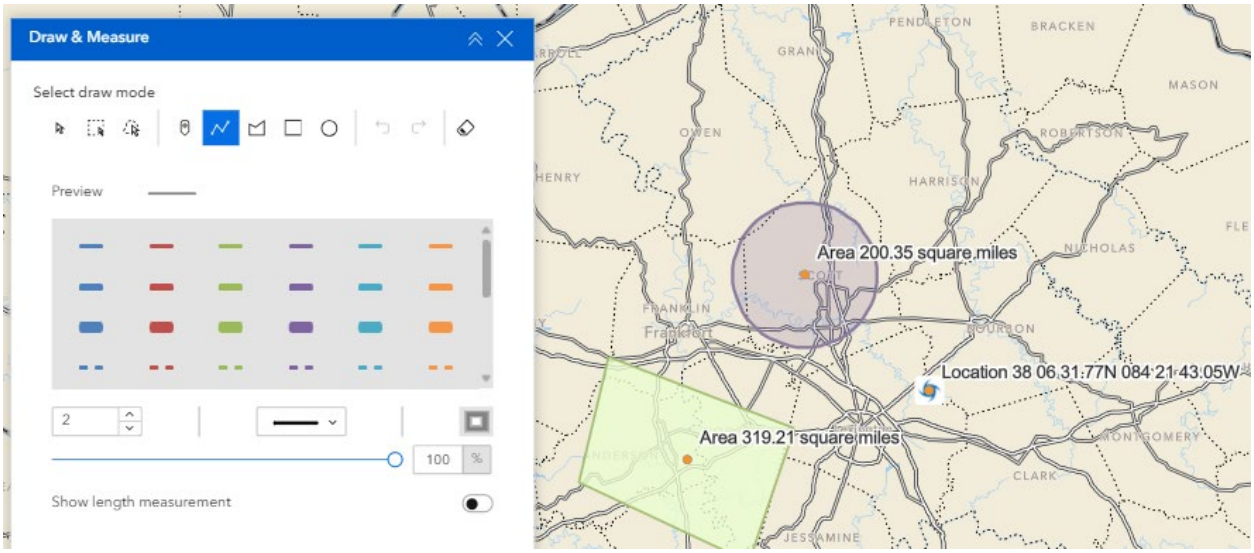


- Once you select the shape you want, formatting options will appear below that allow you to adjust the border, color and transparency of the figure.

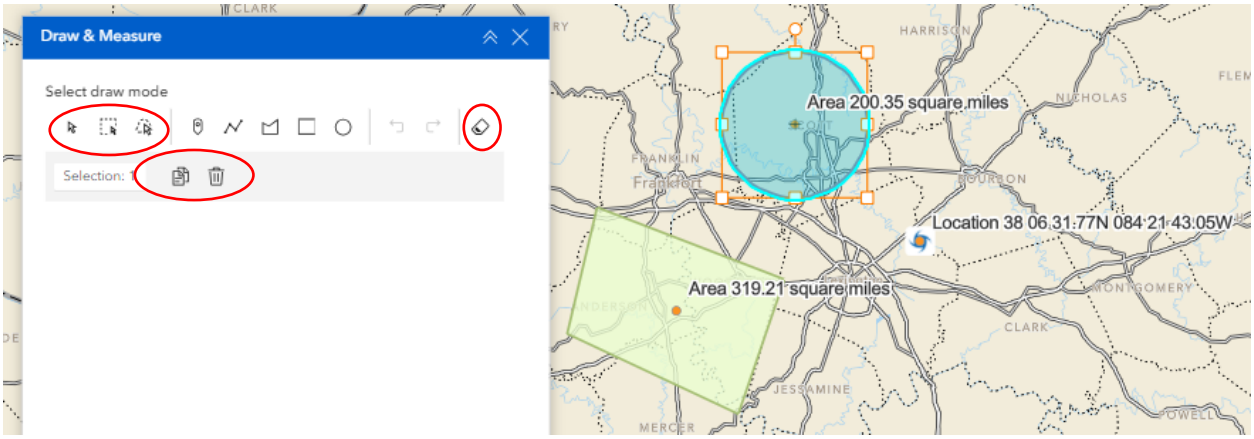


- Users can also include measurements for drawn shapes, depending on the type of shape. Use the drop-down for “Show area measurement” to select the unit of measurement.

- After you select the shape and choose the formatting, move your cursor to the map. Depending on the type of shape you've selected, you will see it on the map. For points, click on the location you want to place your shape. For Polylines and Polygons, click on the corners of your shape and double-click to finish drawing. For Squares and Circles, click and drag your mouse to draw your shape on the map.
- You can have multiple shapes on the map. To draw additional shapes, go back to the tool, select your next shape and follow the previous steps.



- Once you have shapes drawn on the map, use the "Select" options to duplicate or delete each option.
- You can clear all drawings by clicking the "Clear all" button in the tool.



- NOTE: Drawings are not saved when you exit RAPT. They remain on the map until you click “Clear all” or refresh your browser.

8.3. Filter Data

The Filter function in the Resilience Analysis and Planning Tool allows you to set parameters and filter certain indicators, infrastructure and hazards by specific characteristics, such as location (state, county, etc.), value (over 50% or between 25-45, etc.) or characteristic (type of hospital, for example).

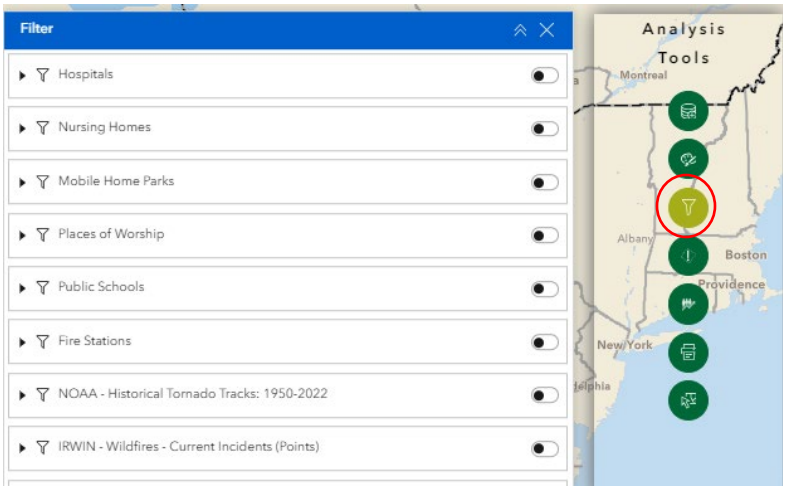
- You can use the Filter function and set parameters three different ways: through the layer list, in the Attribute Table and via the Filter tool.

- Before setting filters in RAPT, turn on the indicator, infrastructure or hazard layers you want to filter. This will allow you to see the changes in display once the filters have been set and applied.

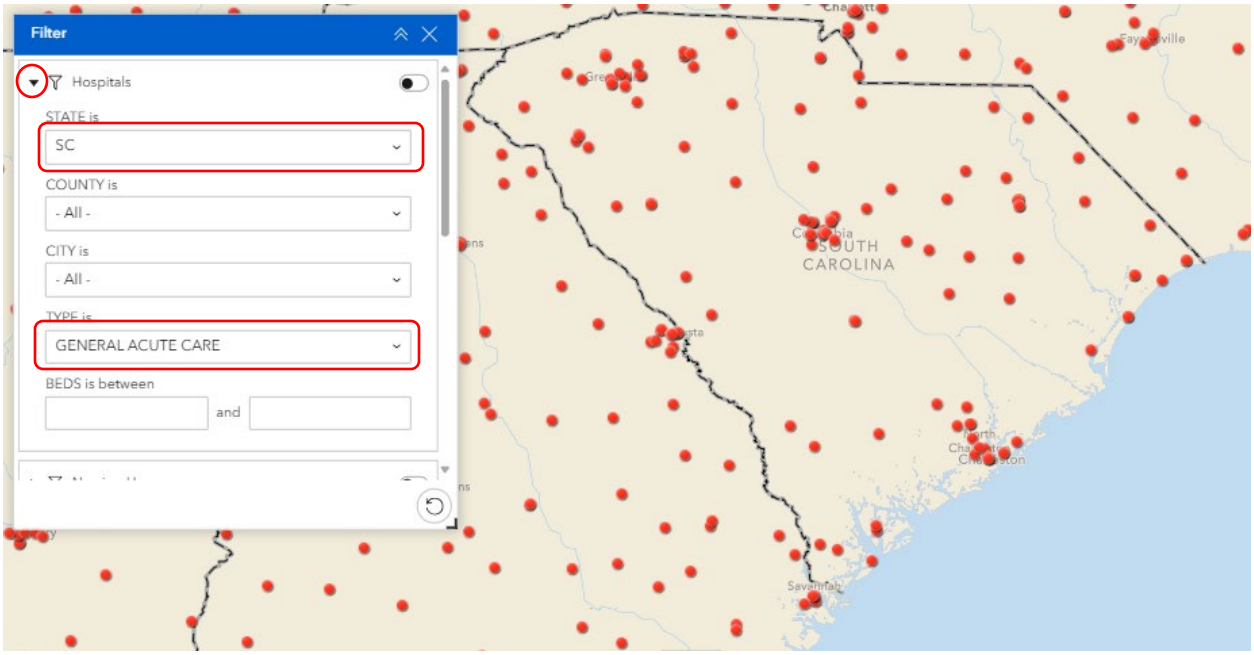
8.3.1. FILTER TOOL

The Filter tool is located in the Analysis Tools group and provides pre-selected parameters for various data layers, including hospitals, public schools, tornado tracks and county-level indicators.

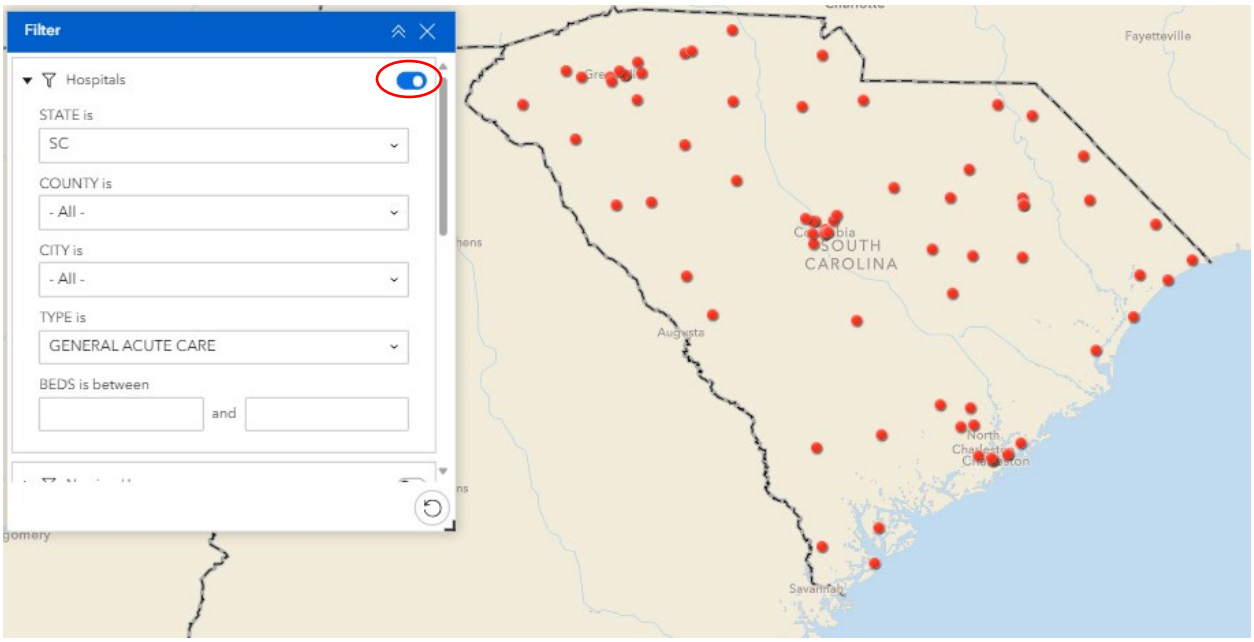
- Click on the Filter icon. You will see a list of pre-selected layers available for filtering.



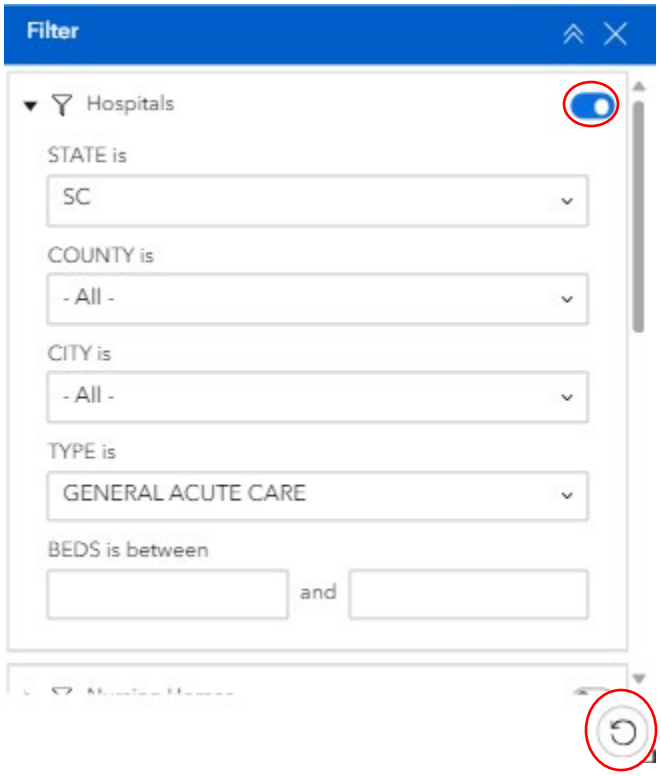
- For this example, we will set a filter for hospitals. After toggling on the Hospital infrastructure layer, click the “expand” arrow next to the layer name in the Filter tool. A list of parameters will appear. Set the desired parameters, such as State, County or Type.
    - Note: The parameter options will vary depending on the data layer you select.



- Toggle on the Filter by clicking the “toggle” button in the upper right. The map will now display only those datapoints that fall within the parameters you have set.



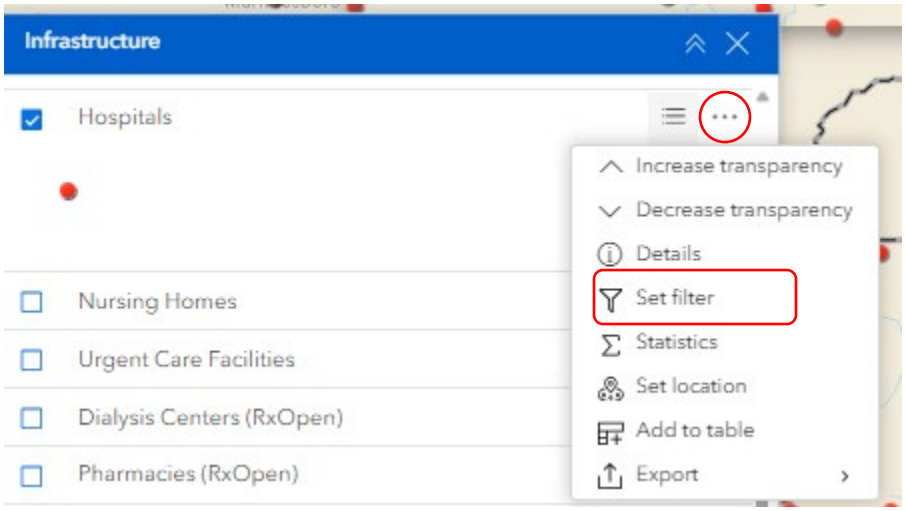
- You can toggle off the Filter by clicking the “toggle” button. You can also clear all Filters by clicking the “Reset all Filters” button in the bottom right of the Filter tool.



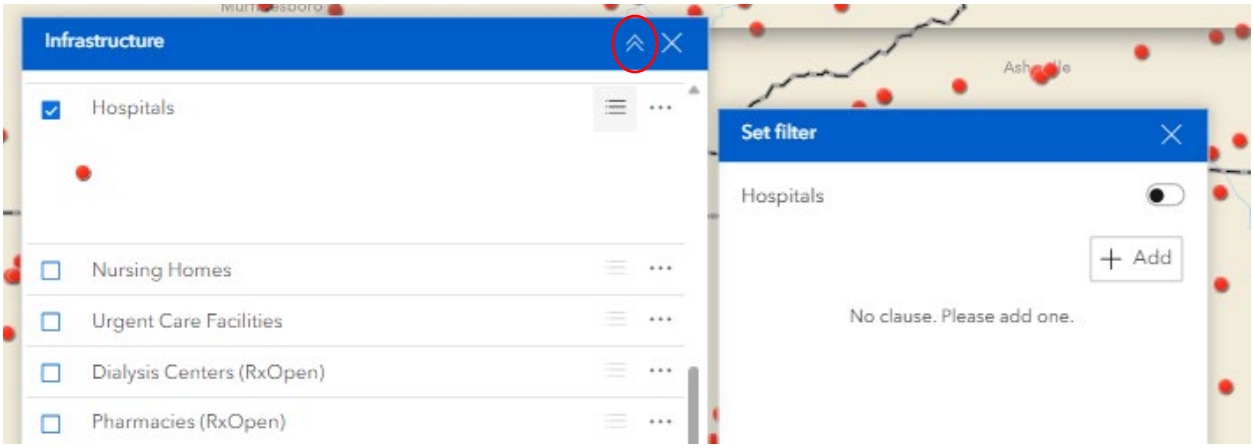
8.3.2. FILTER VIA LAYER LIST

In addition to using the pre-selected parameters in the Filter tool, users can also filter data layers through the data layer lists.

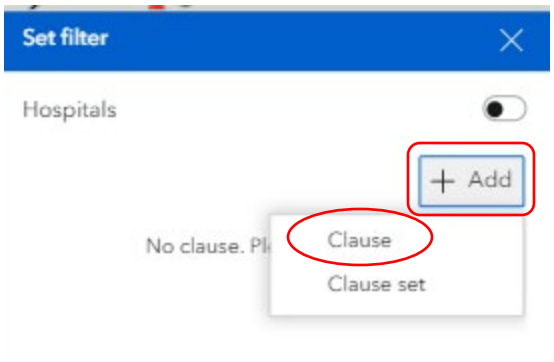
- Open the layer list for the layer you want to Filter. For this example, we will toggle on hospitals in the Infrastructure layer list.
- Click on “Options” and select “Set Filter”.



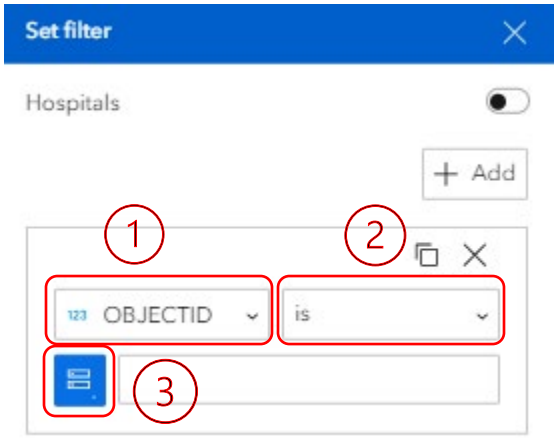
- The “Set Filter” window will open that will allow you to set parameters, or “Clauses” to filter this layer.
  - NOTE: The Set Filter window might open behind the layer list. If this happens, either minimize the layer list by clicking the “Collapse” arrows or drag and move the Set Filter window so you can see it.



- Click “Add” and then “Clause” to set parameters for the layer.

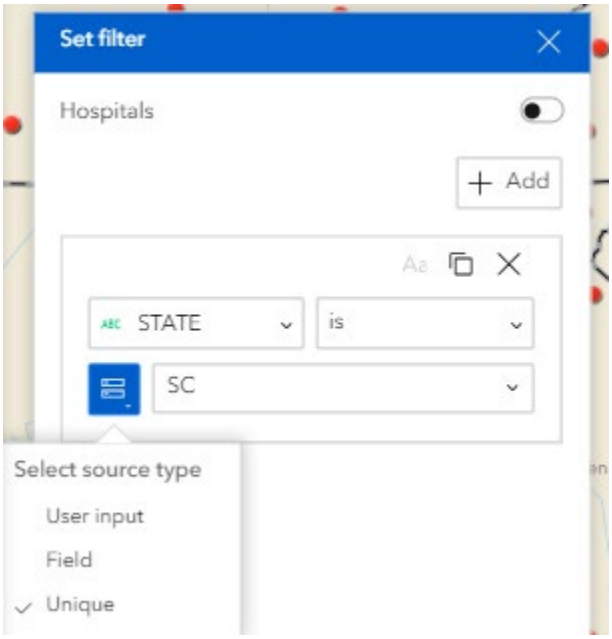


- Next, select the data field which you will use to filter your datasets by clicking the drop-down arrow on box 1. Set your conditions/qualifiers by selecting from options in box 2. Lastly, you will need to specify your input values in box 3.

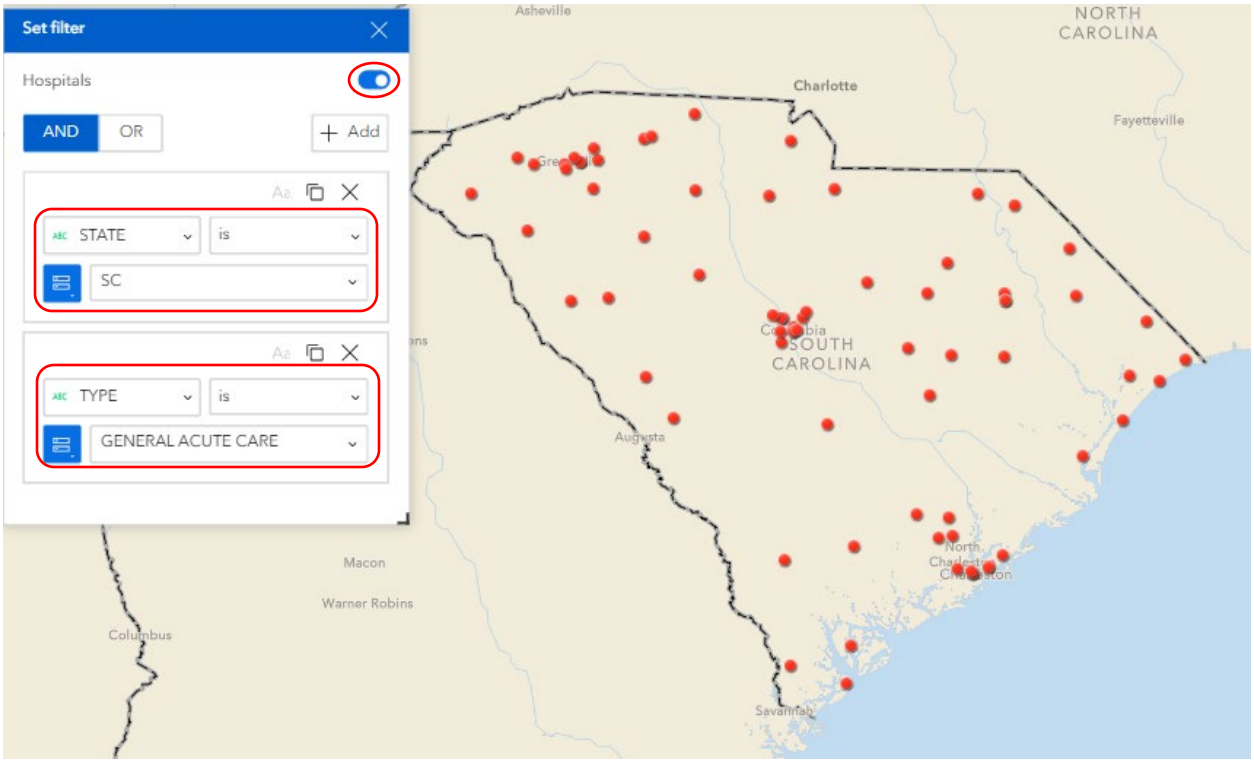


- There are 3 different ways to input values for your filter parameters. Click on the “Select Source Type” icon to set your input type for each parameter.
  - **Value**: The user must type the input for the parameter, and the input value must match the datapoint information *exactly* for it to work correctly.
    - For example, the state parameter value must be entered as a capitalized 2-letter abbreviation, not the full state name.
  - **Field**: The user is given a shortened list of information fields pertaining to the datapoint that is selected based on comparing the value in one field to the value in another field.
  - **Unique** (Recommended Input Type): The user is given a list of the unique values that exist for the datapoint and selects which values will be the parameters for the filter. This is the best option for filters, because it automatically uses the correct formatting for the input type.

- In this example, using the Unique input type creates a drop-down list of all the state abbreviations that exist for hospitals.

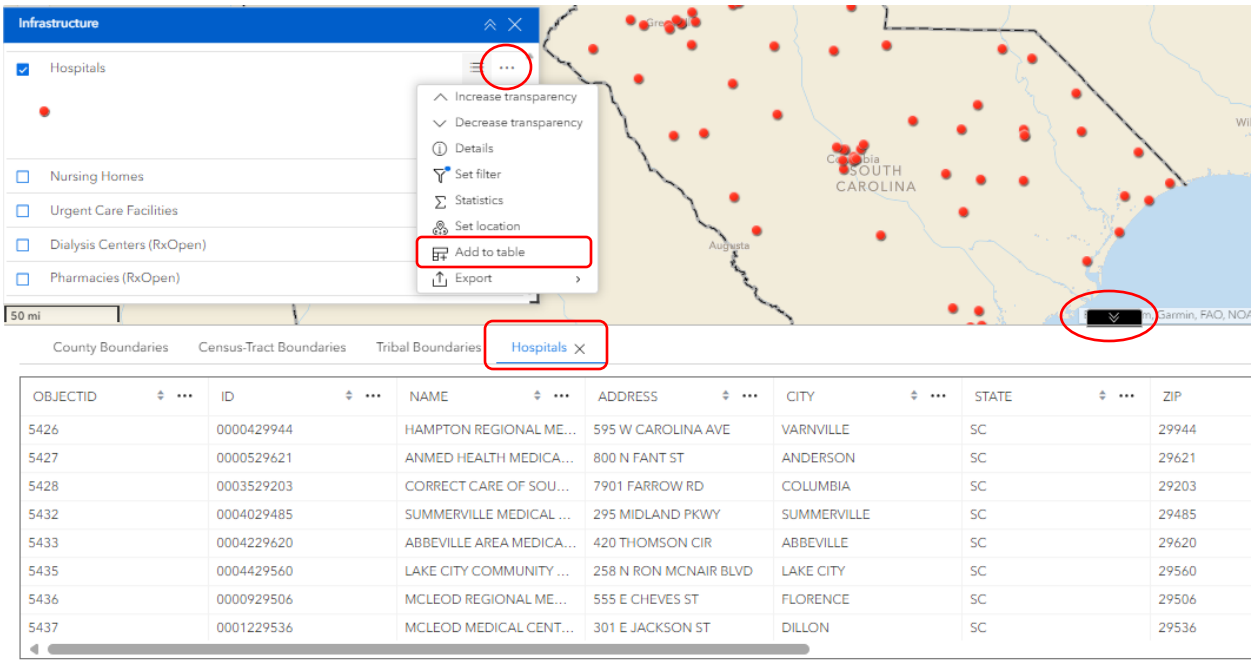


- You can set multiple parameters for a filter by clicking the “Add” button and adding as many “clauses” as you want.
- Once all parameters, or “clauses” have been set, toggle on the filter by clicking the “toggle” button. The map will now reflect only those datapoints that fall within the established parameters. For this example, filters are: state is South Carolina (SC), and the type is General Acute Care.



- At the top of the Set Filter window, there will be an option to connect clauses via the “AND” condition or the “OR” condition. The “AND” condition will only include datapoints that fit all of the parameters established. The “OR” condition will include any datapoints that fit at least 1 of the established parameters. The default setting for filters is the “AND” condition.

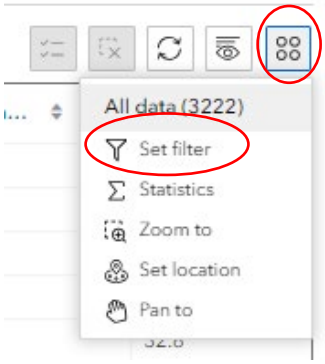
- To view this filtered information in the Attribute Table, go to the data layer list, click on the “Options” icon next to the layer name and click “Add to Table.” Click on the Attribute Table arrow at the bottom of the page. The Attribute Table will now contain a tab with only the filtered datapoints from that data layer.

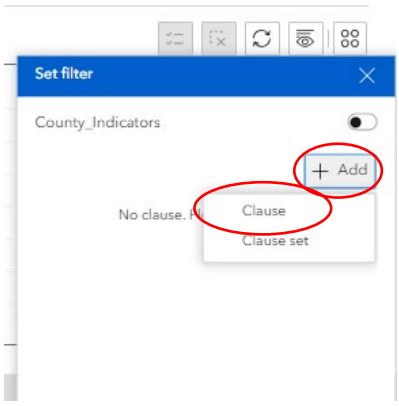


8.3.3. FILTER VIA ATTRIBUTE TABLE

Users can set filters in the Attribute Table to view specific indicator, infrastructure and hazard datasets that fall within desired parameters.

- Refer to section 7 on how to view information in the Attribute Table.
- Once viewing information in the correct tab in the Attribute Table, click on “Actions”. Select “Set Filter”, then “Add” and then “Clause” to set parameters and only view datapoints within those parameters.



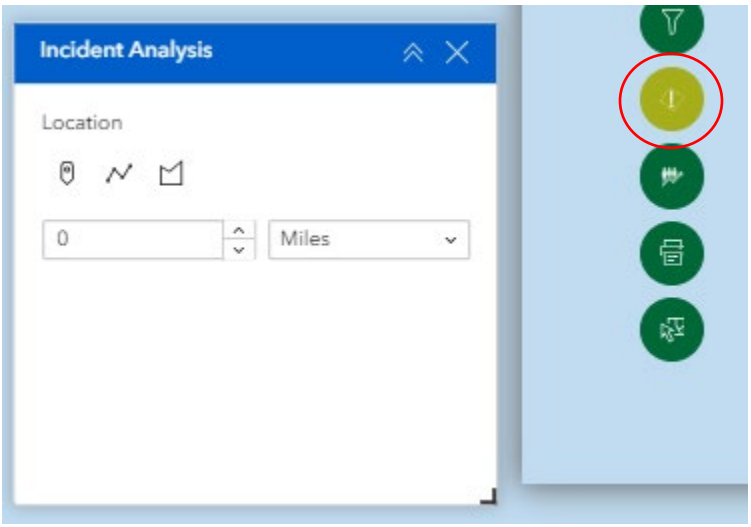


- Follow the steps in Section 8.3.2 above to add clauses to the Filter and view datapoints on the map. Toggle on the Filter for the Attribute Table to reflect the filtered datapoints.

8.4. Incident Analysis

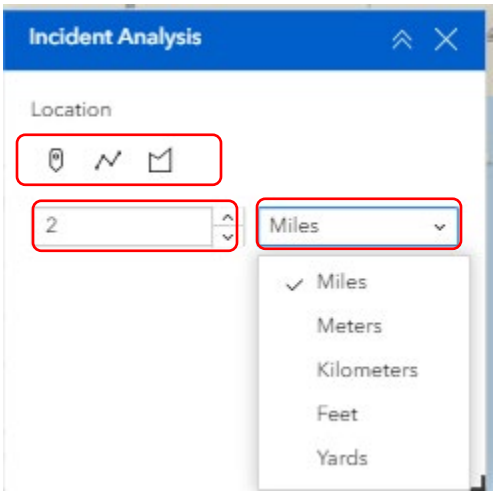
The Incident Analysis tool allows you to create a shape (single point, linear, and polygonal) and a buffer zone around that shape that represents an incident area and identify and visualize infrastructure datapoints within this incident area. This tool provides a comprehensive list of infrastructure datapoints within the incident area. You can also create and export a report of the infrastructure datapoints located within the incident area that provides a list of datapoints as well as their individual characteristics (# of beds, # of students, etc.).

- Click on the “Incident Analysis” icon and the tool will open on the right side of the page.

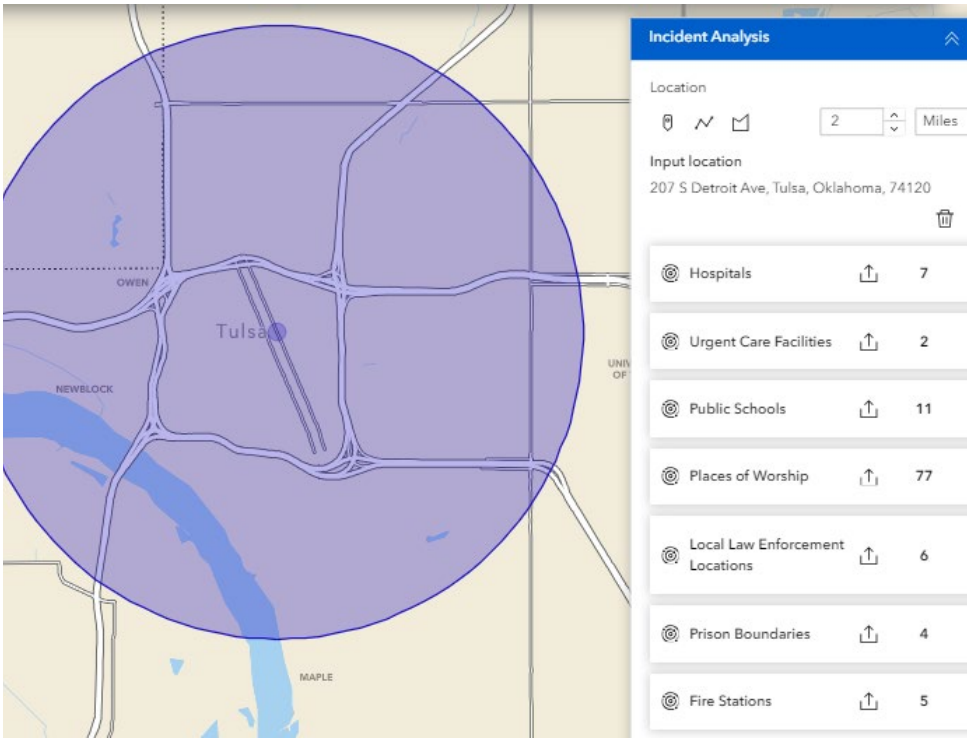


- Set the buffer distance and unit of measurement by using the arrows or clicking inside the box, typing the desired value, and hitting “Enter.”

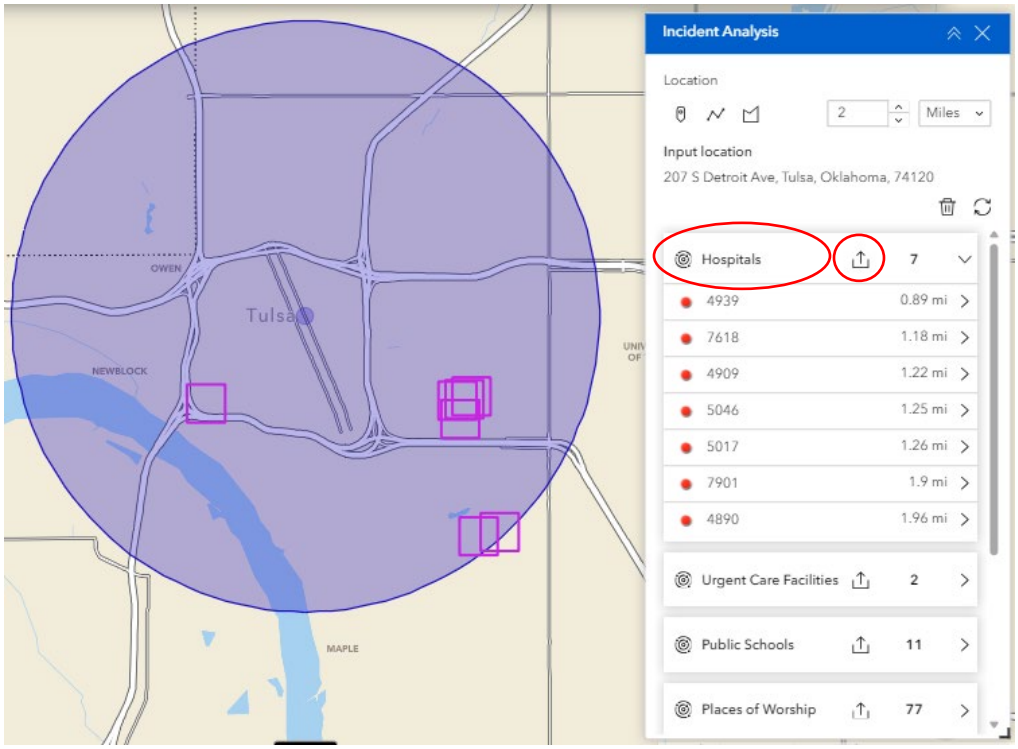
- Select the desired type of buffer (single point, linear, or polygonal). In this example, a single point is used.



- Click on the map to draw the incident area. The map will zoom to the incident area and a list of infrastructure datasets within the area will appear in the Incident Analysis tool.

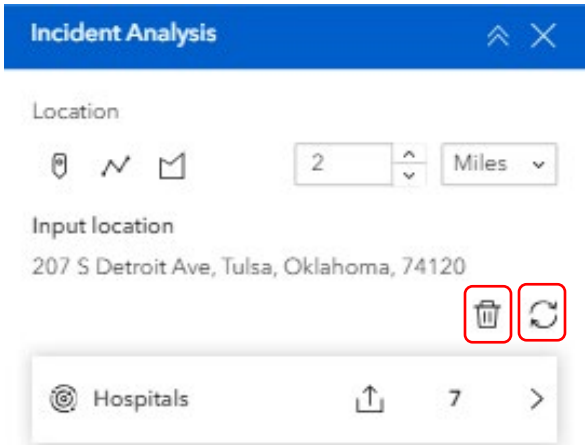


- Click on an infrastructure title in the tool to see a list of those datapoints that fall within the incident area. Each datapoint will be represented on the map by a square around that datapoint. Infrastructure datapoints are listed in order of closest to furthest from the center of the buffer zone.
    - NOTE: If you want to see the pop-up for a datapoint, click on the infrastructure symbol and the pop-up will appear in the Incident Analysis tool layer list.
- To export the list of selected datapoints, click the “Export” icon and the list will open in Excel.



- You can only select one infrastructure layer at a time, but the buffer zone will not disappear as you toggle between layers.
- You can only create one buffer zone at a time.
- To erase the current buffer zone and create a new one, click “Clear.”

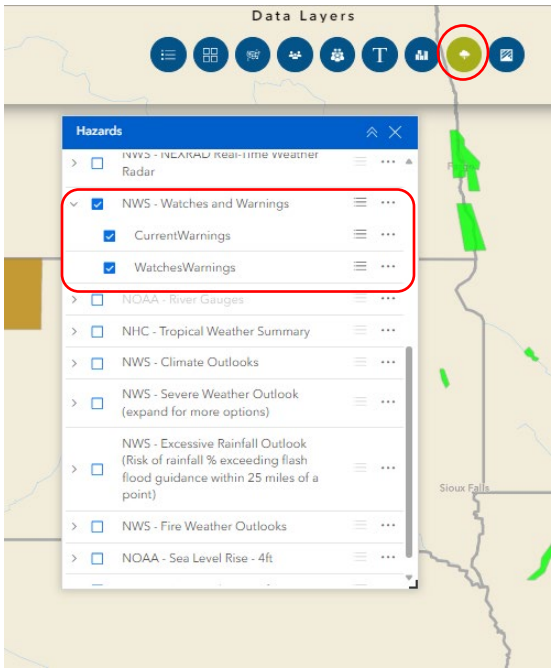
- To adjust the buffer zone and unit of measurement, enter a different buffer zone value and select a unit of measurement. Click “Refresh” to get an updated list.



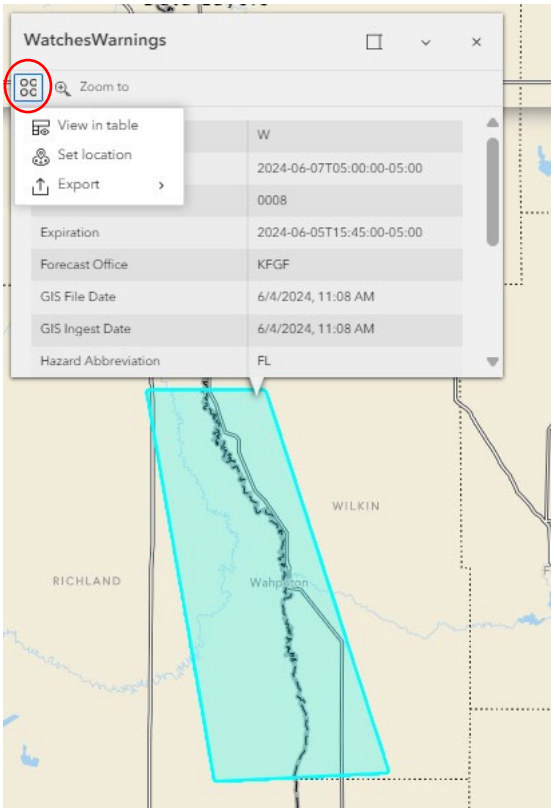
8.5. Incident Area From Shapefile

Users can use shapefiles to set the incident area for the Incident Analysis tool. These can be data layers that are already available in RAPT (Current Weather Watches and Warnings, Tribal Boundaries, etc.) or data layers that are added to RAPT (Census Boundary and Annexation Survey (BAS) Community layer, local land use plans, etc.).

- Toggle on the layer you wish to use to set the unique incident area.
  - For this example, we will use the NWS - Watches and Warnings layer.

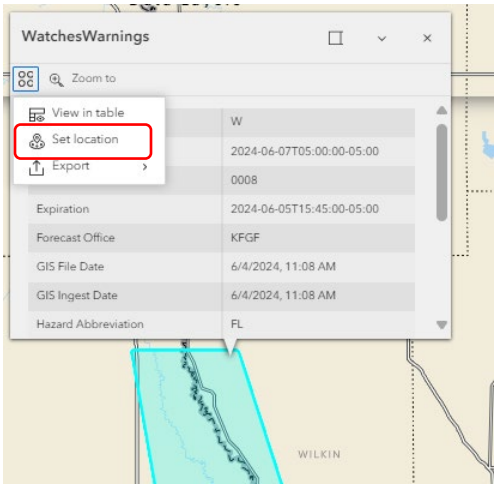


- Click on the NWS Watch or Warning you want to use as your shape.
- In the pop-up box, click the “Actions” button at the top left to display a list of options.

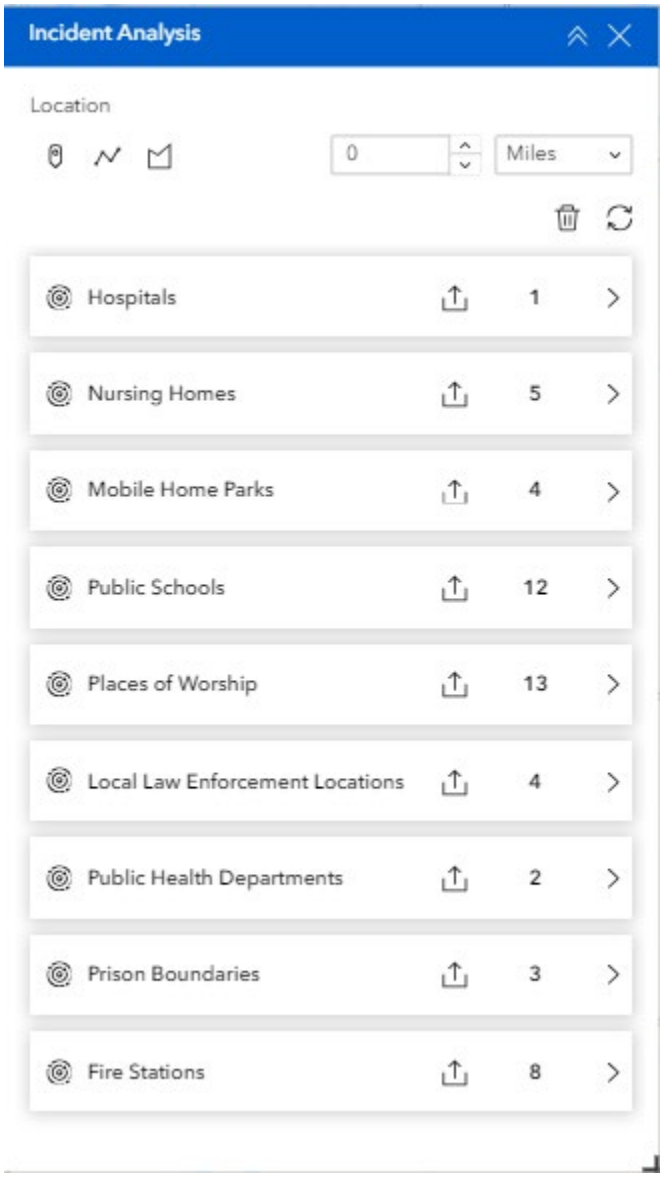


8.5.1. INCIDENT ANALYSIS

- With the pop-up open and the actions listed, click on “Set Location.”

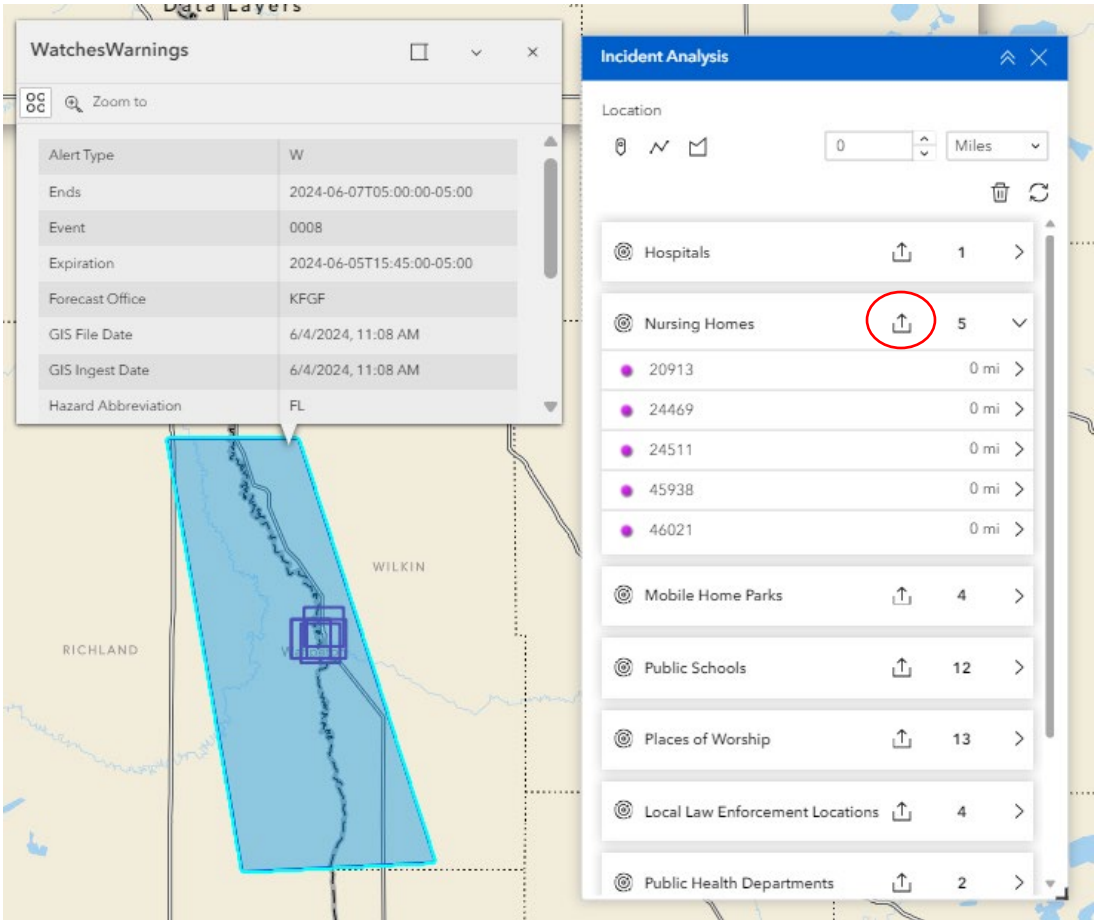


The Incident Analysis tool will open automatically at the right of the screen and the unique incident area will be selected. The tool will have calculated the infrastructure datapoints within the incident area.

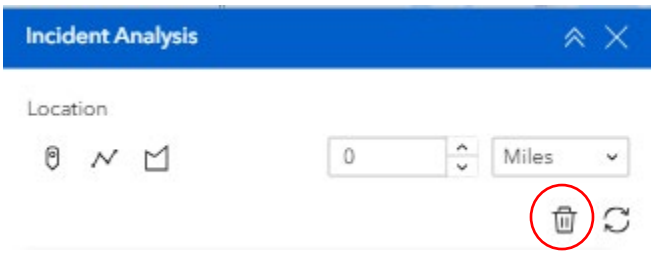


- The default buffer zone will be “0” and default unit of measurement will be ”Miles”. You can adjust the buffer zone and unit of measurement, then click “Refresh” to get an updated list.
- Click on any of the infrastructure titles to see the infrastructure datapoints within the unique incident area.

- Download the list of infrastructure datapoints by clicking the “Export” icon.



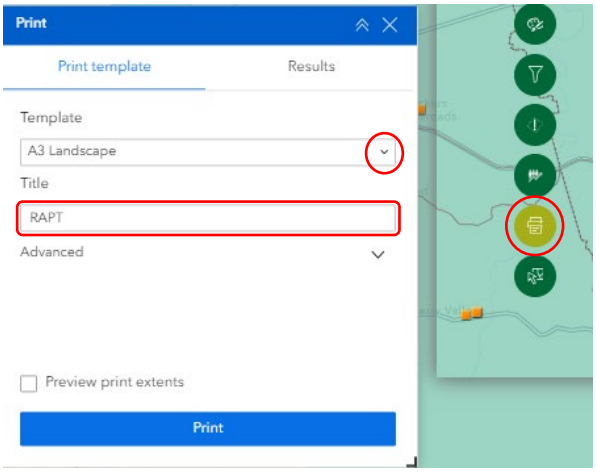
- Be sure to click the “Clear” button when finished using the incident analysis tool.



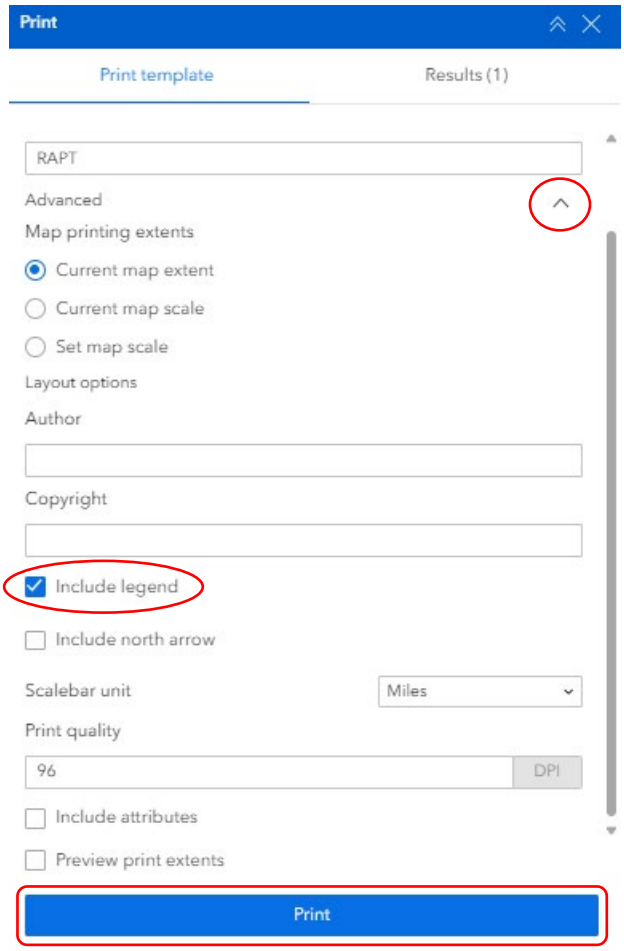
8.6. Print

The Print function lets you save a PDF of the map on your screen. This will include any layers that are showing on the map when you print, and their respective legends.

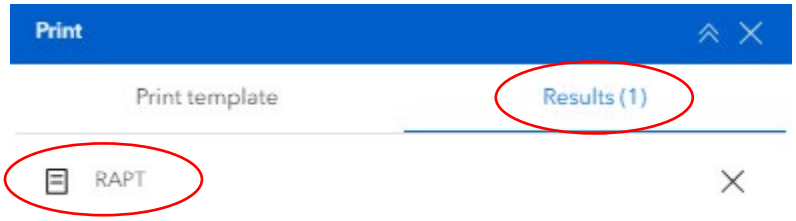
- Click the “Print” icon. Enter your map title and use the drop-down to select template preferences.



- Click the “Advanced” button to modify various aspects of your map, including labels, map size and extent, legend and print quality.



- Click “Print” and your map will be created and appear in the “Results” tab. Click on the map name and it will open in your web browser.



8.7. Select

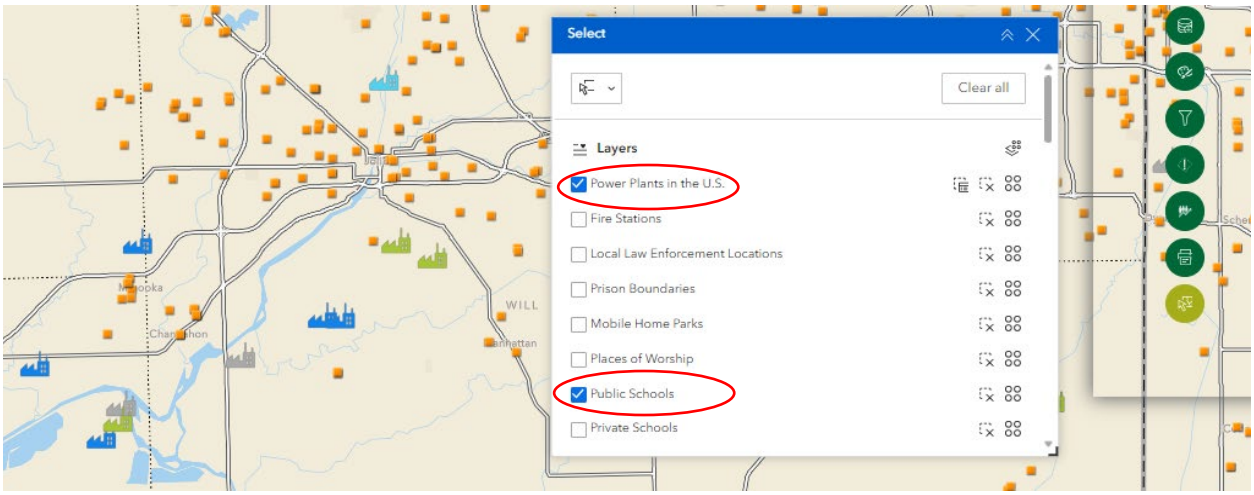
The Select tool can be found in the Analysis Tools section and allows you to select multiple infrastructure, hazard, county, or census tract datasets in a specified region (rectangle, polygon,

circle, etc.). The output provides a number, visual, and comprehensive list of those multiple datasets. You may export, save, or view these datasets in the Attribute Table.

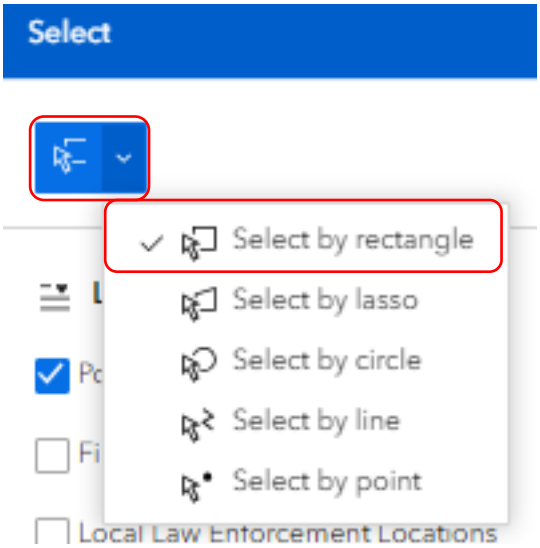
- NOTE: The Select tool differs from the Incident Analysis tool in that it will include any data layers you have added to RAPT.
- NOTE: Before using the tool, turn on the infrastructure, hazard and indicator layers to be included in the output.

- Click the "Select" icon and the tool will open on the right of the page. The tool should open with the toggled-on layers already selected.

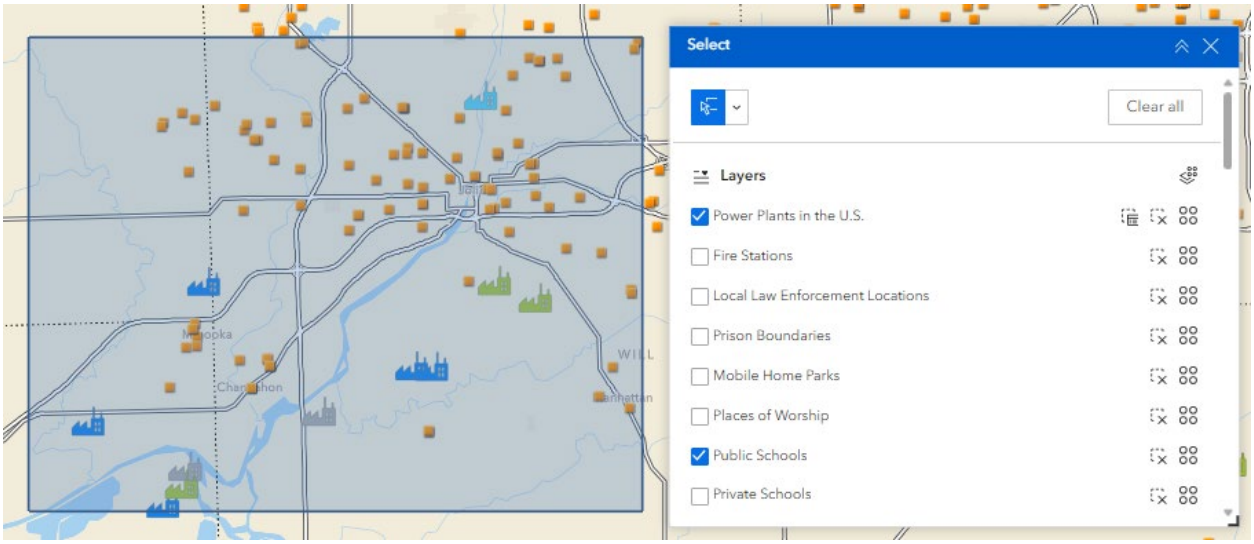
    - In this example, we will focus on public schools and the added data layer of "Power Plants in the U.S.".



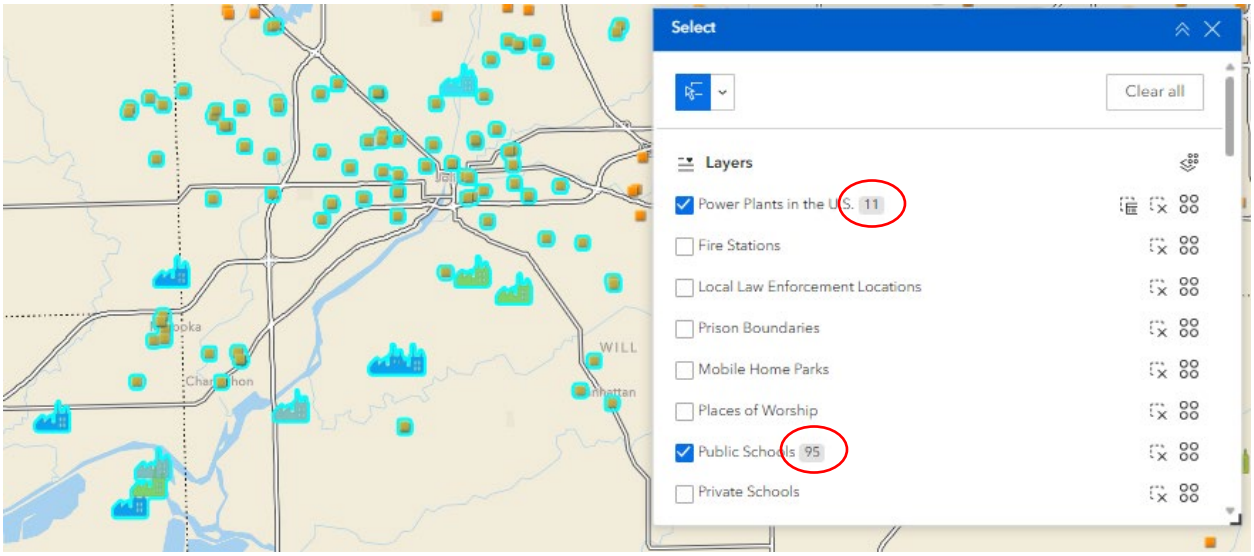
- You will next choose how you are going to draw your selection area on the map. Click the drop-down at the top of the tool to see a list of options.
- Once you have selected your shape, click on the mouse icon at the top of the tool. The mouse icon will turn blue, and you are ready to draw your selection area on the map.



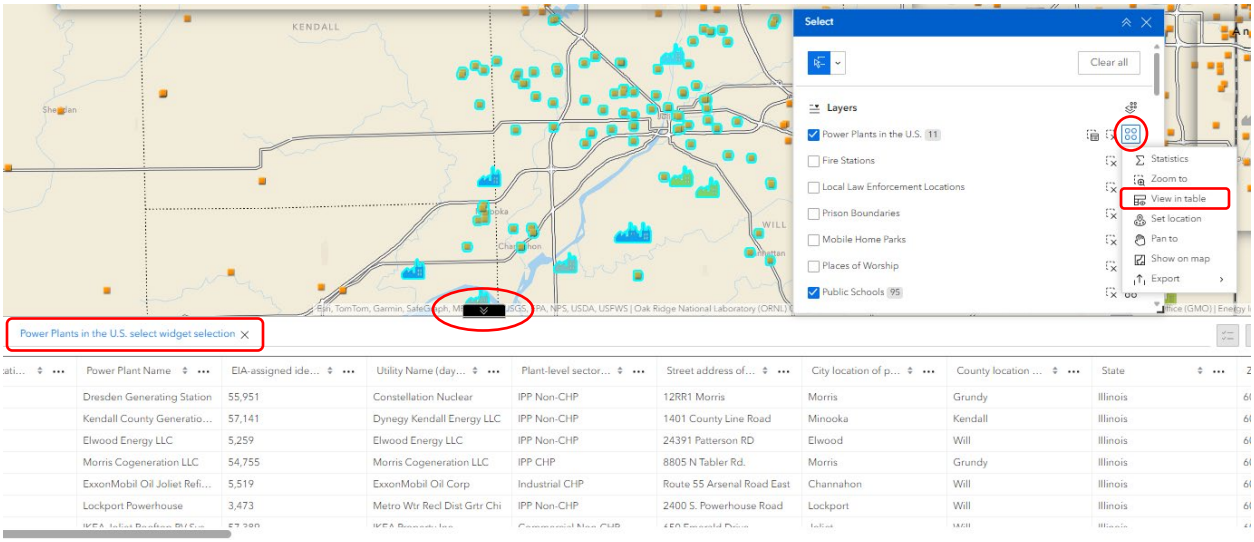
- Draw your selection area on the map. You will be able to see your selection area while drawing it, but it will disappear once you are finished.



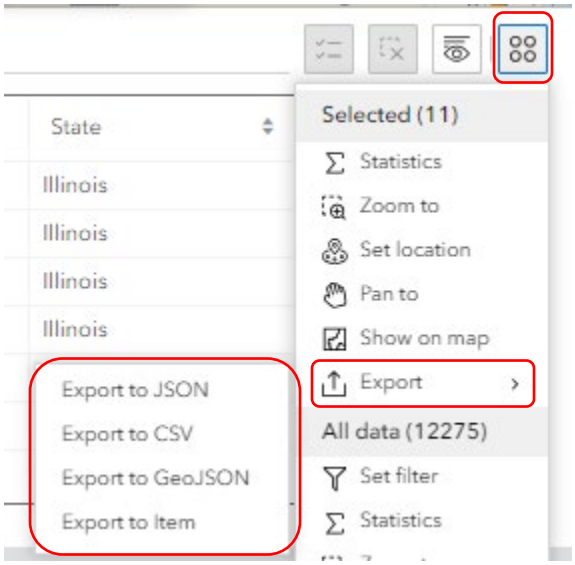
- Once your selection area is drawn on the map, the datapoints within the selection area will be highlighted and the layer list in the tool will update to reflect the # of datapoints within the selection area.
  - In the example below, the area has 11 Power Plants and 95 Public Schools.



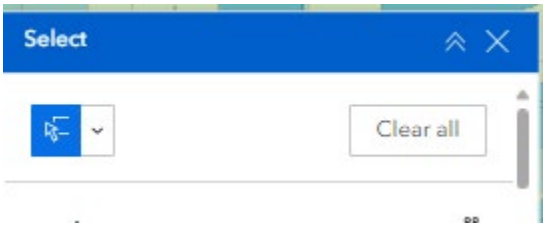
- The information for these datapoints can be viewed in the Attribute Table by clicking “Actions” and “View in Table”. Then click the Attribute Table arrow to view the information in the designated tab.



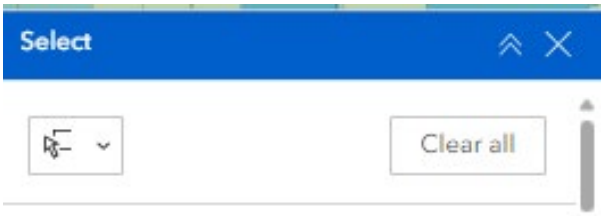
- Users can export this information from the Attribute Table. While viewing the tab in the Attribute Table, click “Actions”, then “Export” and select the type of file you wish to export.



- To clear the results and select different datapoints or a different area, click the “Clear all” button at the top of the tool.
- NOTE: Before closing the Select tool, be sure to click the mouse icon to disable selection mode. The Select tool will continue to run as long as the mouse icon is blue.



Select tool is on, in Select Mode.



Select tool is off.

9. Contact Us

If you have questions or would like additional support in using the Resilience Analysis and Planning Tool, please email FEMA-TARequest@fema.dhs.gov. Please send us examples of how you are using RAPT, as well as recommendations for future improvements.