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INTRODUCTION

This document details how to request, access, and use the Resilience Report, a screening tool to help evaluate the potential impacts of multiple hazard types for a user-specified area of interest. The report summarizes and displays exposure analyses from multiple hazard types.

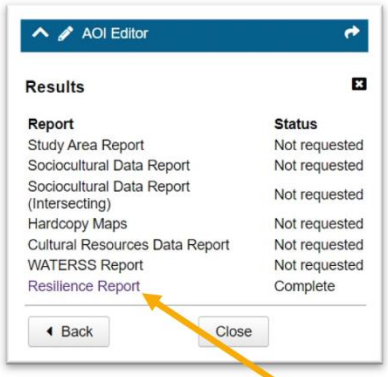
The tool includes the following hazards: coastal flooding from sea level rise, storm surge, and high tide flooding; inland flooding (FEMA flood hazard areas); extreme heat; wildfire risk; severe thunderstorm risk (lightning and strong winds); and sinkhole formation risk.

REQUESTING THE RESILIENCE REPORT

The Resilience Report is requested through the Area of Interest (AOI) Tool in the Environmental Screening Tool (EST) Map Viewer. After drawing an AOI, request the Resilience Report to trigger the resilience analyses. When completed, a link to the report webpage is provided. Below are instructions on how to request, access, and navigate the Resilience Report.

Need help drawing an AOI? See the:
AOI Editor Tool Quick Guide

1. **Log into the EST**: https://www.fla-etat.org/est/secure/ and navigate to the Map Viewer using the map icon in the header bar.
2. **Open AOI Editor widget** > choose "Create" to draw a new AOI.
3. **Enter the Basic Project Information**: project name, type, description, and keep until (date indicating how long to save the results). For Type, choose "Other Area of Interest".
4. **Draw Feature(s)**. Click "Add Feature" to begin drawing the desired area (feature) on the map to be analyzed. Draw a point, line, or polygon, and indicate a buffer amount (optional) around each feature.
    a. One or more features can be drawn. By default, each feature is analyzed separately. Optionally, features can be grouped into an "analysis area" to analyze together as a single analysis area.
    b. **Request Resilience Report**. When done drawing, under the "Report Options", select the checkbox for "Resilience Report" and then choose "Run".
5. **Wait for the Results**. The report analyses takes approximately 1-3 minutes to run, depending on the number and size of features drawn. Features covering larger geographic areas will take longer to run.



When Status = "**Complete**", a link to resilience report will appear.

For help with EST Map Viewer or AOI Tool, contact the FDOT OEM Help Desk at help@fla-etat.org or 850-414-5334.

For questions about the Resilience Report data, please contact sls@geoplan.ufl.edu.

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ACCESSING THE REPORT

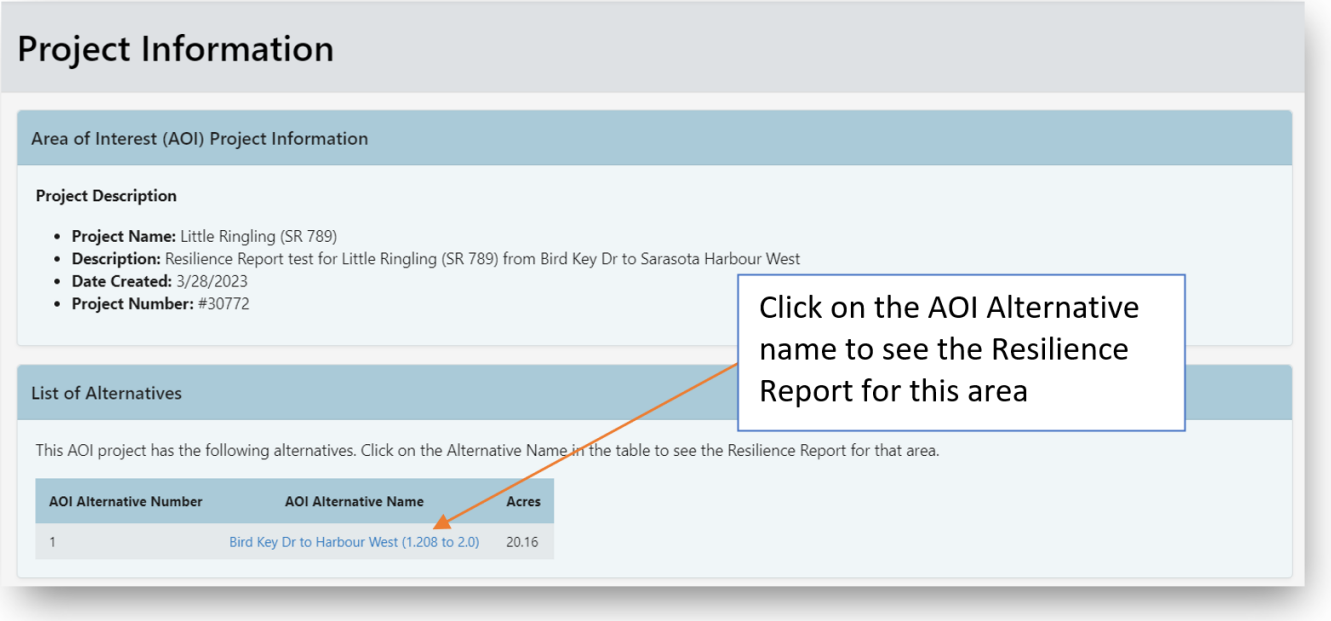
There are two ways to access the results report webpage for your AOI project:

- AOI Tool Editor → a link will appear when the analyses are complete (see figure above).
- EST AOI Dashboard → Click on AOI Project > Choose AOI Details > Link under "Resilience Report"

There are three main pages in the Resilience Report, described on the following pages:

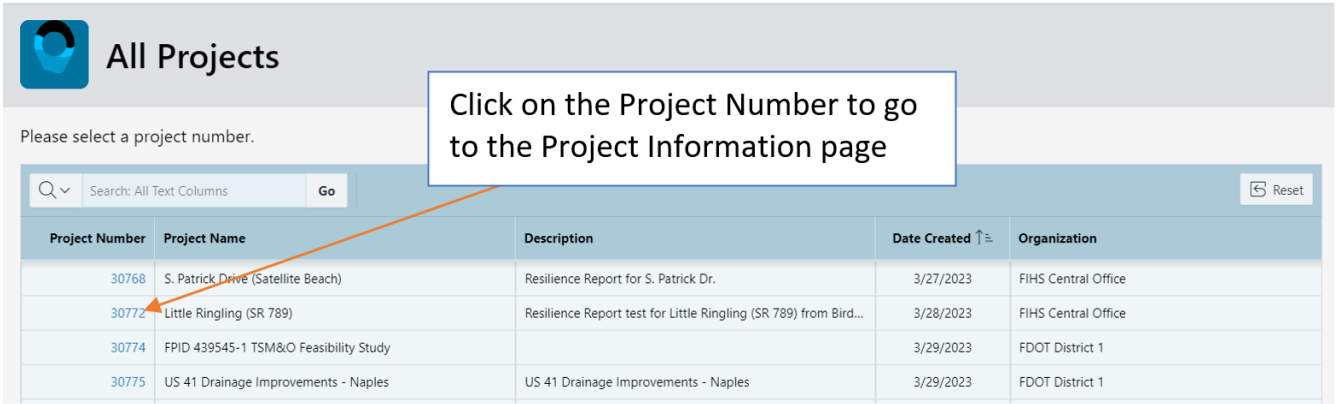
PROJECT INFORMATION PAGE

This is the landing page for the AOI Project and the default page a user will see when clicking on the link from the EST (either in the AOI Widget or AOI Dashboard). This page includes information the user submitted about the project and a list of AOI alternatives (or features) associated with the project. In many cases, there will only be one alternative, but multiple alternatives can be drawn and analyzed. The resilience report display results for one alternative at a time, unless they are grouped into an analysis area.



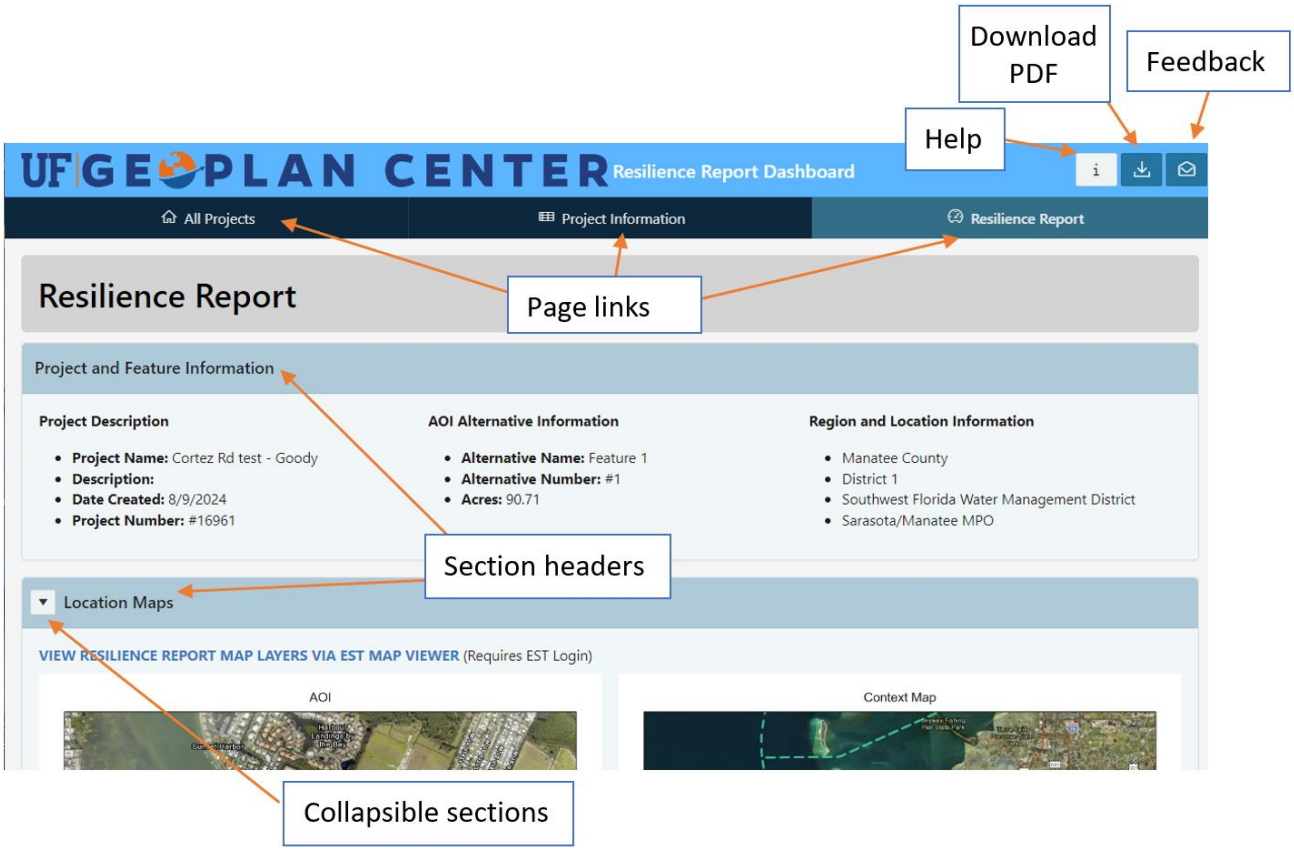
PROJECT LIST PAGE

This page includes a list of all projects for your organization that have requested a resilience report. A link to this page is available from the Resilience Report page. There is a search function to find the project of interest.



RESILIENCE REPORT PAGE & DATA SOURCES

This page contains the results of the overlay analyses for the alternative(s) drawn in the EST Map Viewer. Below are descriptions of the data included in each section.



PROJECT AND FEATURE INFORMATION

- **Project Description**: displays the project name and description (submitted by the user), date created and project number.
- **AOI Alternative Information**: displays the alternative information for which this report has analyzed (name, number, and size in acres). If there is only one, it will be named “Alternative #1”.
- **Region and Location Information**: displays the county, MPO, WMD, and FDOT District in which the project is located.

LOCATION MAPS

This section contains a map zoomed into the AOI alternative area and a context map showing the overview location of the feature. This section also contains a link to the EST Map Viewer, where the user can view and interact with the Resilience Report layers.

COASTAL REGION INFORMATION

This section indicates whether the AOI alternative is located in or intersects with these coastal regions:

- **Areas at Risk Due to Sea Level Rise - SLIP Study Area.** Projects that intersect this area and are state-financed may require a Sea-Level Impact Projection (SLIP) Study. (Section 161.551, F.S.). SLIP Layer Metadata.
- **Coastal Building Zone (CBZ)**: number of acres located in CBZ. CBZ Layer Metadata.
- **Coastal Construction Line (CCCL):** number of linear feet intersecting the CCCL. CCCL Layer Metadata.

SEA LEVEL RISE SCENARIOS (NOAA 2022)

Sea level rise projection values for the five NOAA 2022 SLR Scenarios: Low, Intermediate-Low, Intermediate, Intermediate-High, and High. SLR values are the 50th percentile values provided by NOAA. SLR values are in feet and referenced to mean sea level (MSL) with a baseline year of 2000 to align with NOAA SLR inundation depth layers.

This region will not display if there are no SLR impacts.

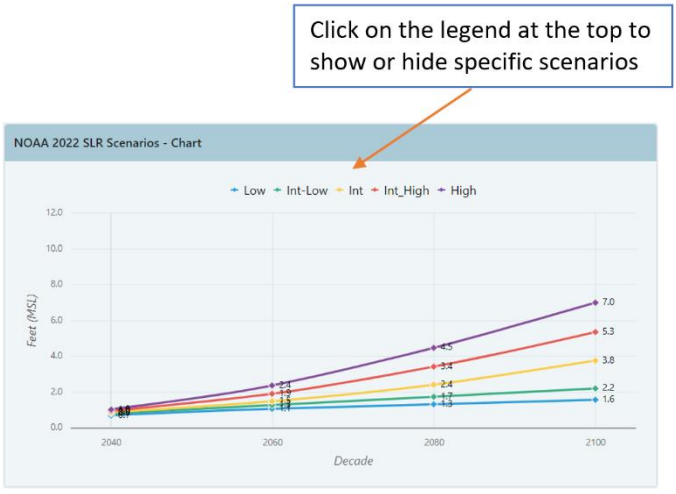
Data was obtained from NOAA in spreadsheet format, with SLR scenario values listed by tide station, relative SLR amount in centimeters (cm), and baseline year 2005. Using the median SLR values, the Team converted the values from cm to feet and added the 2000 to 2005 offset provided by NOAA to align with the baseline year of 2000 and maintain consistency with the NOAA SLR inundation depth layers.

For more information on the NOAA 2022 SLR Scenarios, see the 2022 SLR Technical Report.

Sea Level Rise – Tide Station Information and Datums
Displays the tide station name and ID located closest to the AOI alternative, and the current MSL and MHHW datum values. Source: NOAA Tides and Currents.

NOAA 2022 SLR Scenarios – Chart.
Interactive chart of the five NOAA SLR scenarios, in feet, from 2040 – 2100. Click on the legend at the top of the chart to hide or display a scenario.

NOAA 2022 SLR Scenarios – Feet by Decade.
Table of SLR values, in feet, for each decade between 2040 – 2100 and for each of the five SLR scenarios.



SEA LEVEL RISE EXPOSURE ANALYSIS

This section includes an exposure analysis using the NOAA Sea Level Rise layers downloaded from https://coast.noaa.gov/slrdata/

Summary of Sea Level Rise Exposure
Exposure analysis using the NOAA SLR inundation depth layers. Areas exposed to SLR would be potentially permanently flooded under these future scenarios.

Summary of Sea Level Rise Exposure. Table showing acres and percentage of AOI exposed to SLR inundation 1 to 7 feet above Mean Higher High Water (MHHW), or the daily high tide.

Depth of Flooding Histograms. Histogram showing the depth of flooding for four scenarios – 1ft, 3ft, 5ft, and 7ft of SLR over MHHW. If there is less than 1 acre flooded, then the histogram area will show: "Minimal or no flooding found".

GIS Layer Metadata:

- NOAA 1 Feet Sea Level Rise Inundation Depths
- NOAA 2 Feet Sea Level Rise Inundation Depths
- NOAA 3 Feet Sea Level Rise Inundation Depths
- NOAA 4 Feet Sea Level Rise Inundation Depths
- NOAA 5 Feet Sea Level Rise Inundation Depths
- NOAA 6 Feet Sea Level Rise Inundation Depths
- NOAA 7 Feet Sea Level Rise Inundation Depths

SEA LEVEL RISE MAPS

Maps showing the extent of flooding for four scenarios – 1ft, 3ft, 5ft, and 7ft of SLR over MHHW. This region will not display if there are no SLR impacts.

CURRENT HIGH TIDE FLOODING (HTF)

This section contains data on high tide flooding (HTF), also known as nuisance flooding, tidal flooding, and sunny-day flooding. HTF is recurrent, temporary flooding that occurs during high tides. HTF is now twice as frequent in U.S. coastal areas as it was 20 years ago, and is expected to increase in frequency with rising sea levels. Read more about High Tide Flooding here.

NOAA delineates and maps three HTF levels: minor, moderate, and major, using standard thresholds above the daily average high tide (mean higher high water).

- **Minor HTF** includes when tides exceed approximately 0.55m (1.8ft). GIS Metadata.
- **Moderate HTF** when tides exceed 0.85m (2.8ft). GIS Metadata.
- **Major HTF** when tides exceed 1.2m (3.9ft). GIS Metadata.

Summary of AOI Exposure to Current High Tide Flooding

- Table showing acres and percent of AOI alternative flooded under each HTF threshold.
- Raster data layers for each threshold were downloaded from NOAA and used in the overlay analysis.

High Tide Flood Days per Year (Current)

- Table showing the number of observed HTF days for each threshold for the prior meteorological year, which spans May 2023 through April 2024. Data source: NOAA CO-OPS Derived Product API v0.1.

Acres Flooded – All Levels

- Bar chart showing acres flooded under each HTF threshold. Corresponds with the "Acres Flooded" column in table above: Summary of AOI Exposure to Current High Tide Flooding.

High Tide Flooding Map

- Map of AOI extent with the three HTF thresholds: minor, moderate, and major HTF.

Percent of Area Impacted by Current High Tide Flooding

- Three pie charts with the percentage of the AOI alternative exposed to each HTF threshold. Corresponds to the "Percent Flooded" column in the table above: "Summary of AOI Exposure to Current High Tide Flooding."
- The percent flooded is shown in blue and percent not flooded is shown in green.

PROJECTED ANNUAL DAYS OF MINOR HIGH TIDE FLOODING

This section includes the projected annual days of *minor* HTF per decade and under each of the NOAA 2022 SLR scenarios. These projections can be used to understand how SLR will increase the frequency of minor tidal flooding events. Used in combination with the percent of area impacted by minor HTF, users can get a sense of what areas will be impacted by future minor HTF flooding and how often the flooding will recur. Projections are only included for minor HTF events (not moderate or major).

Projections were pulled from: NOAA CO-OPS Derived Product API v0.1, querying the "High Tide Flooding – Decadal Projections" for 14 tide stations.

STORM SURGE ZONES

Results of an overlay analysis of storm surge zones by hurricane category (1-5). Zones obtained from the Florida Division of Emergency Management and developed by Florida's Regional Planning Councils (August 2021). Zones were derived from National Hurricane Center SLOSH model runs and provide a worst case snapshot of surge for each hurricane category under perfect storm conditions. Storm Surge Zones Metadata.

Note: this data represents current storm surge and does not account for surge under future SLR conditions.

Also note: exposure is calculated for each category individually. However, impacts are additive for each lower category of surge. For example: if the Cat 1 surge exposure is 127 acres and Cat 2 is 13 acres, then the total exposure for Cat 2 would equal 140 acres (127 + 13).

FEMA FLOOD ZONES

Results of an overlay analysis of the 1% annual chance flood event ("100-year") and 0.2% annual chance flood event ("500-year"), as defined by the Federal Emergency Management Agency (FEMA). Data sourced from FEMA's National Flood Hazard Layer and downloaded from the Florida Geographic Data Library (www.fgdl.org). DFIRM Metadata.

Note: this data represents current flood hazard areas and does not account for future climate conditions or changing precipitation patterns.

EXTREME HEAT

Extreme heat is represented by projections of annual days above 95 degrees Fahrenheit for future time periods. Data is provided in ranges (minimum and maximum change in days), as the AOI may intersect with multiple heat data points.

Historic Data (1976 – 2005) Annual Days Above 95 degrees Fahrenheit. Historical climate data for the time period 1976 - 2005.

Projections for Early Century (2016 – 2045) Change in Annual Days Above 95 degrees Fahrenheit. Simulated change in the annual days above 95 degrees F, relative to the historical data period. GIS Layer Metadata.

Projections for Mid-Century (2036 – 2065) Change in Annual Days Above 95 degrees Fahrenheit. Simulated change in the annual days above 95 degrees F, relative to the historical data period. GIS Layer Metadata.

The total projected annual days above 95 degrees F for each time period (early century or mid-century) is the sum of the historic days plus the projected change in days.

Data Source: 4th National Climate Assessment Scenarios. Derived from Localized Constructed Analogs (LOCA) data set, developed by the University of San Diego Scripps Institution of Oceanography. Projection values use the "Lower Emissions" scenario - Representative Concentration Pathway (RCP) 4.5.

WILDFIRE RISK

Wildfire Ignition Density is the likelihood of a wildfire igniting in an area. Historic wildfire ignition locations from 1981 to 2007 were modeled to create an average ignition rate map.

Summary of Wildfire Ignition Density Levels. Acres and percent of AOI by ignition level, from Level 1 (lowest ignition density and lowest wildfire risk) to Level 7 (highest ignition density and highest wildfire risk).

Data Source: Southern Group of State Foresters Wildfire Risk Assessment Portal.

Wildfire Ignition Density – GIS Layer Metadata.

FAVORABLE GEOLOGY FOR SINKHOLE FORMATION

Represents areas with geology favorable to sinkhole formation. Includes four classes that represent areas where the geology is least favorable to most favorable to sinkhole formation: (1) Least Favorable, (2) Favorable, (3) More Favorable, (4) Most Favorable.

Data Source: Florida Geological Survey.

Favorable Geology for Sinkhole Formation - GIS Layer Metadata.

SEVERE THUNDERSTORM RISK

Lightning risk and strong winds are used as a proxy for assessing risks from severe thunderstorms. Data Source: FEMA National Risk Index (NRI), which summarizes risk at the census tract level. FEMA NRI GIS Layer Metadata.

Analyses show the risk ratings from the census tracts that intersect the AOI. There are five risk levels, from highest risk to lowest: Very High, Relatively High, Relatively Moderate, Relatively Low, and Very Low.

Lightning Risk Summary Table. Lightning risk is calculated as the estimated the number of recorded lightning strikes each year for a specific area. Table shows the lightning risk ratings by census tracts that intersect the AOI.

Thunderstorm Strong Wind Risk Summary Table. Strong Wind Risks consists of damaging winds, often originating from thunderstorms, that are classified as exceeding 58 mph. Table shows the strong wind risk ratings by census tracts that intersect the AOI.

SAVING THE REPORT

In the top right corner of the page, there is a download button to save a PDF version of the Resilience Report. 

REQUESTING ACCESS TO THE AOI TOOL

For FDOT staff or consultants with FDOT IT accounts:

- District users request access through your FDOT District ETDM Coordinator
- Central Office users request through Statewide ETDM Coordinator or contact ETDM Help Desk
- Once approved by ETDM Coordinator, submit an AARF selecting the EST – AOI Only application

For MPO and FDOT consultants without FDOT IT accounts:

- Request access through your MPO or FDOT Project Manager
- Your Project Manager can then request through the appropriate ETDM Coordinator
- The ETDM Coordinator can then email authorization to the ETDM Help Desk

For MPO staff:

- Request access through your MPO ETDM Coordinator
- If MPO ETDM Coordinator position is vacant, contact the FDOT District ETDM Coordinator

The ETDM Coordinator can then email authorization to the ETDM Help Desk

For help with EST Map Viewer or AOI Tool, contact the FDOT OEM Help Desk at **help@fla-etat.org** or 850-414-5334.

List of ETDM contacts: https://etdmpub.fla-etat.org/est/index.jsp?url=contacts.jsp

For questions about the Resilience Report data, please contact **sls@geoplan.ufl.edu**