

Sea Level Scenario Sketch Planning Tool

GIS Data: Strategic Intermodal Systems (SIS) Highways, Rails, and Facilities –Current and Future Flood Exposure

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Description

This download contains analyses of Strategic Intermodal Systems (SIS) highways, rails, and facilities exposed to current flooding and future flooding under various sea level rise (SLR) scenarios. These datasets were created for the Sea Level Scenario Sketch Planning Tool.

Each download contains a zipped ArcGIS 10.4.1 ESRI File Geodatabase (FGDB) with three SIS layers, each analyzed for exposure under five SLR projections. SLR scenarios were mapped by county using local tide gauge data and sea level trends. Inundation surfaces were created by the University of Florida GeoPlan Center using the United States Army Corps of Engineers (USACE) Sea-Level Change Curve Calculator (2015.46), USACE SLR projections (2013), National Oceanic and Atmospheric Administration (NOAA) SLR projections (2012), NOAA tide gauge data, NOAA tidal surfaces, and a 5-meter horizontal resolution Digital Elevation Model (DEM). A hydrologic connectivity filter was applied to the inundation surfaces to remove isolated inundated areas not connected to a major waterway.

The SIS data was intersected against the hydro-connectivity inundation model outputs. Fields were added to the SIS data to indicate the feet and % of facility potentially affected under each SLR scenario.

For more information and full technical methods, please see the metadata included with the feature classes, as well as the project website: <http://sls.geoplan.ufl.edu>

SLR Projections Mapped

Five SLR projection curves from the USACE (2013) and NOAA (2012) were used for mapping inundation (listed below). SLR inundation models (which can be downloaded separately) and transportation analysis fields are named with a “C1” through “C5” to indicate the SLR curve used.

SLR Curve	SLR Curve Description	Amount of SLR (relative to mean sea level) by 2100
C5	NOAA High Rate (2012)	~ 6.6 feet (or 2.0 m)
C4	USACE High Rate (2013)	~ 5.0 feet (or 1.5 m)
C3	NOAA Intermediate High Rate (2012)	~ 3.9 feet (or 1.2 m)
C2	USACE Intermediate Rate (2013) / NOAA Intermediate Low Rate (2012)	~ 1.6 feet (or 0.5 m)
C1	USACE Low Rate (2013)/ NOAA Low Rate (2012)	~ 8 inches (or 0.2m)

For more information on the SLR models, please see the document: “Guide to GIS Data: SLR Models”: <https://sls.geoplan.ufl.edu/download-data/>

Base SIS Data Used in Analysis

SIS layers were downloaded from the Florida Department of Transportation. The SIS facilities layer was created by merging multiple SIS layers and includes airports, seaports, spaceports and freight terminals. Polygon boundaries were created for some facilities where only points existed.

Transportation Analyses and SLR Scenario Fields

The base SIS data was intersected against 35 SLR inundation layers, each representing a different amount of SLR and time period. 35 scenarios = 5 SLR Projection Curves x 7 decades (2040, 2050, 2060, 2070, 2080, 2090, 2100).

For each segment that intersected a SLR inundation layer, the number of feet intersecting was calculated. For each facility that intersected a SLR inundation layer, the acreage intersecting was calculated. Individual intersecting segments and areas were then joined back to the base SIS data to calculate the total feet, total acreage, and percentage of segments and areas affected. Fields were added back to the base SIS data to summarize the impacts per segment and facility.

Each scenario analysis field represents either the feet (or acreage) or percentage of the segment or facility that is affected under a particular SLR scenario. The SLR scenario is indicated in the field name. For segments or facilities with no affects (no intersecting SLR scenarios), a null value is listed.

Example SLR Scenario Fields for Five SLR Projections for One Decade (2090):

Field Name	Description
C1MHHW90FT	Feet of Segment Affected 2040 USACE Low/NOAA Low, MHHW
C1MHHW90PC	% of Segment Affected 2040 USACE Low/NOAA Low, MHHW
C2MHHW90FT	Feet of Segment Affected 2040 USACE Int/NOAA Int Low, MHHW
C2MHHW90PC	% of Segment Affected 2040 USACE Int/NOAA Int Low, MHHW
C3MHHW90FT	Feet of Segment Affected 2040 NOAA Int High, MHHW
C3MHHW90PC	% of Segment Affected 2040 NOAA Int High, MHHW
C4MHHW90FT	Feet of Segment Affected 2040 USACE High, MHHW
C4MHHW90PC	% of Segment Affected 2040 USACE High, MHHW
C5MHHW90FT	Feet of Segment Affected 2040 NOAA High, MHHW
C5MHHW90PC	% of Segment Affected 2040 NOAA High, MHHW

Current Flood Risk Fields

The base SIS data was also intersected with current flood risk layers to analyze each road segment’s exposure to current flood risks. Layers analyzed include: 100-year and 500-year floodplains from Federal Emergency Management Agency (FEMA) Digital Flood Rate Insurance Maps (DFIRM) and Storm Surge Zones from the Florida Division of Emergency Management and Florida’s Regional Planning Councils. The current flood risk fields follow the same naming convention as the SLR Scenario fields.