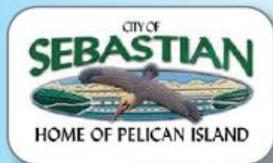


Coastal Resiliency Plan

Resilience Plan Development



presented to



presented by

Kimley»Horn

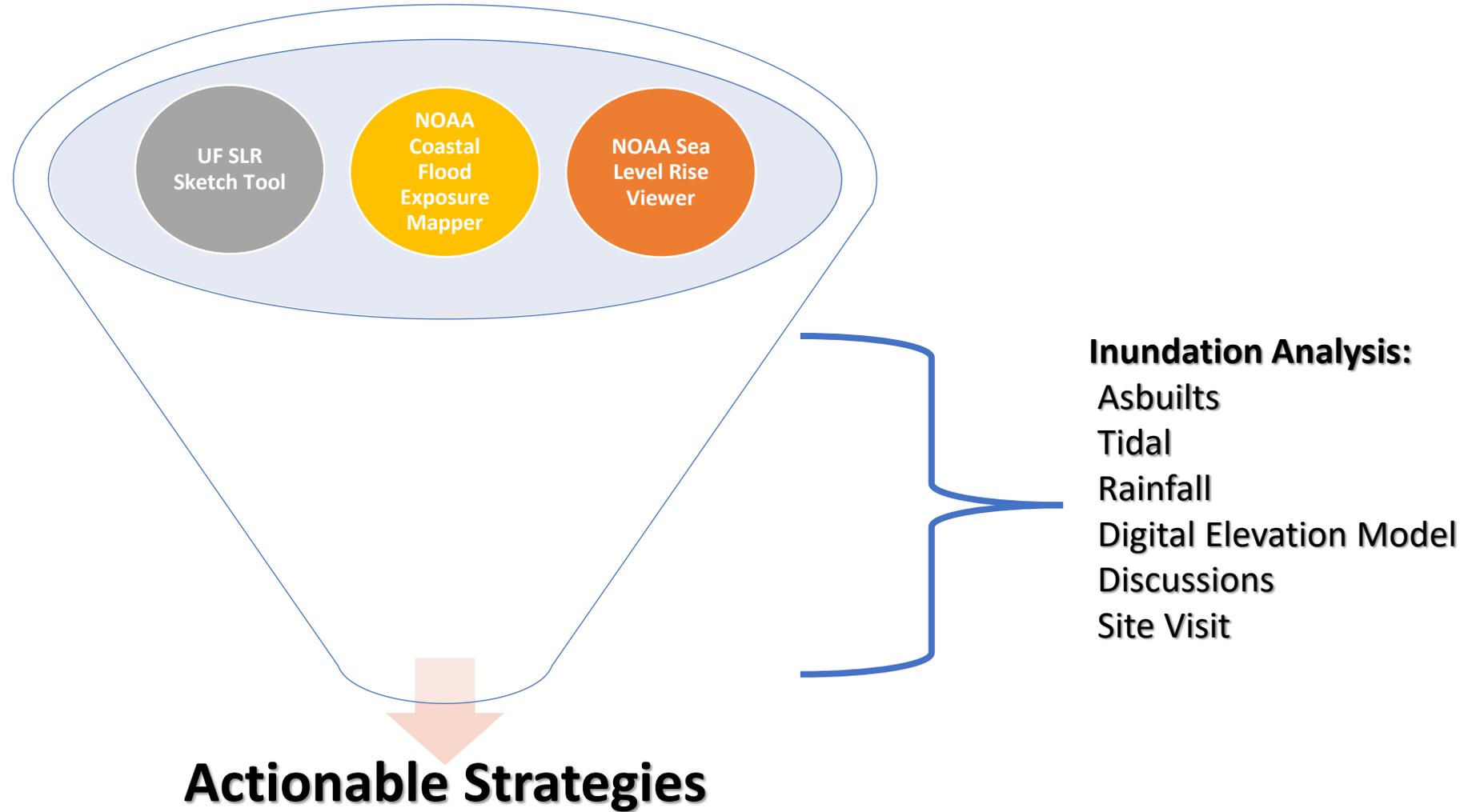


Goal

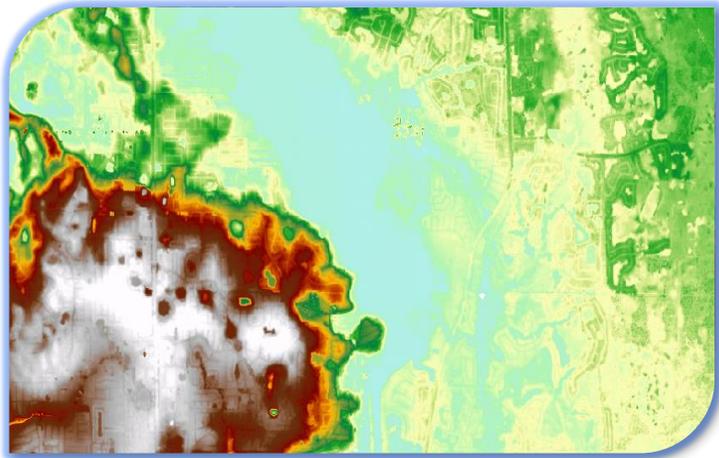
- ▶ Florida Statute - meet *Peril of Flood* requirements as part of the **Comprehensive Plan Update**
 - **Reduce flood risk in coastal areas**
 - High Tide Events
 - Storm Surge
 - Flash Floods
 - Stormwater Runoff
 - Sea Level Rise



Procedure



Rapid Inundation Analysis



DEM



Flood Extents

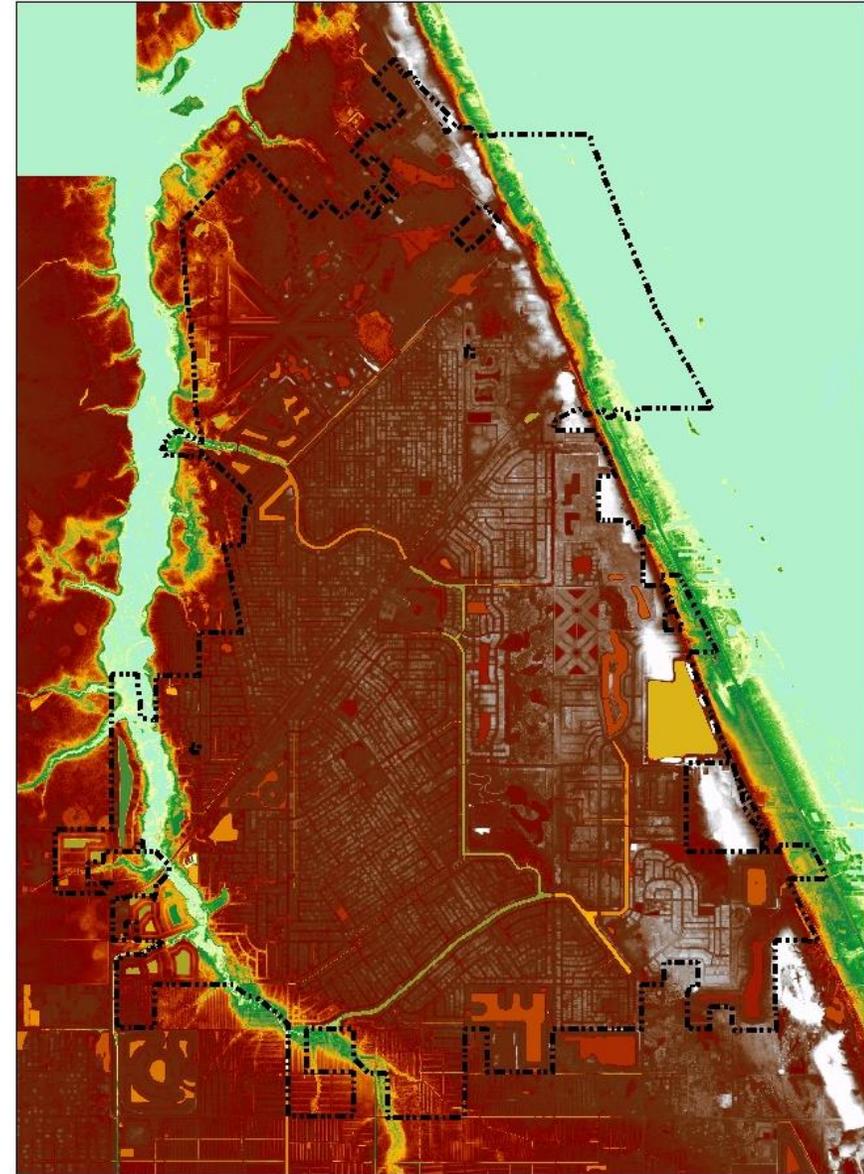
▶ Run multiple events in one day

▶ Combine SLR with varying rainfall events

▶ Aids in knowledge transfer

Digital Elevation Model

- ▶ **Based on 2007 LiDAR**
- ▶ **EL ranges from 53.0 (West) to 1.0 (East)**
- ▶ **Hi ridge along FECRR**



Rainfall Depths

▶ 100-Year Event

- *12 inches/24 hours*

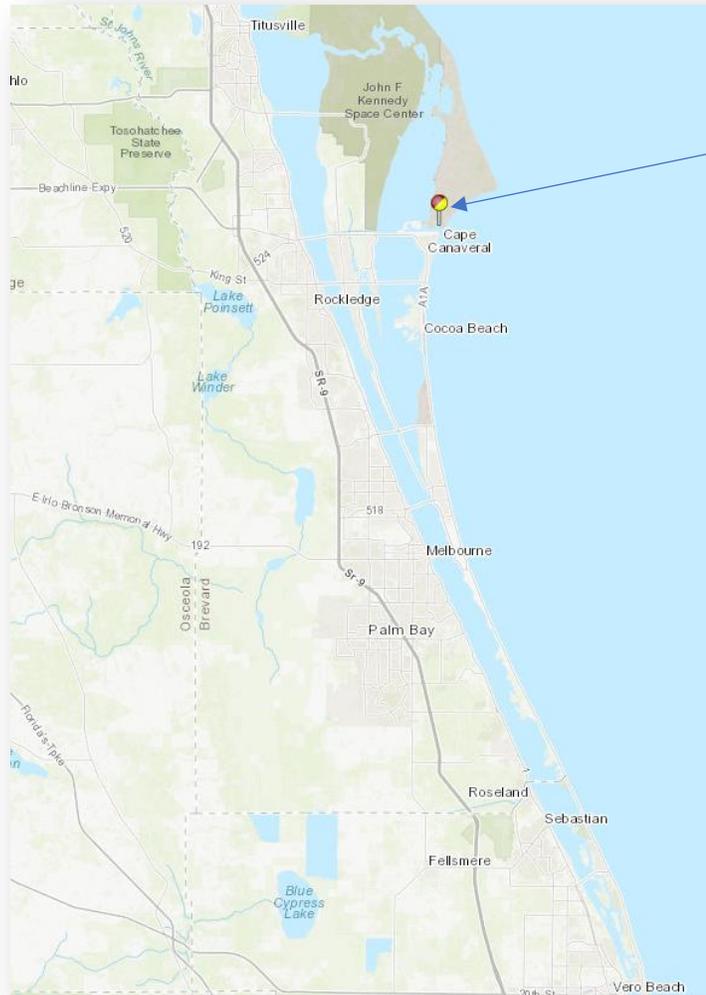
▶ 25-Year Event

- *9.5 inches/24 hours*



Data Sources: SJRWMD

Tidal Information



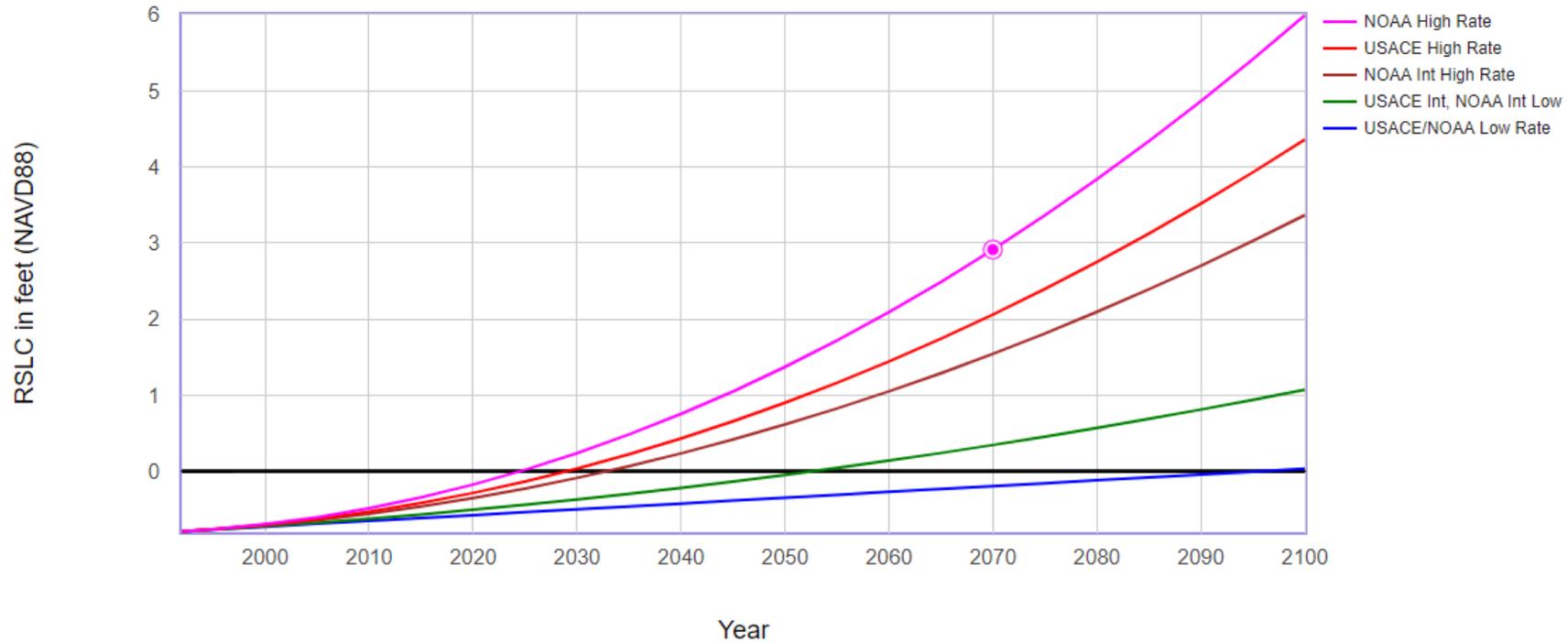
Average MHHW taken from 2008 to 2018 = 1.32 (NAVD)

Data Source: NOAA, Station 8721604 Port Canaveral, FL

2070 SLR (NOAA High)

8721120, Daytona Beach Shores, FL
NOAA's 2006 Published Rate: 0.00761 feet/yr

Estimated Relative Sea Level Change Projections - Gauge: 8721120, Daytona Beach Shores, FL



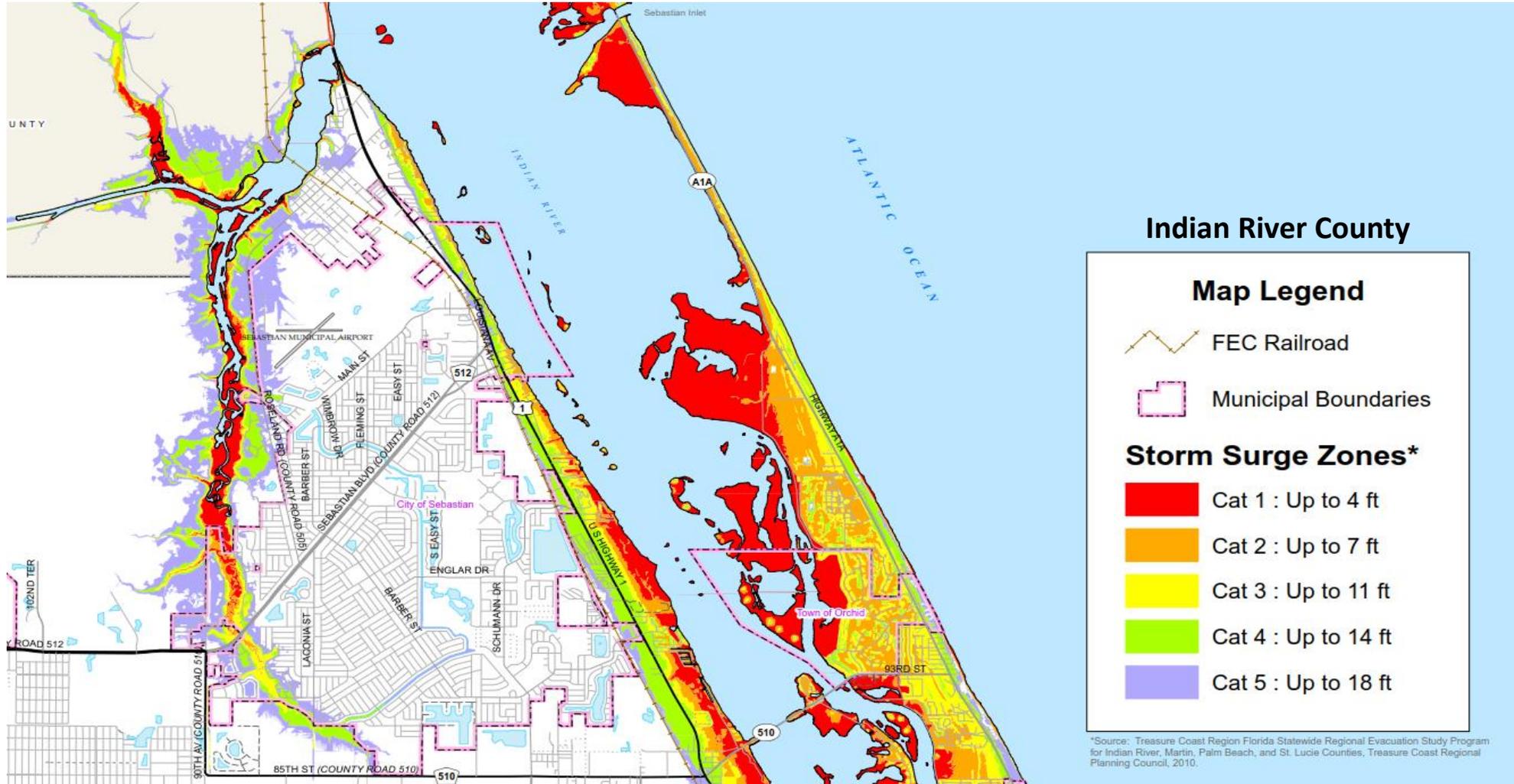
Rapid Inundation Analysis

► Inundation Extents Analyzed

- *100-Year*
- *25-Year*
- *2070 SLR (NOAA High)*
- *2070 SLR (NOAA High) + 100 YR*
- *CAT 1 Storm Surge*
- *CAT 3 Storm Surge*



Indian River County Surge Map



*Source: Treasure Coast Region Florida Statewide Regional Evacuation Study Program for Indian River, Martin, Palm Beach, and St. Lucie Counties, Treasure Coast Regional Planning Council, 2010.

RI: 25-year/24-hour storm event



2070 SLR – NOAA High



2070 SLR + 100-YR Rainfall

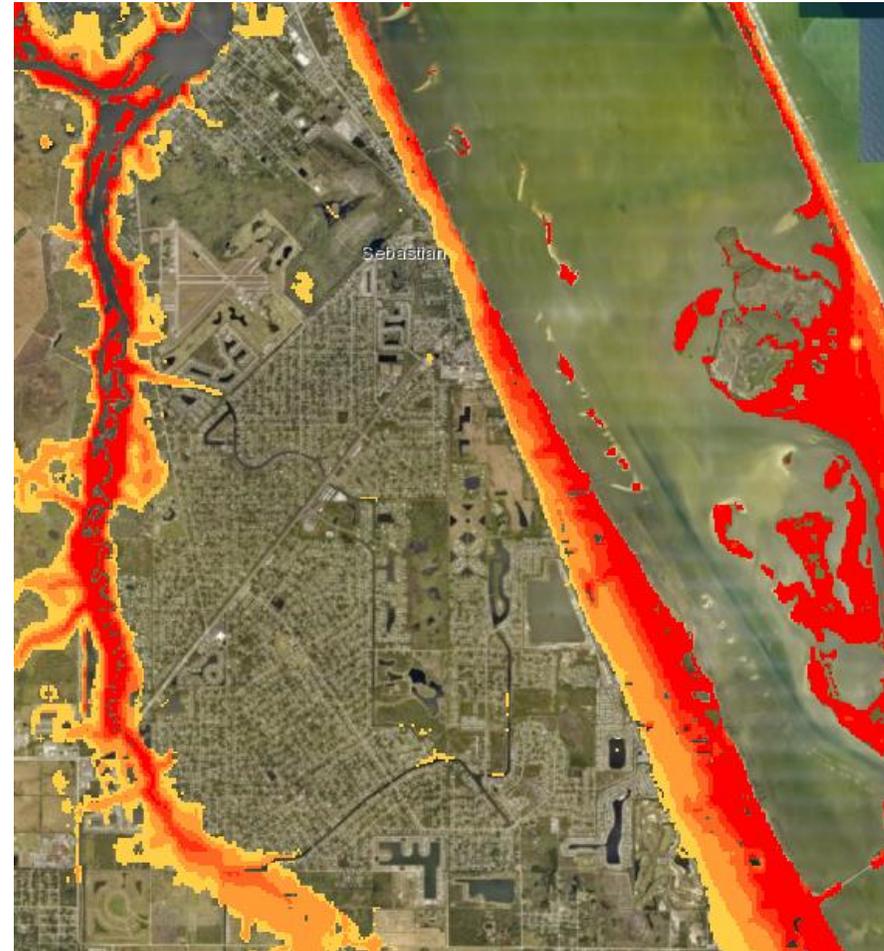


City of Sebastian – Category 1 Surge

RI Tool CAT 1



NOAA Coastal Exposure Map CAT 1 (Bright Red)

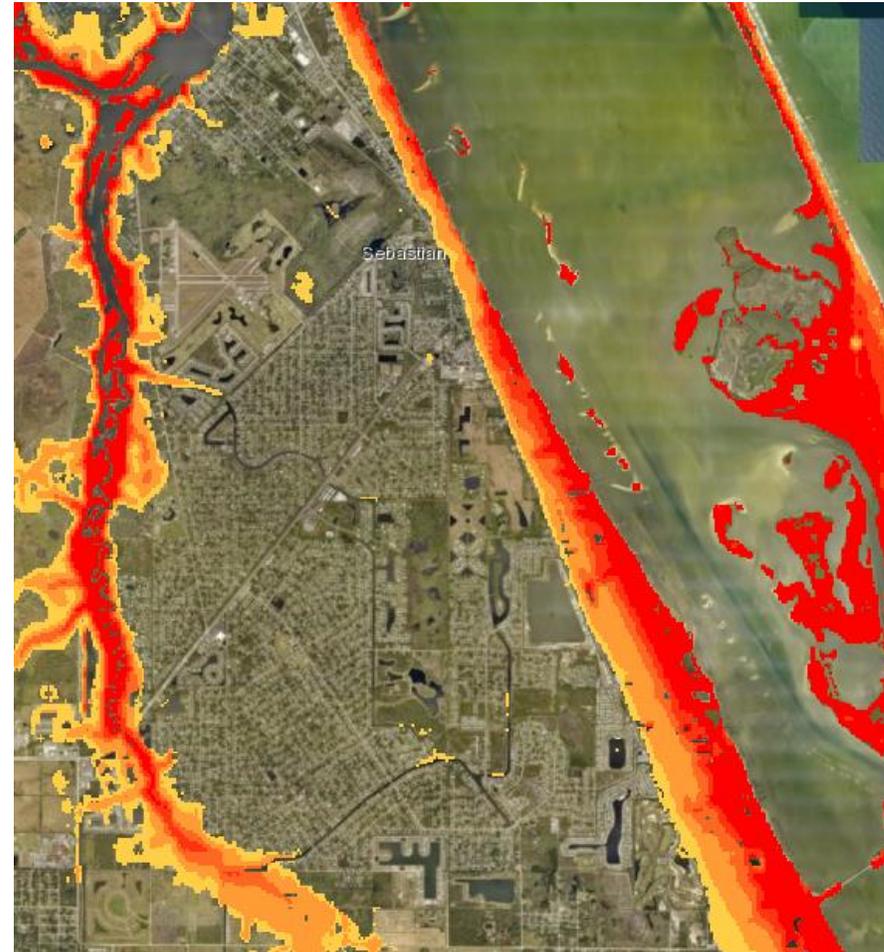


City of Sebastian – Category 3 Surge

RI Tool CAT 3



NOAA Coastal Exposure Map CAT 3 (Light Orange)



Critical Infrastructure

- ▶ City owned buildings
- ▶ Maintained roads
- ▶ Airport
- ▶ Lift-stations
- ▶ Schools and Shelters
- ▶ Parks

Asset Analysis

▶ Asset Elevations

- DEM (point) Elevation as FFE if no other information is available
- As-Builts
- Lift Station As-Builts

▶ Government Facilities Criticality

- **High** – Impacts emergency or critical infrastructure needed during major events
- **Medium** – Impacts infrastructure where individuals may work or live
- **Low** – Impacts outdoor facilities

▶ Lift Stations Priority

- **High** – More than 3' of flood water – Impact to electrical equipment
- **Medium** – More than 2' of flood water – Possible impact to electrical equipment
- **Low** – Under 2' of flood water – Pumps will still remain in operation

Paired Asset Threats

NAME	OWNER	CATEGORIES	2070 SEA LEVEL RISE	2070 SEA LEVEL RISE + 100 YEAR	25 YEAR/24HOUR	100YEAR/24HOUR	CAT 1	CAT 3	FIRM ELEVATION	DEM ELEVATION	CRITICALITY
CAPTAIN ROBERT HARDEE BOAT LAUNCH	CITY OF SEBASTIAN	BOAT RAMP	3.812999964	5.893000126	0	0	3.990999937	11.01399994	7	1.821529984	LOW
SEBASTIAN YACHT CLUB	CITY OF SEBASTIAN	BOAT RAMP	3.803999901	5.893000126	0	0	3.987999916	11.01900005	7	3.020329952	LOW
SCHUMANN LAKE PARK	CITY OF SEBASTIAN	PUBLIC PARK	0	0	0	0	0	0	0	24.0048008	
BARBER STREET SPORTS COMPLEX	CITY OF SEBASTIAN	PUBLIC PARK	0	0	0	0	0	0	0	21.13439941	
SEBASTIAN BARK PARK	CITY OF SEBASTIAN	PUBLIC PARK	0	21.11400032	21.07799911	21.11499977	0	0	18	19.8654995	LOW

CRITICALITY	Definition
HIGH	Impacts emergency or critical infrastructure needed during major events
MEDIUM	Impacts infrastructure where individuals may work or live
LOW	Impacts outdoor facilities

Preliminary Results

- ▶ Sea Level Rise for 2070 – generally limited to coast and along river
 - (notably at Donald MacDonald Park and Dale Wimbrow Park - County)
 - a few backyards off of Robin Lane
 - Several coastal lift-stations
- ▶ Rainfall Inundation present at various locations throughout the City
- ▶ Surge impacts limited to coast, along river and some upstream branches for CAT 1 & CAT 3
 - Over a dozen lift stations for CAT 3 – coastal areas

Adaptive Strategies

▶ Short Term

- ✓ Update Comprehensive Plan
- ✓ Define existing flooding levels of service – streets
- ✓ Locate and map all City outfalls – retrofit with tide valve
- ✓ Discuss potential of early warning systems for elderly

▶ Long Term

- ✓ Re-evaluate bulkhead/sideslope inspections; detailed surveying
- ✓ Update Stormwater Master Plan
- ✓ Coordinate with County to prioritize hardening of lift stations