COASTAL STRATEGIES FOR DRAINAGE RESILIENCE

FDOT's Approach and Vision

Resilient Florida: Planning, Policy & Practice

TODAY'S DISCUSSION

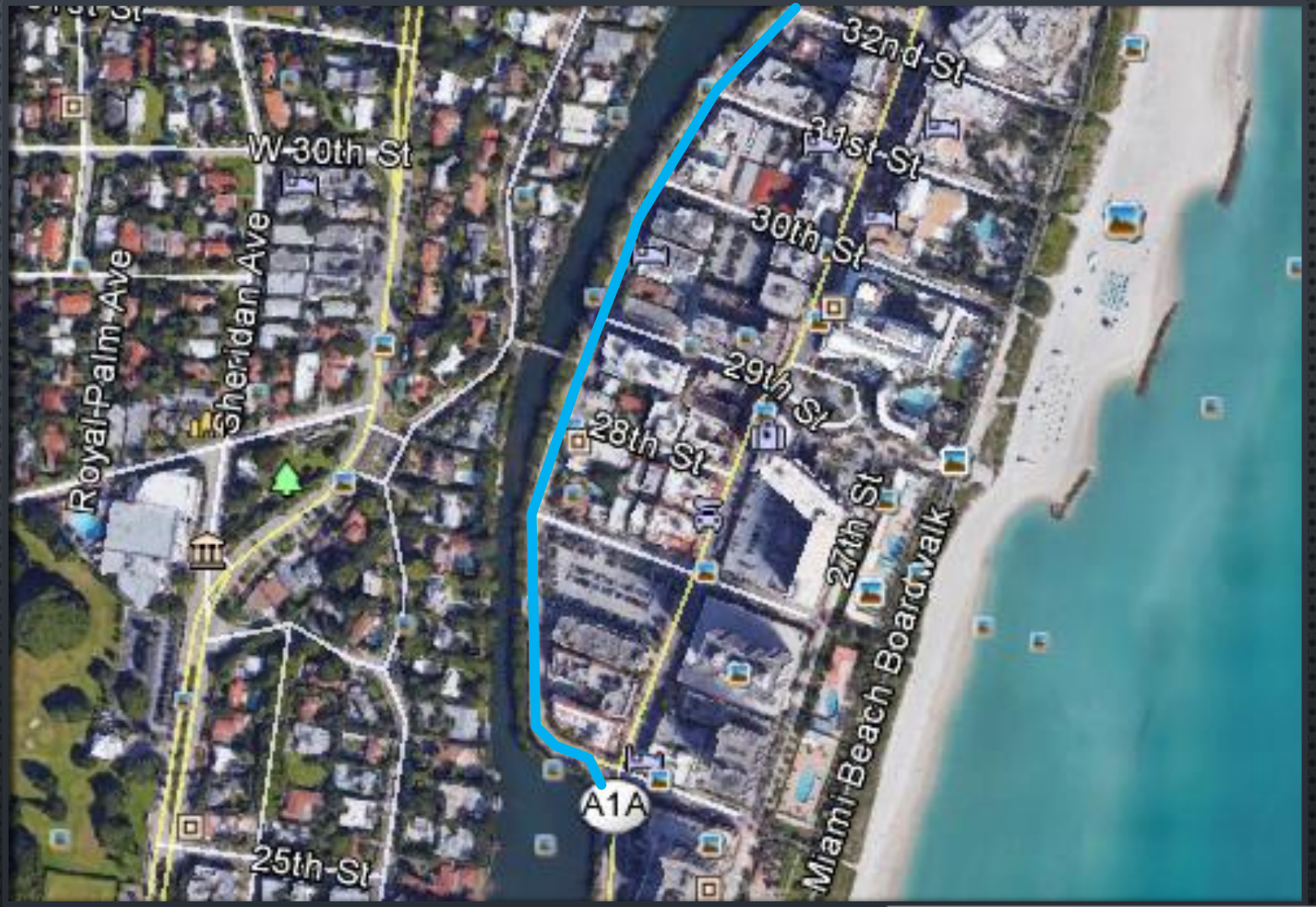
- ✓ Current Concerns and Sea Level Rise
- ✓ Risk Tolerance and Design Considerations
- ✓ Long-Term Coastal Strategies

FDOT

VICINITY MAP OF MIAMI BEACH

S.R. A1A - INDIAN CREEK DRIVE/COLLINS AVENUE, MIAMI BEACH

- ✓ Indian Creek Drive serves as the Southbound Lanes for S.R. A1A
- ✓ Between 24TH Street and 39TH Street
- ✓ Existing Intra-Coastal Area is connected to Biscayne Bay
- ✓ Existing channel is lined with Seawall and Mangroves
- ✓ Existing roadway elevation for Indian Creek Drive varies between 1 and 3-feet, NAVD



Resilient Florida: Planning, Policy & Practice

FDOT

Indian Creek Drive at 32nd Street – Miami Beach, September 2015

Resilient Florida: Planning, Policy & Practice

FDOT

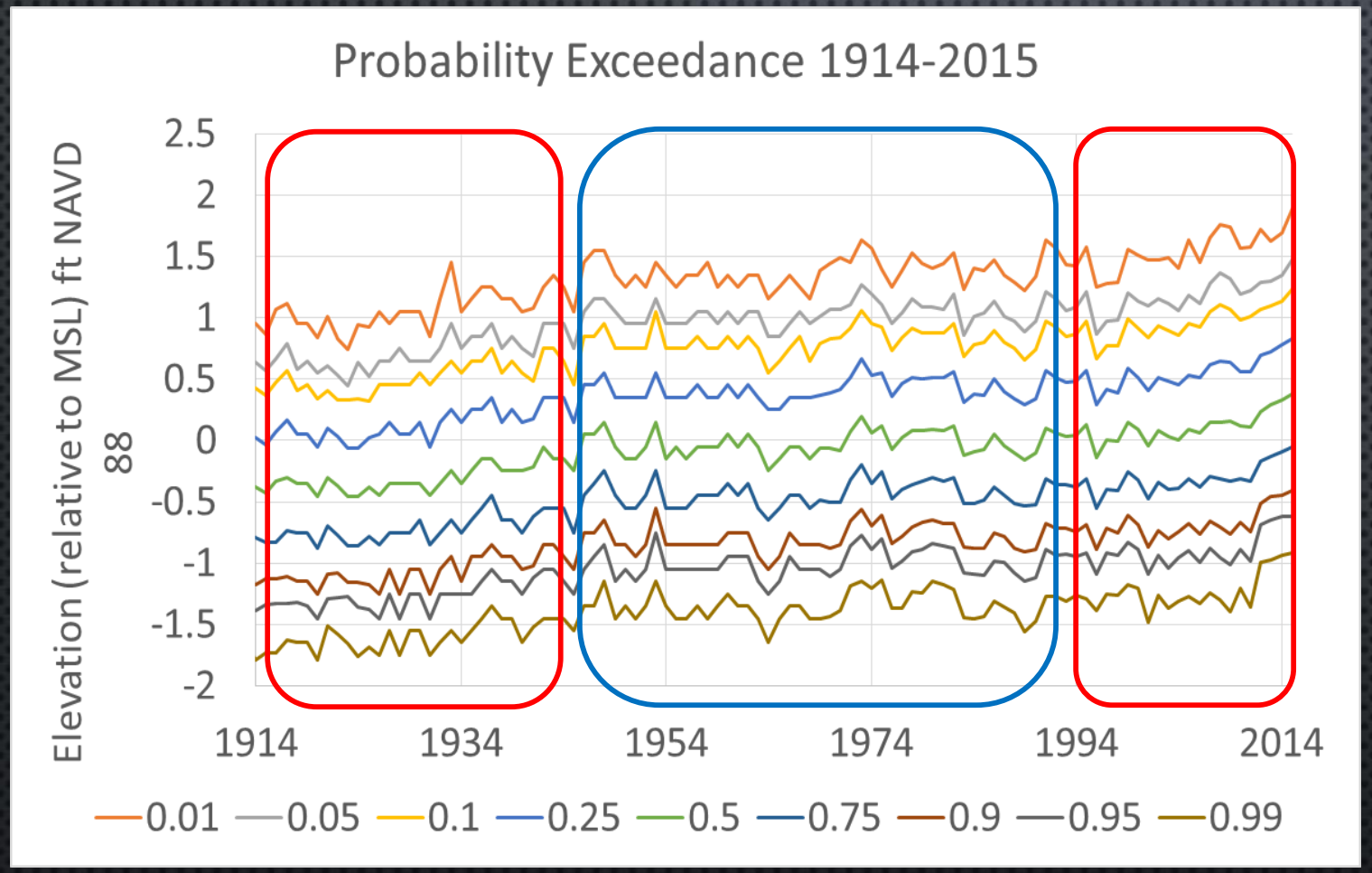
KING TIDE FLOODING

- ✓ Infra-Structure Impacts
- ✓ Traffic Impacts
- ✓ First Responder Coordination
- ✓ Maintenance & Cleanup
- ✓ Damage Assessment

Indian Creek Drive at 34th Street, September 2015

FDOT

PROBABILITY EXCEEDANCE 1914-2015



Three regions can be observed:

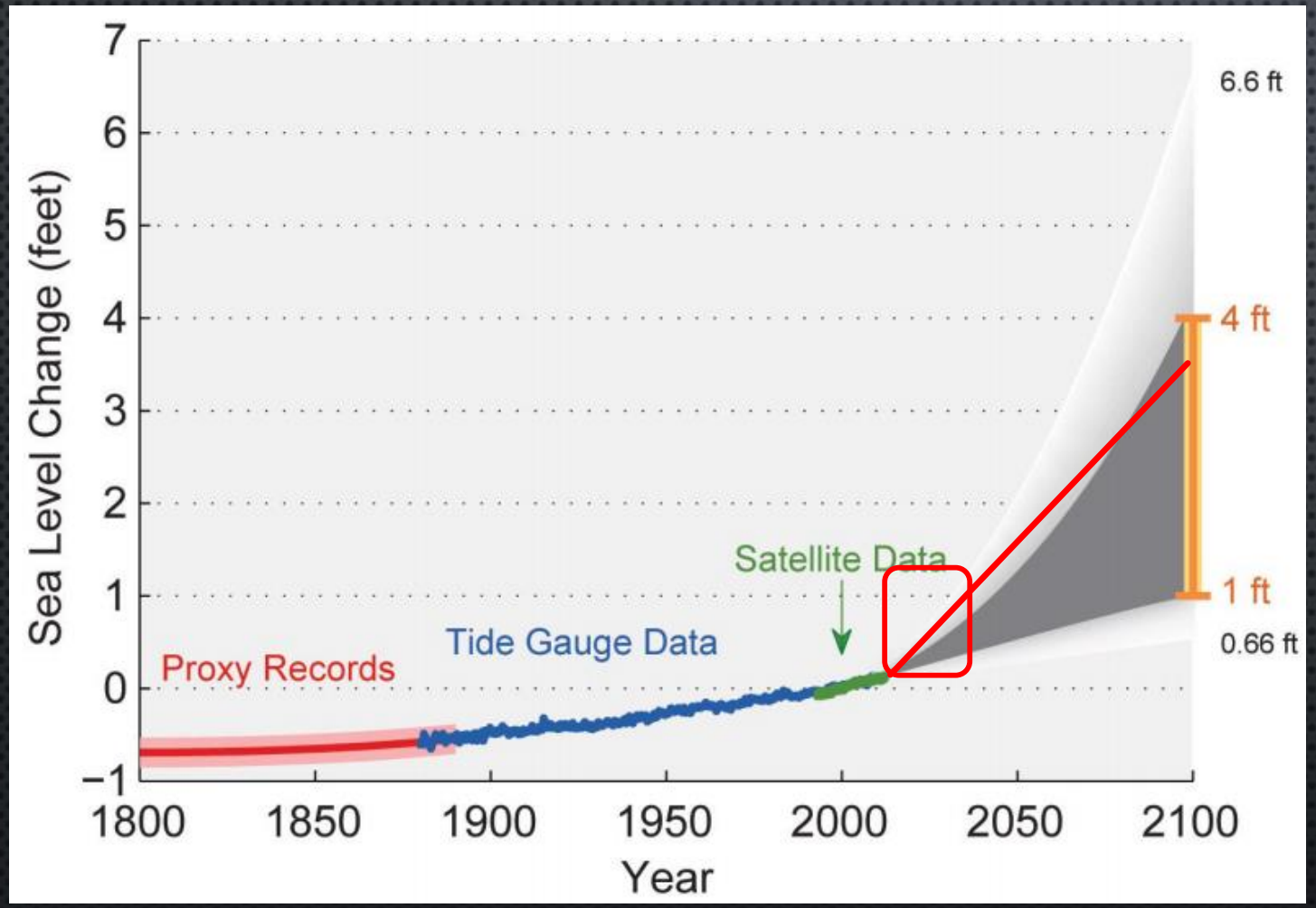
- 1914-1954 – 0.8 ft/100 yr
- 1954-1994 – 0.05 ft/100 yr
- 1994-2014 – 1.5 ft/100 yr

In the last 10 year there is acceleration

- 2004-2014 – 3.3 ft/100 year

If only 2013-2014 year is considered the trend is 4 ft/100 years

SLR OBSERVATIONS AND FEDERAL GUIDANCE



From The Third National Climate Assessment. U.S. Global Change Research Program, 841 pp. doi:10.7930/J0Z31WJ2

- **Next 10 years will be critical to determine if the increase continues to be exponential or linear.**
- **FHWA Guidance – HEC-25 for Coastal Roadways, 2.0-feet by the Year 2100**
- **FHWA Guidance – HEC-17 for Riverine Roadways**

FDOT

RISK ALLOWANCE

- ✓ SITE SPECIFIC
- ✓ EXTENT OF INUNDATION
- ✓ TEMPORARY UTILITY IMPACTS
- ✓ IMPORTANCE OF PROTECTION VERSUS ENVIRONMENTAL IMPACTS
- ✓ BUSINESS/TOURISM IMPACTS
- ✓ AGRICULTURAL IMPACTS

FDOT

DESIGN CONSIDERATIONS

- ✓ Desired Service Life, i.e. 25, 50 or 100-Year
- ✓ Appropriate Design Frequency, i.e. 3, 5, 10, or 25-Year LOS for Shared Outfalls
- ✓ Tailwater Considerations, i.e. MHHW, MHW
- ✓ Tropical Systems and Storm Surge
- ✓ Coastal FEMA Floodplain Map Updates
- ✓ Criteria for Pressurized Storm Sewer Systems

FDOT

RESILIENCE PLANNING – LIVING SHORELINES AND PERMITTING

U.S. 98 along the Gulf of Mexico in Franklin County

Resilient Florida: Planning, Policy & Practice

FDOT

LONG-TERM STRATEGIES

- ✓ Collaborative Planning to address Protection Areas, Vulnerable Areas and Mitigation
- ✓ Planning for Registered Estuaries
- ✓ Type Of Protection
- ✓ Back-flow Prevention Devices
- ✓ Dikes/Levees/Dunes

FDOT

LONG-TERM DESIGN STRATEGIES

- ✓ Stormwater Management Designs to Protect Against Landward Saltwater Intrusion
- ✓ Multi-purpose designs, i.e. Parks and Recreation Areas
- ✓ Phased Designs to allow for adjustments in response to the localized Sea Level Rise
- ✓ Restore Coastal Inlets and Relief Passes

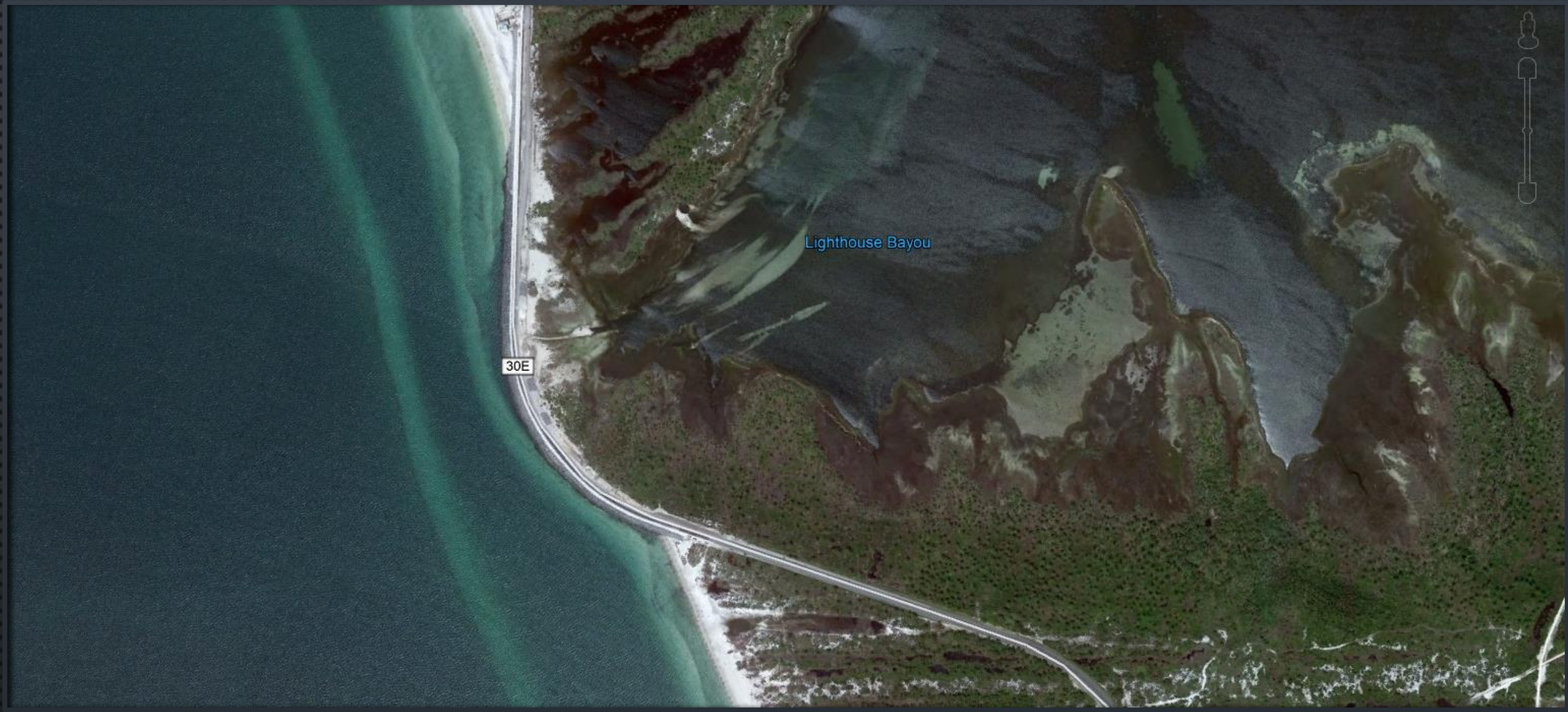
Resilient Florida: Planning, Policy & Practice

FDOT

Long-Term Shoreline Regression – Cape San Blas (1970's)

Resilient Florida: Planning, Policy & Practice

FDOT



Long-Term Shoreline Regression – Cape San Blas (2019)

Resilient Florida: Planning, Policy & Practice

FDOT

LONG-TERM STRATEGIES FOR FDOT's INVOLVEMENT

- ✓ Utility Relocations
- ✓ Infra-Structure Improvements
- ✓ Flexibility Amongst the Regulatory Agencies
- ✓ Early Project Identification
- ✓ Greater Stakeholder Engagement

Wastewater Plant on Virginia Key, Miami

FDOT

FURTHER CONSIDERATION FOR COASTAL RESILIENCY???

Carlton Spirio, P.E.

State Drainage Engineer

Florida Department of Transportation

605 Suwannee Street

Tallahassee, Florida 32399

(850) 414-4351

Carlton.Spirio@dot.state.fl.us

Resilient Florida: Planning, Policy & Practice