Urban Land Institute

SOUTHEAST FLORIDA REGIONAL COMPACT CLIMATE CHANGE

Business Case for Resilience in Southeast Florida

PROJECT OVERVIEW

APRIL 2020

Opening Remarks

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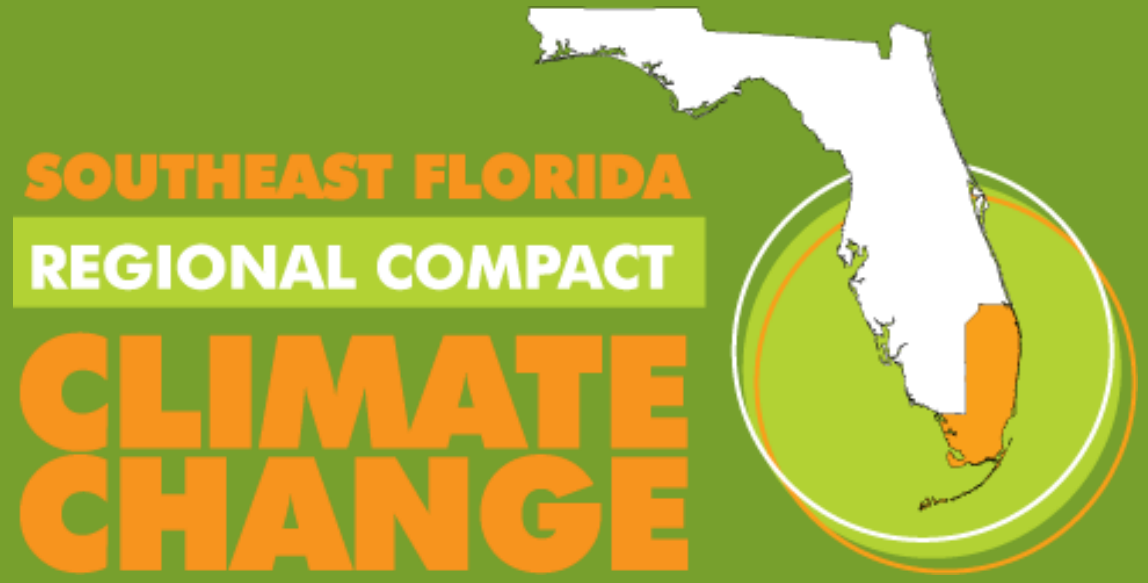
Chief Resilience Officer

Broward County



Rules of the Road

- Please remain muted
- Ask questions using the chat function
- Have your cell phone ready for virtual polling

Urban Resilience at ULI

- Global membership of 40,000+ professionals in the real estate and built environment industries, with 50+ local District Councils in ULI Americas

- Urban Resilience program addresses how buildings, communities and cities can be more **prepared for the impacts of climate change.** The program has also looked at policies and plans preparing cities for other types of shocks, disruptions and stresses.

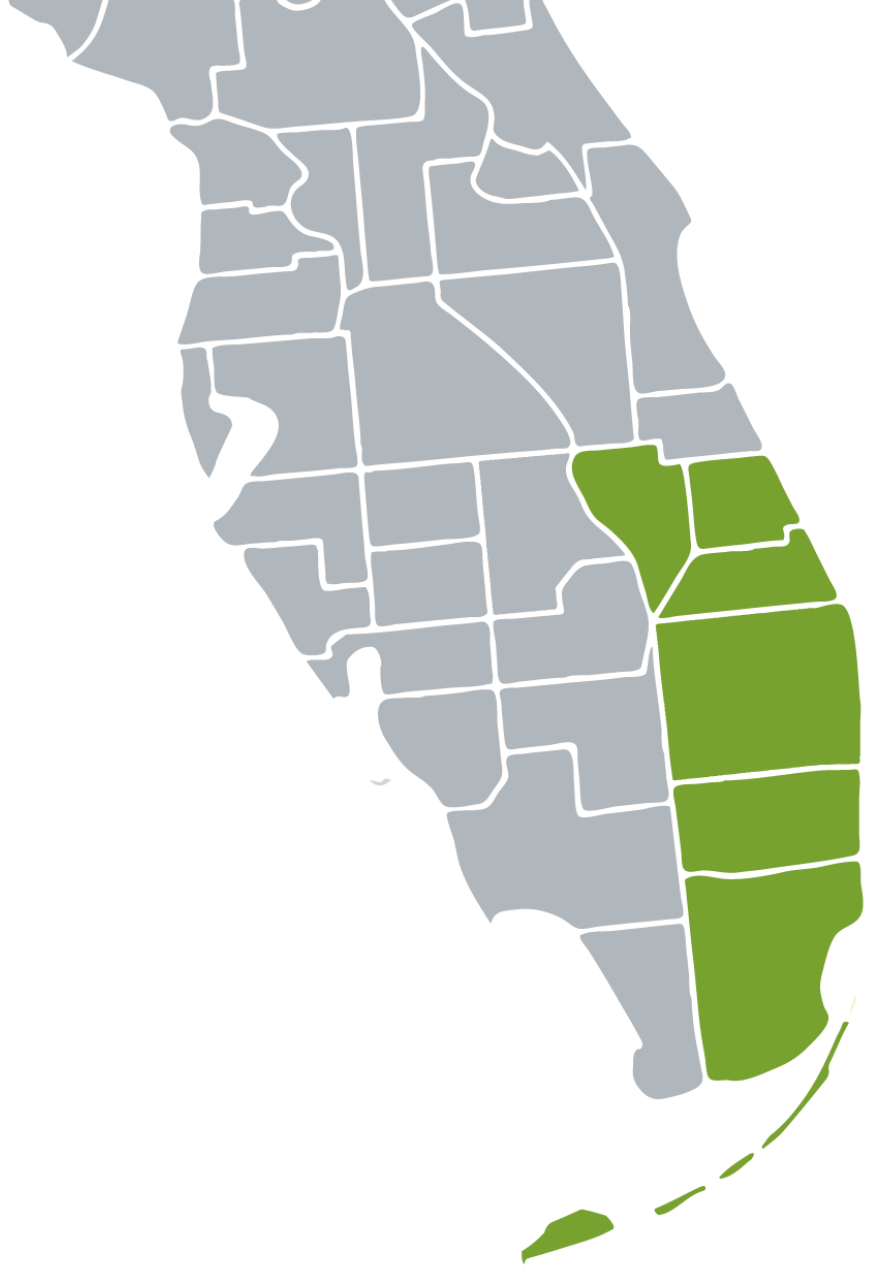
- Program components:
  - Conducting Research
  - Advising Communities
  - Supporting Local-Level Resilience Work
  - Convening Leaders in Resilience

- Long-time collaboration w/ULI Southeast Florida

ULI Southeast Florida/Caribbean

Our Local ULI District Council

- Serves the 7 southeasternmost Florida counties, plus Puerto Rico, and the Caribbean
- We have 1,100+ members and over 3,000 active participants
- Our primary focus areas are resiliency, mobility, and housing affordability



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Southeast Florida Regional Climate Change Compact

- In 2010, Broward, Miami-Dade, Monroe, and Palm Beach Counties formed the Compact
- The Southeast Florida Regional Climate Change Compact
  - Support local government efforts to meet shared mitigation and adaptation challenges
  - Facilitate collaborative opportunities and investments with/by state and federal agency partners
  - Developed a Regional Climate Action Plan, which outlines recommended mitigation and adaptation strategies for the region

SOUTHEAST FLORIDA
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Business Case for Resilience in Southeast Florida

ULI has partnered with the Southeast Florida Regional Climate Change Compact to regionally examine the economic and fiscal impacts to public and private property under various sea level rise and storm scenarios.

- Goal: Identify **return on investment for resilience and adaptation measures** that considers the risks of sea level rise, coupled with other flooding risks that are applicable to Southeast Florida.
- Project Partners
  - Florida DEP
  - Broward, Miami-Dade, Monroe, and Palm Beach Counties
  - Business Community
  - Philanthropy
  - AECOM

Project Understanding

Achieving Transparency

- Industry & Community Outreach
  - Hosting consultation events
  - Hosting regional launch and outreach events
- Best Practices
  - Examining how other cities and regions are using economic analyses to inform infrastructural decisions
  - Identifying national examples and case studies applicable to Southeast Florida
- Communications
  - Integrating the economic modeling consultants' findings into a report for an industry audience
  - Creating communication toolkit to aid conversations with and by the private sector
  - Aiding alignment of communication to benefit region

Post Project Impacts

Regional Risk Understanding:

- Core infrastructure assets
- Public + private property
- Economic sectors

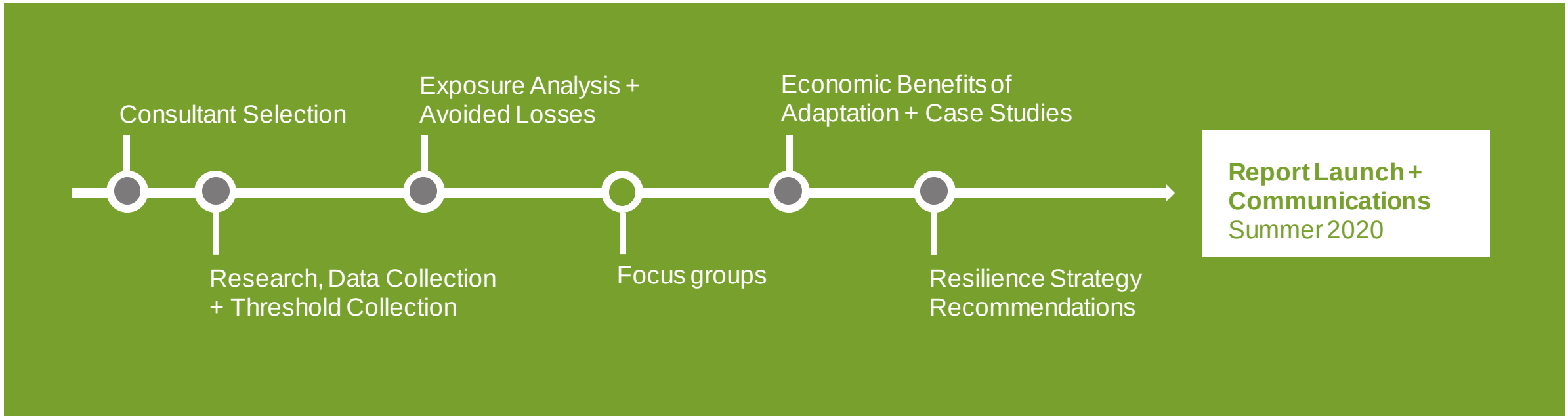
Return on Investment:

- Systemic strategies (e.g., seawalls)
- Building level strategies (e.g., floodproofing)

Broad Support for Adaptation + Resilience Investments:

- Public + private sectors
- State, region, local levels

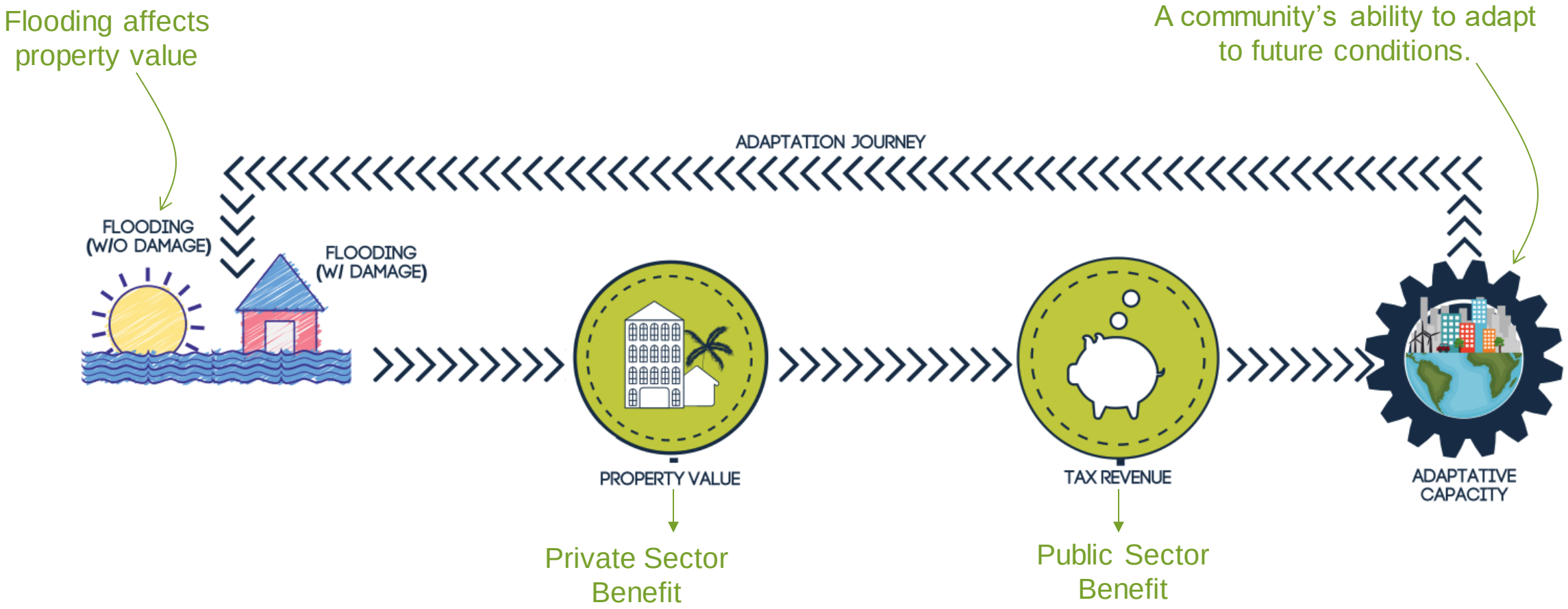
Project Outline & Milestones



Defining Economic Resilience

The capacity to prevent, withstand, recover from, and otherwise bounce back better from human or natural caused shocks or disruptions to the economy.

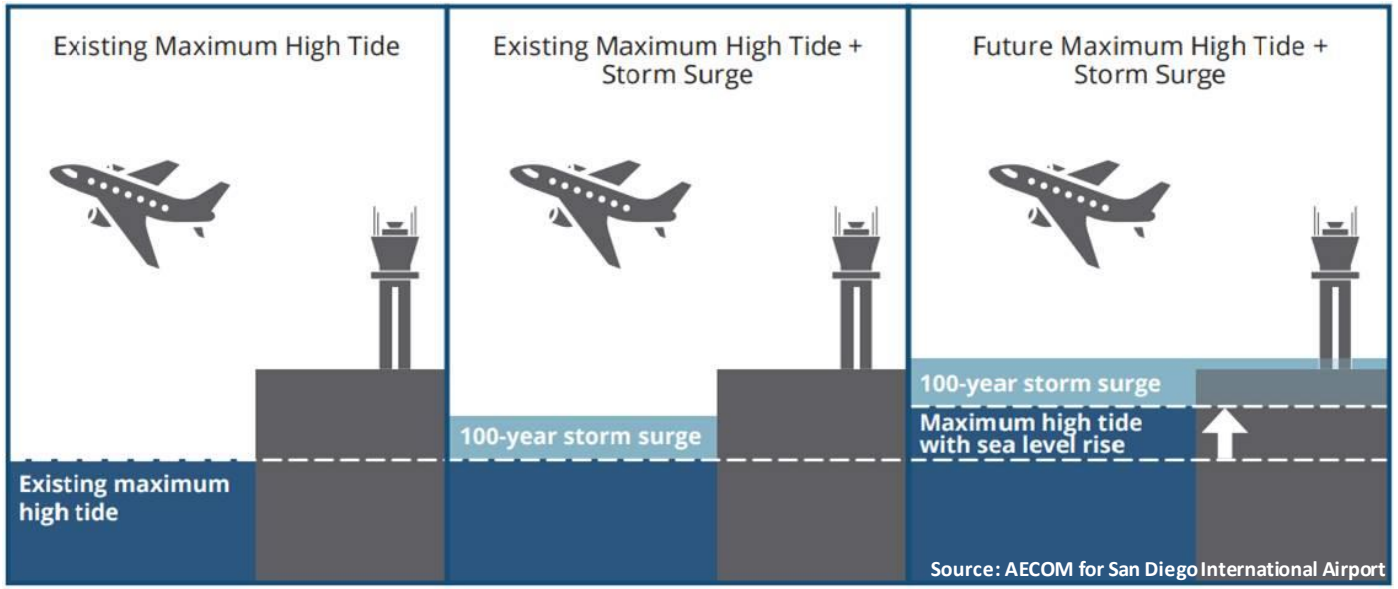
What is the "Return on Resilience"?



Physical Scenarios

Exploring the impact of more frequent flooding

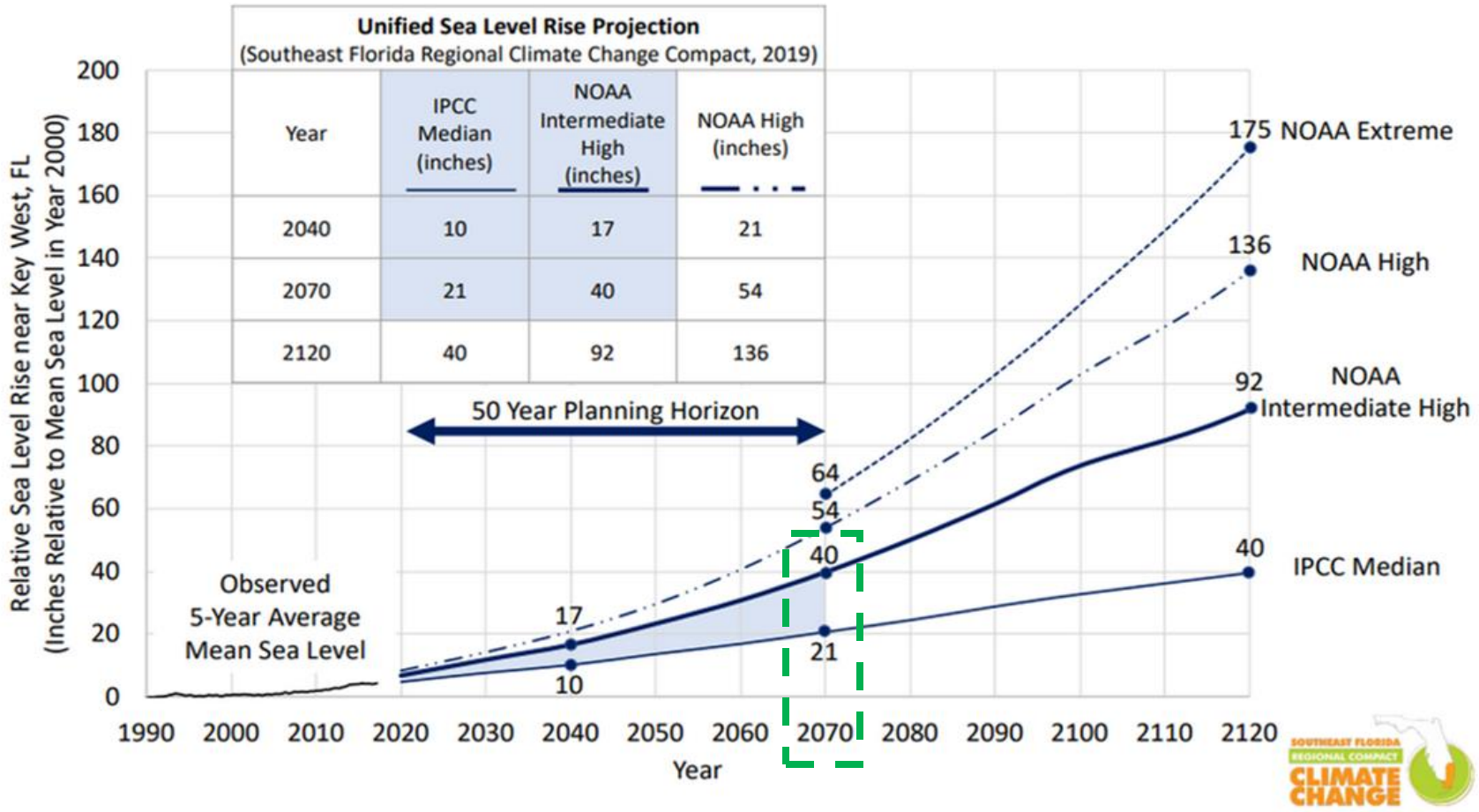
- Mean Higher High Water (Average Daily High Tide)
- 1-year Tidal Level (King Tide)
- 10-year Tidal Level (Frequent Coastal Storm)



Selecting Future Conditions

Newly adopted unified sea level rise projections

- Examining:
  - Current conditions
  - 20 years from now
  - 50 years from now
- This is consistent with the Compact planning horizons

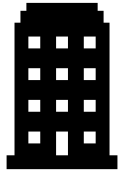


Economic Questions to Answer

In the context of coastal hazards, how can communities in Southeast Florida support adaptation actions and redevelopment investments that promote economic resilience?

What are the economic vulnerabilities communities face now and in the future?

What are the costs and benefits of different adaptation actions?



What actions can be taken today to promote resilience?

Economic Modeling Concepts

- Risk Assessment Approaches
  - Deterministic
  - Probabilistic
- Dimensions of Impacts
  - Primary vs. secondary
  - Temporary vs. permanent
  - One-time vs. recurring
- Categories of Effects
  - Economic damage
  - Economic and fiscal impact
  - Economic value
- Reporting Metrics
  - Single-event
  - Cumulative

Economic Data and Modeling Resources

Data Inputs

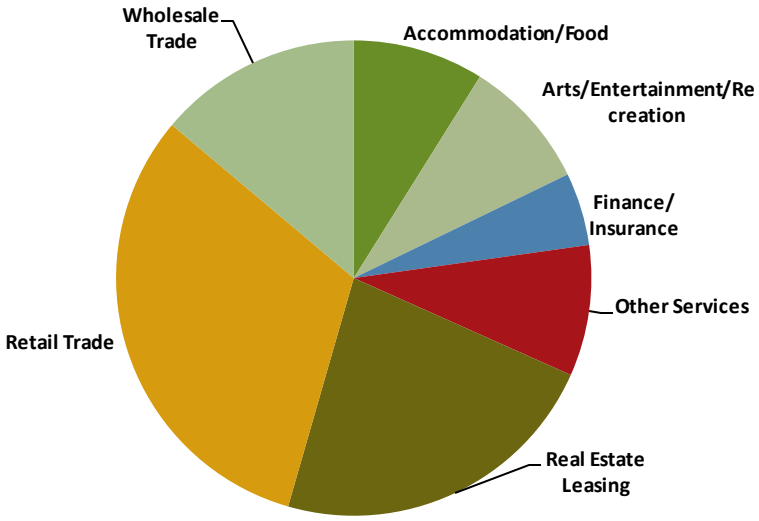
- Critical Infrastructure Assets
  - Transportation, utilities, hospitals
- Parcel Data
  - Land use, square footage, market value
- Business Data
  - Industry type, sales output, employees
- Adaptation Data
  - Shoreline type, unit costs, burden of payment

Modeling Resources

- Agency planning / policy memorandums
- Customized models for primary impacts
- REMI PI+ model for secondary impacts

Example Flood Depth Exposure

Example Industries Affected



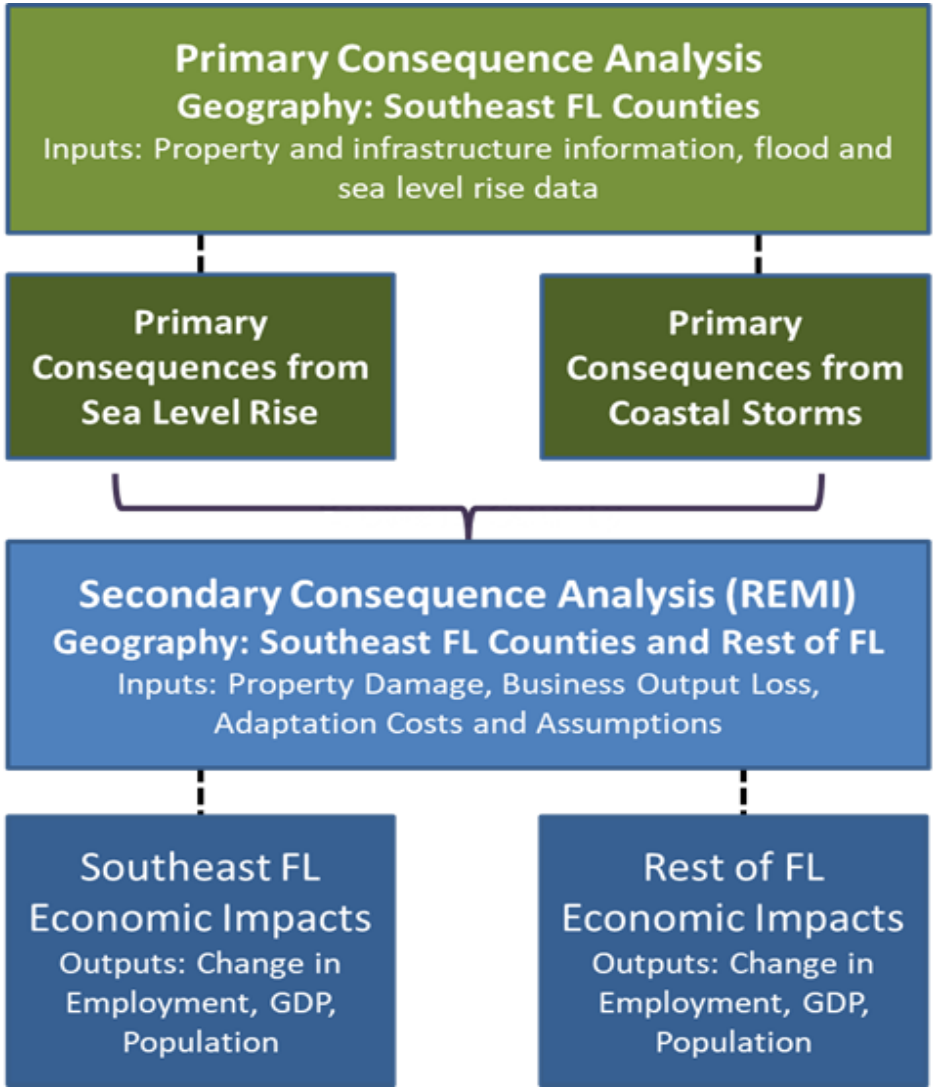
Economic Modeling Workflow

Primary Consequence Modeling

- Direct impacts from sea level rise or coastal storms. For instance, damage to a structure.

Secondary Consequence Modeling

- Indirect impacts from sea level rise or coastal storms. For instance, business and supply chain interruptions.



Key Economic Reporting Metrics

Impact Type	Impact Category	Physical Scenario	By City	By County	Rest of Florida
Structure and Content Damage*	Primary	Coastal Storm	X	X	
Business Output Loss**	Primary	Coastal Storm & SLR	X	X	
Property Tax Loss*	Primary	SLR	X	X	
Sales Tax Loss**	Primary	Coastal Storm & SLR	X	X	
Market Value Loss	Primary	SLR	X	X	
Change in GDP	Secondary	Coastal Storm & SLR		X	X
Change in Employment**	Secondary	Coastal Storm & SLR		X	X
Change in Population	Secondary	Coastal Storm & SLR		X	X
Adaptation Costs	Primary	Coastal Storm & SLR	X	X	

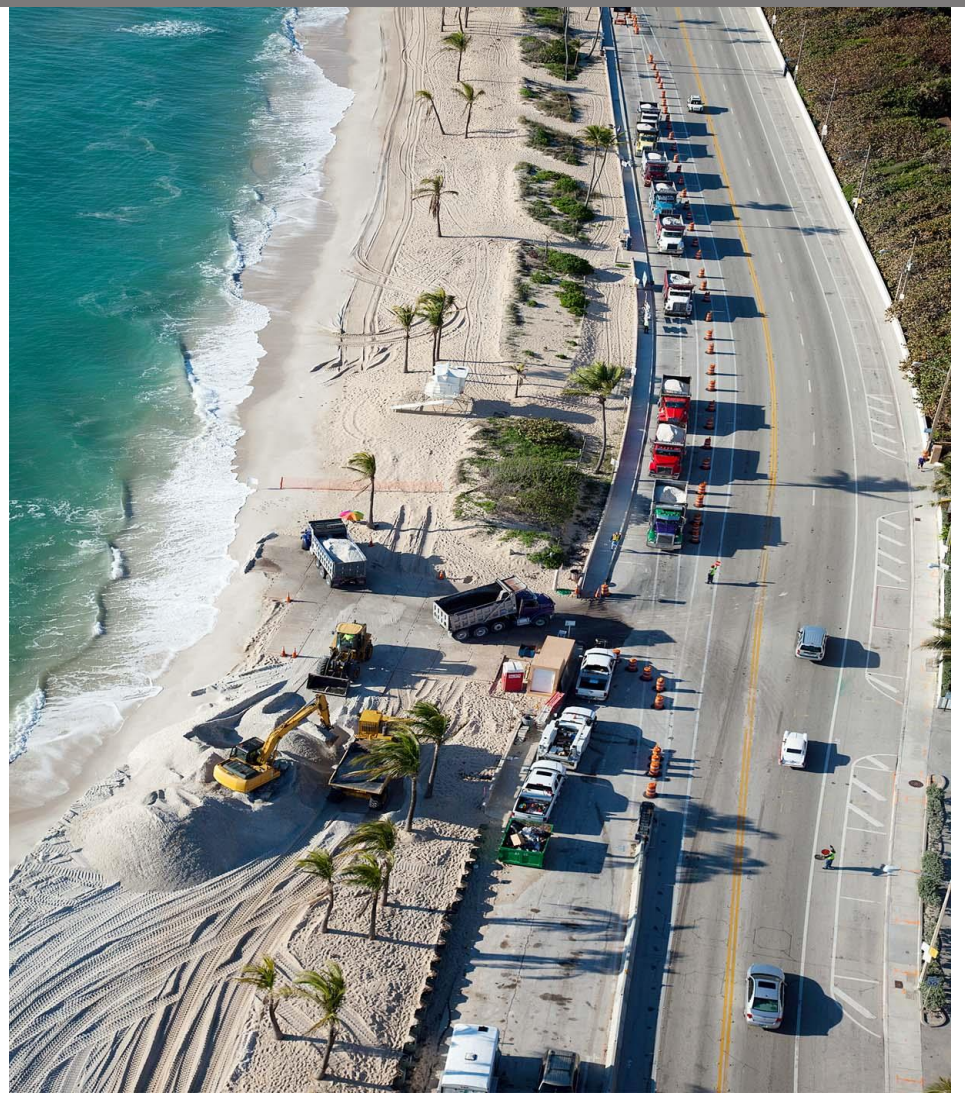
* Results to be broken out by land use
** Results to be broken out by sector/industry

Adaptation Scenarios

Examples	Adaptation Bucket	Strategy	Description
	Protect	• Beach nourishment • Dune enhancements • Seawall and bulkhead raising	The protect scenario will involve a combination of soft and hard engineering investments, the application of which is dependent on open coast and intercoastal determinizations.
	Accommodate	• Dry and wet floodproofing • Elevating structures • Elevating interior roadways	The accommodation scenario will involve a combination of structural improvements to exposed property, the application of which is dependent on building type and FEMA principles and procedures.
	Hybrid	• Fortifying infrastructure • Hardening infrastructure • Elevating infrastructure	The hybrid scenario will combine elements of protect and accommodate strategies and will be focused on one type of critical regional infrastructure such as wastewater treatment plants.

Protect Case Study: Post-Sandy A1A Improvements

- Severe erosion occurred after Superstorm Sandy in 2012, and undermined roadway.
- Fort Lauderdale, Broward County, worked with FDOT to improve the resilience of the reconstruction project.
- Project included 40’ deep sheet piles, 2’ road raising, 1’ higher wall, and new backwalls.
- This was a needed repair and not ”new money.” Resilience was considered as part of the overall project.



Protect Case Study: Lake Worth Lagoon

- Largest estuary in the county situated between two permanent, man-made inlets
- Ecosystem Enhancements:
  - Implementation of seagrass, mangrove planters, oyster reefs, and clean sand, and paths
  - Results: improvement to the turbidity of the water, increasing habitat for fisheries and wildlife, while creating added storm protection for the area.

Protect Case Study: Virginia Key

- Miami-Dade County, in conjunction with the City of Miami, Frost Science Museum, and other local non-profits restored over **20 acres of coastal habitat and dune on Virginia Key**.
- For the right places, living shorelines are quite effective. The project created a natural buffer that helps reduce erosion and protect Miami-Dade's central wastewater treatment plant.

Next Steps

Thank you for sharing your expertise with the ULI project team!

- Your feedback is critical to helping us frame the report for an industry audience
- Webinar has been recorded and will be distributed
- Final report will be available this summer and results will be shared at a local convening on the topic
- Questions? Further input? Reach out to Leah.Sheppard@uli.org

Thank you!