

Florida Keys Coastal Storm Risk Management Feasibility Study



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National Environmental Policy Act
Public Scoping Meeting

Susan Conner:
U.S. Army Corps of Engineers
Norfolk District

Rhonda Haag:
Monroe County, Florida

December 2018

Key West

Lower Keys

Middle Keys

Upper Keys





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NATIONAL ENVIRONMENTAL POLICY ACT PUBLIC SCOPING MEETING ARMY

- Welcome/Introductions 6:00 pm
- NEPA Public Scoping 6:15 pm
- Monroe County Efforts to date 6:30 pm
- Project Overview 6:45 pm
- Open House and Public Comment Period 7:00 – 8:00 pm



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NATIONAL ENVIRONMENTAL POLICY ACT OF 1969 (NEPA)

NEPA requires a federal agency to disclose its actions and decision making process and provides the procedure to evaluate the effects of those actions on the human environment



NEPA



- Requires federal agencies to consider, document and disclose environmental consequences prior to making final decisions
- Requires federal agencies to cooperate with federal, state and local governments, and other concerned public and private organizations and citizens.
- Provide agencies with a mechanism to coordinate overlapping, jurisdictional responsibilities
- Scoping invites the participation of affected federal, state, and local agencies, any affected Indian tribe, the proponent of the action, and other interested persons
- Early and open process for determining the scope of issues & identifying the significant issues



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NEPA



A Federal Action results in one of three documents:



Categorical
Exclusion

No Impacts



Environmental
Assessment



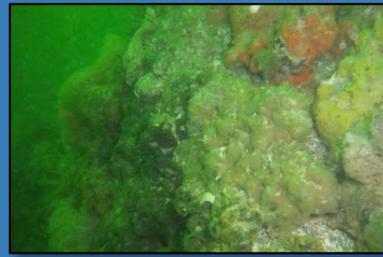
Environmental
Impact
Statement

Significant Impacts

As Environmental Impacts Increase

Potential Topics to be Considered in the NEPA Document

- Air Quality
- Archaeological/Cultural Resources
- Benthic Resources
- Contaminants
- Essential Fish Habitat
- Hydrology
- Navigation
- Noise
- Recreation
- Socioeconomics
- Threatened and Endangered Species
- Turbidity
- Sedimentation
- Visual Landscape/Aesthetics
- Water Quality
- Wetlands
- Wildlife Resources



New Planning Process

- **3x3x3 Planning Process – No more than 3 years, 3 million dollars, and efficient/effective coordination among 3 levels U.S. Army Corps of Engineers governance**
- **Process and outputs are decision focused, and within the 6 step planning process**
- **Risk and uncertainty for each decision is acknowledged and appropriate level of details is managed**
- **Report developed from the beginning of the study, documenting the decisions**

Public Engagement



How you can get involved:

- Provide knowledge and expertise on any aspect of the study. Your contribution will be considered.
- Provide scientific data on resources, maps, charts, location of resources potentially not currently known.
- Provide written comments during today's scoping meeting or during the public scoping period.
- Review the Draft Integrated document at the USACE, Jacksonville District website when released for public review.
- Provide comments and concerns for items addressed and not addressed in the report



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Please submit scoping comments by:

January 8, 2019

Please send written comments to:

Kimberly C. Koelsch

U.S. Army Corps of Engineers

803 Front Street

Norfolk, Virginia 23510

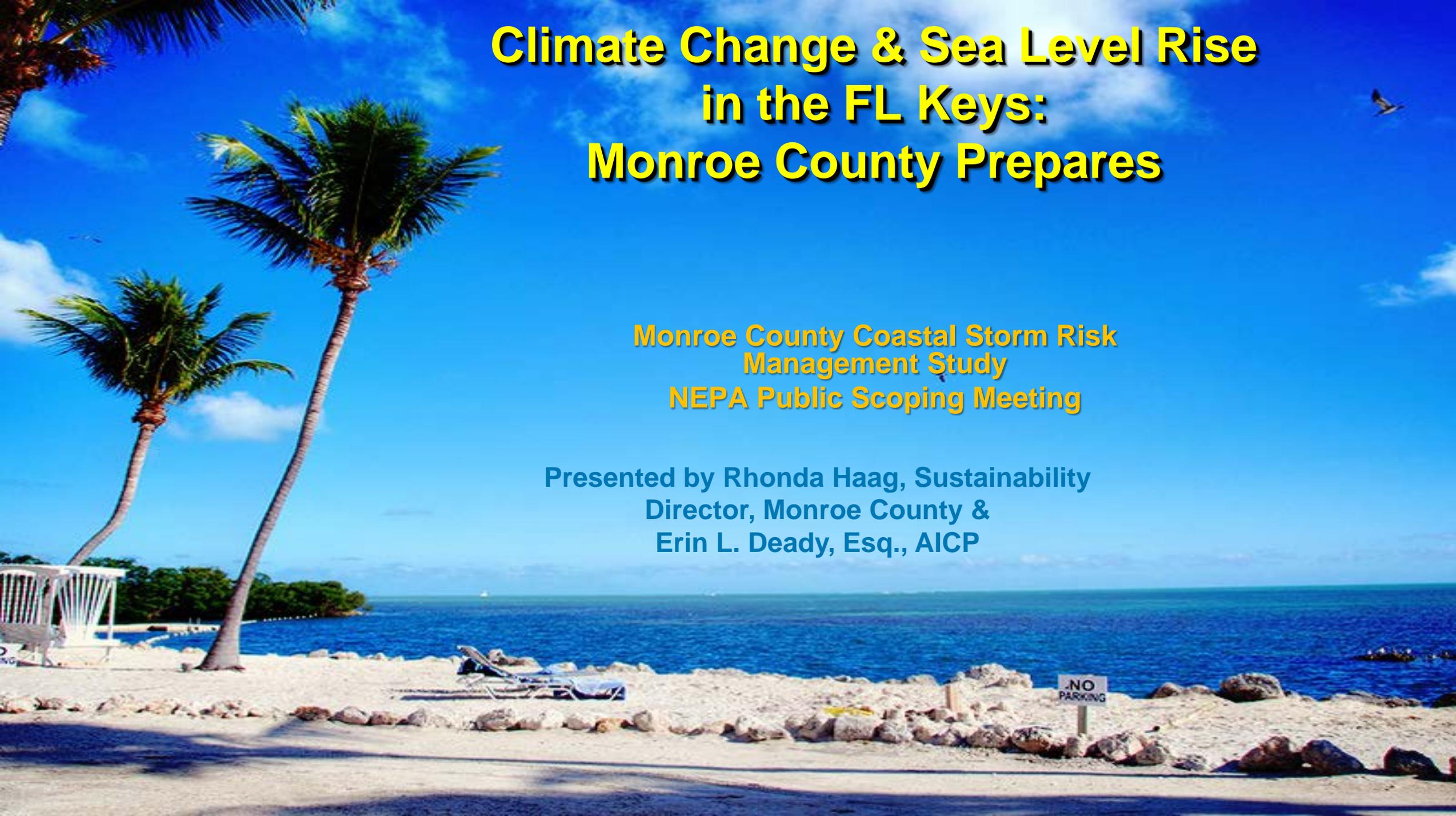
Email: Kimberly.C.Koelsch@usace.army.mil





Monroe County Presentation





Climate Change & Sea Level Rise in the FL Keys: Monroe County Prepares

**Monroe County Coastal Storm Risk
Management Study
NEPA Public Scoping Meeting**

**Presented by Rhonda Haag, Sustainability
Director, Monroe County &
Erin L. Deady, Esq., AICP**

Overview of Presentation

1. County efforts on climate, sustainability and sea level rise to date
2. Data collection
3. Policy development
4. What's on Deck



Monroe County, Florida Among Most Vulnerable Counties in Nation



Rank	County	Population Displaced
1.	Tyrell, NC	45%
2.	Hyde, NC	42%
3.	Monroe, FL	36%
4.	Dare, NC	21%
5.	Currituck, NC	20%
*	Miami-Dade, FL	3%
*	Broward, FL	1%

Land that's dry now that will go **under water by **2060** in relation to the number of people living there**

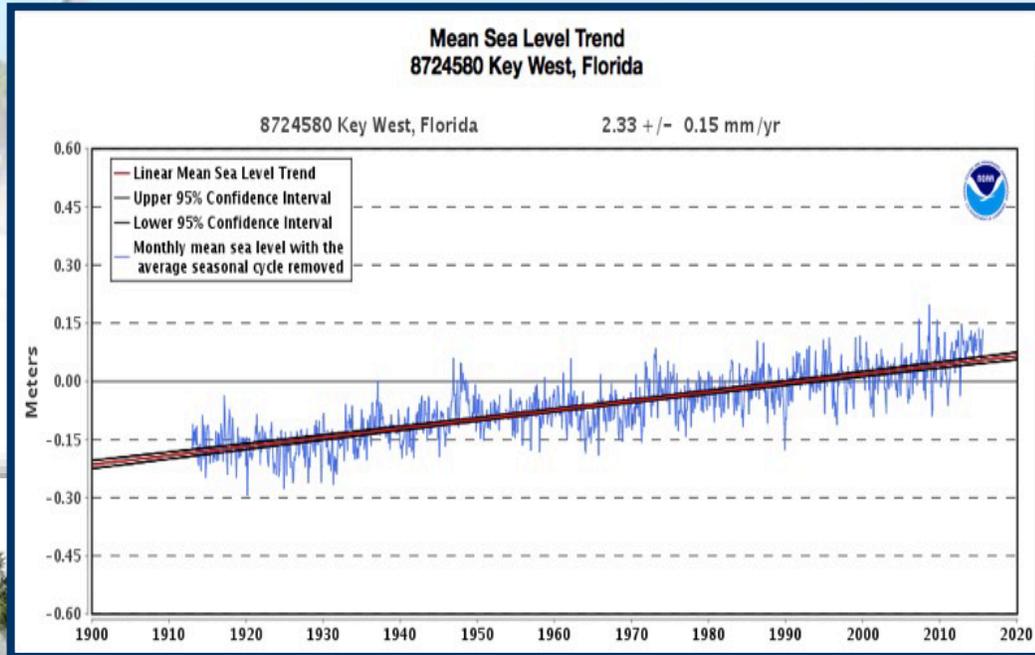
**National-scale analysis of over 300 coastal counties
Matthew Hauer, Applied Demography Program,
University of Georgia*

Sustainability and Climate Milestones

<u>2007-2011</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015-2016</u>	<u>2017+</u>
<ul style="list-style-type: none"> ✓ US Mayor's Climate Agreement ✓ Green Building/Green Initiatives Task Force ✓ EECB Grant/CCAC ✓ GHG Inventories ✓ 1, 2, 3' SLR Scenarios 	<ul style="list-style-type: none"> ✓ EAR for Comprehensive Plan (Energy & Climate Element) ✓ Communitywide GHGs ✓ EECs for County GHG reductions ✓ Compact's Regional Climate Action Plan 	<ul style="list-style-type: none"> ✓ County Climate Action Plan ✓ Bid for Sustainability and Climate Vulnerability Plan - GreenKeys 	<ul style="list-style-type: none"> ✓ Launched GreenKeys! ✓ Data collection ✓ SLR modeling for 2030 and 2060 ✓ Community SLR Modeling ✓ Outreach ✓ Plan Development 	<ul style="list-style-type: none"> ✓ Completed GreenKeys ✓ NOAA 4-State Grant launched ✓ Bayshore Manor Adaptation ✓ Pilot Roads Analysis ✓ Interim Roads Design Resolution 	<ul style="list-style-type: none"> ✓ Mobile LiDAR (county roads) ✓ HAZUS modeling ✓ Pilot Roads Design ✓ NOAA Grant Legal & Policy work



Seeing Sea-Level Rise Today



From the Key West tide gauge. **9" increase** in sea-level in the past 100 years.

Non-storm-related flooding



Photo by *The New York Times*



Monroe County's Sea Level Rise and Climate Planning Process

THE HIGHLIGHTS

Preparing Today for Tomorrow

1. County developed a *Sustainability and Climate Plan with Sea Level Rise Vulnerability Analysis* for:
 - Roads - Flooding in neighborhoods
 - Buildings / facilities
 - Water / wastewater
 - Electric utilities
 - Habitat
2. Based on sea level rise projections from the *SE FL Regional Climate Compact*
3. Identified vulnerability for future sea level rise
4. Identified need for additional data needs



Green Keys
Sustainability
and Climate
Action Plan
(2016)

Decision-Making Paradigm Shifts



Land and Infrastructure

Species, Habitat considerations
Adaptation/Mitigation for infrastructure

Policy Implementation

Departmental Collaboration,
Comp Plan, Code, Legal Issues



Project Planning

Addressing Priority Vulnerabilities,
Budget Implications (New Cost Considerations),
Also Departmental Collaboration

January 26, 2016 BOCC Workshop Overview

- **Goal: Overview and interactive discussion of GreenKeys! project, next steps**
 - Introduction
 - Planning Approach – summary of GreenKeys! Plan approach and GHG summary
 - Executive Summary - overview of GreenKeys! Plan results and vulnerabilities
 - Two Part Workshop
 - Part 1: Sustainability
 - STAR Assessment
 - Sustainability Recommendations
 - 5 Year Implementation Plan (with Projects and Costs)
 - When to Implement, Cross Departmental Budgeting, Strategic Planning
 - Sustainability as a Part of Ordinary Planning
 - Part 2: Sea Level Rise Big Picture Issues
 - “Big Picture Issues” from the GreenKeys! Plan Development
 - Issue 1 – Integrating Road, Stormwater, Tidewater Design
 - Issue 2 – Land Acquisition Priorities
 - Issue 3 – Where People Develop and How
 - Issue 4 – How do we Collaborate, Plan for and Fund Issues
 - Future of Monroe County and Keys: Creative Adaptation, Smart Design, New Uses
 - Six hour Workshop Discussion



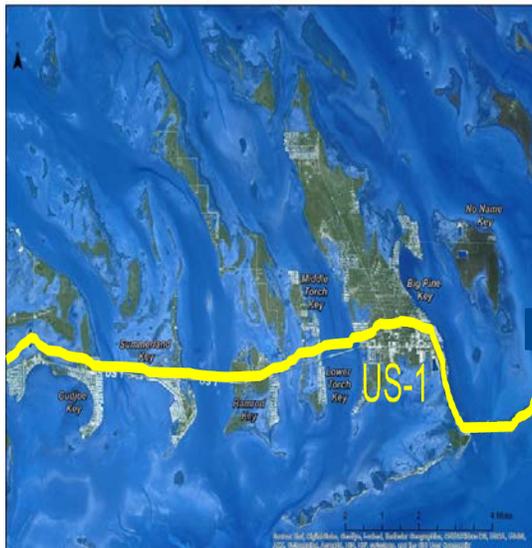
Nuisance Flooding into the Future



Nuisance flooding defined at Vaca Tide Gauge: tide that reaches 1.08 feet above MHHW (NOAA 2014).

Projecting Sea-Level Rise Big Pine Key

TODAY

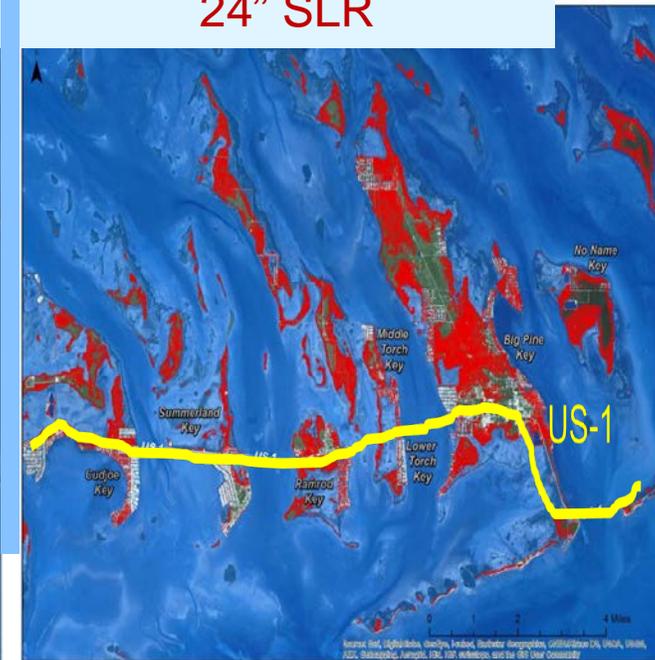


TOMORROW – 2060 PROJECTIONS

Best Case Scenario: 9"
SLR



Worst Case Scenario:
24" SLR



Red areas represent inundated land.

Habitat Vulnerability Results

- 3" SLR (2030, Low Scenario) could bring daily saltwater tides into 19% of County's freshwater wetland areas*
- 24" SLR (2060, High Scenario) could bring daily saltwater tides into 94% of County's freshwater wetland areas*
- 3" SLR (2030, Low Scenario) could bring daily saltwater tides into 2.3% of County's remaining tropical hardwood hammock*
- 24" SLR (2060, High Scenario) could bring daily saltwater tides into 42% of County's remaining tropical hardwood hammock*
- 3" SLR (2030, Low Scenario) could bring daily saltwater tides into 1.8% of County's pine rockland forest areas*
- 24" SLR (2060, High Scenario) could bring daily saltwater tides into 45.1% of County's remaining pine rockland forest areas*

**Analysis based on Monroe County Habitat dataset (2009)*





Immediate Impacts and Response

ROAD ELEVATION

Fall 2015 and 2016 King Tides



Sea Level Rise-Focused Road Elevation Pilot Projects

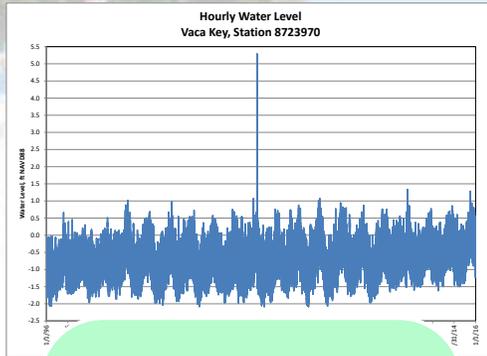
1. Address **flooding impacts** in two communities focused on road and storm water improvements and develop alternatives to consider
2. Develop **cost estimates** for alternatives
3. Develop a **standard method to evaluate impacts** for road improvement projects
4. Create **policies for road improvement** projects countywide considering future flood impacts
5. Develop **conceptual designs**



Pilot Project Locations



Project Technical Assessment Process



1
Assess 20 Year Tidal Record and 2015 Event

2
Incorporate Sea Level Rise Estimates

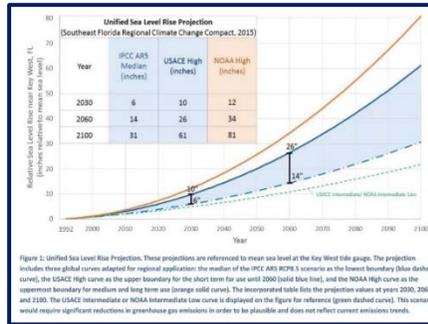


Figure 1: Unified Sea Level Rise Projection. These projections are referenced to mean sea level at the Key West tide gauge. The projection includes three global curves adapted for regional application: the median of the IPCC AR5 RCP8.5 scenario as the lowest boundary (blue dashed curve), the USACE High curve as the upper boundary for the short term for use until 2060 (solid blue line), and the NOAA High curve as the uppermost boundary for medium and long term use (orange solid curve). The incorporated table lists the projection values at years 2030, 2060 and 2100. The USACE Intermediate or NOAA Intermediate Low curve is displayed on the figure for reference (green dashed curves). This scenario would require significant reductions in greenhouse gas emissions in order to be plausible and does not reflect current emissions trends.



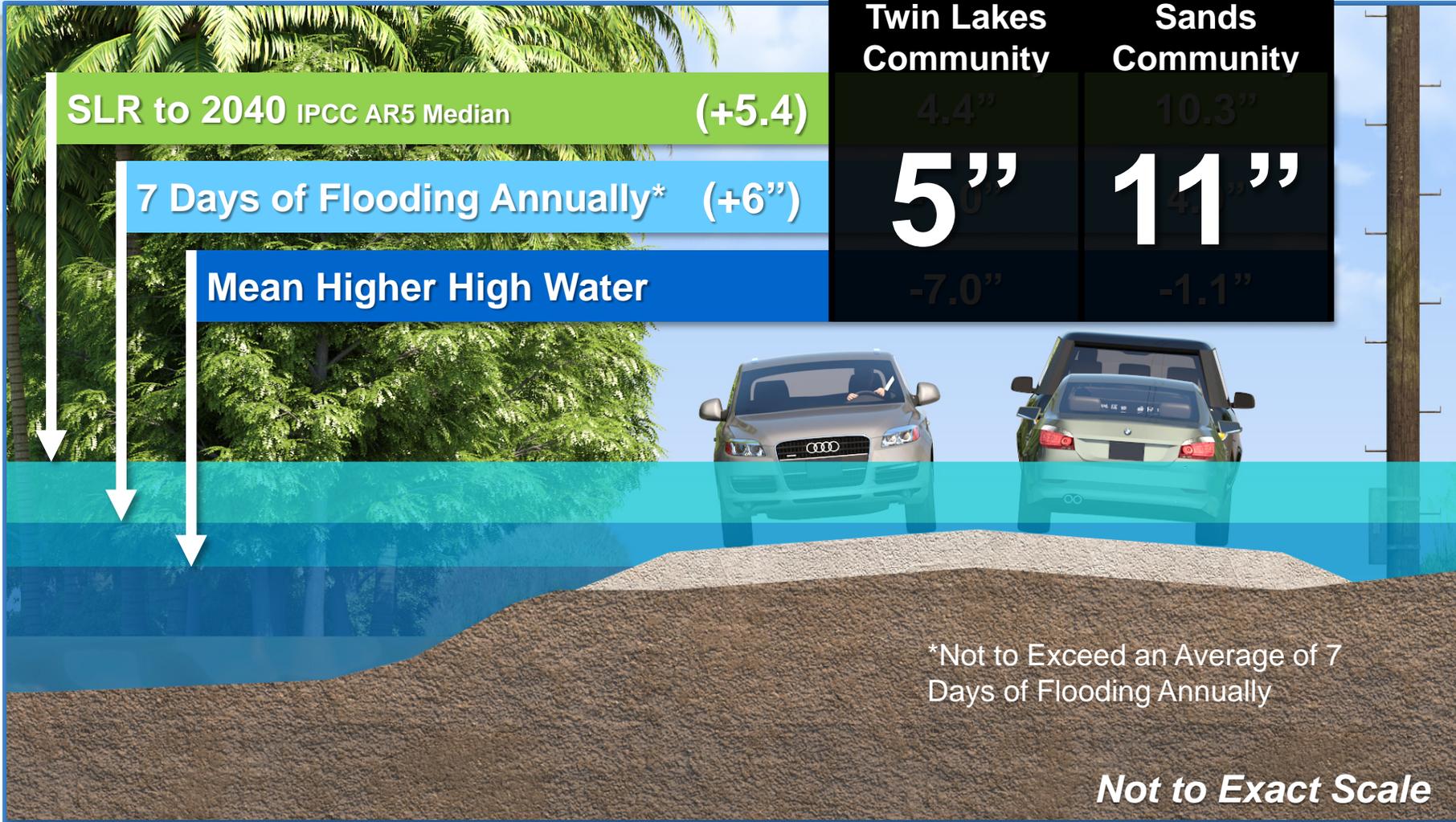
3
Develop Possible Design Scenarios and Estimate Costs



4
Assess Neighborhood Access Benefits for Investments

Technical Recommendations for Elevation

Inches NAVD 88





Future Actions

MULTI-PRONGED PLANNING APPROACH

Data is Critical and is Continually Being Updated

1. Create database for localized flood events – residents send in photos of tidal flooding
2. Obtain(ing) digital building footprints and ground floor elevations for all structures (a work in progress)
3. Obtain Mobile LiDAR elevation for roads and first floors- more accurate elevation readings
4. Accurate Data is not sexy, but it's our friend



Resilience Planning for Facilities

✓ Already have identified **Vulnerable Facilities**

1. Monroe County **Adaptation Projects**

- Stock Island Fire Station (completed)
- Bayshore Manor Assisted Living Facility (grant funded)
- Harry Harris Park (grant funded)

2. Conduct a **Vulnerability Analysis or ID needed elevations** and develop planning alternatives



County Adaptation – Next Steps

1. Use GreenKeys to pursue **grants and partnerships**
2. Continue to integrate the discussion into **countywide decision-making for projects and policies**
3. Incorporate **sea level rise considerations in capital improvements**
4. Countywide roads analysis this year to **identify inundation of roads** (how much inundation)
 - 144-188 out of a total 300 county road miles at risk of inundation by 2030
5. Study and develop projects through **Coastal Risk Management Study**



Keys Road Damaged in Hurricane Irma
September 10, 2017



Stock Island Fire Station Raised 4 feet
beyond Code

Thank you!

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Project Overview





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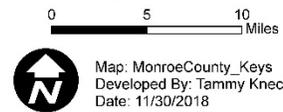
Study Area: The Florida Keys



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Supplemental Planning Studies - South Florida
Monroe County

- Roads
- Cities and Towns
- Monroe County
- ▨ Federal Lands



Map: MonroeCounty_Keys
Developed By: Tammy Knecht
Date: 11/30/2018





Study Overview



- Coastal Storm Risk Management Feasibility Study will assess storm damage and risk within the Florida Keys
- 100% Federally funded
- Study will consider multiple alternatives
- Monroe County is the non-Federal sponsor that will ultimately share part of the cost of implementing a project that is recommended by this study

Purpose of Public Meeting



The main purpose is to gather as much feedback from the public to inform the scope of our study.

- Comments on problems, opportunities, constraints and Planning considerations for the study area
- Provide comments on priorities, measures, and preferred alternatives.



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Study Authority



This study is focused on reducing the potential damages caused by coastal storms. The study will focus on improving safety and reducing the risk of damages to buildings and other infrastructure

The study authority is Public Law 84-71, June 15, 1955.

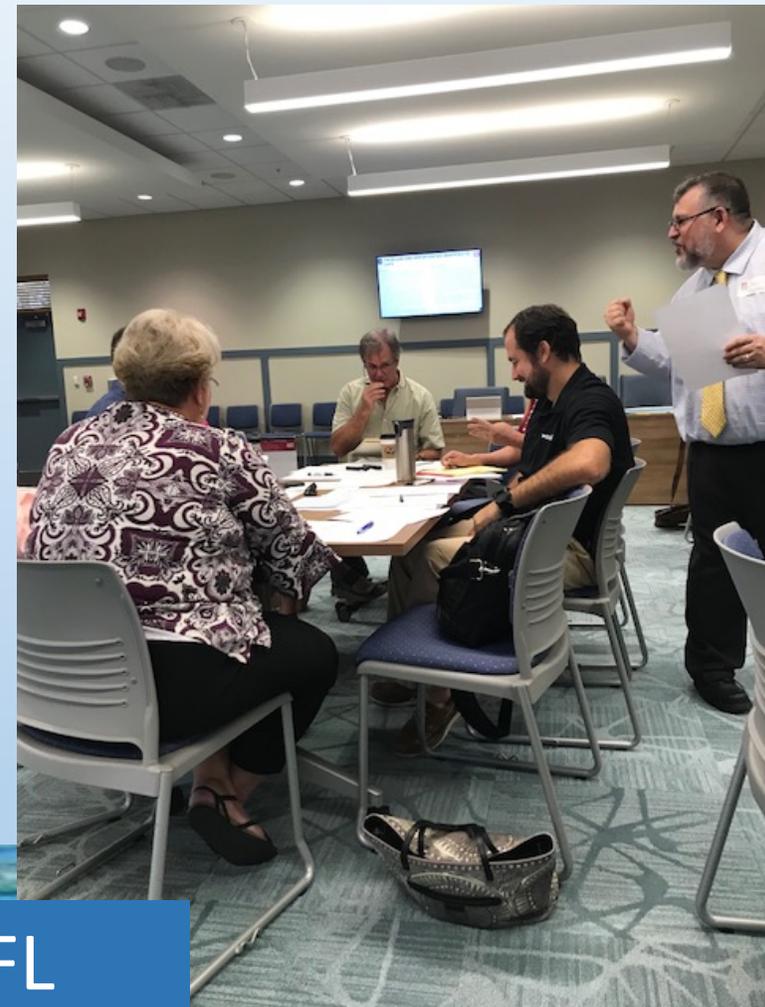


Study Schedule



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Gathering Stakeholder Input



Study Charrette: Marathon, FL
November 14, 2018



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Why Identify Problems & Opportunities?



- Focus study team and stakeholders on why we are undertaking this study
- Provide clear, common understanding of problems to be solved and opportunities to be realized
- Used to develop planning objectives for the study





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Problems



- ❑ Roadway flooding, specifically flooding of U.S. Route 1, impedes evacuation during coastal storms, thereby posing a risk to human life and safety
- ❑ Flooding also causes travel delays, and prevents timely return of residents after an evacuation for storm events
- ❑ Storm surge from hurricanes and tropical storms
- ❑ Flooding due to coastal storm events causes damage to structures (commercial and residential), as well as such critical infrastructure features, i.e. roadways, bridges, airports, and hospitals.
- ❑ Increasing high tides and king tides resulting from sea level rise
- ❑ Loss of Habitats due to coastal storms, and exacerbated by sea level rise



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Opportunities



- Reduce economic damages to the local economy and communities
- Installing new or rehabilitating existing nature based features and/or restoration of the natural coastal system of defenses that were historically present in the study area

- Increase resiliency and reliability of critical infrastructure
- Improve the resiliency and reliability of evacuation routes for the population
- Improve neighborhood cohesion and social fabric by reducing flooding risks

Objectives



- ❑ Reduce damages from coastal storms and coastal flooding to the natural and built environment in the Florida Keys over the period of analysis
- ❑ Reduce the risk to human life, health and safety

- ❑ Reduce the vulnerability of Route 1, the primary and only evacuation route from the Keys, to the effects of coastal storms
- ❑ Improve the resiliency of the Florida Keys to function during, and after significant coastal storm events by reducing the vulnerability of critical infrastructure in the county



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Constraints & Considerations



- ❑ Avoid and minimize impacts to natural resources
- ❑ Avoid and minimize impacts to cultural resources
- ❑ Avoid any potential impacts to navigation

- ❑ The majority of the study area are protected lands, including a National Marine Sanctuary, State Parks, and conservation easements held by NGOs
- ❑ There are strict state and local codes that govern building and development within the study area



MANAGEMENT MEASURES



A management measure is a means to solve the problem

Management measures are the “building blocks” of alternatives

Currently there are many management measures under consideration for this study



POTENTIAL MANAGEMENT MEASURES

STRUCTURAL

Tidal Gates

Deployable
Floodwalls

Bulkheads



POTENTIAL MANAGEMENT MEASURES

NONSTRUCTURAL

Non-residential
Floodproofing
(Wet or Dry)

Elevation
(including
utilities)

Relocation

Acquisition

Flood Warning

Flood Insurance



Flood Plain
Regulation



POTENTIAL MANAGEMENT MEASURES

Natural and Nature Based Features



Mangroves

Living
Shorelines

Reefs



Submerged
Aquatic
Vegetation

Wetlands





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Thank you for your input!

