Sea Level Rise in the Florida Keys

FROM MODELING TO IMPLEMENTATION

CHARTING THE COURSE

FOR THE FUTURE

Rhonda Haag, Monroe County,

7th Annual Climate Summit, Key West

December 2, 2015

Overview of GreenKeys! Sustainability Plan Process

GreenKeys! A Plan to Create a Sustainable Florida Keys

Climate: Forecasting Tools & Modeling

County Assets
Infrastructure
Habitat

Community Impacts

Sustainability: Greenhouse Gas

Government Operations
Natural Systems
Built Environment
Health & Safety
Education, Arts & Community
Economy & Jobs
Equity & Empowerment

Questions Related to Sea Level Rise in the Keys

1. What impacts to County assets, infrastructure and habitat will occur from sea level rise in 2030 (at 3" and 7") and in 2060 (9" and 24")?

- *2014-15 Modeling addressed the projected impacts*

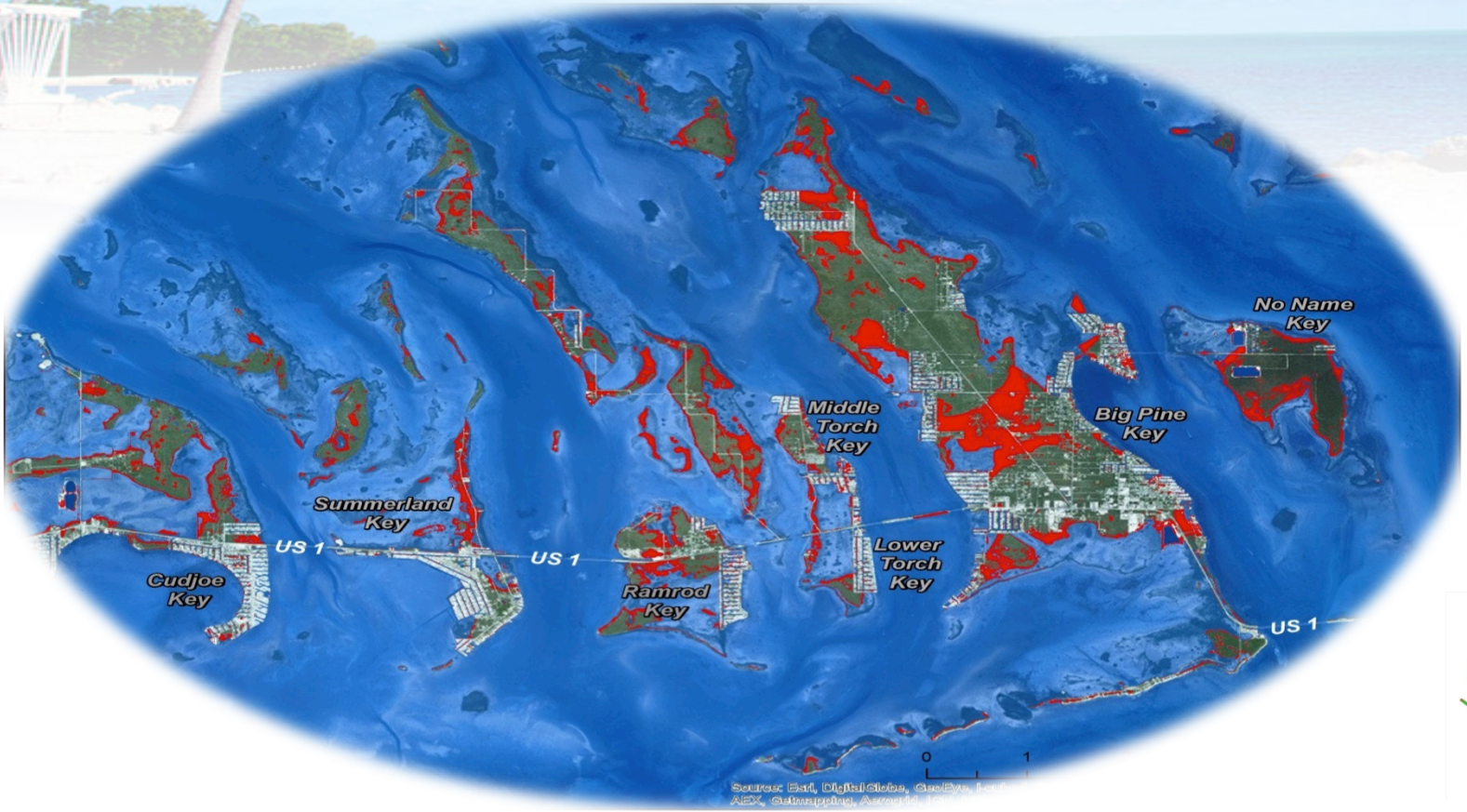
2. How can Monroe County address the impacts and prepare for the future?

- *New data and conceptual designs for* **2016 and Beyond**

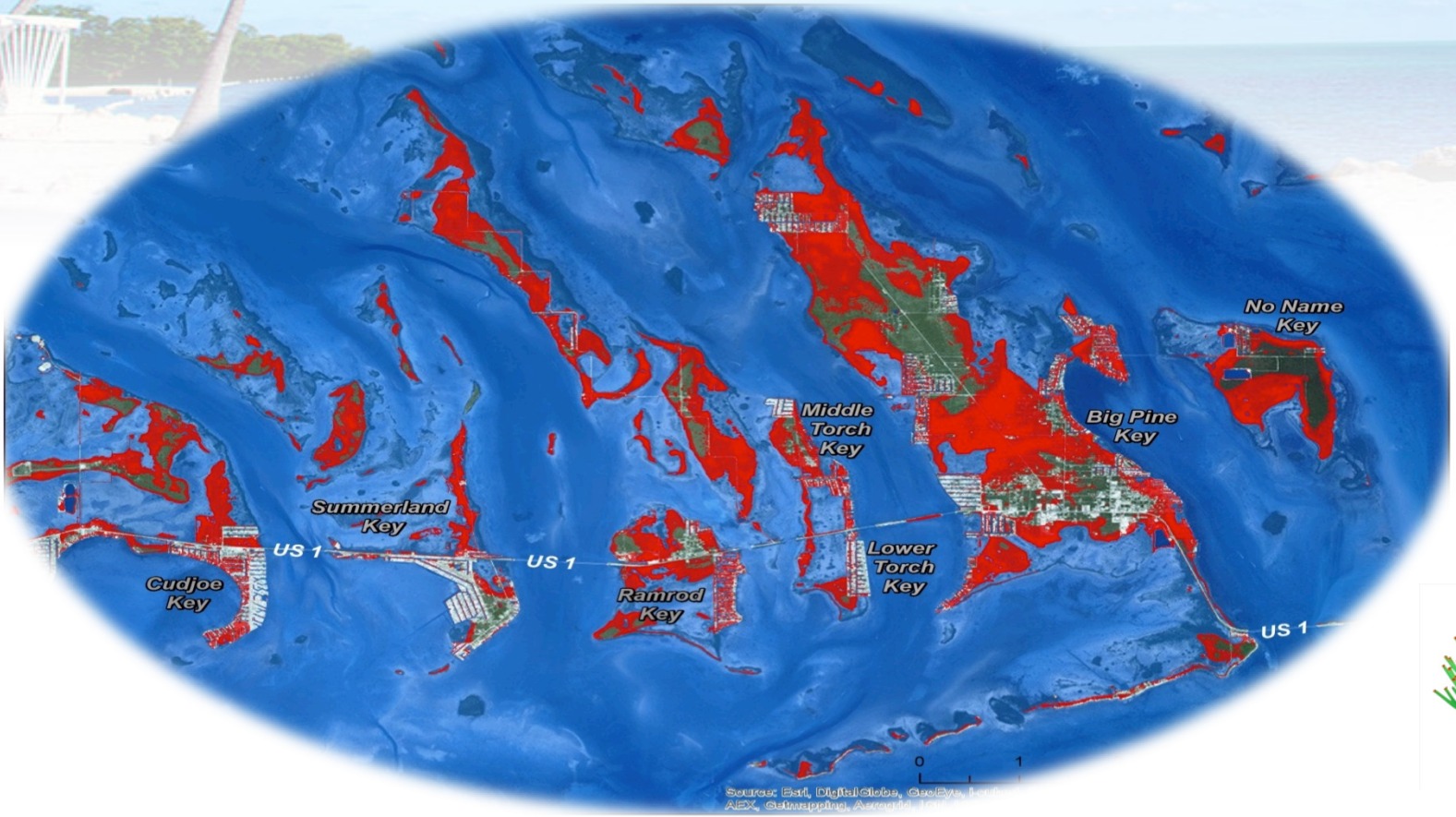
Big Pine Key and Vicinity, Present Day

Big Pine Key and Vicinity, 9 inches Sea Level Rise

(2060, Low Scenario)



Big Pine Key and vicinity, 24 inches Sea Level Rise
(2060, High Scenario)



Key West, Present Day

Key West, 9 inches Sea Level Rise
(2060, Low Scenario)

Key West, 24 inches Sea Level Rise
(2060, High Scenario)

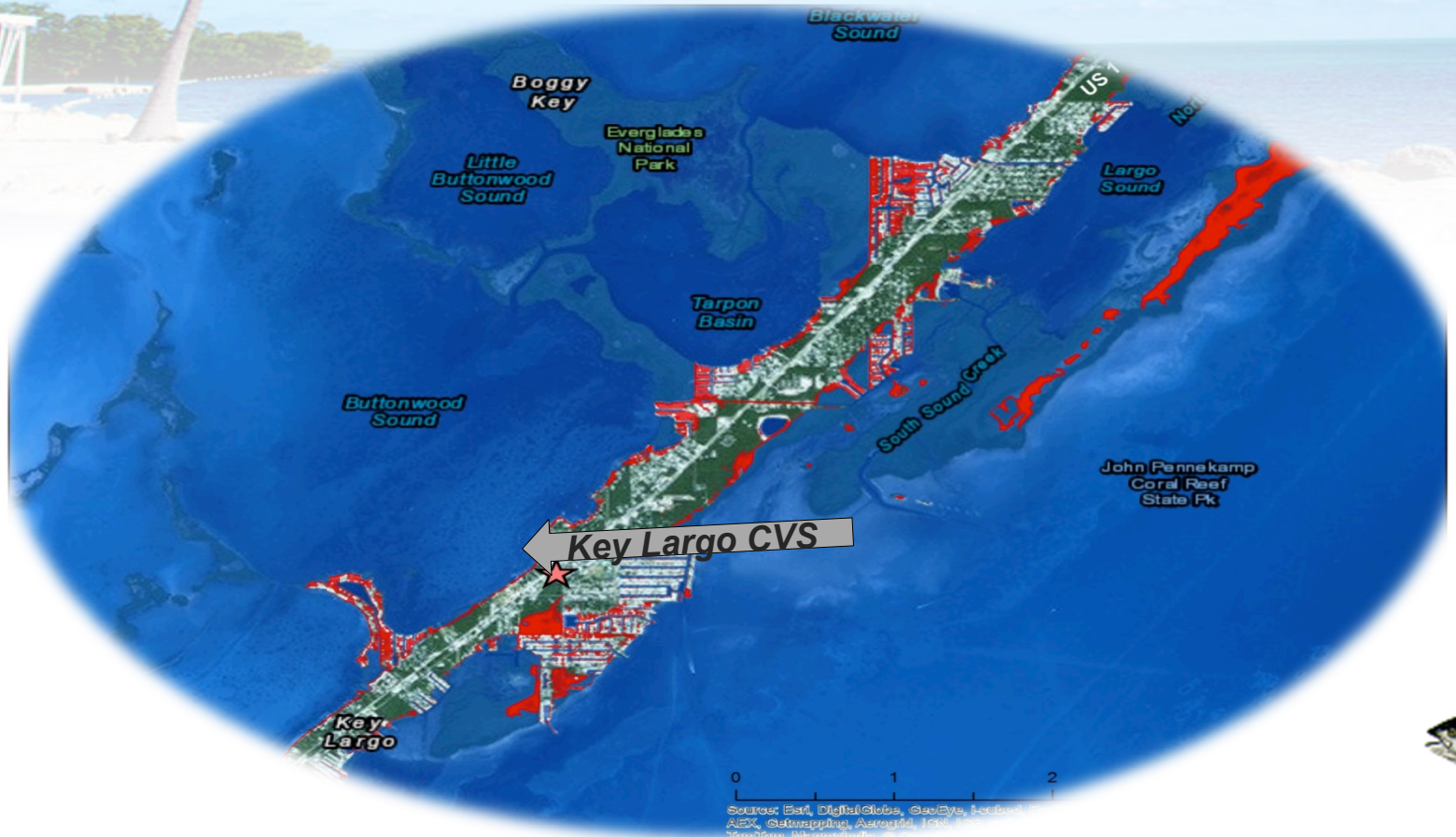
Key Largo, Present Day

Key Largo, 9 inches Sea Level Rise

(2060, Low Scenario)

Key Largo, 24 inches Sea Level Rise

(2060, High Scenario)



Key Largo, Murray E. Nelson, 24 inches SLR

Tidal “Nuisance” Flooding in Key Largo
October 3, 2015

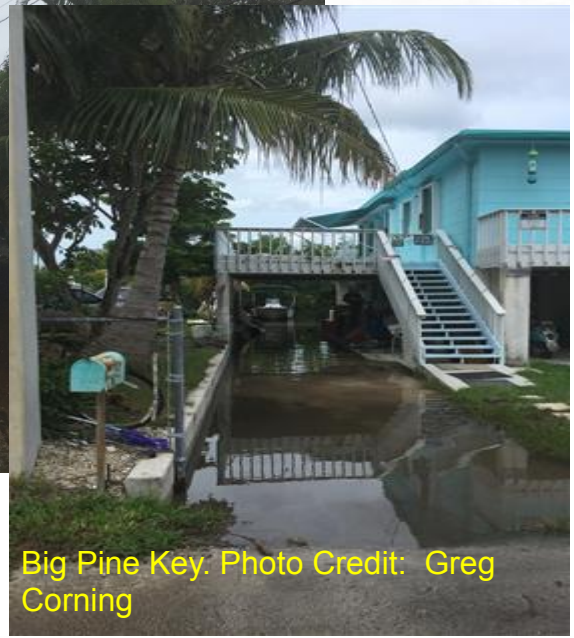
Tidal “Nuisance” Flooding
Key Largo, October 2015


Key Largo,
Photo Credit Joyce Stiner


Key Largo,
Photo Credit Stephanie Russo

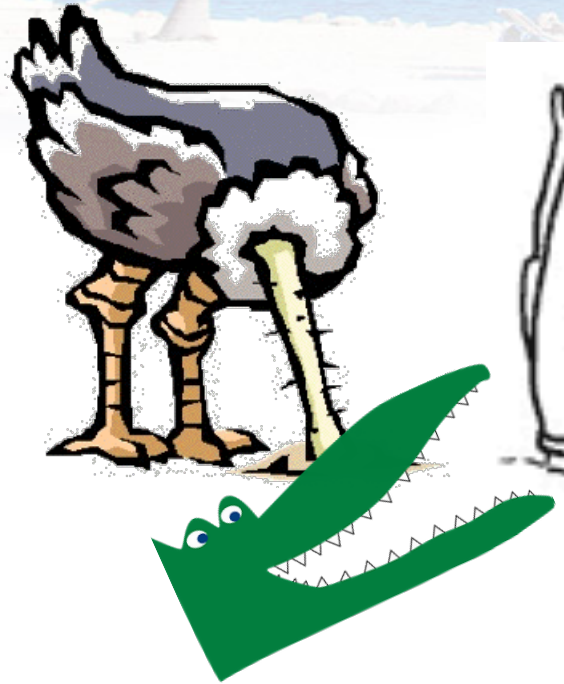
Big Pine Key Nuisance Flooding
October, 2016

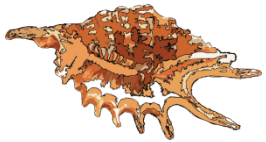

Big Pine Key. Photo Credit: Greg Corning


Big Pine Key. Photo Credit: Greg Corning


Bat Tower, Sugarloaf Photo Credit Will Thompson

COMMUNICATION - COURAGEOUS





What Does Proactive Planning Look Like?
Stock Island Fire Station

What could this mean for Properties?

Elevating properties

Cost- Benefit Ratios

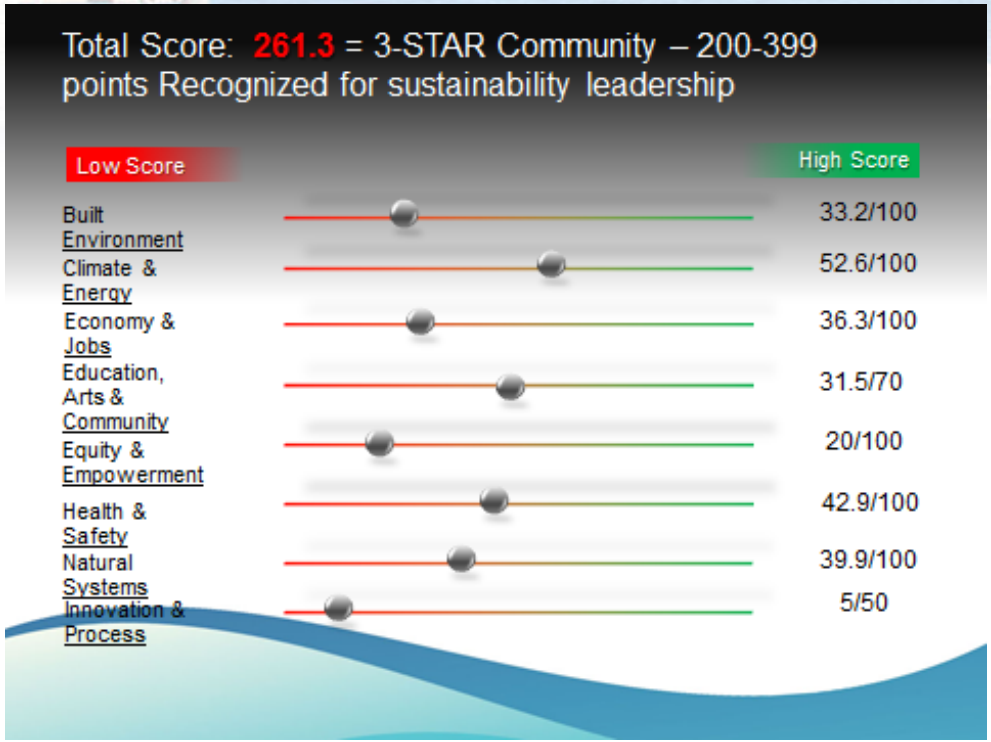
1. For every $1 spent today to elevate and flood proof buildings, $14.25, $12.43 or $11.00 is saved in avoided damages from storm surge and high sea level rise by 2060 (depending on participation).

2. Elevating and flood proofing buildings is modeled as a cost-effective adaptation regardless of costs (high vs. low) or sea level rise scenario (high, low or historic trend).

ACCOMPLISHMENTS FOR 2015

1. Finalized new Energy and Climate Element of Comp Plan (pending final adoption)
2. Completed vulnerability modeling for sea level rise for 2030 and 2060 impacts:
   a) Infrastructure (roads, electric, water and wastewater)
   b) Habitat
3. GreenKeys Climate and Sustainability Plan
   a) Final workshop (January 2016)
   b) Conducted numerous workshops, events and outreach activities
   c) Conducted survey to generate ideas for Plan recommendations and priorities (161 responses)
   d) Online community engagement site was open for 11 months, people discussed sustainability issues, shared photographs and generated plan ideas
4. NOAA Grant Won and NFIP/CRS Prep

Sustainability Tools for Assessing and Rating Communities



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Greenkeys.info

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Implementation:
Translating Recommendations to Actions/Projects

CE: 2.3: Conduct a Comprehensive Feasibility Study for Enhanced Stormwater / Tidewater Criteria on roads for near term areas subject to inundation risk including nuisance flooding.

		MCAP Overlap
G		
CE	the time and	M-3.1
CE	ys! project and facilities. Use, nts.	M-2.2
CE 1.3	Continu viding data to educate residents about opportunities to plan and costs of inaction.	
Goal 2: Mitigat dation and nuisance flooding to County roads and support efforts by FDOT to mitigate impacts on FD within the C		
CE 2.1	new nuisance flooding data informs future road decisions, starting now. These data will also need to be ed for future road decisions. This will require coordination with FDOT for impacts to State Roads (U.S. Highway	M-2.2
CE 2	Create better elevation data County-wide to improve decision-making and inform future decisions, develop improved LiDAR County-wide.	M-2.1
CE 2.3	Conduct a Comprehensive Feasibility Study for Enhanced Stormwater Criteria (prioritizing areas) for near-term areas subject to inundation risk, including nuisance flooding.	
CE 2.4	Develop a ranking process to identify the most vulnerable neighborhoods first. Develop criteria to establish levels of service each road gets subjected to based upon a tolerable level of nuisance flooding (saltwater-based flooding on a road for some amount of time).	M-3.3

Implementation: **Decide on flood risk standard, budget funds, develop solicitation and secure engineering firm to develop County-wide Plan.**

Decision Making Paradigm Shift

Land and Infrastructure-

Species, Habitat considerations

Adaptation and 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

Monroe County
Charting the Course for 2016

1. Shift from identifying vulnerabilities to solving them
   a) Two demonstration sites to be selected for tidal flooding conceptual design projects
2. Improving data sets through better elevation data and vulnerability analysis through the NOAA grant:
3. Policy Decisions: Board of County Commission workshop January, 2016
   a) Presentation of Sustainability Action Plan and recommendations
   b) Policy impacts of sea level rise
      I. How to incorporate SLR into capital infrastructure improvements
      II. Land acquisition needs and priorities
      III. How to retool Code and Comp Plan (development standards)
   c) Implementation
      I. Timelines/phases
      II. Funding Strategies

THE PROJECT TEAM

Erin L. Deady, Esq., AICP, LEED AP

Jason Evans, PhD, Stetson University

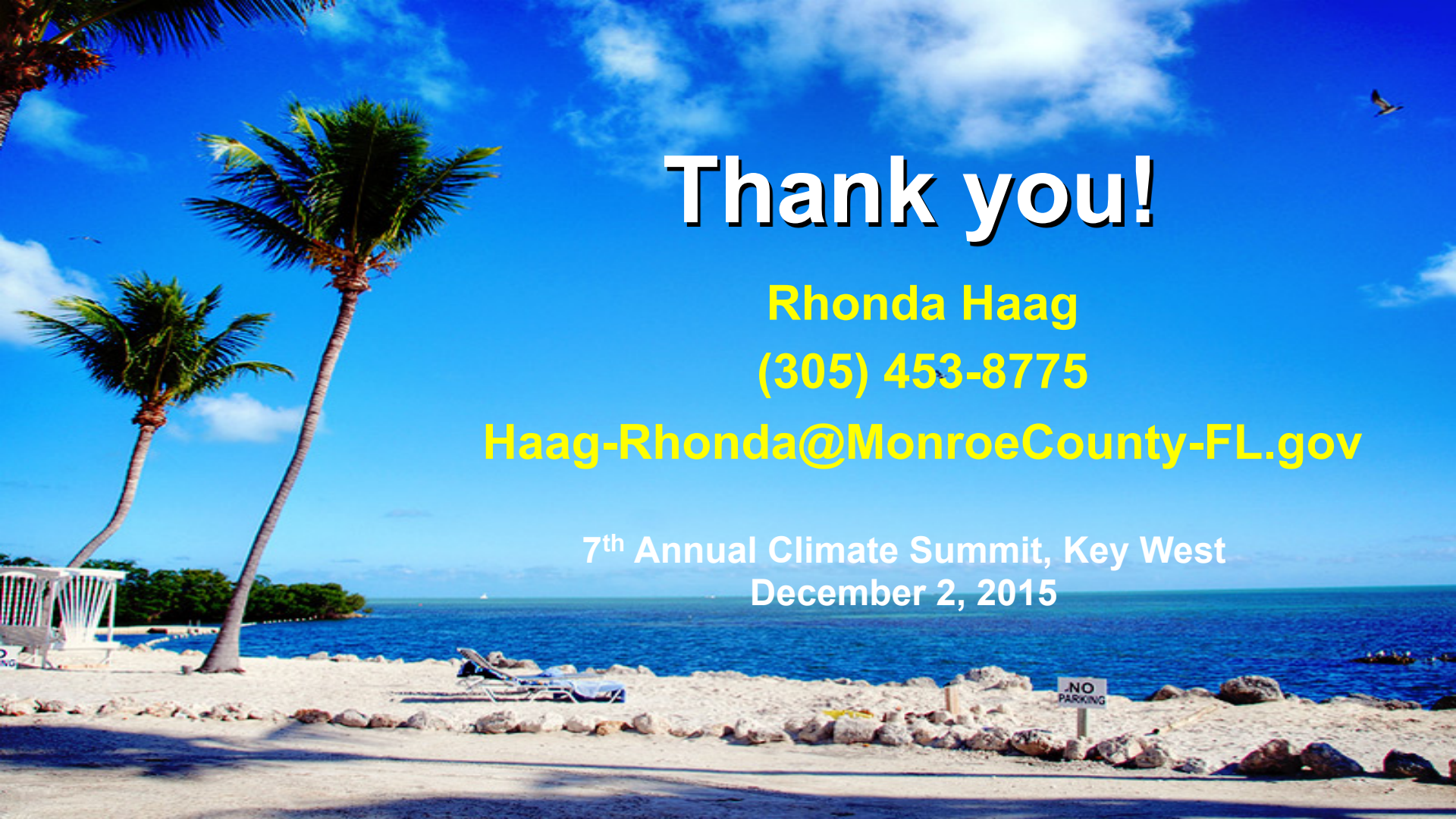
Chris Bergh, The Nature Conservancy

VHB/Miller Sellen

Catalysis Adaptation Partners

Quest Ecology

EcoSmart



Thank you!

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