



Key Largo Rotary Monroe County Resilience

February 4, 2026

Rhonda Haag, Chief
Resilience Officer



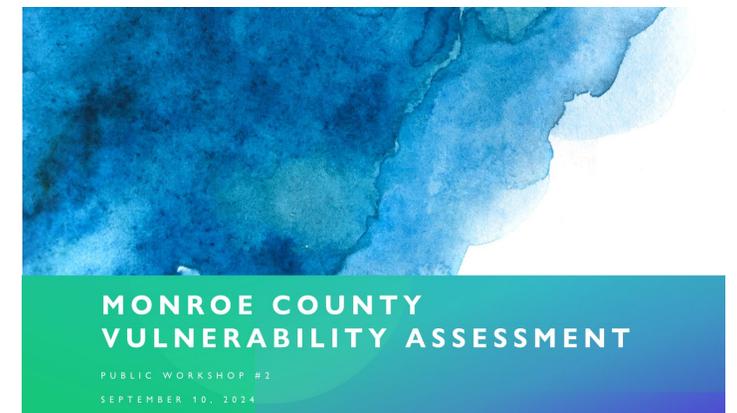
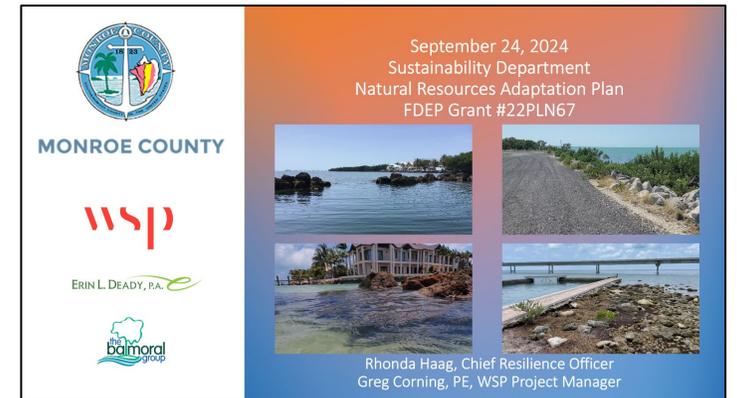
PLANS FOR RESILIENCE

Natural Resources Adaptation Plan \$90,000 DEP grant to develop a Natural Resources Adaptation Plan with cost benefit analysis. This Plan identifies actions addressing the natural resource vulnerabilities found a list of projects was prepared for future grant submission. Completed.

Harry Harris Park Resilient Redesign \$200,000 DEP grant for the Harry Harris park resilient redesign. The County is preparing conceptual plans for a resilient shoreline and other features. State and federal grant funding opportunities will be applied for. Due 06/30/26

Vulnerability Assessment \$93,350 DEP grant to update the County's vulnerability assessment so it meets the new requirements under the Resilient Florida program and the County can submit projects for grant funding.

Watershed Management \$120,843 DEM grant to update the County's watershed management plan as required so the County can maintain its Community Rating Score rating of 3, which helps with discounts on flood insurance. ***Notified of approval on 2/3/2026, will take to March BOCC for approval**



PLANS FOR RESILIENCE

U.S. Army Corp of Engineers / FDOT / Monroe County/ Municipal FL Keys Coastal Storm Risk Project Includes:

- ❑ **U.S. 1 shoreline stabilization** (revetment) in 6 areas – \$1,465,000 Design Agreement. County Share \$513,000, FDOT reimburse.
- ❑ Nonstructural measures for residential and non-residential structures at risk:
 - Elevation** of residential properties 4,698
 - Floodproofing** of commercial 1,052 & gov't 53 facilities
 - The plan does not include *structure acquisition*
- ❑ Floodproofing critical infrastructure at risk

Estimated Project Costs and Benefits:

- ❑ Total Estimated Project Cost (65/35 cost share): \$2,772,359,000
 - 65% federal funding of project = \$1,802,033,000
 - 35% non-federal funding of project = \$970,326,000
- ❑ Total Average Annual Benefit: \$131,603,000



FLORIDA KEYS COASTAL STORM RISK MANAGEMENT FEASIBILITY PROGRAM

Rachel Haug
Senior Planner and Study Lead
Norfolk District
U.S. Army Corps of Engineers

Six Sites Recommended for Shoreline Stabilization by USACE



Reduce storm damage to structures identified at risk by implementing one of the following measures based on structure type and risk:

- ❑ Elevation of residential structures
 - 4,698 structures
- ❑ Floodproofing of commercial properties and critical infrastructure
 - 1,052 commercial structures
 - 53 critical infrastructure buildings



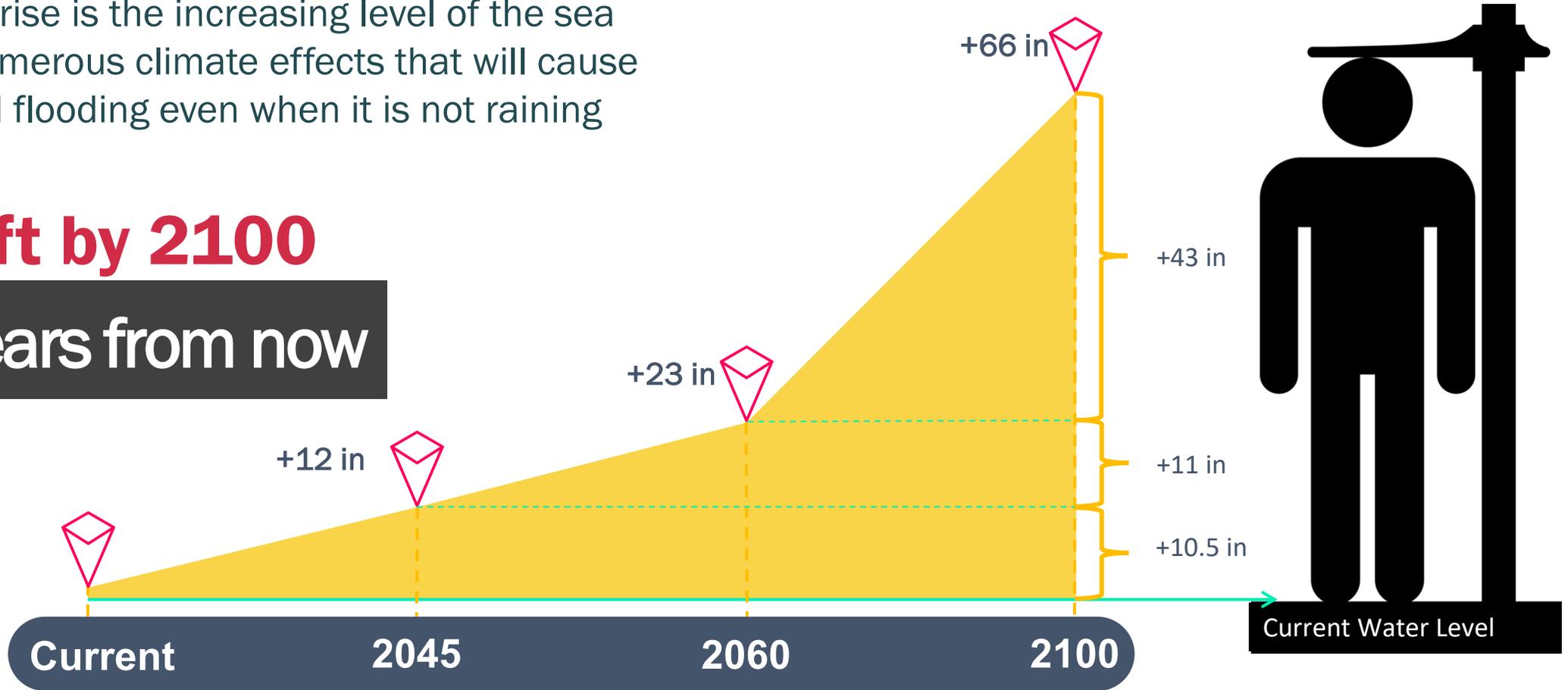
What are the Impacts? **Sea Level Rise**



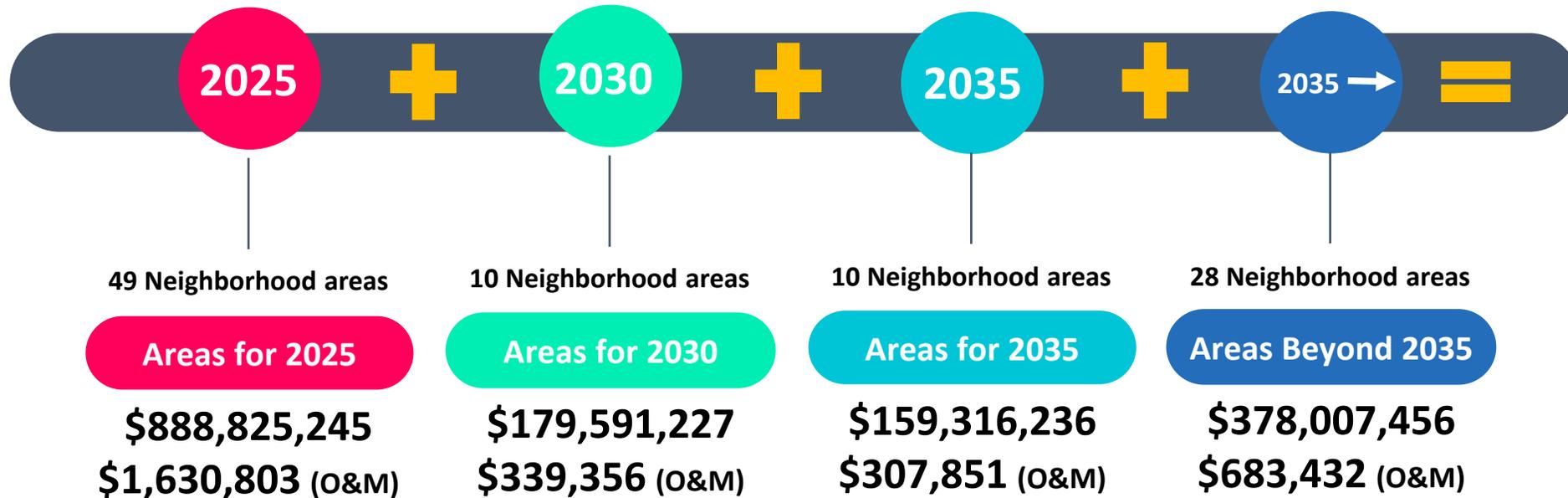
Sea level rise is the increasing level of the sea due to numerous climate effects that will cause increased flooding even when it is not raining

+5.5 ft by 2100

74 years from now



Monroe County Roadway Vulnerability Analysis and Adaptation Plan



\$1.6 Billion*
(Avg \$9.6 Million / Mile)

\$3.0 Million
(Annual Operation & Maintenance)

* Cost estimate is conceptual and does not include design, right-of-way acquisition, harmonization/cost to cure, and legal fees. Cost estimates are preliminary and subject to change. Cost Estimate is based on 2020 Dollars.

Flooding is Impacting the Keys in Different Ways



Frank Walmer

Avenue G - Big Pine (2020)



Kristen Key Szpak

Mahogany & Valencia - Key Largo (2020)

King Avenue - Key Largo (2016)



Stillwright Point – N Blackwater Lane (2020)

Flooding is Impacting the Keys in Different Ways



5th Street – Big Coppitt (2025)



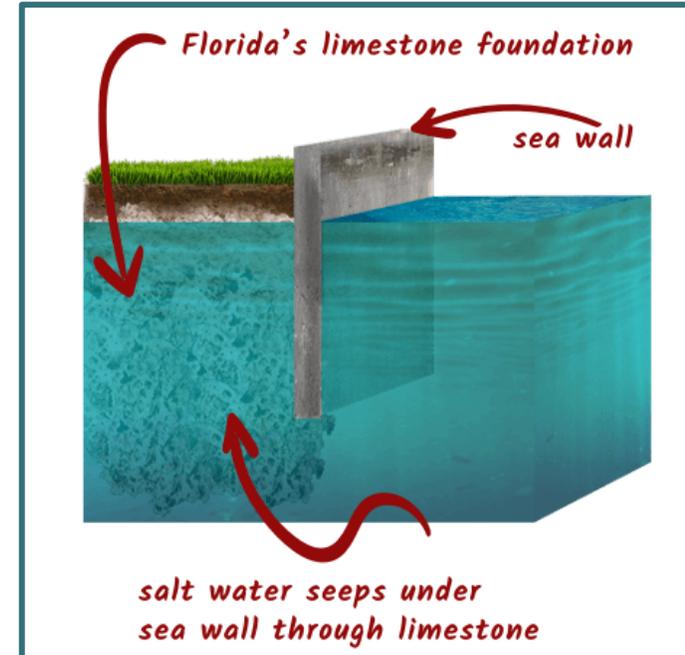
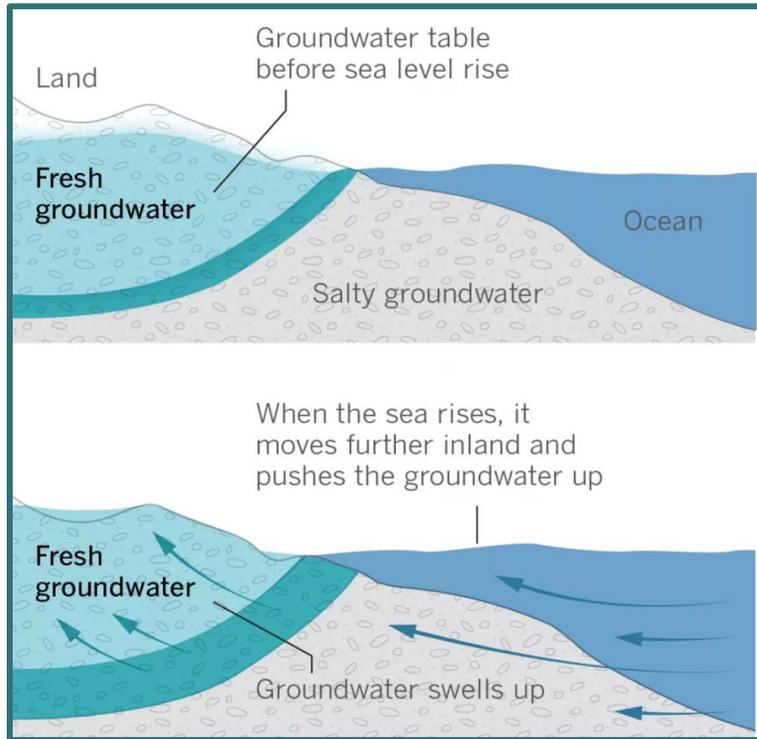
Avenue C - Big Coppitt (2025)

What are the Impacts? Increasing Groundwater and Reduced Ability to Drain



When the sea pushes groundwater up

- Ground stays saturated → exfiltration trenches can't absorb water.



Monroe Resilience & Environmental Projects

Currently under construction:

- Twin Lakes Road Adaptation

Projects currently under design:

- Winston Waterways Road Elevation
- Big Coppitt Road Elevation
- Conch Key Road Elevation
- Flagler Avenue Road Adaptation

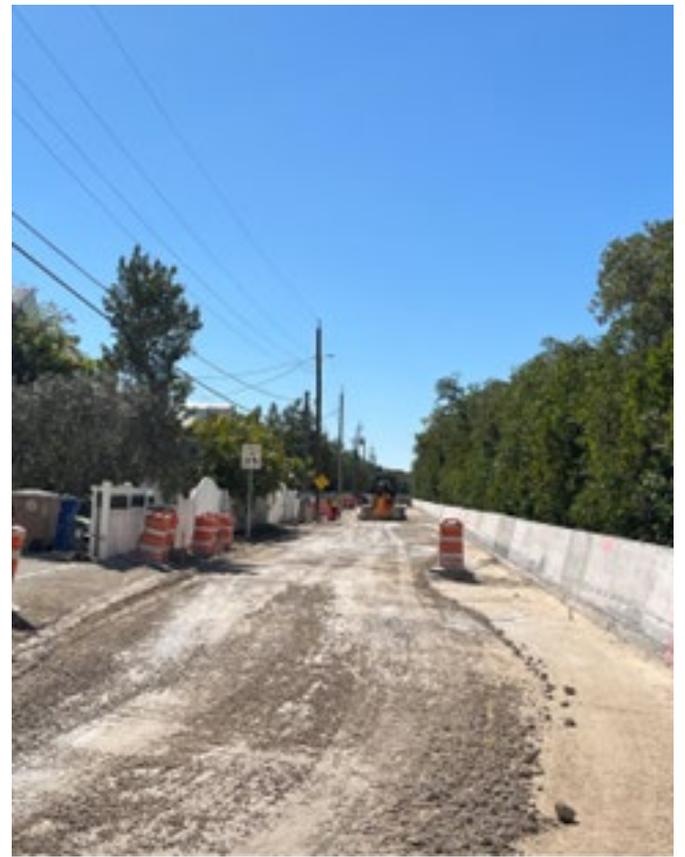
Projects about to construct:

- Long Key Living Shoreline Adaptation
- Duck Key Living Shoreline Adaptation
- Tavernier Breakwater Repair
- Rock Harbor Breakwater Repair
- Canal 82 restoration Rock Harbor

Twin Lakes Road Elevation – Crane Street Pump Station & Injection Well



South Roosevelt Blvd – Aboveground



Twin Lakes – Retaining Wall - Shaw Drive

Big Coppitt Road Elevation & Adaptation



Road Raising Approach

- Elevate Roadways to **minimum 2.26 ft** NAVD88
- Higher roads change how the water flows; this water now needs to be collected.
- **Driveway and private property harmonization** will be required including gravel and decorative pavers, drainage and utility coordination and relocation.

Modern Engineered Drainage System

- A closed stormwater system to **collect rainfall and mitigate king tides**, replacing gravity infiltration which does not function with high ground water conditions.
- The Drainage System includes a collection system with inlets and pipes, a pump station and backup generator, and injection wells.

Grant Funds

- Florida Department of Environmental Protection (FDEP) Resilient Florida Grant - **\$23,661,605**
- FEMA Hazard Mitigation Grant Program (HMGP) Phase II Federal Grant - **\$60,906,616***
- **Total Potential Grant Funding - \$84,568,221**
- *HMGP Phase II funds will be available upon completion of the design and successful FEMA benefit cost analysis outcome.
- **Current Construction Estimate - \$85 Million**
- **MSBU:** BOCC decided individuals who are benefitting from the project will fund shortfall, if any; residents will vote on whether to proceed when final costs are known.

BIG COPPITT ROAD ELEVATION RESILIENCY AND ADAPTATION PROJECT

BIG COPPITT KEY
STAKEHOLDER ENGAGEMENT MEETING



February 18, 2026

County Staff:

Judith Clarke, P.E.
Director of Engineering Services

Rhonda Haag
Chief Resilience Officer

Leonel Montiel
Sr Project Manager



Winston Waterways Key Largo Sea Level Rise Solutions



Grant Funds

Road Raising Approach

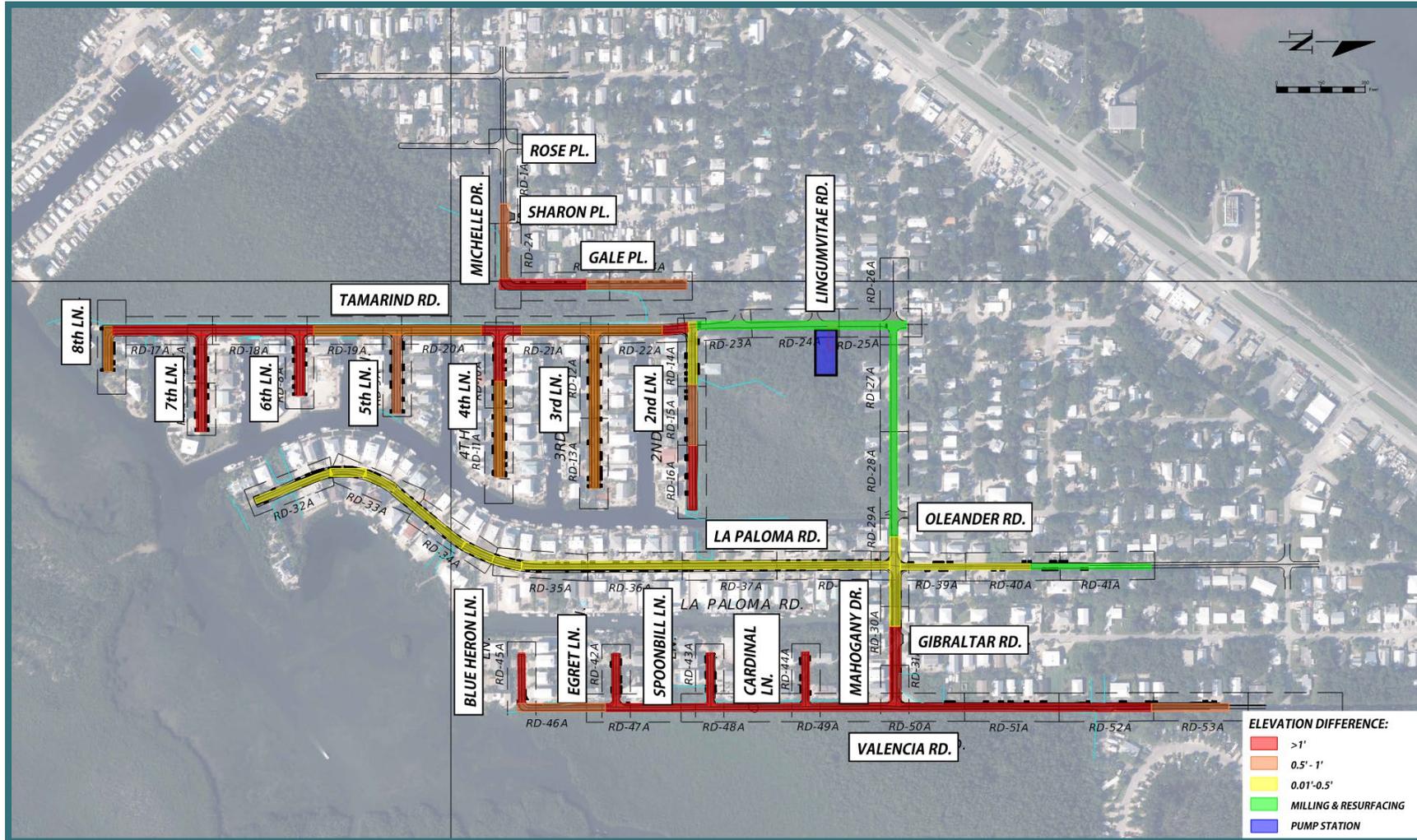
- Elevate Roadways to minimum **2.26 ft NAVD88**
- Higher roads change how the water flows; this water now needs to be collected.
- **Driveway and private property harmonization** and utility relocation will be required.

Modern Engineered Drainage System

- A closed stormwater system to collect rainfall and mitigate king tides, replacing gravity infiltration.
- The Drainage System includes a collection system with inlets and pipes, a pump station and backup generator, and injection wells.

- FL Department of Environmental Protection (FDEP) Resilient Florida **\$ 14,859,975**
- FEMA Hazard Mitigation Grant Program (HMGP) Phase II **\$ 36,644,277**
- HMGP Phase II funds will be available upon completion of the design and successful FEMA benefit cost analysis outcome.
- **Total Potential Grant Funding - \$51,504,252**
- **Current Construction Estimate Underway**
- MSBU: BOCC decided individuals who are benefitting from the project will fund shortfall, if any; residents will vote on whether to proceed when final costs are known.

Project Location



WINSTON WATERWAYS ROAD ELEVATION AND STORMWATER DESIGN AND PERMITTING PROJECT

STAKEHOLDER ENGAGEMENT MEETING

February 10, 2026



County Staff:
Judith Clarke, P.E.
Director of Engineering Services
Rhonda Haag
Chief Resilience Officer

Leonel Montiel
Project Manager



Flagler Avenue – Key West Sea Level Rise Solutions



Grant Funds

Road Adaptation Approach

- Full roadway reconstruction over 2 miles with a resilient asphalt base (replacing vulnerable lime rock).
- Complete removal and replacement of the outdated, gravity-based stormwater system, currently hydrologically connected to the ocean.
- Construction of:
 - Two pump stations and force mains
 - Injection wells for stormwater disposal and infiltration
 - Storm sewer collection and treatment systems
 - Nature-based stormwater attenuation areas (.43 acres on City-owned property)

Modern Engineered Drainage System

- A closed stormwater system to collect rainfall and mitigate king tides, replacing gravity infiltration.
- The Drainage System includes a collection system with inlets and pipes, a pump station and backup generator, and injection wells.

- FL Department of Environmental Protection (FDEP) Resilient Florida **\$ 0**
(\$22M applied for)
- FEMA Hazard Mitigation Grant Program (HMGP) Phase II **\$54,394,037**
- HMGP Phase II funds will be available upon completion of the design and successful FEMA benefit cost analysis outcome.
- **Total Potential Grant Funding - \$ 76,394,037**
Current Construction Estimate Underway
- MSBU: BOCC decided individuals who are benefitting from the project will fund shortfall, if any; residents will vote on whether to proceed when final costs are known.
- CITY OF KEY WEST – Partner, contributing land, O&M cost



Road Adaptation Project Benefits

1. Proactively addresses drainage and flooding conditions that will worsen as climate change impacts increase.
2. Makes community more resilient to future impacts
3. Preserves and improves long term access to homes
4. Reduces/eliminates standing water on roads
5. Increases value of homes and desirability of community
6. Level of grant funding is very significant; may not be available in the future.





Federally-Funded Breakwater Repairs

Rock Harbor Breakwater Repairs:

- DEO Grant IR036 for **\$1,353,986**
- Repair the Rock Harbor Breakwater in Key Largo damaged from Hurricane Irma
- Improve resiliency for the waterfront homes
- Improving the water quality in the canals behind the breakwater by keeping out the floating sargassum in addition to an air curtain to be installed
- Construction starts February 2026

Tavernier Breakwater Repairs:

- DEO Grant IR045 for **\$2,194,599.00** executed in March 2022
- Repair the Tavernier breakwater damaged from Hurricane Irma
- Improving resilience for the homes
- Improv the water quality in Canals 82, 83 and 84 by keeping out the floating sargassum (in addition to an air curtain to be installed).
- Construction starts February 2026.





Federally-Funded Living Shorelines / Breakwater Repair

Long Key Living Shoreline

DEP Grant 22FRP131 **\$900,000**

Construct a living shoreline of 1,282-feet of structural and nature-based solutions.

Provide designed breaks to create essential wetland habitat, mangrove planting to increase shoreline stabilization, and seagrass plantings.

Starts February 2026

Duck Key – Jetty Repair / Living Shoreline

DEP Grant 22FRP132 **\$ 3,327,266.00**

Rebuild and enhance 10,650-linear feet of existing breakwater wall and rehabilitate it as a Living Shoreline and provide resilience to homes.

Includes natural vegetated aspects from mangrove plantings, seagrass beds, and other living shoreline applications to reduce climate risks while enhancing habitat and benefiting the environment.

Anticipate start March 2026





Canal Restoration



Canal Restoration Program Benefits

- A. Removal of organic muck to **improve dissolved oxygen concentrations**
- B. Air curtain to **reduce future seaweed accumulation**
- C. **Improved water quality**
- D. **Increased Benthic Resources**
- E. **Increase in marine life**
- F. **Reduction of dead zones** within the canal
- G. **Increased enjoyment by residents.**



Before



After

Recent Canal Projects – Grant Funded

- **Canal 82 Organic Removal & Backfill** in Rock Harbor Key Largo MM95 - **\$2 Million**. On Feb 18 2026 Commission Agenda
- **Canal 90 in Tavernier Backfill** – A **\$1.3 Million** contract was executed in February 2024 and the restoration work was completed in June 2024. DEP Grant LPA0248
- **Canal 278 Injection Well Pilot Project** in Eden Pines in Big Pine Key – **\$324,000** contract was executed in July 2023 and work was completed June 2024. DEP Grant LPA0248
- **Canal 475 Geiger Key Culvert installation**– **\$1.6 Million** culvert installation water quality improvement contract was executed and work was completed in January 2024. DEP Grant LPA0249.



New Canal Grants 2026

Canal #82 Rock Harbor

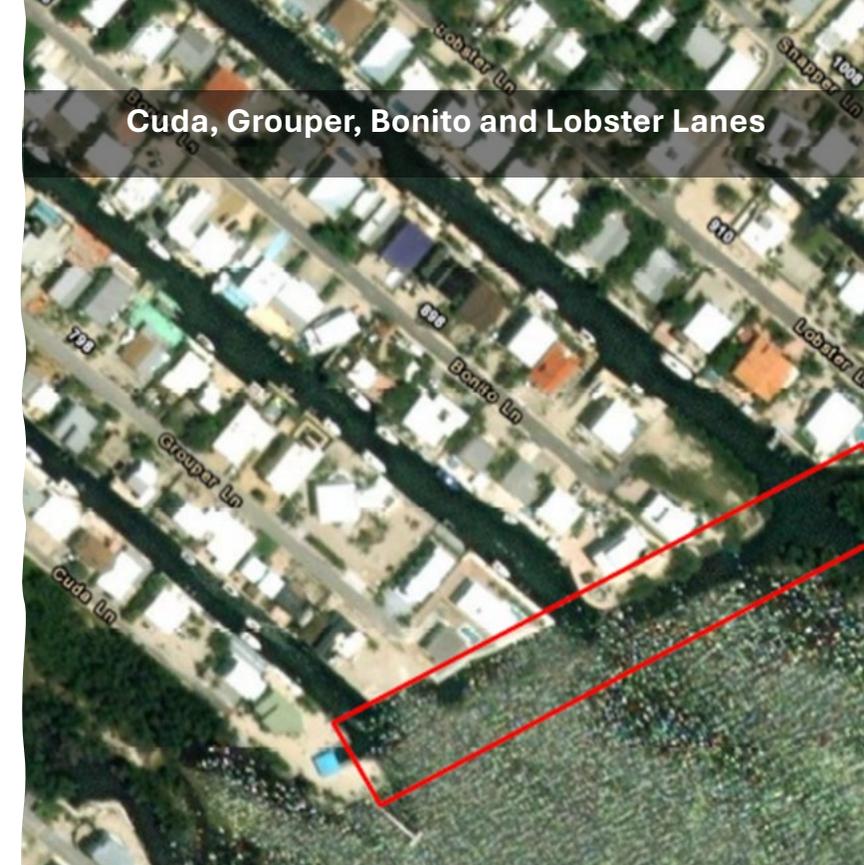
- **\$3 Million**
- Organic removal and backfill.
- Construction

Canal #266 Big Pine Key

- **\$2 Million**
- Initial demonstration project for organic muck removal. Needs more restoration for backfill and larger capacity air curtain and pumps. Residents already via an MSBU.

Canal #255 Big Pine Key

- **\$1.4 Million**
- Organic muck removal, backfilling, an air curtain, and an injection well. Community approval for MSBU is in place.



CANAL RESTORATION DETAILS CANAL 266 BIG PINE KEY



Federal \$12.4 Million RESTORE Funds for 6 Canals

- **\$12.4 M Subrecipient Award** to County received 03/17/25
- **Canals 293, 295, 297, 299, 300, 315** in the “Avenues” area of Big Pine Key
- **Shovel-Ready** Design and permitting nearing completion, work funded by **Stewardship** funds





Outreach

- **Public outreach** is included to inform and engage the communities and receive feedback.

MUNICIPAL PARTICIPATION

County assists municipalities with planning for regional resilience.

Resilience Planning:

- Mobile Lidar – all 5 municipalities. Complete
- Street Elevation Planning – 4 municipalities, Key West not included, local funded. In process.

Vulnerability Assessment Grants

- Layton & Key Colony Beach \$137,875 23PLN97 03/31/25
- Marathon \$240,000 22PLN65

Watershed Management Plan Grant (CRS)

- Layton, Key Colony Beach, Marathon \$399,506 H0856

New! Monroe County Municipal Update to Vulnerability Assessment for Statutory Compliance & Adaptation Plan

- 25PLN38 \$700,000 DEP Grant to complete an Adaptation Plan and a list of prioritized projects for each asset class. In process of grant development.

Bi-weekly coordination meetings



An aerial photograph of a tropical island, likely in the South Pacific, showing a vibrant turquoise lagoon with white sand beaches and lush green vegetation. The text "Thank you" is overlaid in white on the upper part of the image.

Thank you