CENTRAL AND SOUTHERN FLORIDA (C&SF) FLOOD RESILIENCY STUDY

PERFORMANCE METRICS WORKSHOP

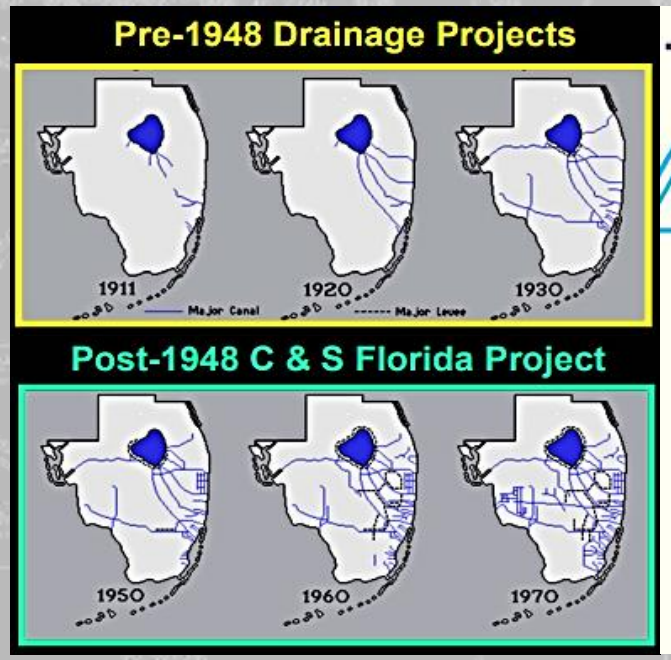
Public Meeting

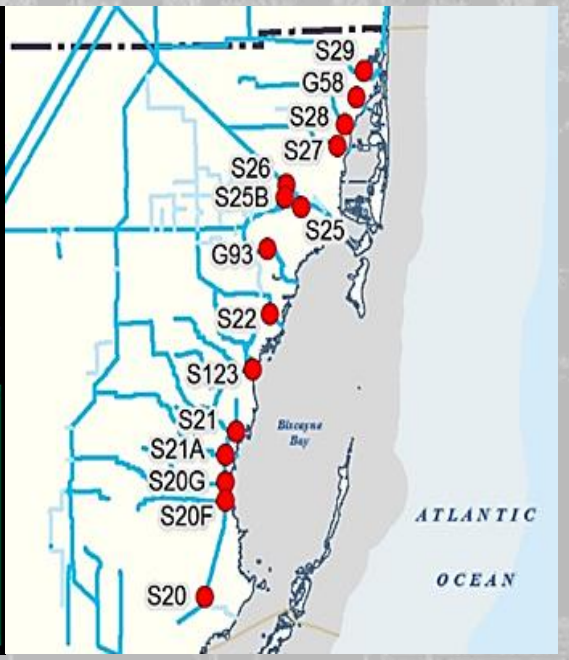
7 and 8 March 2024

Virtual Meeting

Working Today to Build a Better Tomorrow

US Army Corps of Engineers®





1. WORKSHOP GOAL AND AGENDA

Presenters: Gustavo Suarez, USACE Planning Technical Lead
Jenny Smith, SFWMD Project Manager

WORKSHOP GOAL

- Day 1
  - Present a summary of the C&SF Section 216 Flood Resiliency Study Evaluation Criteria Public Workshop held in October 2023.
  - Present Study Draft Performance Metric Developed from Workshop Input.

- Day 2
  - Group Discussion, team input Draft Performance Metrics, identify Reach performance metric priorities for each USACE account (RED, EQ and OSE).

AGENDA – DAY 1

1. Workshop Goals and Agenda — 1:00 pm to 1:10 pm
   Speakers: Gustavo Suarez, USACE Planning Technical Lead and Jenny Smith, SFWMD Project Manager

2. Welcoming and Projects Overview — 1:10 pm to 1:30 pm
   Speakers: Tiphanie Mattis, USACE , Chief of Plan Formulation Branch
   Eva Velez, USACE Chief of Ecosystems Branch, Carolina Maran, SFWMD Chief of District Resiliency
   - I. Projects Status
     Speaker: Tim Gysan, USACE, Project Manager
   - II. Preliminary Modeling Results Overview
     Speaker: : Amanda Bredesen, USACE Hydrologic and Hydraulic Engineering Lead

3. Planning Process, — 1:30 pm to 2:10 pm
   Speakers: Gustavo Suarez, USACE Plan Formulation, Kenneth Kau, USACE, Economics,
   Del Cabeche, USACE Economics and Nicole Cortez, SFWMD District Resiliency Coordinator
   - I. Study Objective
   - II. Plan Evaluation, Comparison and Selection
   - III. Evaluation Strategy
   - IV. USACE Accounts Overview
     - i. National Economic Development (NED)
     - ii. Regional Economic Development (RED)
     - iii. Environmental Quality (EQ)
     - iv. Other Social Effects (OSE)
     - v.

4. Summary of the Past Workshop — 2:10 pm to 2:25 pm
   Speaker: Gustavo Suarez, USACE Planning Technical Lead

5. Break — 2:25 pm to 2:30 pm

AGENDA – DAY 1

6. Draft Metrics – Developed Metrics from Workshop Input
   Speakers: Kenneth Kau, USACE, Economics, Ken Bradshaw, USACE Chief Environmental, Del Cabeche, USACE Economics — 2:30 pm to 4:00 pm
   - I. Regional Economic Development (RED)
   - II. Environmental Quality (EQ)
   - III. Other Social Effects (OSE)

7. Summary — 4:00 pm to 4:15 pm

8. Closing Remarks and Next Day Agenda
   Speaker: Tim Gysan, USACE Project Manager — 4:15 pm to 4:30 pm

9. Meeting Adjourn

AGENDA – DAY 2

1. Welcoming
   - I. Summary of Previous Day Workshop — 8:30 am to 9:00 am
   - II. Goals and Instructions
2. Performance Metrics Discussion and Breakout Sections (by Reach)

   Regional Economic Development (RED) — 9:00 am to 10:00 am

   - Breakout Section 1 - Reach A: Broward and Hillsboro Basins
   - Breakout Section 2 - Reach B: Little River and Nearby Basins
   - Breakout Section 3 - Reach C: Miami River and Nearby Basins
   - Breakout Section 4 - Reach D: South Miami Basins

   Environmental Quality (EQ) - Performance Metrics — 10:00 am to 11:00 am

   - Breakout Section 1 - Reach A: Broward and Hillsboro Basins
   - Breakout Section 2 - Reach B: Little River and Nearby Basins
   - Breakout Section 3 - Reach C: Miami River and Nearby Basins
   - Breakout Section 4 - Reach D: South Miami Basins

   Other Social Effects (OSE) — 11:00 am to 12:00 pm

   - Breakout Section 1 - Reach A: Broward and Hillsboro Basins
   - Breakout Section 2 - Reach B: Little River and Nearby Basins
   - Breakout Section 3 - Reach C: Miami River and Nearby Basins
   - Breakout Section 4 - Reach D: South Miami Basins
3. Summary and Reporting — 12:00 pm to 12:30 pm
4. Closing Remarks and Next Steps — 12:30 pm to 1:00 pm
5. Meeting Adjourn

2. WELCOME

Presenter: Tiphanie Mattis – USACE , Chief of Plan Formulation Branch
Eva Velez – USACE, Chief of Ecosystems Branch
Carolina Maran – SFWMD, Chief of District Resiliency

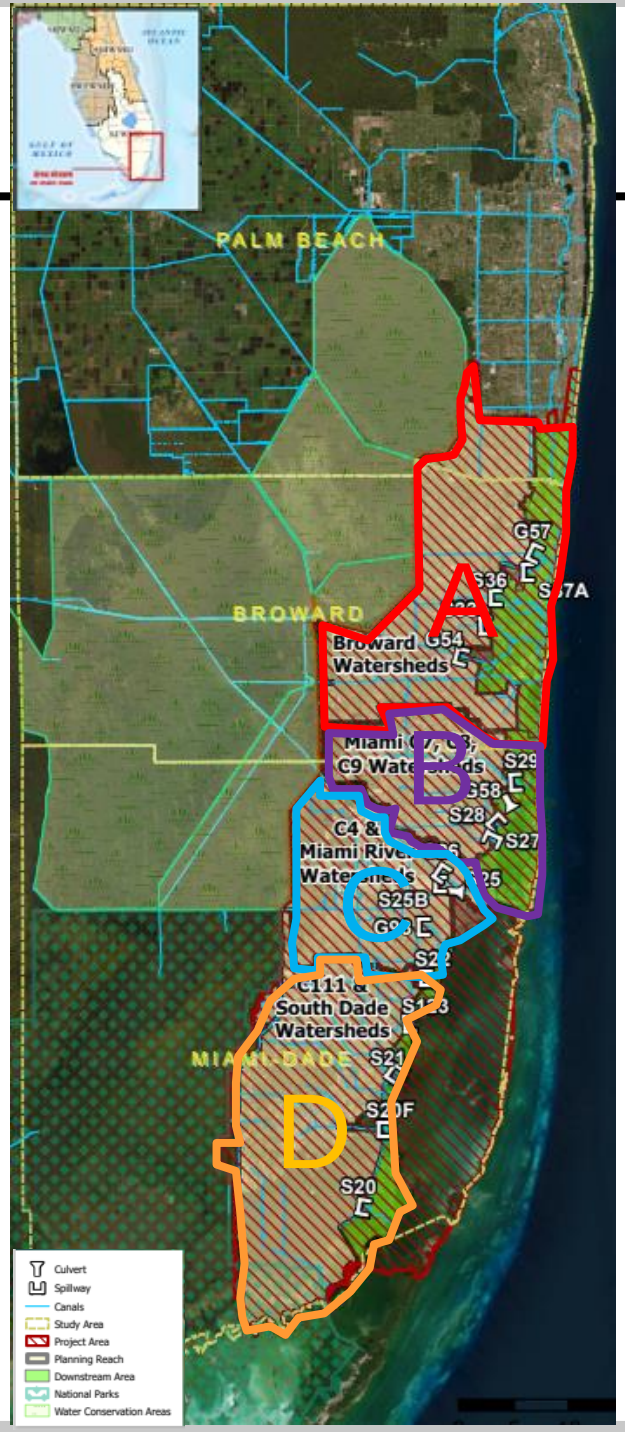
PROJECT OVERVIEW

Presenter: Tim Gysan – USACE, Project Manager

PLANNING FOCUS AREAS

There are currently 4 planning focus areas identified for the study:

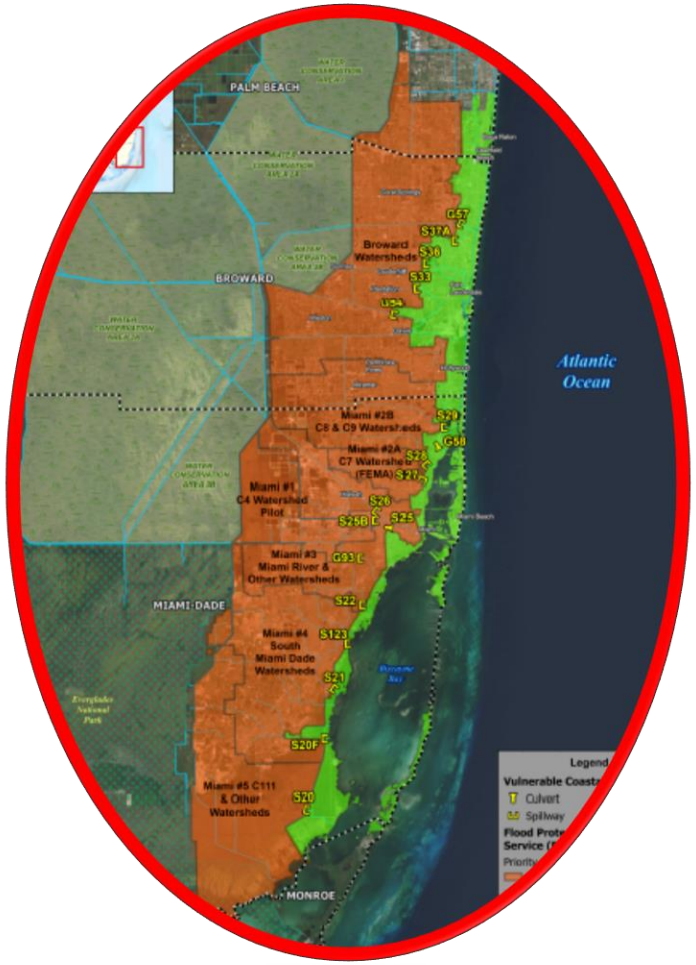
- Reach A: Broward and Hillsboro Basins
- Reach B: Little River and Nearby Basins
- Reach C: Miami River and Nearby Basins
- Reach D: South Miami Basins

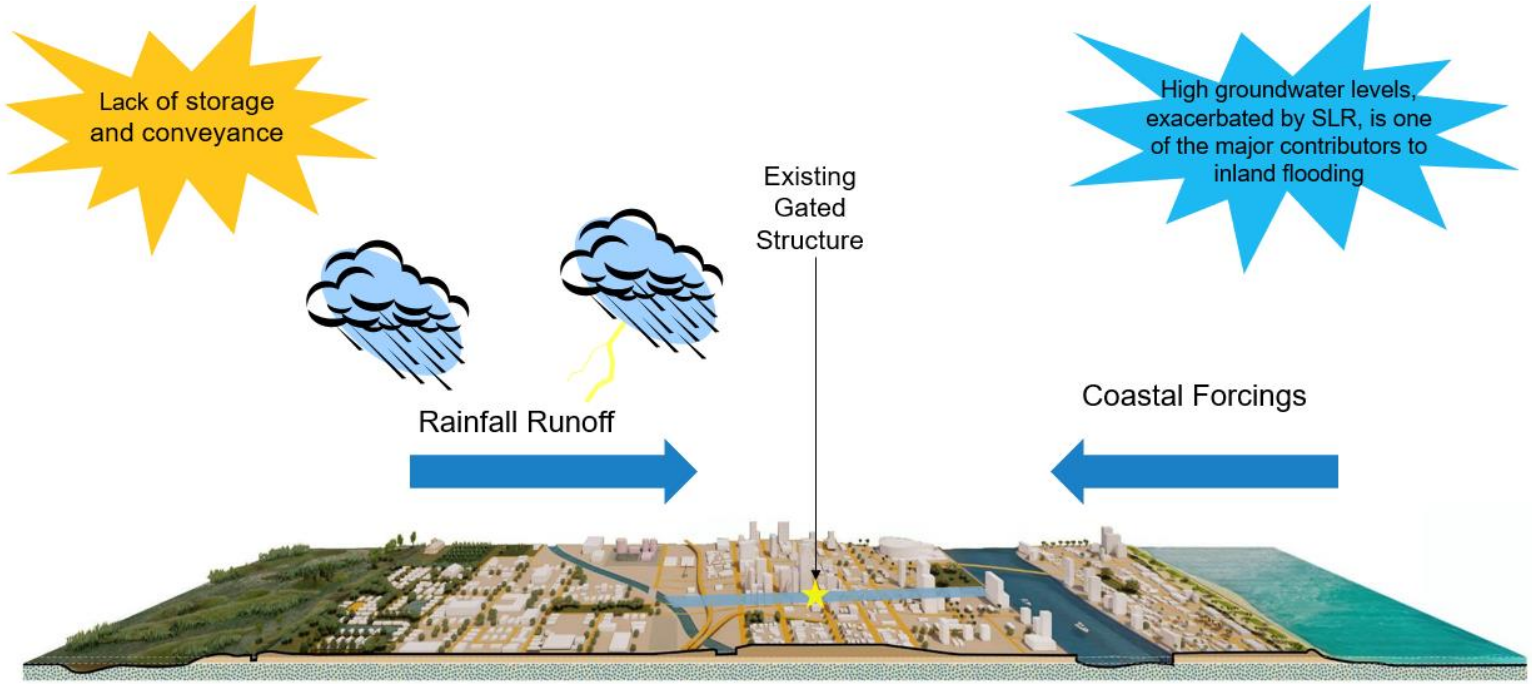


C&SF FLOOD RESILIENCY STUDY
FOCUSED SCOPE

Project Area

- Focus on the **highly vulnerable infrastructure including salinity control structures and associated primary canals** that can reduce the most immediate flood risks
- Lower East Coast – Southern Palm Beach, Broward and Miami-Dade counties.





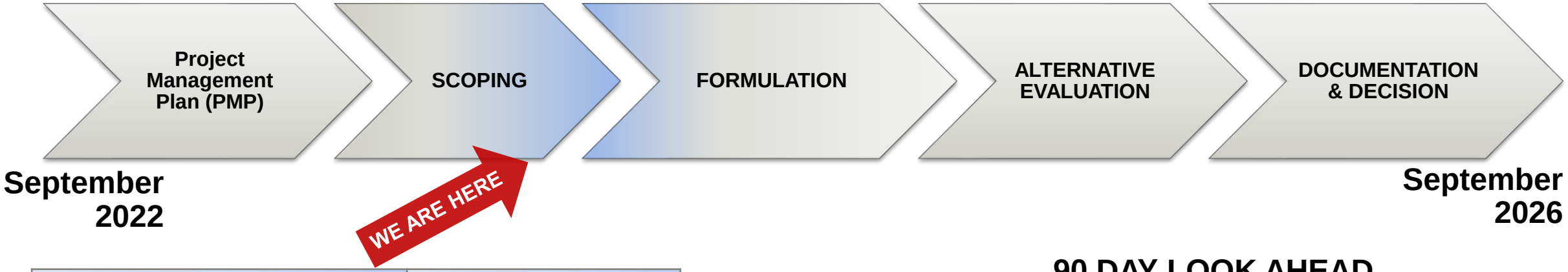
TYPICAL SOUTH FLORIDA CROSS-SECTION

Green = area downstream of coastal C&SF structures

Orange = area upstream of coastal C&SF structures

C&SF FLOOD RESILIENCY STUDY

SCHEDULE AND NEXT STEPS



MILESTONE	DATE
Scoping Meetings	✓ January 2023
Alternatives Milestone Meeting (AMM)	✓ June 2023
Tentatively Selected Plan (TSP)	April 2025
Draft Integrated Report Release	June 2025
Agency Decision Milestone (ADM)	
Final Integrated Report Release	July 2026
Chief's Report	September 2026

90 DAY LOOK AHEAD

April 2024
- Model Development completed
- Base condition and Future Without Project (FWOP) modeling
- Continue compilation of Performance Evaluation tools
- Hydrologic & Hydraulic Model Meeting

May 2024
- Economic Damages modeling for Future Without Project (FWOP) completed
- Performance metrics priorities

June 2024
- Identify study priorities

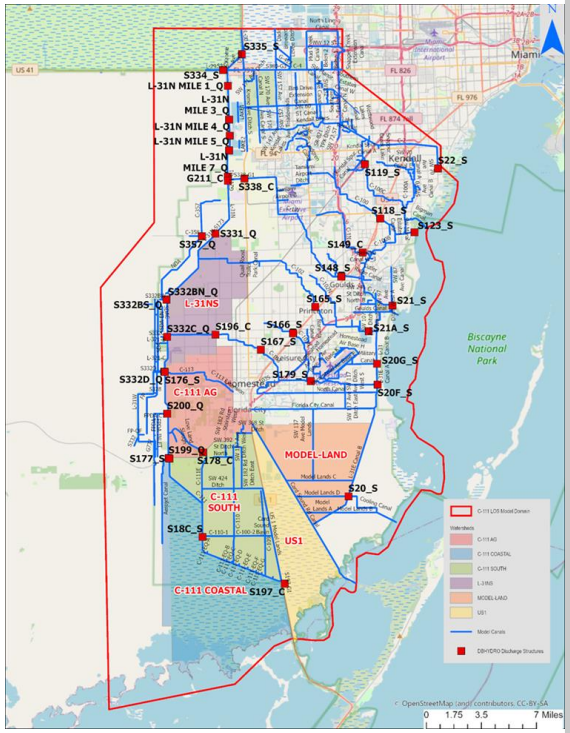
MODELING

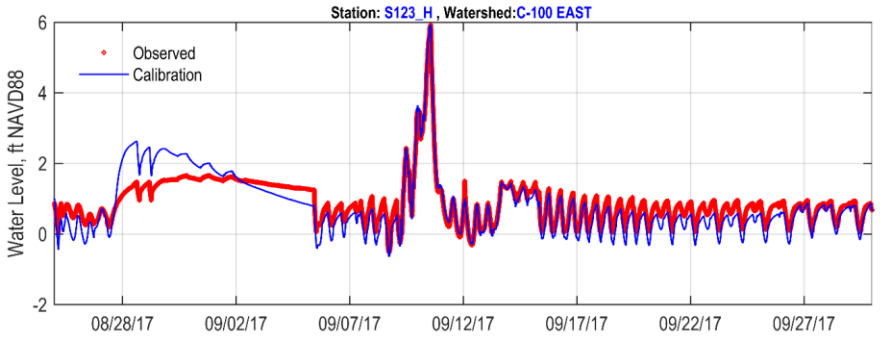
Presenter: Amanda Bredesen – USACE, Water Resources Lead

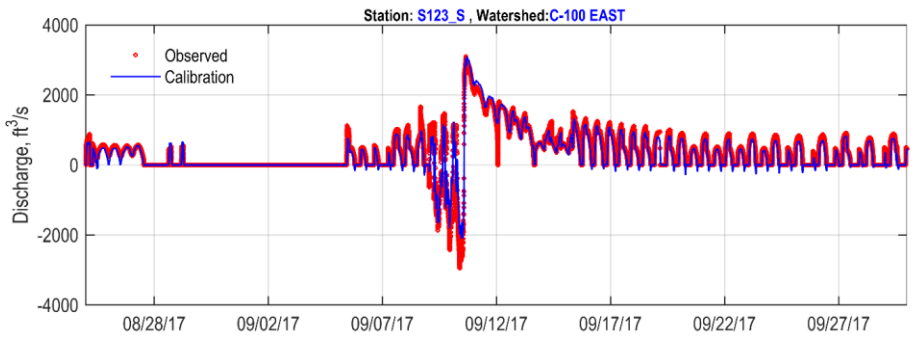
HYDROLOGIC & HYDRAULIC MODELING TOOL

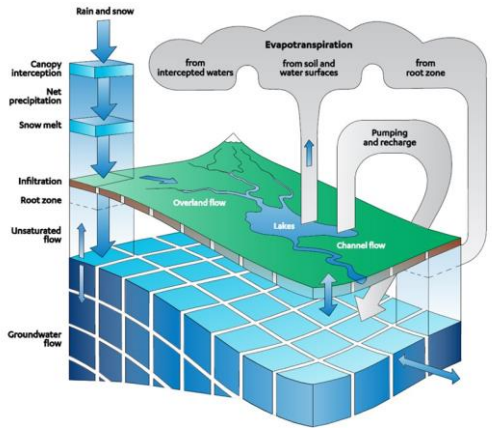
The integrated/coupled surface-groundwater model MIKE SHE/MIKE Hydro (2022) will be used to simulate the hydraulics and hydrology for the project area.

- Capability of conducting sub-regional scale simulations
- Simulate surface water and groundwater interactions
  - Allows for the accounting of rising water tables and reduced soil storage
- Able to simulate the effects of different boundary conditions such as tidal and storm surge-influenced tailwater conditions with current and future sea-level rise scenarios
- Comprehensive operational flexibility, can simulate structure gate operating rules and can use calibrated flow parameters for canal structures



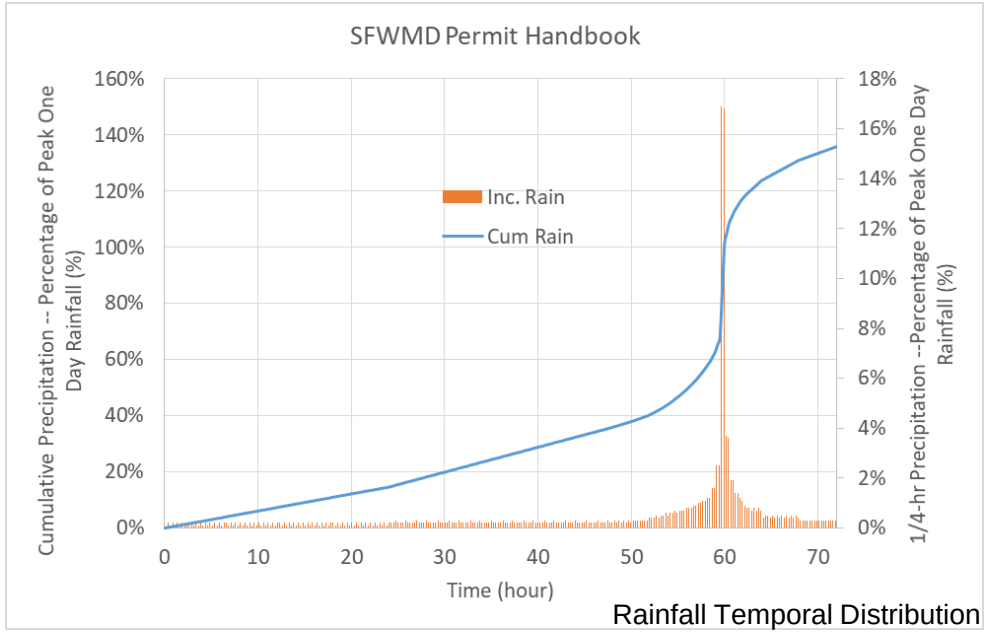






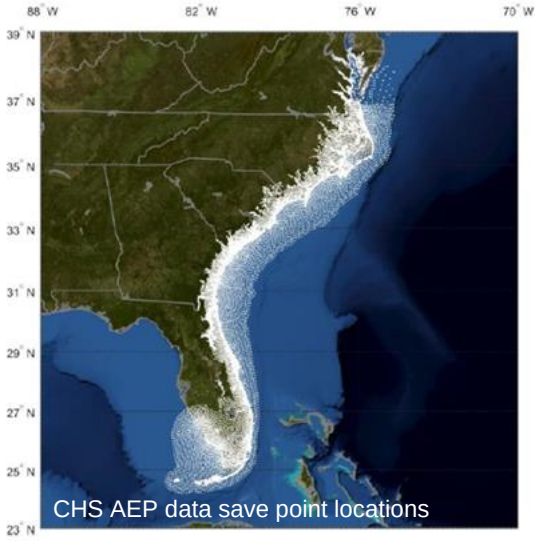
MODEL INPUT DATA

- **Rainfall:** The design storm will use spatially distributed gridded input derived from National Oceanic and Atmospheric Administration (NOAA) Atlas 14 rainfall depths that are temporally distributed based on the South Florida Water Management District (SFWMD) 3-day distribution.
    - The 72-hour rainfall distribution is found in the District's Surface Water Environmental Resource Permit Manual (SFWMD, Environmental Resource Permit Applicant's Handbook Volume II (2016).

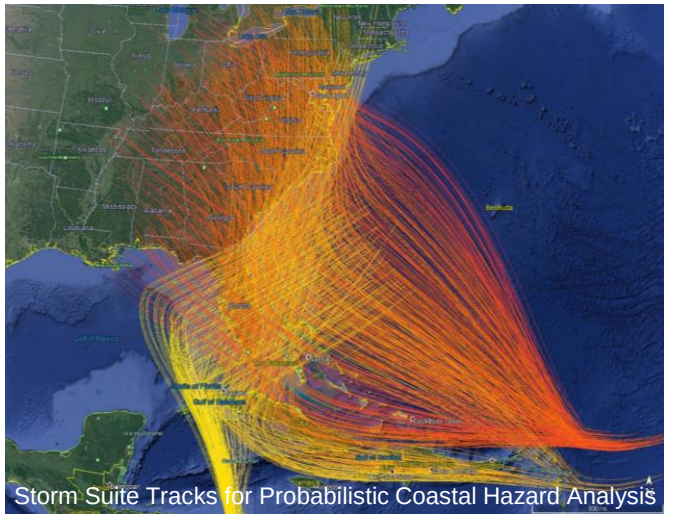


Rainfall Temporal Distribution

- **Coastal Boundary:** The South Atlantic Coastal Study (SACS) Coastal Hazard System (CHS) provides numerical and probabilistic modeling results for coastal forcings, including storm surge. The CHS stage-hydrographs will be applied as a downstream boundary condition within the MIKE model.



CHS AEP data save point locations

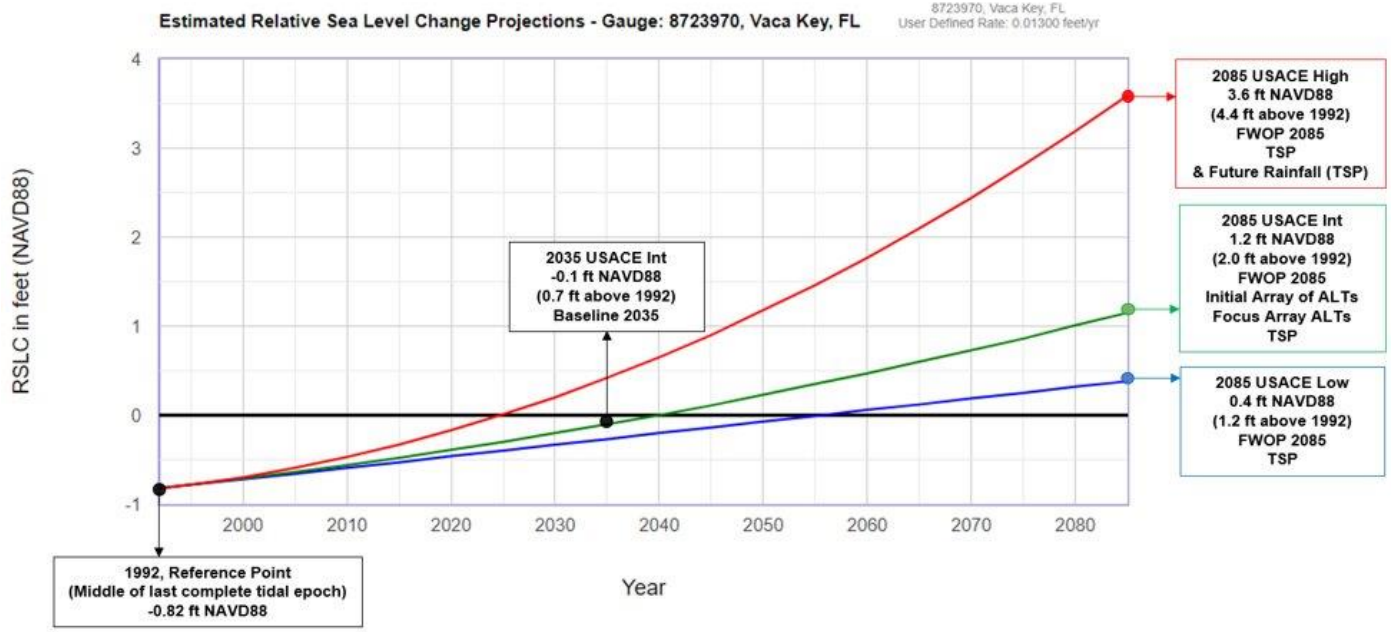

Storm Suite Tracks for Probabilistic Coastal Hazard Analysis

COMPOUND FLOODING

- The total water level (i.e., compound flooding) due to multiple flood sources, including rainfall runoff, groundwater and coastal forcings will be simulated.

- Hydrologic & Hydraulic model simulations include an array of rainfall and coastal return frequency events. Sea level change is included in the coastal water level data.

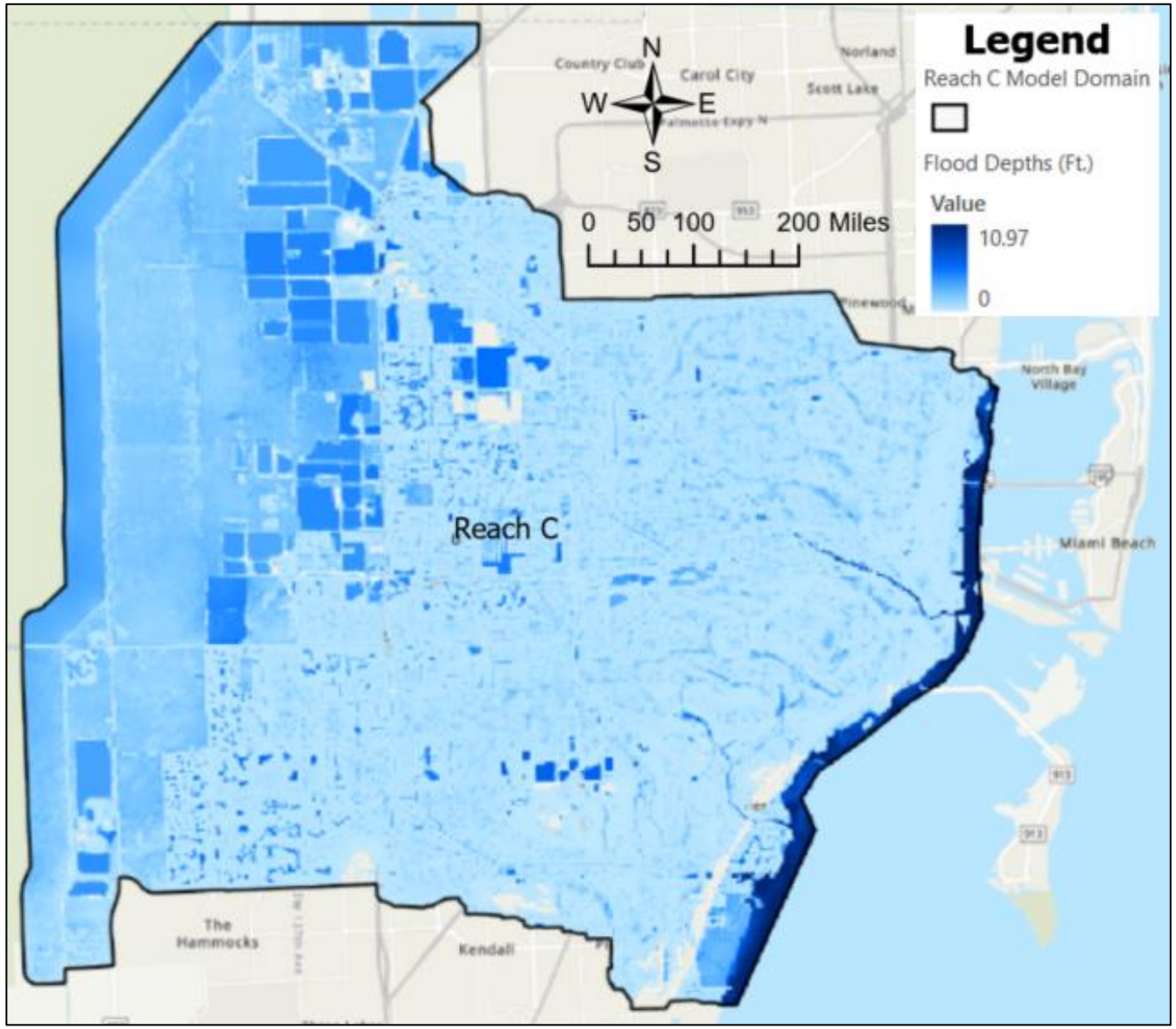
Coastal water level Return Period (CHS data)	Rainfall return period (NOAA Atlas14)
2-year	5-year
2-year	10-year
10-year	10-year
2-year	25-year
20-year	25-year
2-year	100-year
100-year	100-year
2-year	500-year



H&H MODEL SIMULATIONS AND OUTPUT

- Model has been simulated for the Baseline Condition (2035) and Future without project condition (2085) for the low, high and intermediate sea level change scenarios.

- Multiple options regarding model output including depth, water surface elevation, stage/flow hydrographs, velocity, canal profiles, structure performance, groundwater levels, etc. can be used to demonstrate the H&H response in each planning Reach.



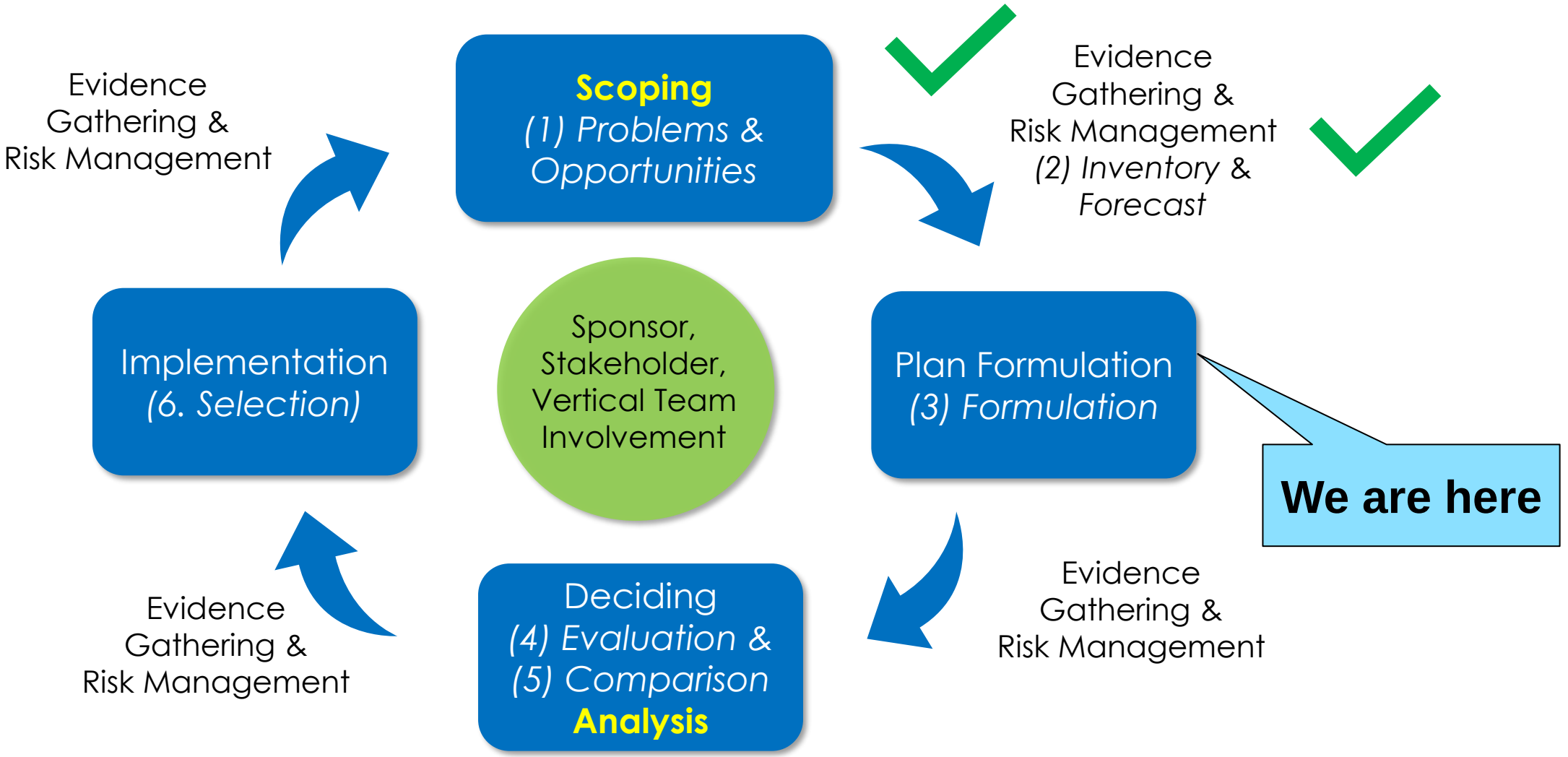
2. PLANNING PROCESS

Presenters: Gustavo Suarez, USACE Plan Formulation

PLAN FORMULATION

Presenter: Gustavo Suarez, USACE Planning Technical Lead

Risk-Informed Planning Process



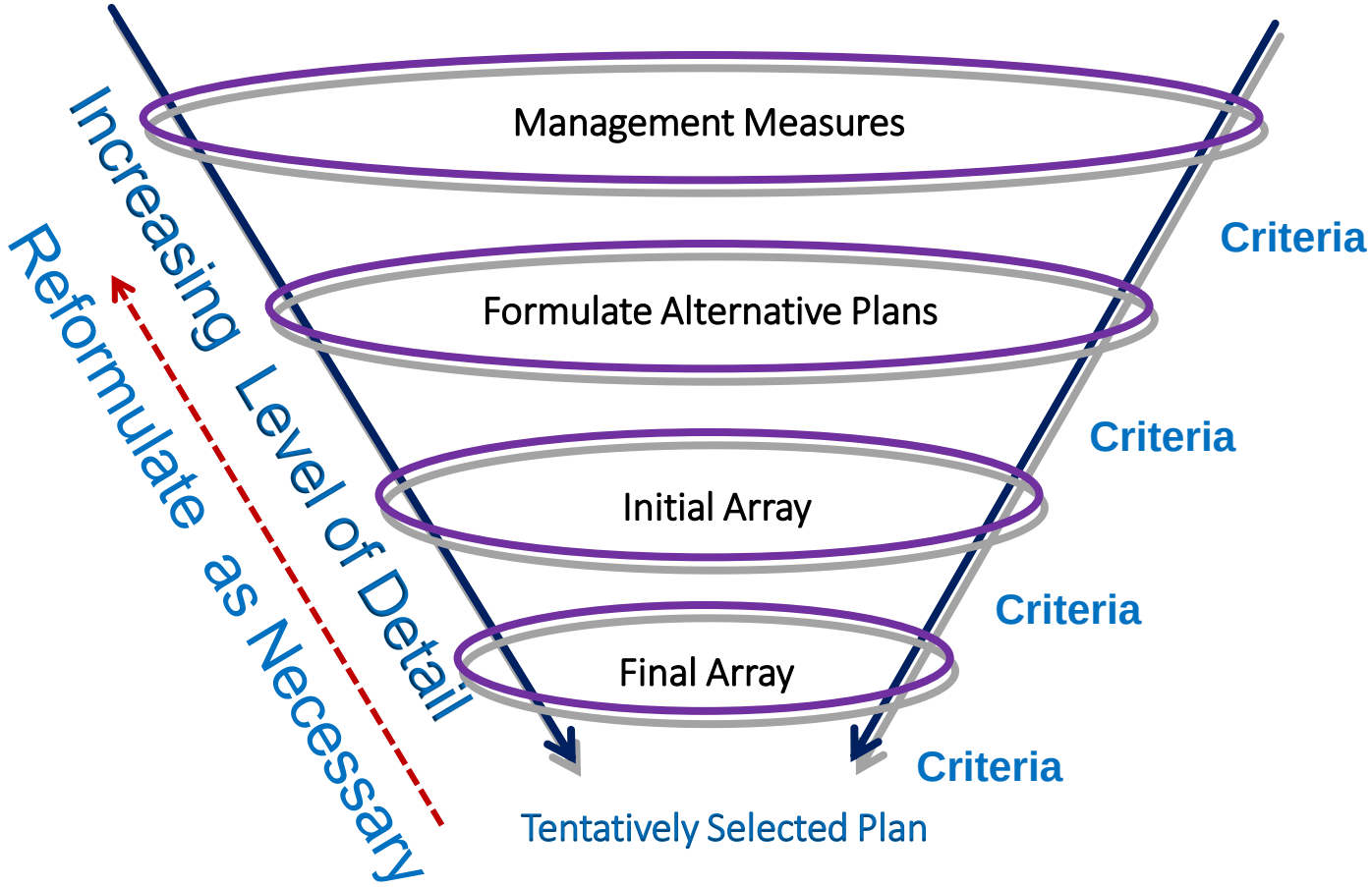
(#) Shows the planning steps within the risk-informed planning process

STUDY OBJECTIVE

The study objective is to:

"Enhance existing C&SF water control system and salinity control structure's functionality and capacity to ***improve flood risk management*** (***FRM***) and ***resiliency*** which has been degraded by inland inundation and changed conditions within southern Palm Beach, Broward and Miami Dade Counties over the **50-year period of analysis from 2035-2085**."

PLAN EVALUATION, COMPARISON AND SELECTION



Step 1: Specify Problems and Opportunities

Step 2: Inventory and Forecast

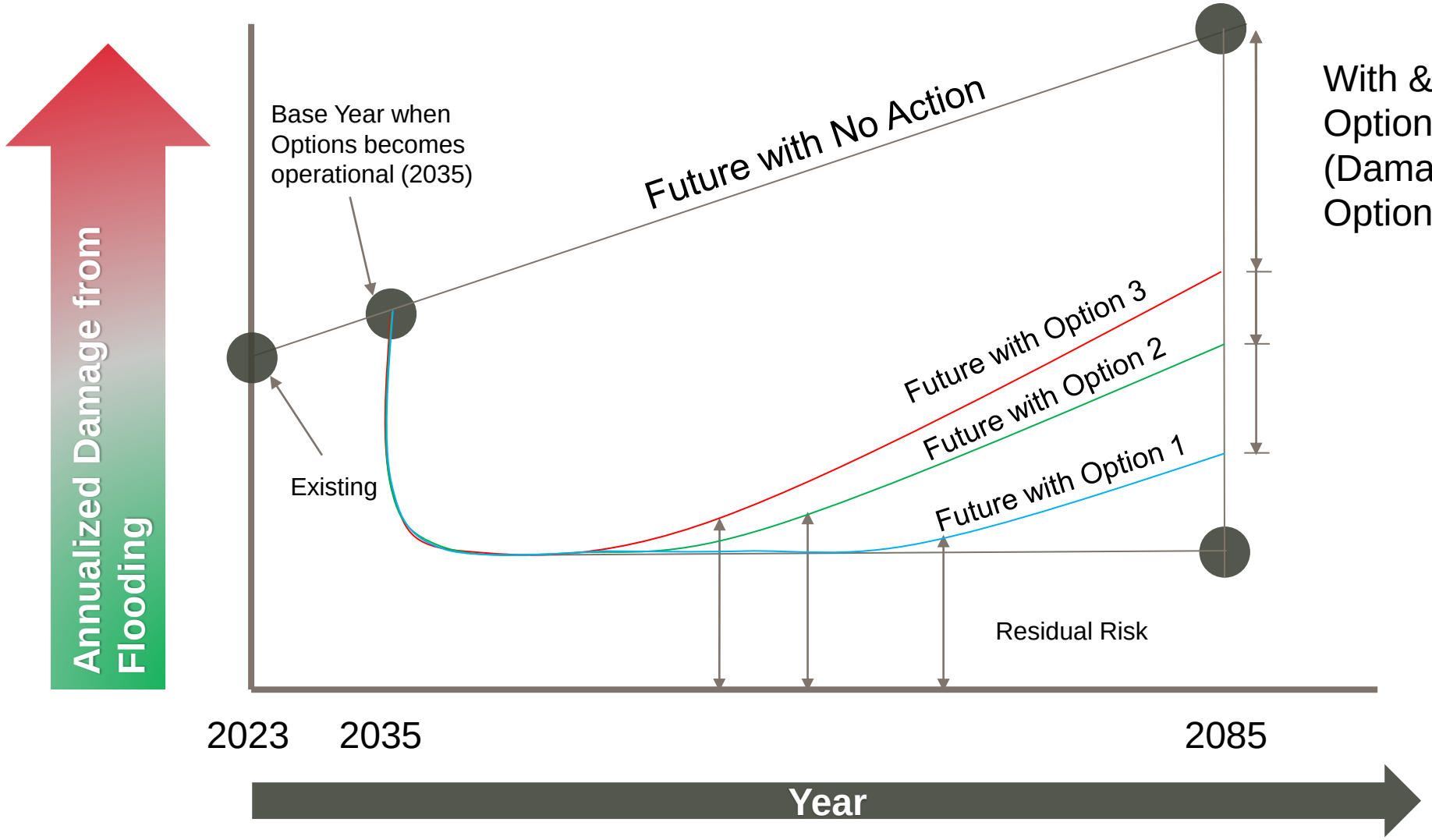
Step 3: Formulate Alternative Plans

Step 4: Evaluate Alternative Plans

Step 5: Compare Alternative Plans

Step 6: Plan selection

USACE -Risk-Informed Planning Process
Comparing Scenarios



With & Without Option Comparison (Damage avoided due to Options)

Modified from: Yoe – 2019

CRITERIA and USACE Accounts

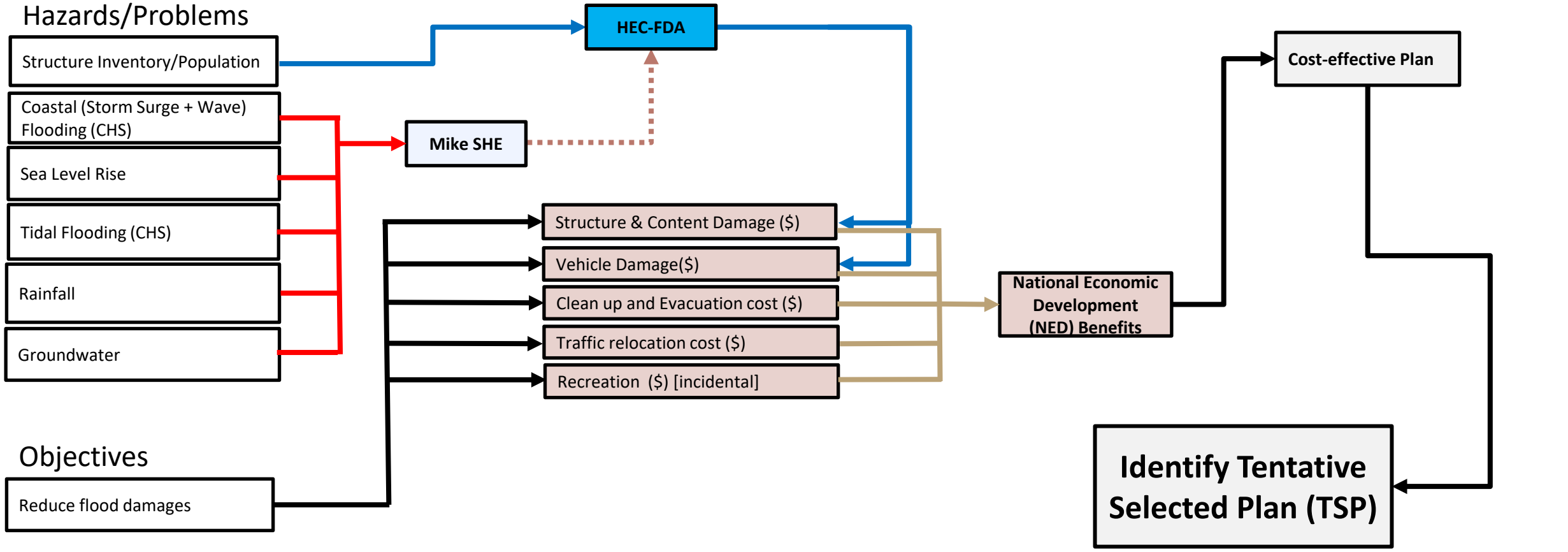
USACE Planning Guidance

- **Completeness** is the extent to which the alternative plans provide and account for all necessary investments or other actions to ensure the realization of the planning objectives, including actions by other Federal and non-Federal entities.
- **Effectiveness** is the extent to which the alternative plans contribute to **achieve the planning objectives**.
- **Efficiency** is the extent to which an alternative plan is the most **cost-effective** means of achieving the objectives.
- **Acceptability** is the extent to which the alternative plans are acceptable in terms of applicable laws, regulations and public policies. Appropriate mitigation of adverse effects shall be an integral component of each alternative plan.

Comprehensive System Account:

- **NED -** Displays the net increase of monetary value from a project to the nation.
- **RED** – Displays the value added from a project to the region.
- **EQ -** Displays nonmonetary effects of significant natural and cultural resources.
- **OSE** – Displays the project's social impacts or impacts not classified under the prior three accounts.

EVALUATION STRATEGY



- ✓ **Total Benefits (Quantitative/Qualitative)**
- ✓ **Sponsor & Local Input through the process**
- ✓ **Iterative process through multiple rounds of evaluation**

USACE ACCOUNT OVERVIEW

Presenters: Erik Adamiec – USACE, Economics
Del Cabeche - USACE, Economics
Nicole Cortez – SFWMD, District Resiliency Coordinator

TOTAL BENEFITS GUIDANCE

Comprehensive Documentation of Benefits Policy Directive: January 2021. Two Key changes to our approach:

- **More comprehensive evaluation of all four P&G accounts:**

NED: National Economic Development
RED: Regional Economic Development
OSE: Other Social Effects
EQ: Environmental Quality

- **Mandatory Alternatives carried forward to the final array:**

g. Each study must include, at a minimum, the following plans in the final array of alternatives for evaluation:

(1) The "No Action" alternative.

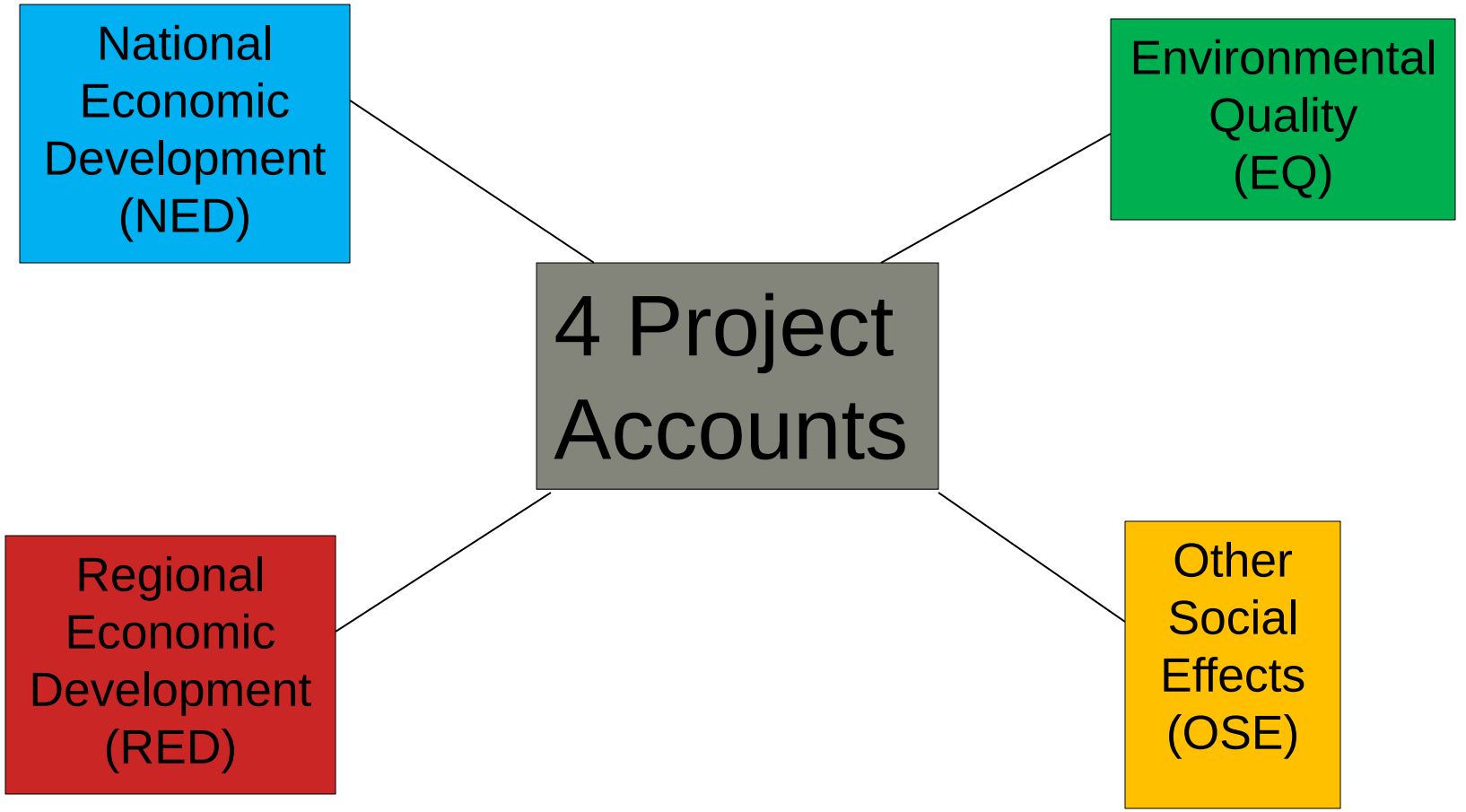
(2) A plan that maximizes net total benefits across all benefit categories.

(3) A plan that maximizes net benefits consistent with the study purpose.

(4) For flood-risk management studies, a nonstructural plan, which includes modified floodplain management practices, elevation, relocation, buyout/acquisition, dry flood proofing and wet flood proofing.

(5) A locally preferred plan, if requested by a non-federal partner, if not one of the aforementioned plans.

EVALUATION OF AN ALTERNATIVE



EXAMPLES FROM EACH ACCOUNT

NED

- Damages Prevented
- Transportation Cost Savings
- Emergency Cleanup cost reduction
- Incidental Recreation Benefits

RED

- Job Created/wages supported
- Local economic impact from wages supported
- Local Tax Revenue
- Local Business Revenue

OSE

- Life Safety/ Population at Risk
- Cost of Living
- Quality of Life
- Community Cohesion
- Voter Participation
- Civic Participation
- Community Resiliency

EQ

- Habitat Units
- Acres Restored
- Species Risk or Loss
- Cultural Resource Risk or Loss
- Critical Habitat created

*These are examples and not all are possible to measure within every study scope

BENEFITS IN THE OTHER ACCOUNTS

- Monetized ($)
- Quantified but not Monetized
- Measured but not fully quantified
- Evaluated using Directional Impacts
- Discussed qualitatively

Fully Quantitative	Semi-Quantitative	Categorical	Fully Qualitative
Precise numbers (dollars and cents, etc.)	Orders of Magnitude (Thousands, millions, billions, etc.)	Categories (Major positive effects, minor positive effects, major adverse effects, etc.)	Narrative discussion of effects only
Hypothetical Example: Alternative 1 will reduce expected average annual flood damages by $2,445,980 per year throughout the system	**Hypothetical Example**: Alternative 1 will reduce expected average annual flood damages by between $1 and $ 10 million per year	**Hypothetical Example**: Alternative 1 will have a minor positive effect on flood risk in Area A, a significant effect in Area B, and no effects in Area C	**Hypothetical Example**: Alternative 1 will likely reduce flood risk throughout the system

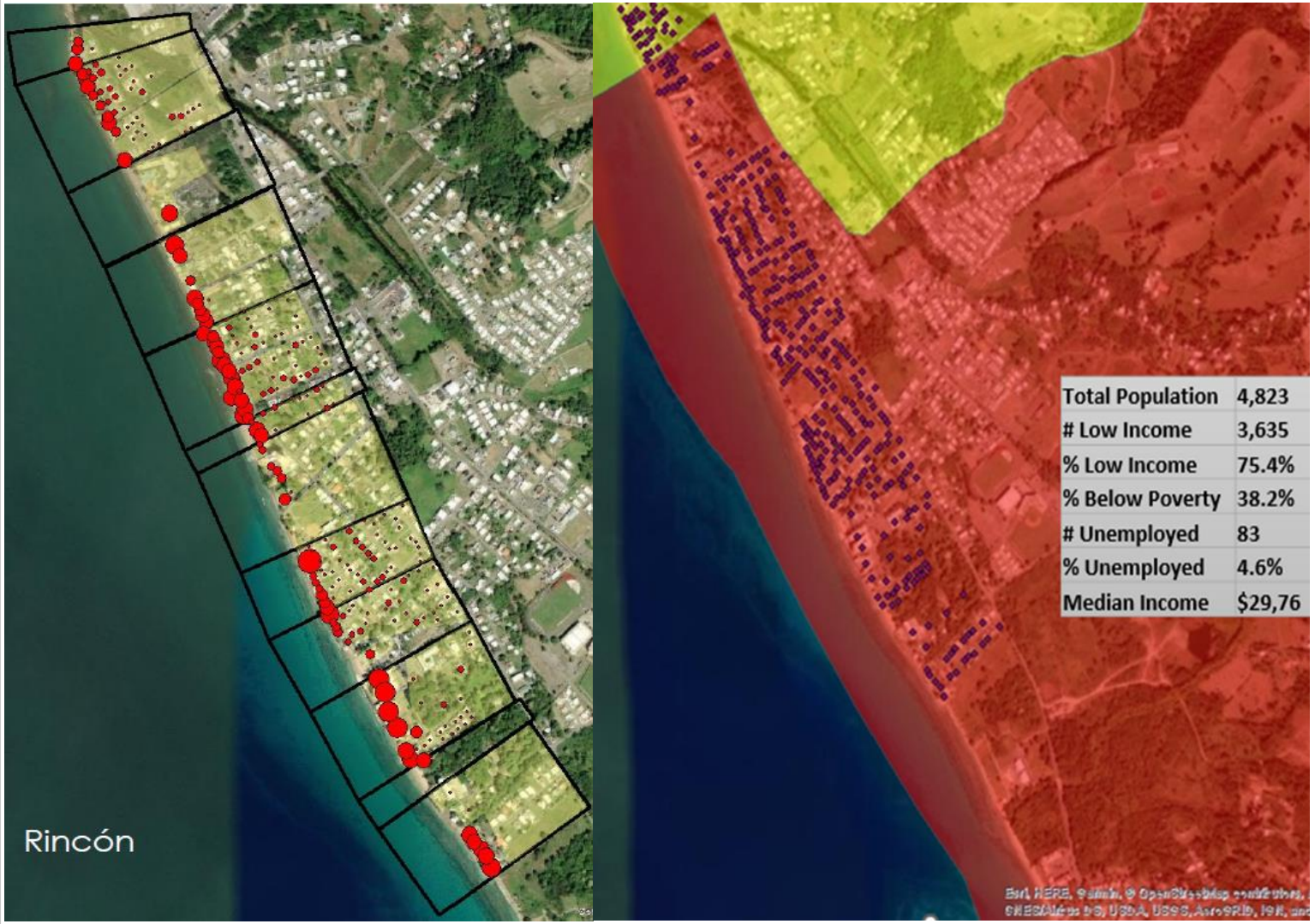
CURRENT USACE EXAMPLES

INDIAN RIVER LAGOON (IRL) SOUTH

Additional information was added about benefits to tourism, recreation, water supply, and economic viability of the affected counties.

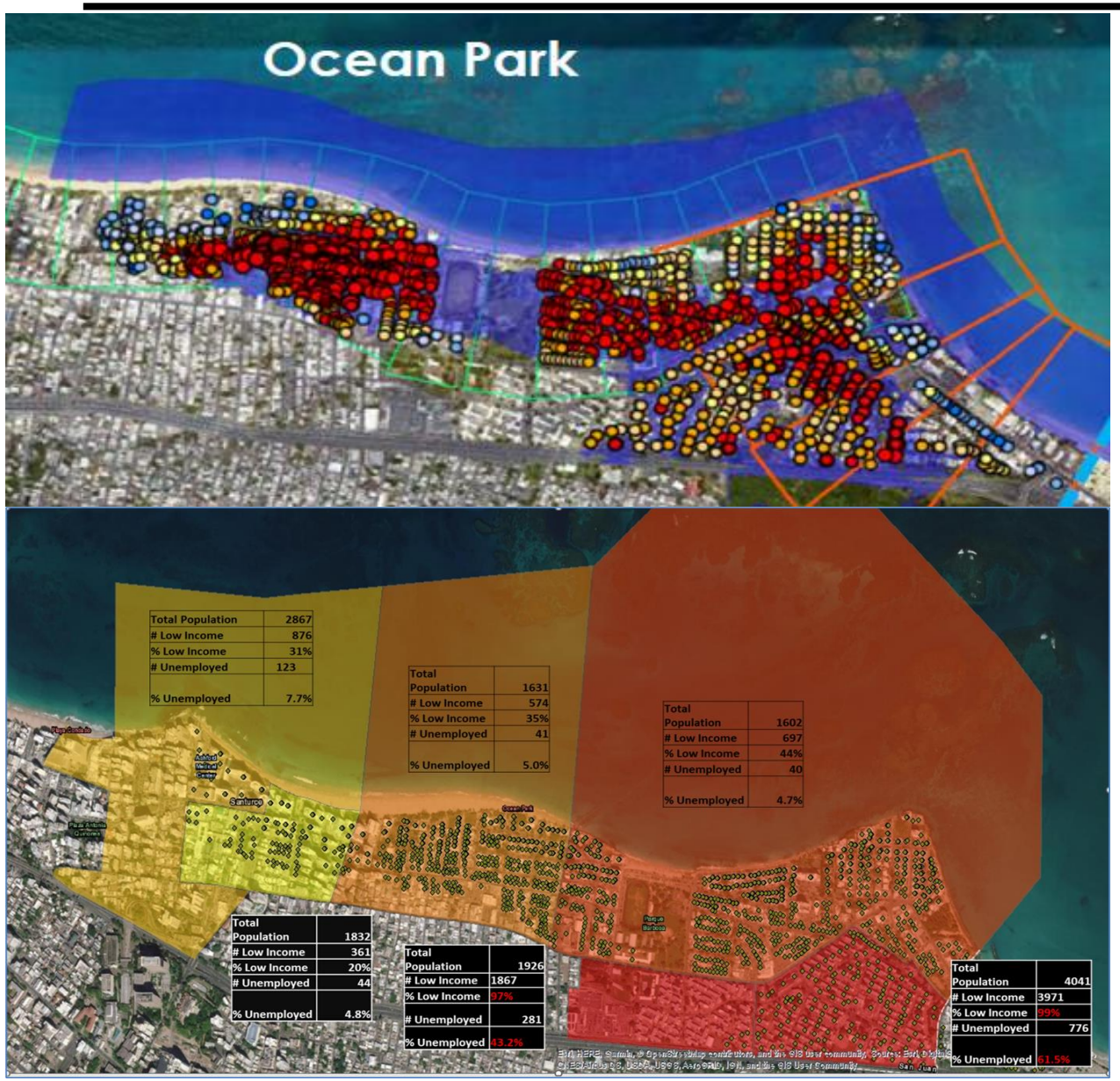
CURRENT USACE EXAMPLES

PUERTO RICO COASTAL FEASIBILITY STUDY (PRCS)



- Rincon Planning Reach does **not** have any economically justified alternatives (i.e., Benefit-Cost Ratio (BCR) < 1.0).
- Other four accounts, specifically OSE, being used to recommend a plan. FWOP presents a blighted condition.
- Though net National Economic Development (NED) benefits are negative, the expected annual damages have a significant impact on local economy and the population of the community (~40 structures are condemned in the Future Without Project (FWOP) condition, for example).
- The Recommended Plan required an NED waiver based on net positive impact in all four accounts. The PDT made the case: the NED BCR doesn't tell the full story.

CURRENT USACE EXAMPLES - PRCS



- Ocean Park Planning Reach, after cost increases, not economically justified based on NED (i.e., Benefit-Cost Ratio (BCR) < 1.0).
- NED waiver has been requested based on net positive impacts in the OSE and RED (EQ is net positive to a minor degree)
- Specifically, over 40% of benefits accrue to the most socially disadvantaged, many of whom are in the 99th percentile of low income. 98% risk reduction to the largest public housing systems in the Caribbean.
- The recommended plan avoids over 7,000 days of business disruptions over the 50-year period of analysis.
- Dollarization was unnecessary; the PDT made the case: the NED BCR didn't tell the full story.

DEEP DIVE: KEY TAKEAWAYS

- Application of the Comprehensive Benefits Directive is required for all USACE Planning studies.
- Project Delivery Team (PDT) economists are well prepared (with certified tools and methods) for National Economic Development (NED) evaluations.
- Capabilities with respect to the other accounts are more limited. **Creativity, innovation, and use of existing data is required. Need to tell the story.**
- Close coordination with the vertical team and the relevant Planning Center of Expertise (PCX) (early and often)is even more important than ever.
- Successful implementation also requires close coordination with the Non-Federal Sponsor and affected communities.

ENVIRONMENTAL JUSTICE (EJ)

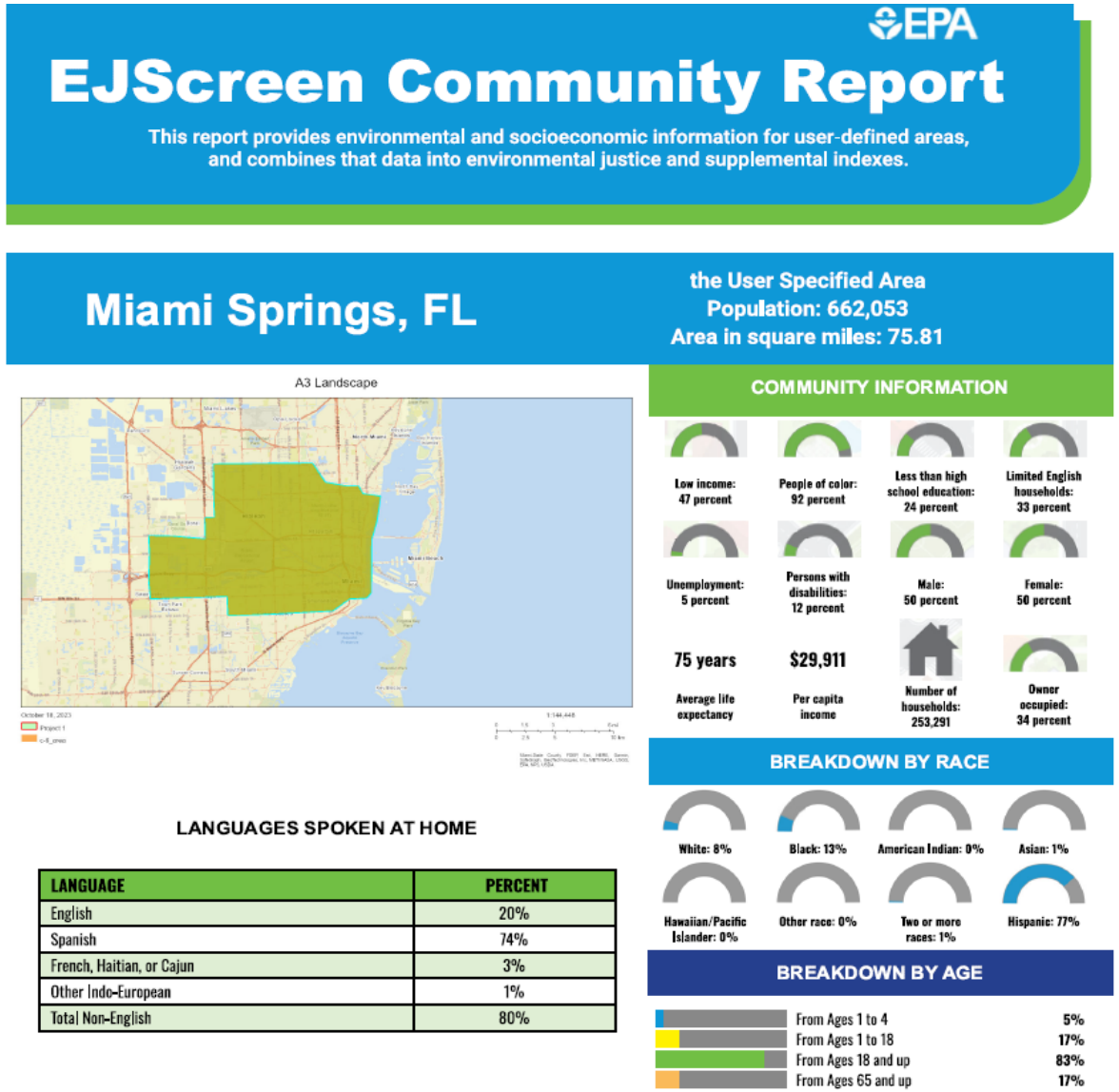
Environmental Justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin or income regarding the development, implementation and enforcement of environmental laws, regulations, and policies, with no group bearing a disproportionate burden of environmental harms and risks.

USACE considers environmental justice impacts as required by Executive Order 128981(1994) and Executive Order 13985(2021)

JACKSONVILLE ENVIRONMENTAL JUSTICE (EJ) PROGRAM

The USACE and project non-federal sponsors works and/or partners directly with community groups and local governments in Florida, Puerto Rico, and the U.S. Virgin Islands to address Environmental Justice issues associated with coastal storm risk management, flood risk management, and ecosystem restoration projects. The Corps and South Florida Water Management District (SFWMD) also employs full-time Tribal Liaisons, Cindy Thomas and Armando Ramirez, who work closely with groups of Native Americans that have an ancestral or historical interest in the project area footprint

EPA ENVIRONMENTAL JUSTICE (EJ) SCREEN TOOL



EPA

EJScreen Community Report

This report provides environmental and socioeconomic information for user-defined areas, and combines that data into environmental justice and supplemental indexes.

Miami Springs, FL

the User Specified Area
Population: 662,053
Area in square miles: 75.81

A3 Landscape

COMMUNITY INFORMATION

Low income: 47 percent
People of color: 92 percent
Less than high school education: 24 percent
Limited English households: 33 percent
Unemployment: 5 percent
Persons with disabilities: 12 percent
Male: 50 percent
Female: 50 percent
75 years — Average life expectancy
$29,911 — Per capita income
Number of households: 253,291
Owner occupied: 34 percent

BREAKDOWN BY RACE

White: 8%
Black: 13%
American Indian: 0%
Asian: 1%
Hawaiian/Pacific Islander: 0%
Other race: 0%
Two or more races: 1%
Hispanic: 77%

BREAKDOWN BY AGE

From Ages 1 to 4	5%
From Ages 1 to 18	17%
From Ages 18 and up	83%
From Ages 65 and up	17%

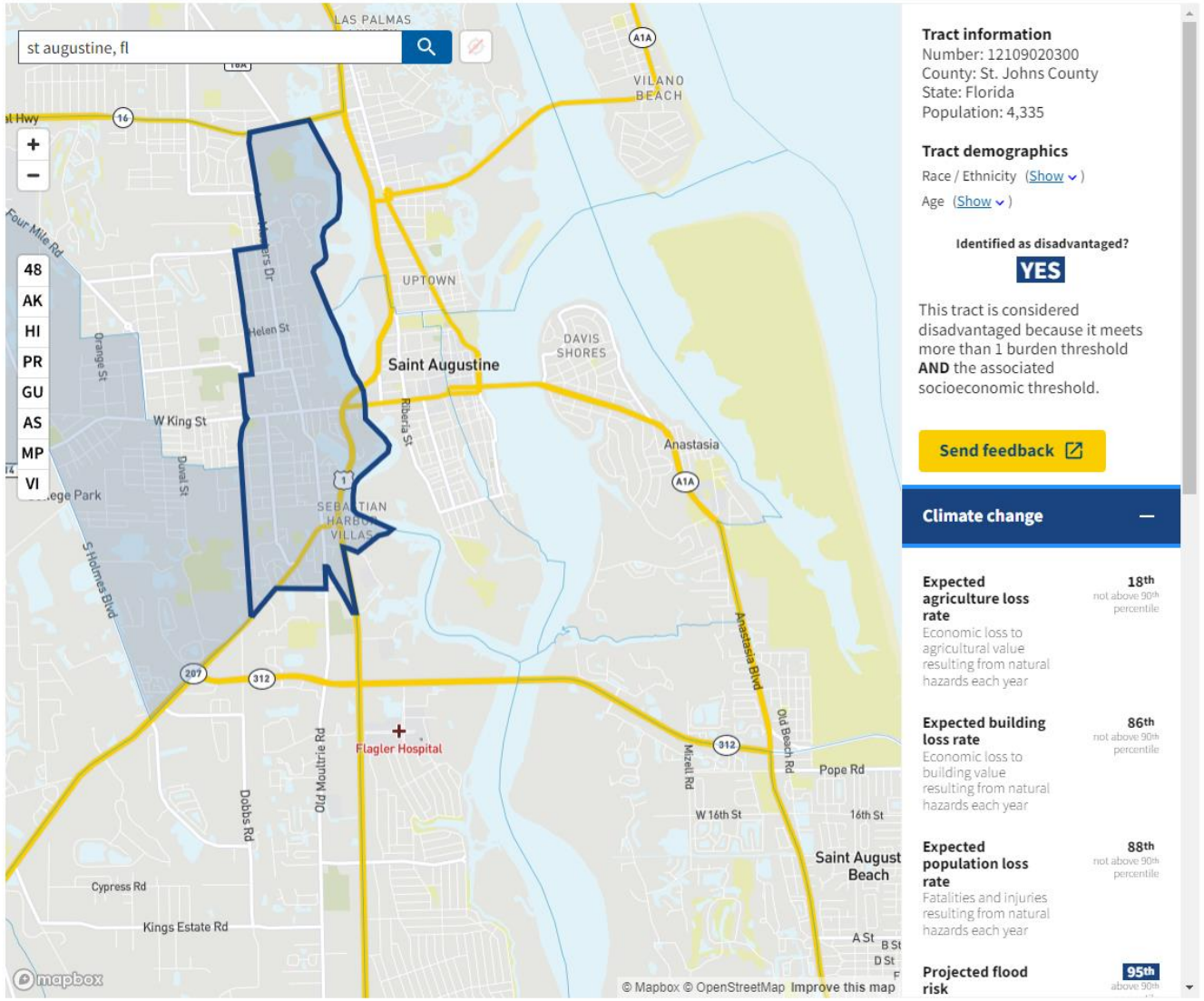
LANGUAGES SPOKEN AT HOME

LANGUAGE	PERCENT
English	20%
Spanish	74%
French, Haitian, or Cajun	3%
Other Indo-European	1%
Total Non-English	80%

Using the EPA's EJ Screening tool, we can identify relevant EJ neighborhoods based on socioeconomic indicators such as race, income, and unemployment

Example from our study area – Miami Springs

EXPLORE THE MAP SCREENING TOOL

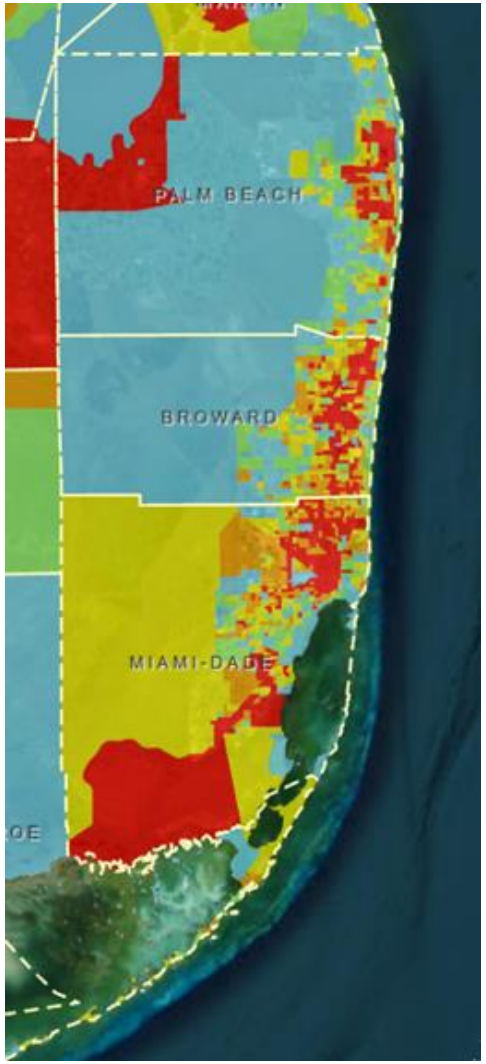


The Explore the Map tool allows USACE to identify Environmental Justice communities via census tracts using various climate change metrics along with socio-economic indicators

CENTER FOR DISEASE CONTROL (CDC) VULNERABILITY INDEX (SVI)

Center for Disease Control (CDC) Agency for Toxic Substances and Disease Registry (ATSDR) Social Vulnerability Index (SVI)

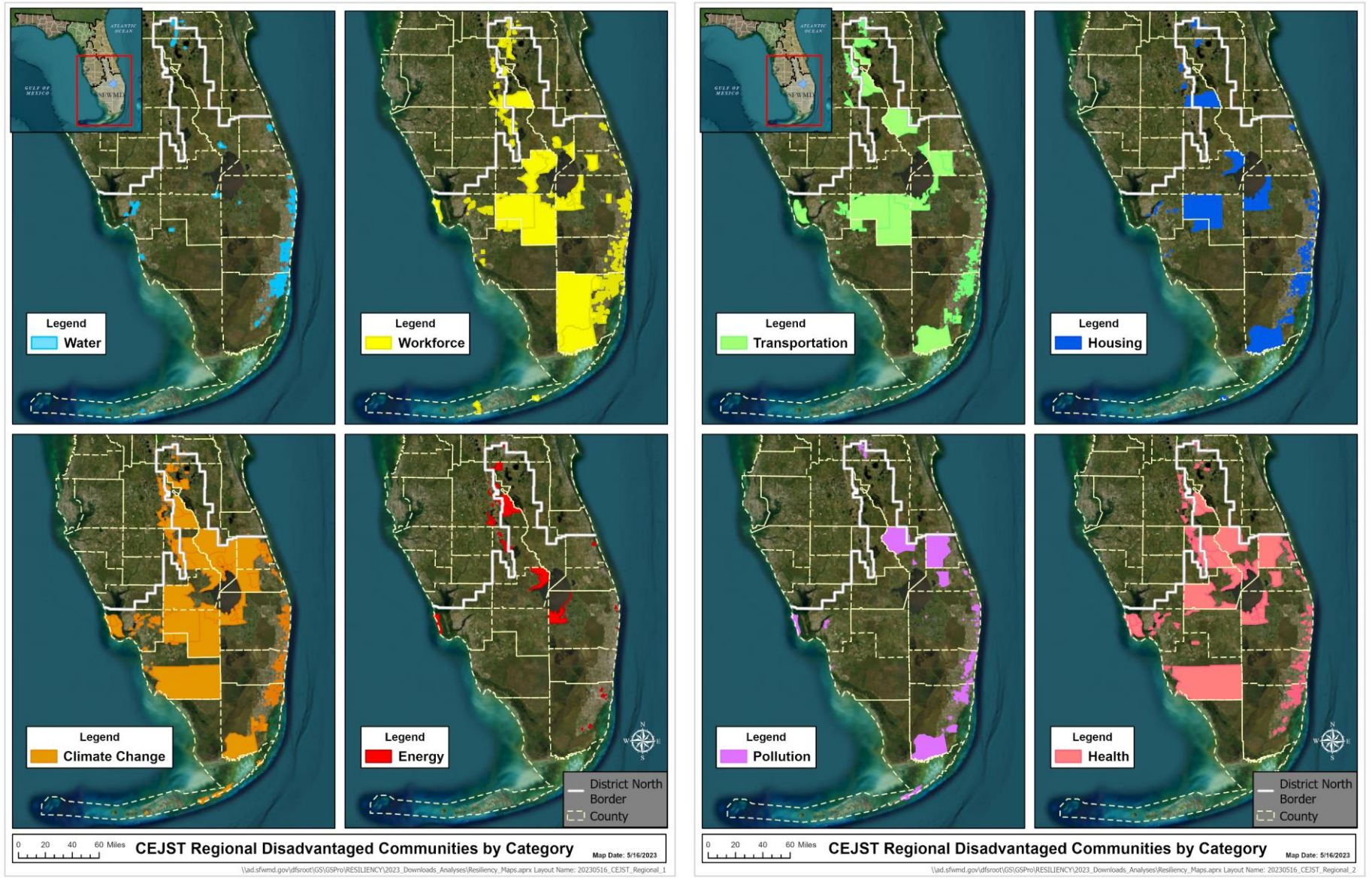
- **Basis:** Demographic and economic (socioeconomic) data
- **Application:** Rank vulnerability



COUNCIL ON ENVIRONMENTAL QUALITY (CEQ), CLIMATE AND ECONOMIC JUSTICE SCREENING TOOL (CEJST)

Council on Environmental Quality (CEQ), Climate and Economic Justice Screening Tool (CEJST)

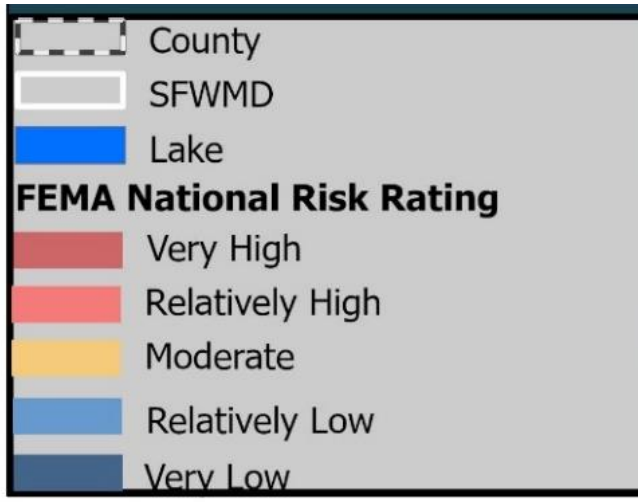
- **Basis:** socioeconomic data plus environmental, historical, and community data
- **Application:** Identify as disadvantaged

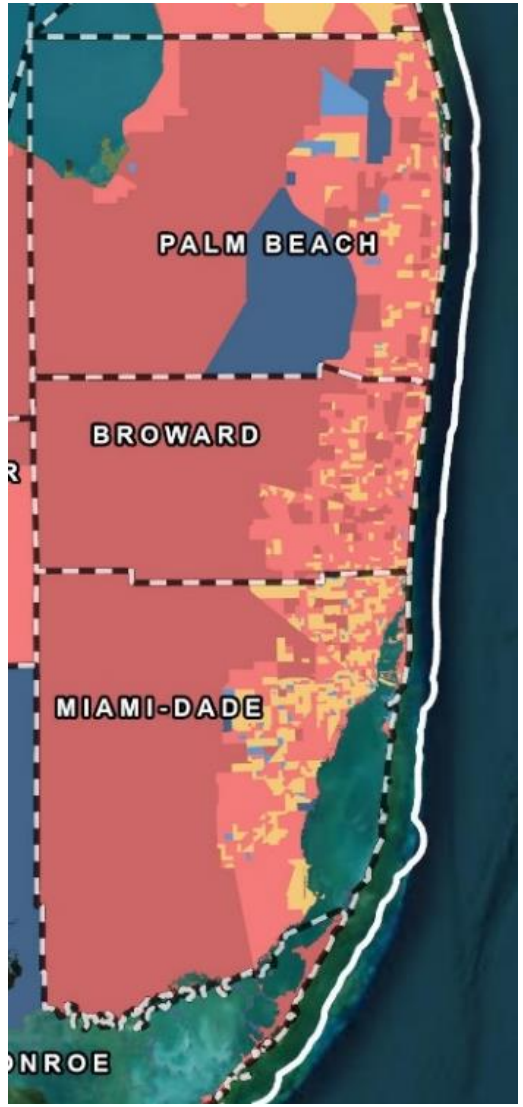


FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA) NATIONAL RISK INDEX (NRI)

Federal Emergency Management Agency (FEMA)
National Risk Index (NRI)

- **Basis:** Socioeconomic data plus hazard exposure and community resilience data
- **Application:** Rate relative risk





FEMA National Risk Index Rating for Census Tracts

40 Miles

Current Time: 8/3/2023 4:30 PM

3. SUMMARY OF PAST WORKSHOP AND METRICS DEVELOPMENT

Presenter: Gustavo Suarez, USACE Planning Technical Lead

METRIC DEVELOPMENT

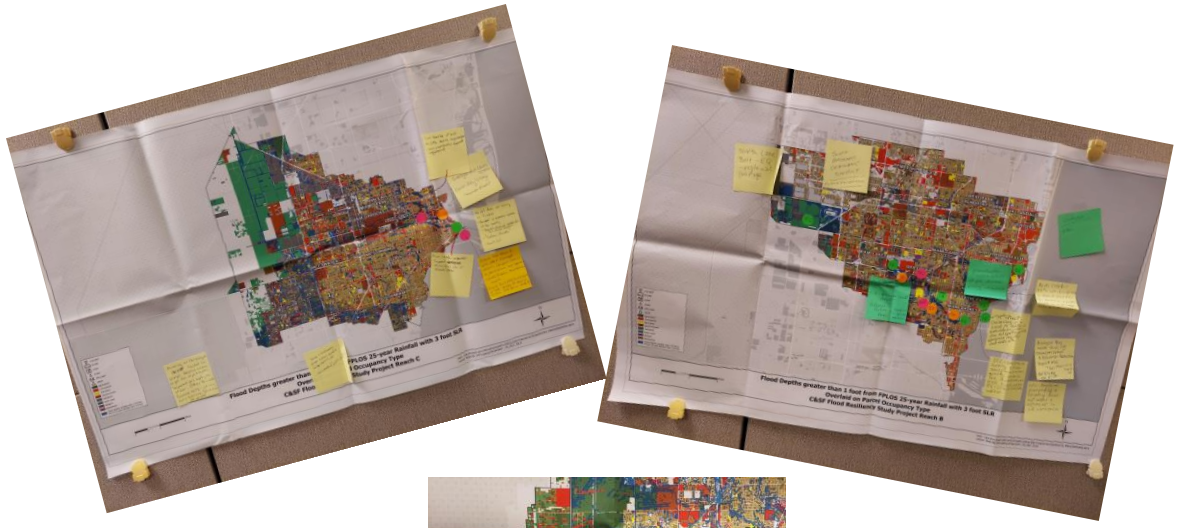
Presenter: Gustavo Suarez, USACE Planning Technical Lead

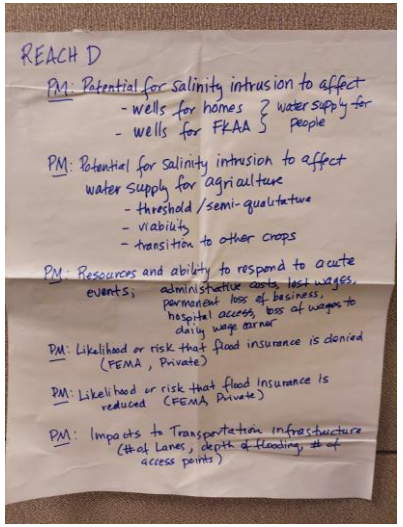
October Workshop Discussion

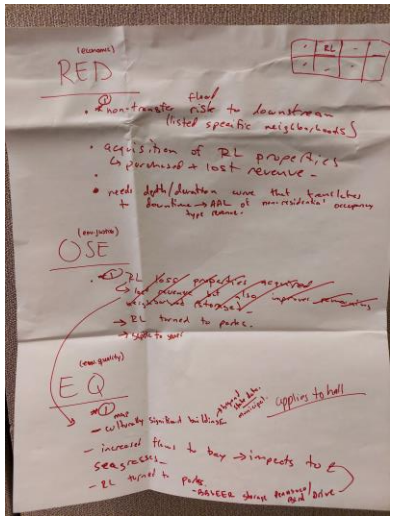
USACE Account

- National Economic Development (NED)
- **Regional Economic Development (RED)**
- **Environmental Quality (EQ)**
- **Other Social Effects (OSE)**

OCTOBER WORKSHOP (In Person and Virtual)







What we Heard – Regional Economic Development (RED)

Public Concerns

Loss of wages
- Loss of disposable income

Business
- Monetary losses
- Permanent lost of business
- Business disruption
- Agricultural impacts

Loss of tax revenue

Loss of property value

Inability to build back after flood


Sawgrass Mall – Sunrise, FL

What we Heard – Regional Economic Development (RED)

Public Concerns

Inability to build back after flood

Flood insurance

- Denied/Increased
- Reduce coverage

Transportation impacts

- Flooded roads
- Airport impacts
- Port Everglades Flooding
  - Impact to gas supply
- Limited access to hospitals

What we Heard – Environmental Quality (EQ)

Public Concerns

Flood induced pollution

Wildlife fragmentation
- Wildlife barriers caused by hydraulic structures

Impact to manatee habitat

Future permanent flooding

Water supply impact due to salinity intrusion
- Utilities – lower withdrawals rates
- Impact to private wells
- Agriculture – crops

Flooding septic systems

What we Heard – Other Social Effects (OSE)

Public Concerns

Subsistence hunting

Public health

- Cost of mosquito control

What is needed?

Performance Metric:

- Relationship of Metric to the Study Objective
- Metric use in Planning
  - Can metric be used to distinguish between alternatives?
- Is there available data to quantify or qualitatively develop the metric?
- Level of Effort to Measure (None, Low, Medium, High)
- Value Added to Decision Making (None, Low, Medium, High, Critical)

5 Minutes Break

6. DRAFT METRICS

REGIONAL ECONOMIC DEVELOPMENT (RED)

Presenter: Kenneth Kau – USACE, Economics

Draft Performance Metrics

Regional Economic Development (RED)

- PM_1 : Loss of Income
- PM_2 : Local Business Revenue
- PM_3 : Taxes Revenue
- PM_7 : Construction Expenditure Impacts
- PM_10: Recreational Activities

Draft Performance Metrics

Regional Economic Development (RED)

- PM_1 : Loss of Income
  - Description
    Inability for people to work during flood events
  - What/How can we measure?
    - Business down time/days closed
  - Evaluation
    - Business disruptions due to flooding and flooding duration cause inability for people to work
    + Reduction of business disruption due to improvement in flood risk management allows people to work

Draft Performance Metrics

Regional Economic Development (RED)

- PM_2 : Business Revenue
  - Description
    - Monetary losses to business due to disruptions caused by flooding
  - What/How can we measure?
    - Business revenue impact
  - Evaluation
    - \- Monetary losses to business due to disruptions caused by flooding
    - \+ Reduction in business disruption and monetary losses due to improvement in flood risk management

Draft Performance Metrics

Regional Economic Development (RED)

- PM_3 : Tax Revenue
  - Description
    County tax revenue losses due to business disruptions caused by flooding
  - What/How can we measure?
    Tax revenue impact
  - Evaluation
    - County tax revenue losses due to business disruptions caused by flooding
    + Reduce counties' monetary losses due to improvement in flood risk management to reduce business disruptions

Draft Performance Metrics

Regional Economic Development (RED)

- PM_7 : Construction Expenditure Impacts
  - Description
    Construction expenditure generates regional economic benefits
  - What/How can we measure?
    Economic value added

Draft Performance Metrics

Regional Economic Development (RED)

- PM_10: Recreational Activities

- Description

  Disruption in access to, or availability of, recreational activities caused by flooding

  - What/How can we measure?

    Decreased flooding to recreational facilities/areas

  - Evaluation

    - Disruption in access to, or availability of, recreational activities cause by flooding

    + Reduction in disruption of access to, or availability of, recreational activities caused by flooding due to improvement in flood risk management

ENVIRONMENTAL QUALITY (EQ)

Presenter: Ken Bradshaw – USACE, Chief, South Florida Section Environmental Branch

Draft Performance Metrics

Environmental Quality (EQ)

- PM_1 : Environmental Resources Loss (Future Permanent Flooding)
- PM_2 : Water Supply Impact due to Salinity Intrusion
- PM_3 : Flooding Septic Tanks
- PM_4 : Wildlife Mobility
- PM_6 : Impacts to municipal/Commercial waste field systems
- PM_7 : Impact to Industrial Facilities

Draft Performance Metrics

Environmental Quality (EQ)

- PM_1 : Environmental Resources Loss (Future Permanent Flooding)
  - Description
    Natural areas become permanent inundated due to sea level changes and/or groundwater
  - What/How can we measure?
    Acreages of areas likely subject to permanent inundation
  - Evaluation
    - Natural areas become permanent inundated due to sea level changes and/or groundwater
    + Improvement in flood risk management reduce areas permanent inundated due to sea level changes and/or groundwater

Draft Performance Metrics

Environmental Quality (EQ)

- PM_2 : Water Supply Impact due to Salinity Intrusion
  - Description
    Saltwater intrusion impact to water supply
  - What/How can we measure?
  - No salinity indicators as output in the modeling

Draft Performance Metrics

Environmental Quality (EQ)

- PM_3 : Flooding Septic Tanks
  - Description
    Septic tanks impacted due to increase in groundwater levels and/or flooding
  - What/How can we measure?
    Number of septic tanks impacted by flood increase/decrease
  - Evaluation
    - \- Septic tanks impacted due to increase in groundwater levels and/or flooding
    - \+ Improvement in flood risk management reduce number of septic tanks impacted

Draft Performance Metrics

Environmental Quality (EQ)

- PM_4 : Wildlife Mobility
  - Description
    Relocation of structures likely to cause a wildlife mobility restriction
  - What/How can we measure?
    Qualitative

Draft Performance Metrics

Environmental Quality (EQ)

- PM_6 : Impacts to municipal/Commercial waste field systems
  - Description
    Impact to municipal/Commercial waste field systems due to flooding
  - What/How can we measure?
    Increase/Decrease flooding to municipal/commercial waste field systems
  - Evaluation
    - Impact to municipal/Commercial waste field systems due to flooding
    + Improvement in flood risk management reduce impact to municipal/Commercial waste field systems

Draft Performance Metrics

Environmental Quality (EQ)

- PM_ : Impacts to industrial facilities
  - Description
    Impact to industrial facilities due to flooding
  - What/How can we measure?
    Increase/Decrease flooding to industrial facilities
  - Evaluation
    - \- Impact to industrial facilities due to flooding
    - \+ Improvement in flood risk management reduce impact to industrial facilities

OTHER SOCIAL EFFECTS (OSE)

Presenter: Del Cabeche – USACE, Economics

Draft Performance Metrics

Other Social Effects (OSE)

- PM_2 : Physical Health (Limited Access to Hospitals)
- PM_3 : Community Identity
- PM_5 : Life Safety
- PM_6 : Cultural Resources

Draft Performance Metrics

Other Social Effects (OSE)

- PM_2 : Physical Health (Limited Access to Hospitals)
  - Description
    Flooding impact to roads limits the access to health care facilities
  - What/How can we measure?
    Decrease flooding to roads that provide access to health care facilities
  - Evaluation
    - Flooding impact to roads limits the access to health care facilities
    + Improvement in flood risk management reduces flood impact to roads that provide access to health care facilities

Draft Performance Metrics

Other Social Effects (OSE)

- PM_3 : Community Identity
  - Description
    Flooding impact to community and/or historic resources
  - What/How can we measure?
    Decrease flooding to community and/or historic resources
  - Evaluation
    - Flooding impact to community and/or historic resources
    + Improvement in flood risk management reduces flood impact to community and/or historic resources

Draft Performance Metrics

Other Social Effects (OSE)

- PM_5 : Life Safety
  - Description

    Risk to population due to flooding

  - What/How can we measure?

    Population at risk affected

Draft Performance Metrics

Other Social Effects (OSE)

- PM_6 : Cultural Resources
  - Description
    Flooding impact to cultural resources
  - What/How can we measure?
    Decrease flooding to cultural resources
  - Description
    - Flooding impact to cultural resources
    + Improvement in flood risk management reduces flood impact to cultural resources

7. SUMMARY

8. CLOSING REMARKS AND DAY 2 AGENDA

Presenters: Jenny Smith – SFWMD, Project Manager
Tim Gysan – USACE, Project Manager

AGENDA – DAY 2

1. Welcoming
   - I. Summary of Previous Day Workshop — 8:30 am to 9:00 am
   - II. Goals and Instructions
2. Performance Metrics Discussion and Breakout Sections (by Reach)
   - Regional Economic Development (RED) — 9:00 am to 10:00 am
     - Breakout Section 1 - Reach A: Broward and Hillsboro Basins
     - Breakout Section 2 - Reach B: Little River and Nearby Basins
     - Breakout Section 3 - Reach C: Miami River and Nearby Basins
     - Breakout Section 4 - Reach D: South Miami Basins
   - Environmental Quality (EQ) - Performance Metrics — 10:00 am to 11:00 am
     - Breakout Section 1 - Reach A: Broward and Hillsboro Basins
     - Breakout Section 2 - Reach B: Little River and Nearby Basins
     - Breakout Section 3 - Reach C: Miami River and Nearby Basins
     - Breakout Section 4 - Reach D: South Miami Basins
   - Other Social Effects (OSE) — 11:00 am to 12:00 pm
     - Breakout Section 1 - Reach A: Broward and Hillsboro Basins
     - Breakout Section 2 - Reach B: Little River and Nearby Basins
     - Breakout Section 3 - Reach C: Miami River and Nearby Basins
     - Breakout Section 4 - Reach D: South Miami Basins
3. Summary — 12:00 pm to 12:30 pm
4. Closing Remarks and Reporting — 12:30 pm to 1:00 pm
5. Meeting Adjourn

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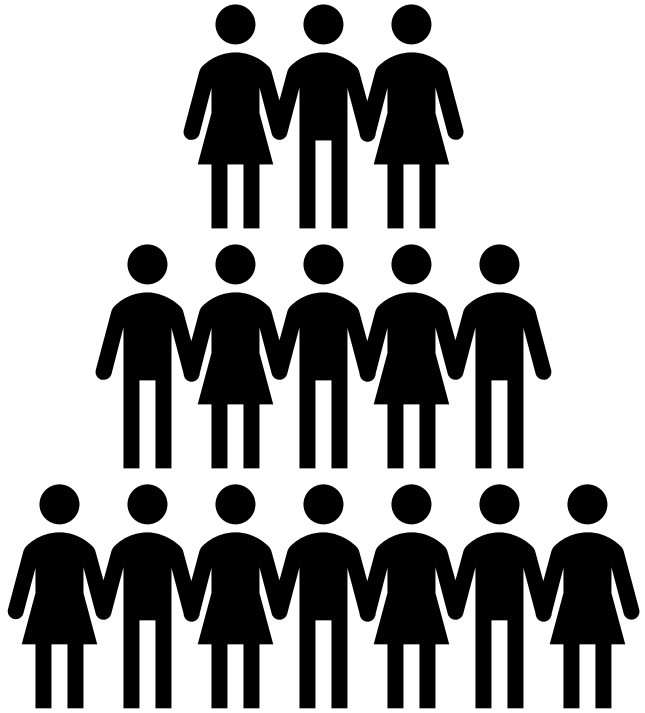

COLLABORATION!