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

Development of Preliminary Alternatives

Reach A: Broward and Hillsboro Basins

15 FEB 2023

Working Today to Build a Better Tomorrow

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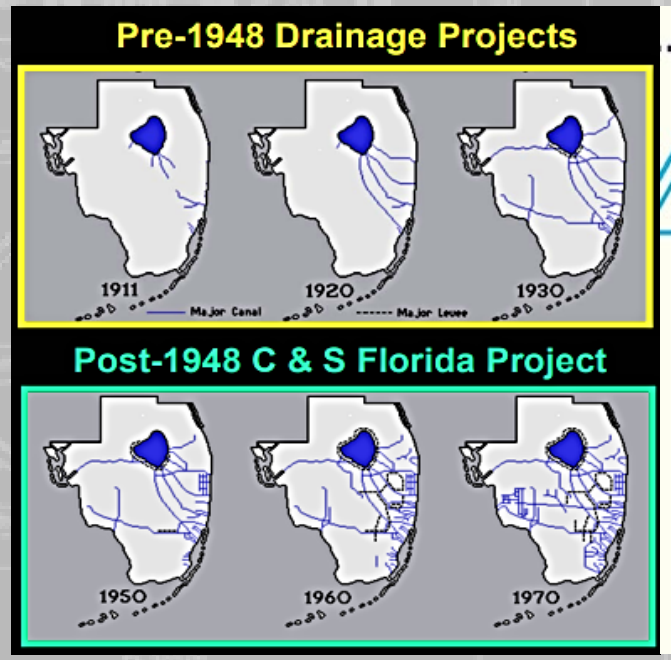


AGENDA

Meeting Purpose: Workshop will focus on development of preliminary alternatives for planning Reach A Broward and Hillsboro Basins.

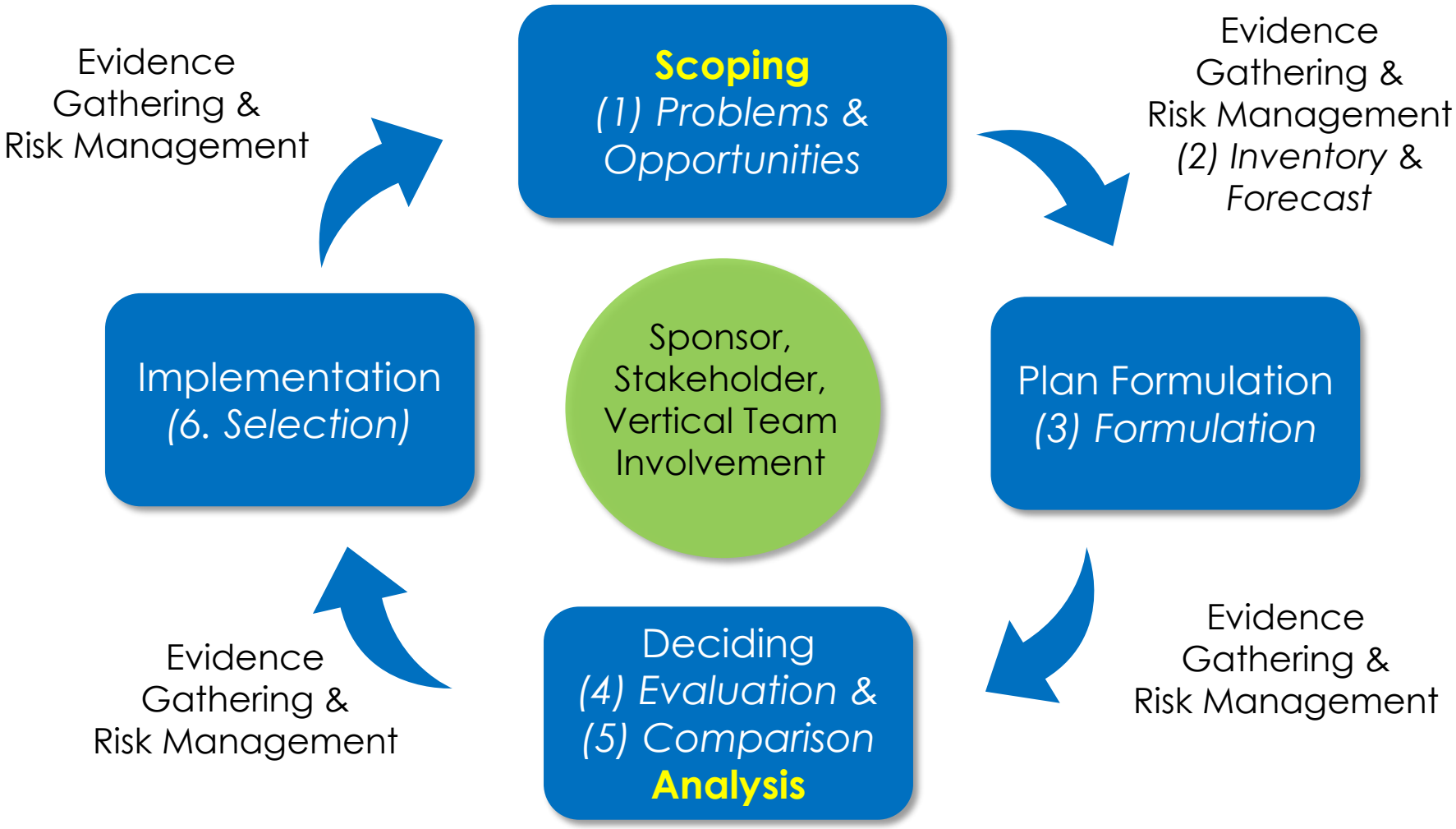
<u>Day 1: Wednesday, 15 February 2023; 9:00 am – 12:00 pm</u>

Welcome, purpose of the meeting	9:00 - 9:10am
RECAP on planning process and conceptual measures	9:10 - 9:45am
Development of Preliminary / Draft Alternatives	9:45 - 11:45am
Building alternatives (1.5 hrs)	
Reporting/Discussion (0.5 hrs)	
Closing	11:45 – 12:00pm

RECAP: PLANNING PROCESS

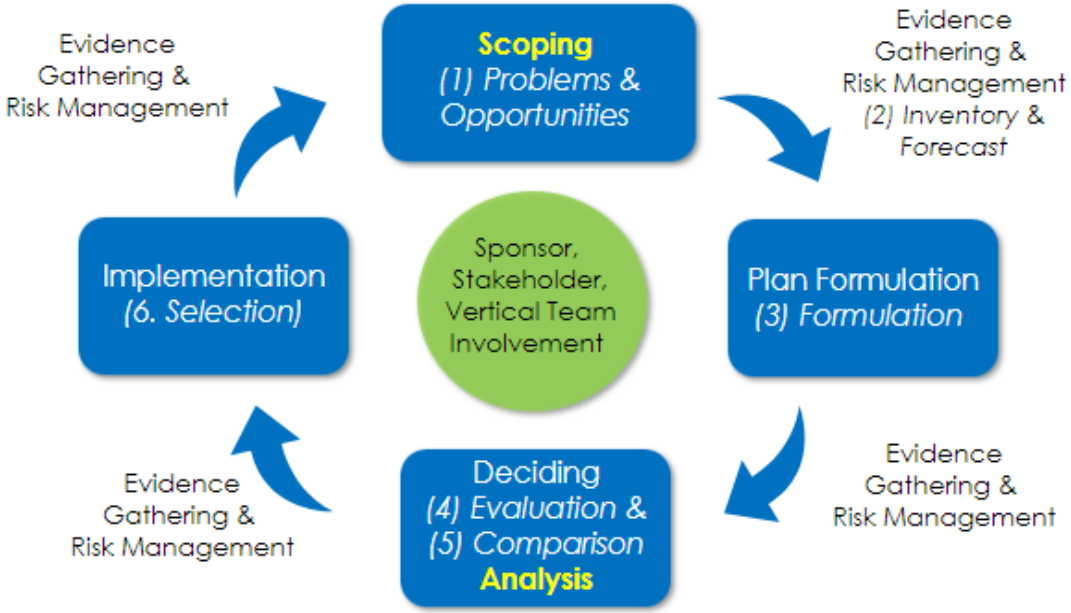
Presenter: Zulamet Vega-Liriano

RISK-INFORMED PLANNING PROCESS



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

WHERE ARE WE AT IN THE PROCESS



Scoping

★ Preliminary Array of Alternatives

Formulation

★ Initial Array of Alternatives

Alternative Evaluation

★ Focus Array of Alternatives

★ Tentative Selected Plan (TSP)

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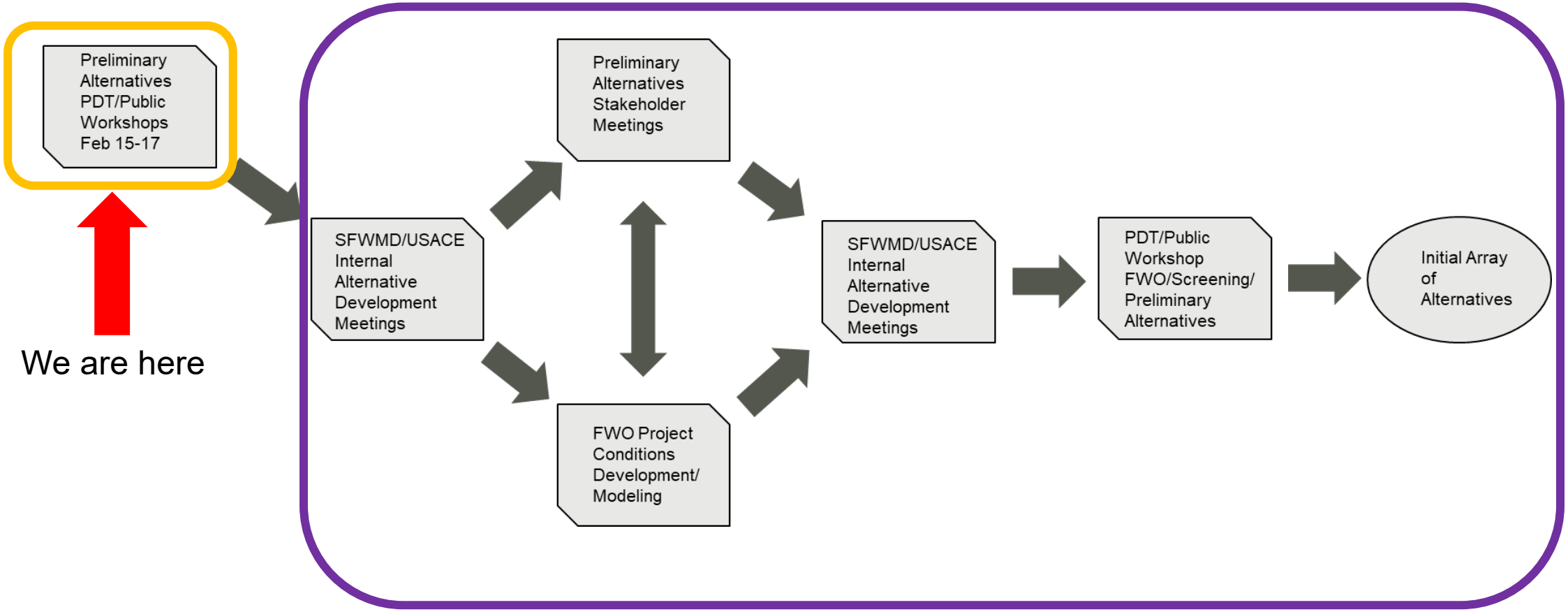
DEVELOPING INITIAL ALTERNATIVE ARRAY

Process to Get to First Round of Modeling



Scoping

Formulation Phase

CHALLENGES IN THE PROJECT AREA

Flood Risk Management challenges:

- Flood risk due to a combination of factors such as runoff, storm surge, high tides, groundwater, and sea level rise.
- Life safety risk due to a combination of factors such as runoff, storm surge, high tides, groundwater, and sea level rise.

Additional challenges:

- Minimize negative impacts to other Federal water resources projects in the study area (integration) (i.e., Everglades, BBSEER, Miami Backbay)
- Land availability
- Social equity – Older developments sit in lower elevations
- Impacts to cultural and historical resources
- Avoid transferring flood risk from one community/basin to another.
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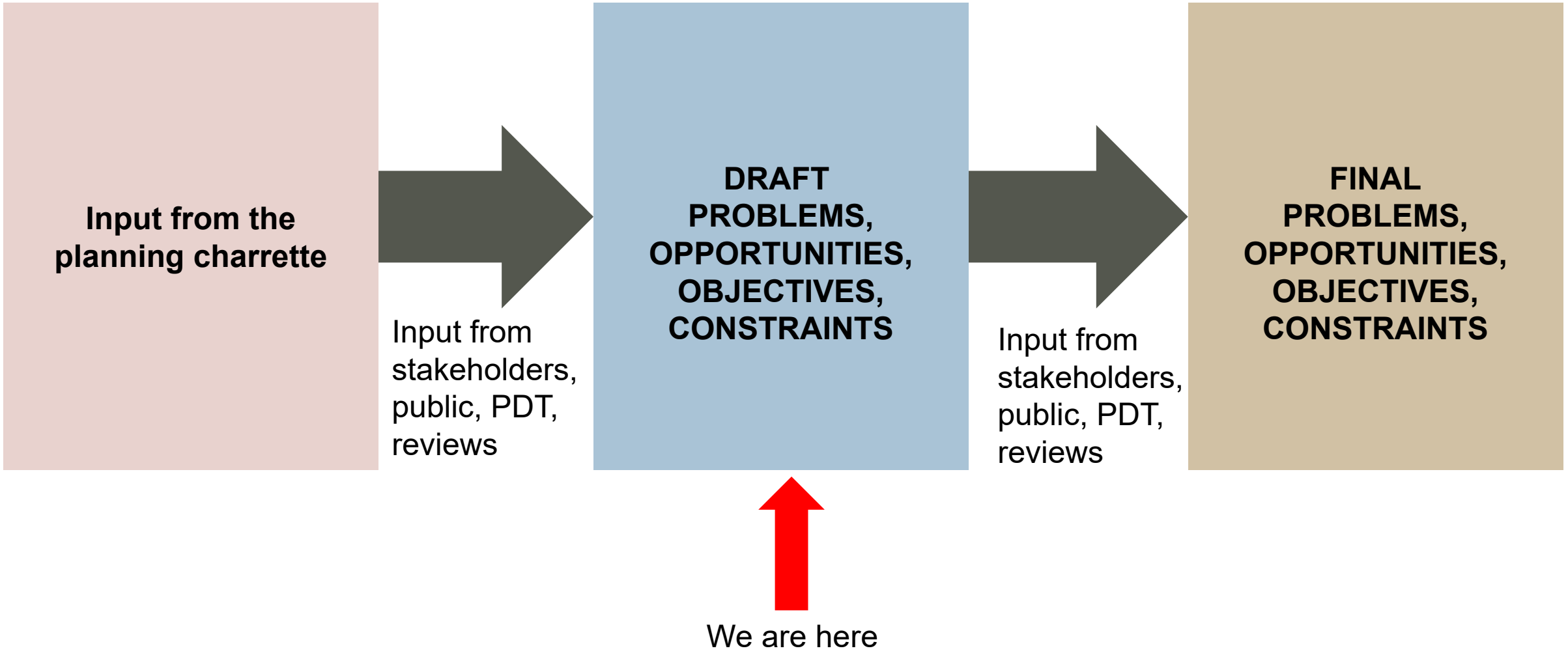
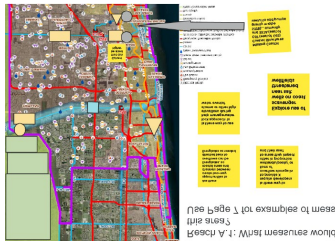
RECAP: PROBLEMS, OPPORTUNITIES, OBJECTIVES AND CONSTRAINTS

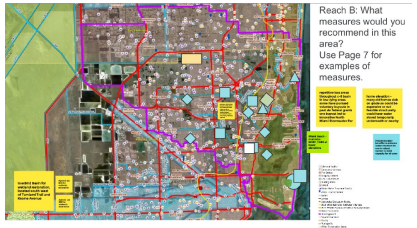


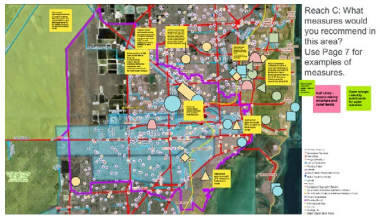
MEASURES INPUT DURING CHARRETTE

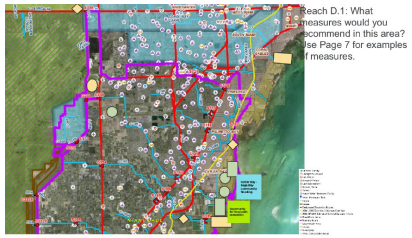
In person - Input

Virtual - Input

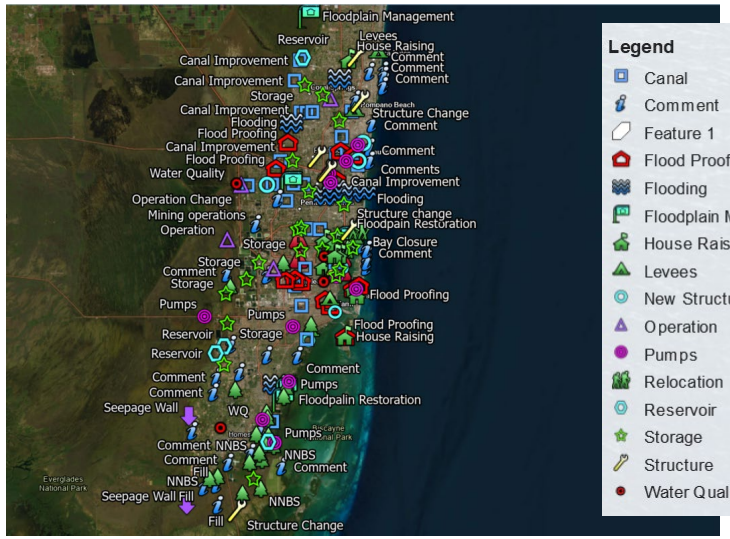








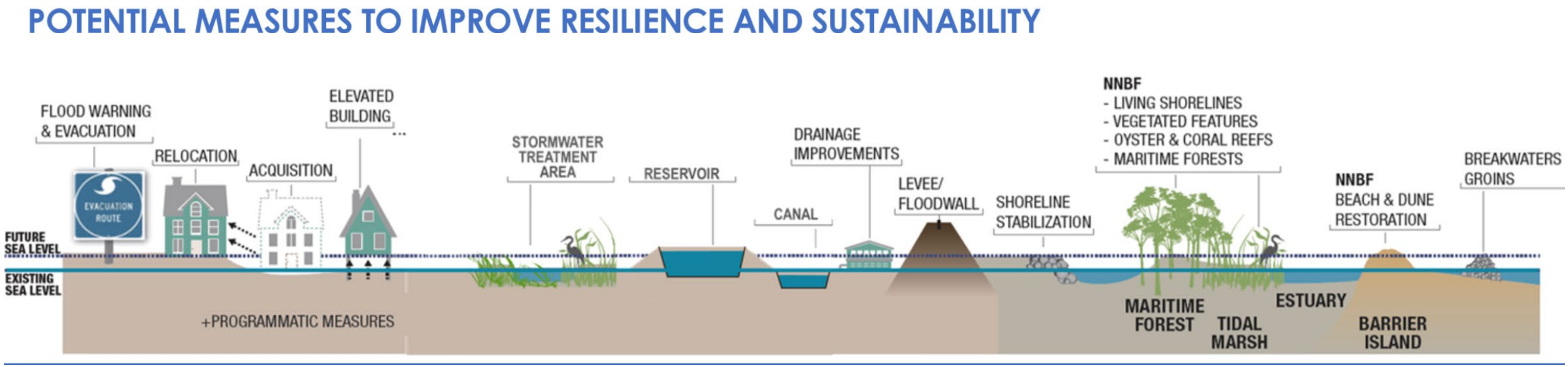
Combined - Input



FLOOD RISK MANAGEMENT (FRM) MEASURES

Type of measures:

- **Structural (S)**
- **Non-Structural (NS)**
- **Natural and Nature-Based Features (NNBF)**

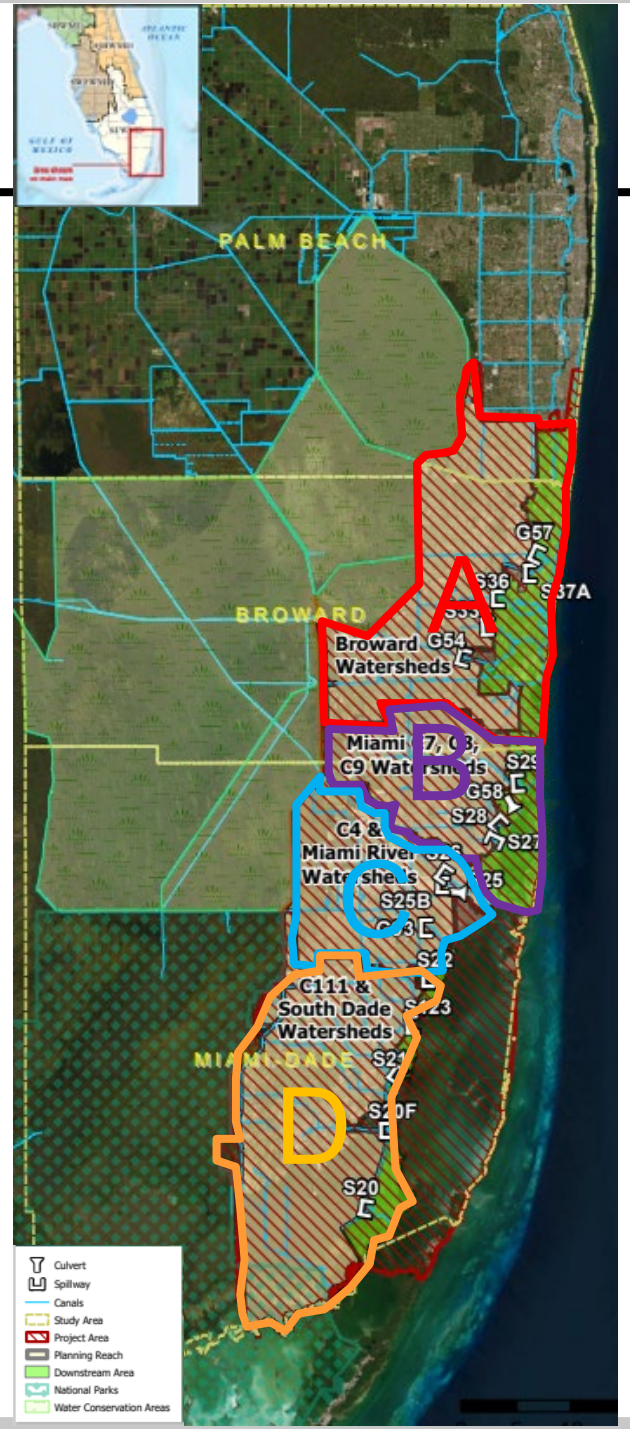


Graphic modified from https://ewn.el.erdc.dren.mil/nnbf/other/5_ERDC-NNBF_Brochure.pdf

PLANNING FOCUS AREAS

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

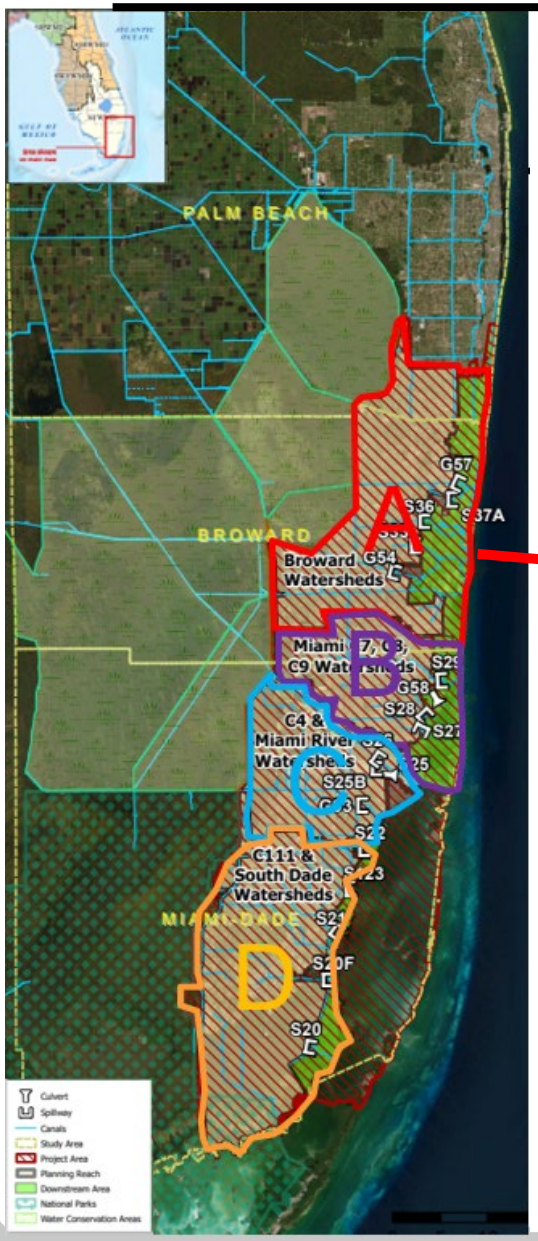
- Reach A: Broward and Hillsboro Basins
- Reach B: Little River and Nearby Basins
- Reach C: Miami River and Nearby Basins
- Reach D: South Miami Basins

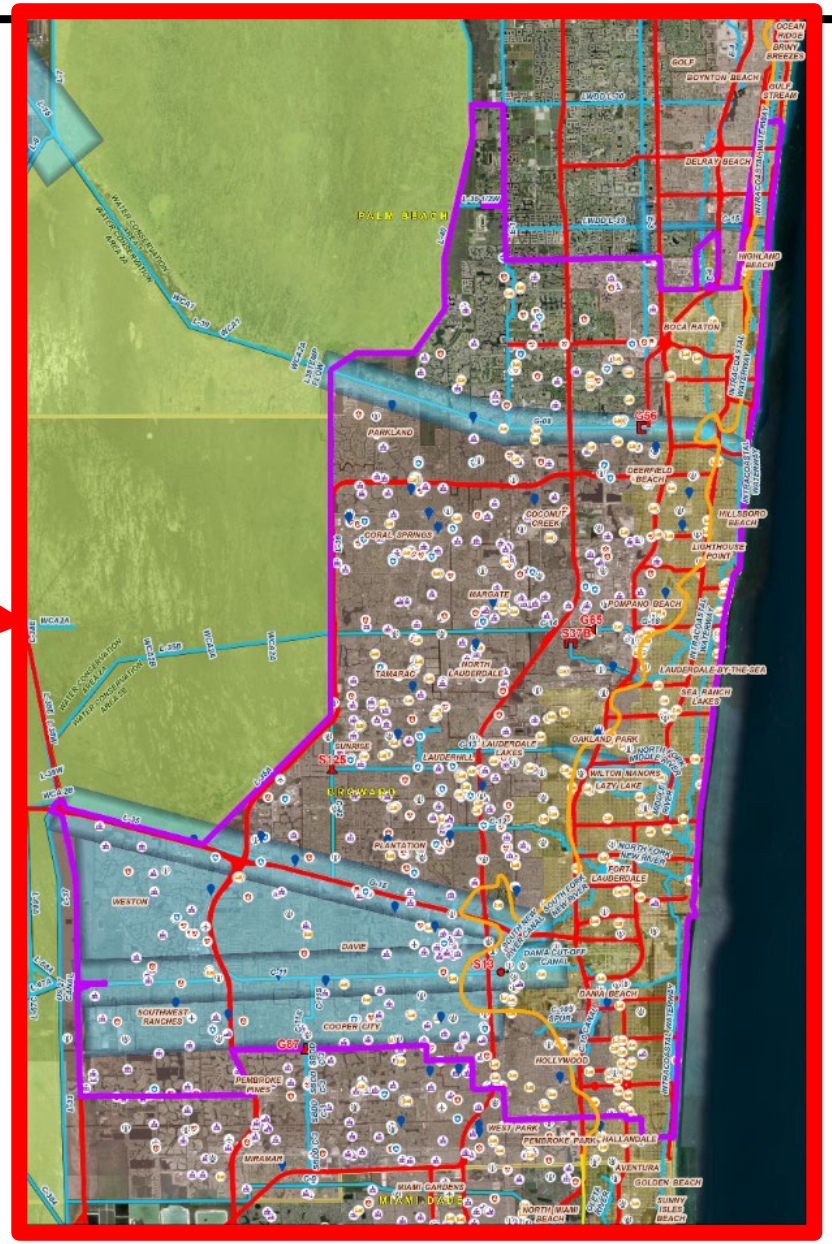


REACH A: BROWARD AND HILLSBORO BASINS

Presenter: Zulamet Vega-Liriano

REACH A: BROWARD AND HILLSBORO BASINS



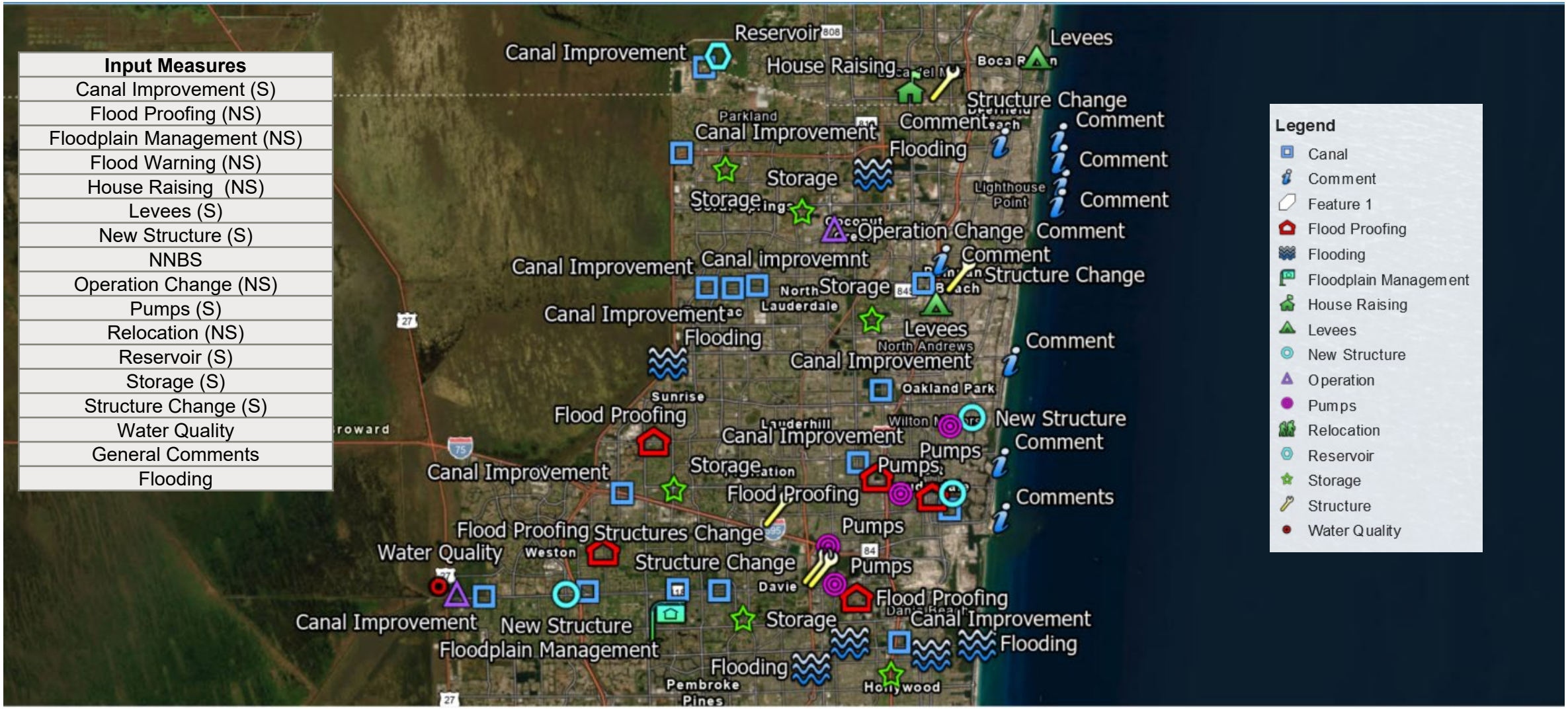


RECAP: CONCEPTUAL MANAGEMENT MEASURES – REACH A

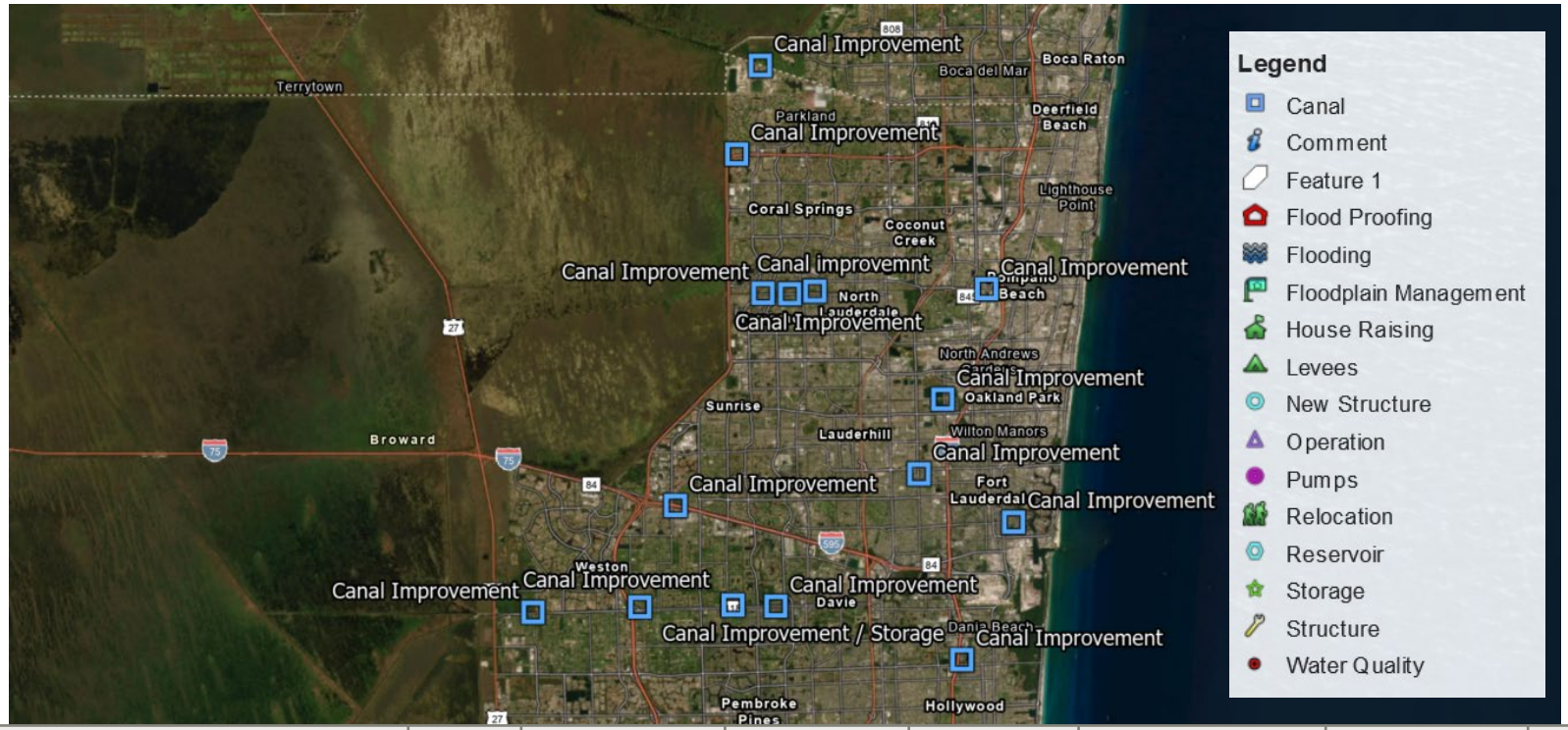
Presenter: Gustavo Suarez-Narvaez

COMBINED DRAFT INPUT FOR REACH A: BROWARD AND HILLSBORO BASINS

Input Measures
Canal Improvement (S)
Flood Proofing (NS)
Floodplain Management (NS)
Flood Warning (NS)
House Raising (NS)
Levees (S)
New Structure (S)
NNBS
Operation Change (NS)
Pumps (S)
Relocation (NS)
Reservoir (S)
Storage (S)
Structure Change (S)
Water Quality
General Comments
Flooding

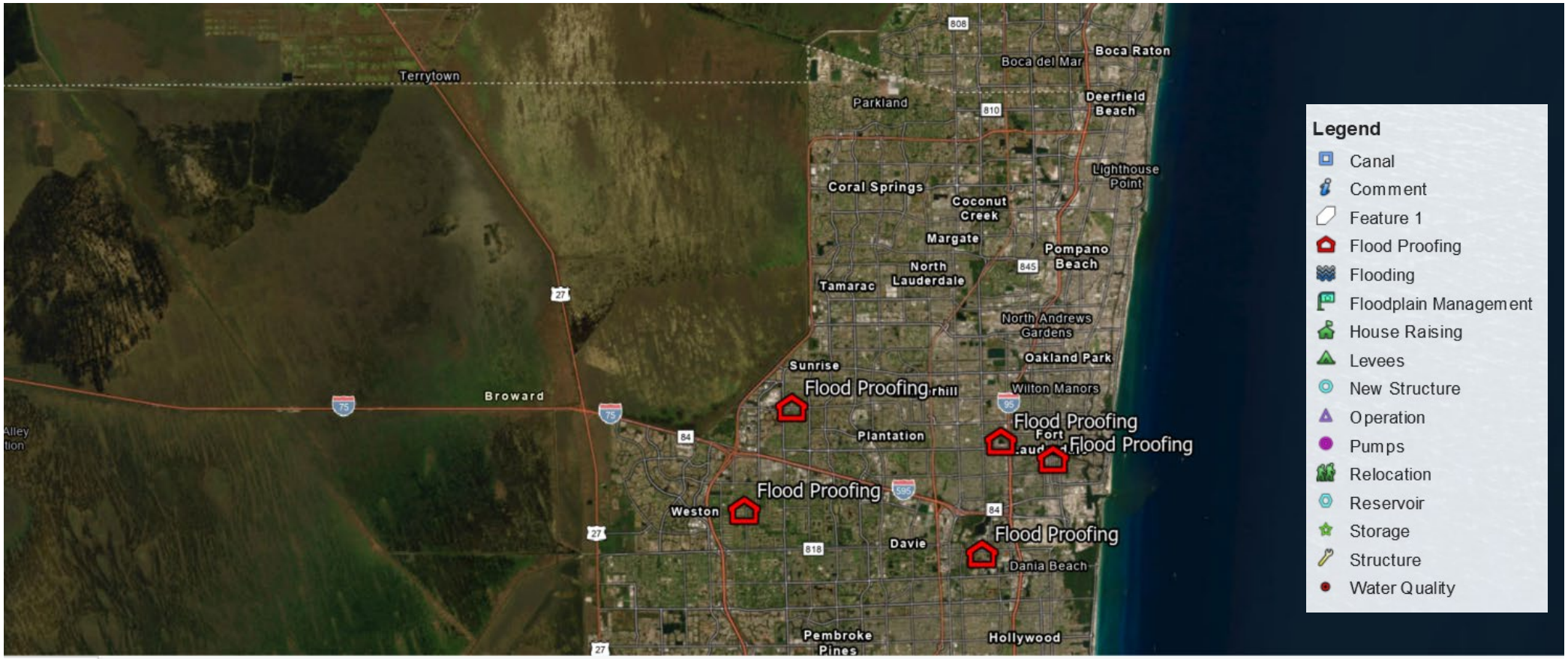


COMBINED DRAFT INPUT FOR REACH A: BROWARD AND HILLSBORO BASINS (CONT.)



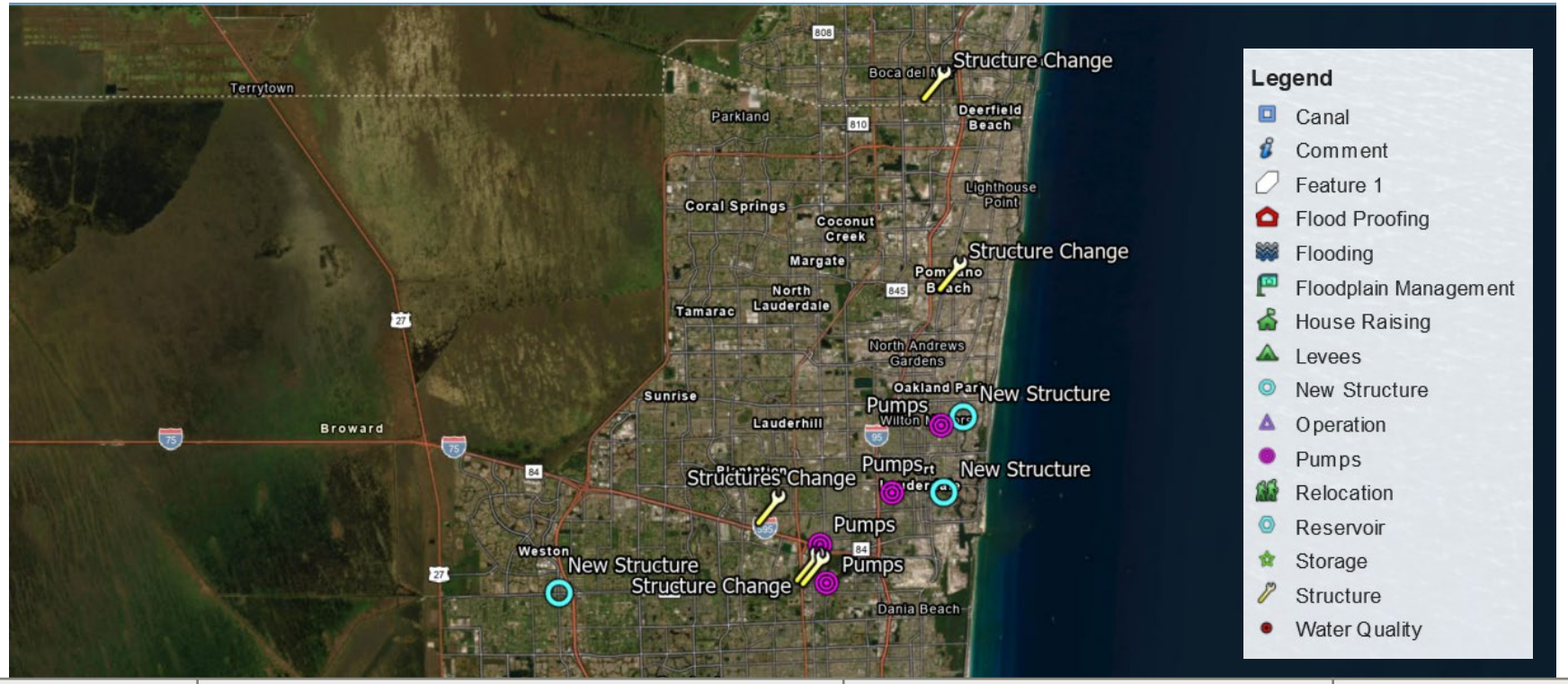
Canal Improvement (S)	C-11 Canal Increase cross-sections of 1o canal for conveyance/storage Elevate banks Increase conveyance in secondary and tertiary system canals and canal's crossing improvement expansion of the C-11 capacity/discharge Use of the existing green public space on what floods by design	G-15 Canal	C-15	C-14	G-08	Secondary System 2o canal improvement as part of CERP	C-10 Spur canal secondary flow for recovery at low tide	C-13	C-12	New River Elevate bank of flow ways downstream of discharge points

COMBINED DRAFT INPUT FOR REACH A: BROWARD AND HILLSBORO BASINS (CONT.)



Flood Proofing (NS)	Emerald Hills	Melrose Manors	Harbordale	Plantation Acres	Weston	Malaleuca Isle

COMBINED DRAFT INPUT FOR REACH A: BROWARD AND HILLSBORO BASINS (CONT.)



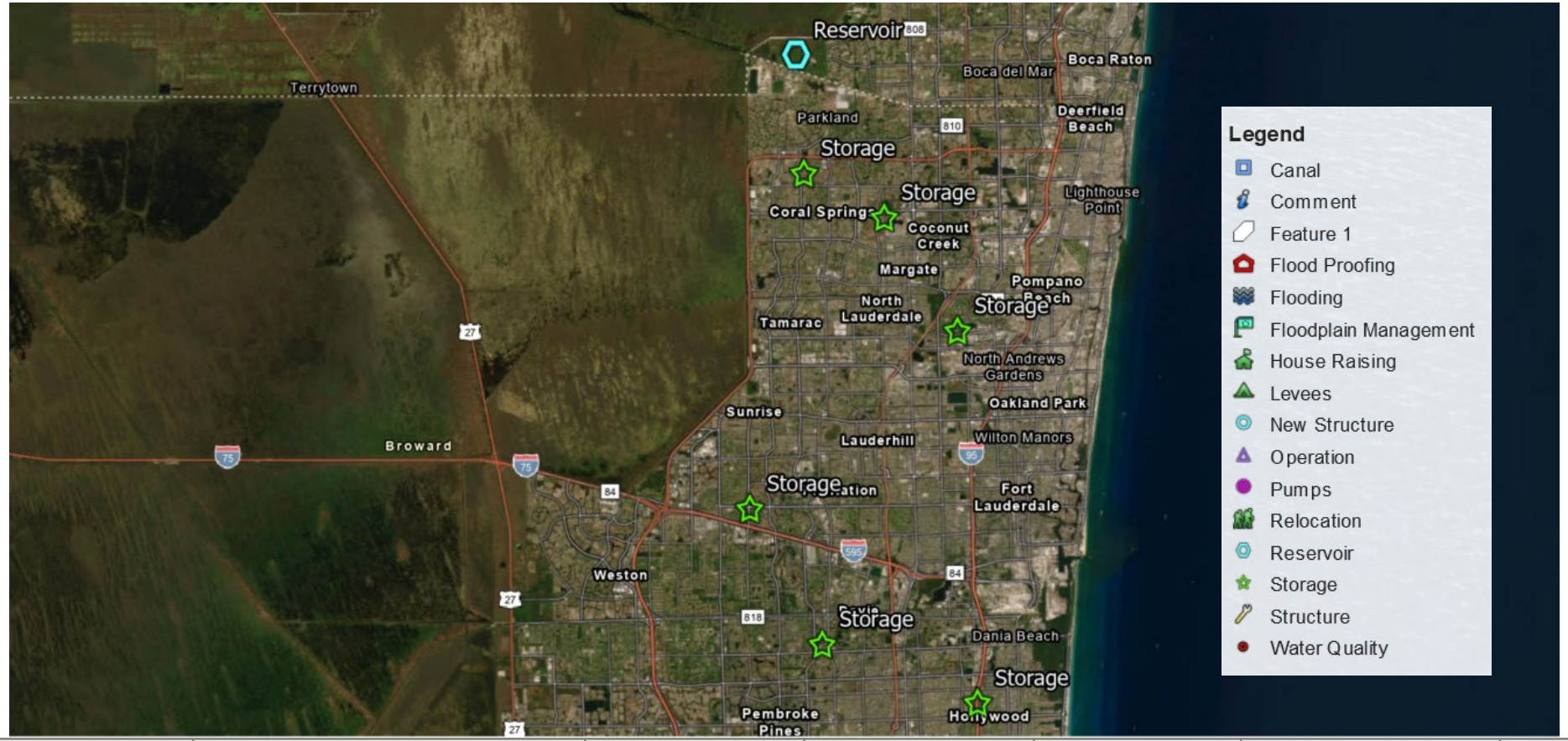
New Structure (S)	C-11 Canal Additional structure in C-11 separating SBDD Weston from CBWCD so that higher stages from other districts don't impact those relying on gravity discharge	New River Add federally supported pumping system in coastal communities to mitigate discharges from the C&SF system	Middle River Add structures (e.g. storm surge 2o pump)	
Operation Change (NS)	Cocomar Cocomar GW recharge with pre-storm drawdown under automatization for efficiency	WPA C-11 & C-9 Optimize design and operation of Broward County WPA CERP project to improve C-11 and C-9 max stages		
Pumps (S)	South Fork Middle River	G-15	North Fork New	C-11
Structure Change (S)	Secondary System	G-56	S-13	

DRAFT INPUT FOR REACH A: BROWARD AND HILLSBORO BASINS (CONT.)

Additional Input

Project Name	Basin
Structure S-37B improvements	Broward County
Add gates / pumps on the secondary system	Broward County
Raise levees at selected locations on the C-14 Canal	Broward County
Canal dredging in areas with significant head loss	Broward County
Raise levees on the Cypress Creek Canal	Broward County
Canal dredging in areas with significant head loss	Broward County
Culvert Modification	Broward County
Divert Water Through C-14 West / C-14 East Basin	Broward County
Raise levees along the C-13 Canal and add gates / pumps on secondary branches	Broward County
Structure Operation Modification	Broward County
Raise Levees at Select Location(s)	Broward County
Canal dredging in areas with significant head loss	Broward County
Lower water control elevation of primary canal	Broward County
Improve C-11 conveyance capacity / operation modification	Broward County
Add gates / pumps to the secondary system	Broward County
Use the existing inter-basin connection with C-11 East	Broward County
Structure S-13 Improvements Option 1	Broward County
Structure S-13 Improvements Option 2	Broward County
Add Gates / Pumps to the Secondary System	Broward County

COMBINED DRAFT INPUT FOR REACH A: BROWARD AND HILLSBORO BASINS (CONT.)



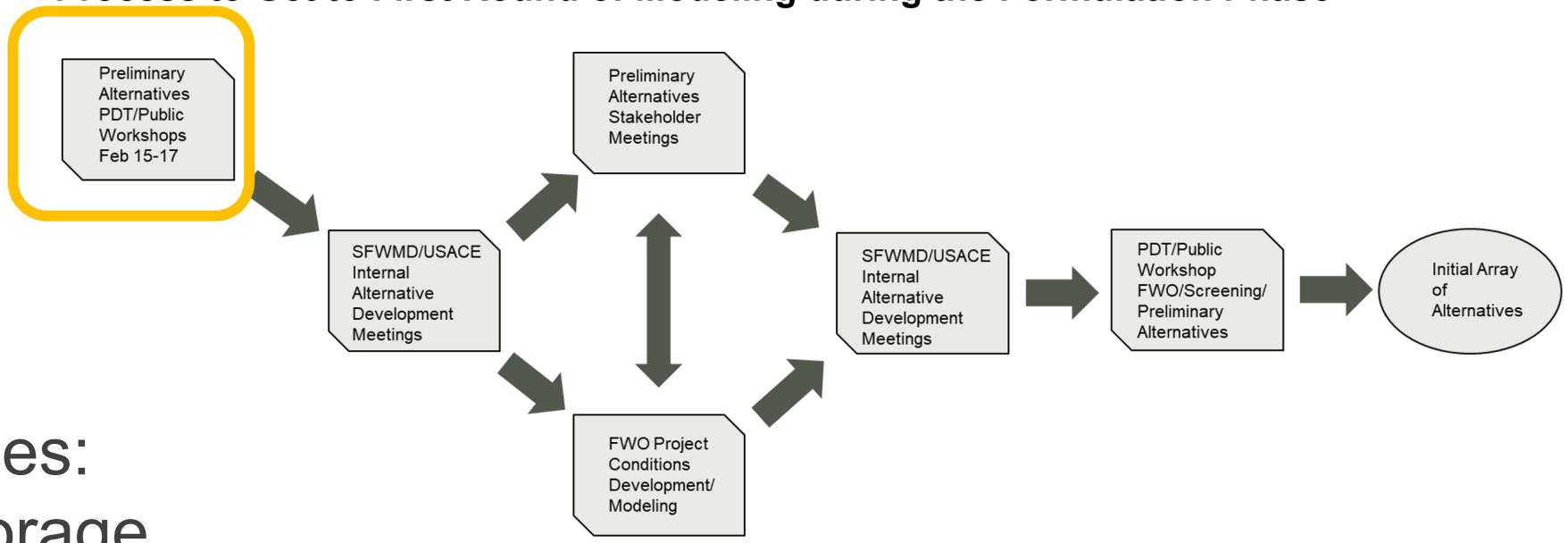
Reservoir (S)	North Of G-08 Canal					
Storage (S)	Consequence stormwater impacts from street flooding. Measure - below ground/road retention detention	Direct flows to FPL easements - opportunity for storage - green ways	Golf courses for water storage	Nursery acquisition for storage	Retrofit, diversify, modify existing municipal/city green space for storage (e.g. schools and parks)	Storage opportunities along Turnpike in Hollywood reservation

ALTERNATIVE DEVELOPMENT: PRELIMINARY INITIAL ARRAY OF ALTERNATIVES

Presenter: Zulamet Vega-Liriano

SCOPING: ALTERNATIVES FORMULATION

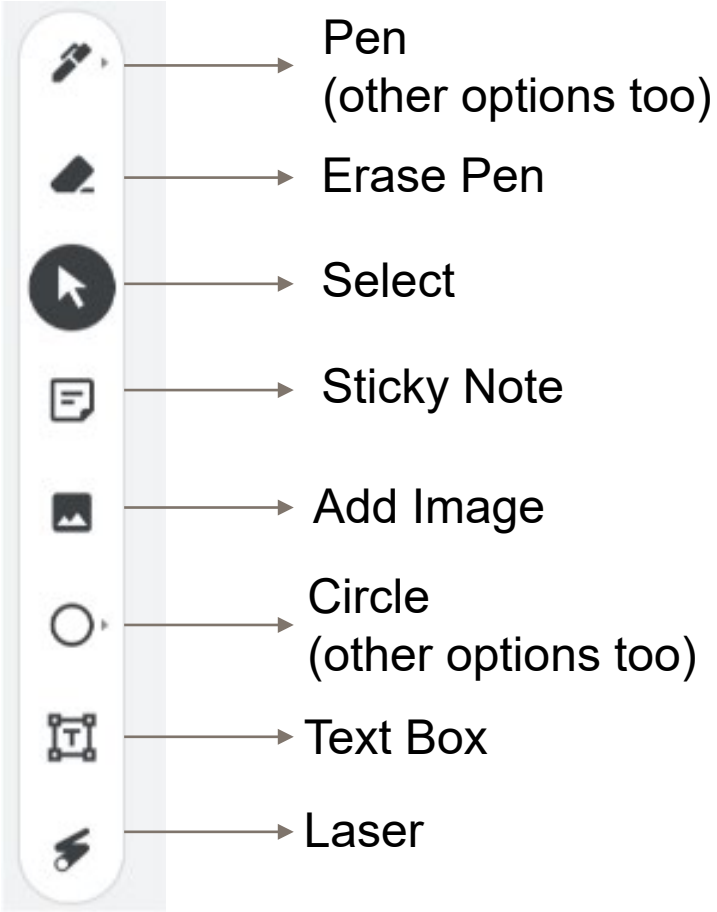
Process to Get to First Round of Modeling during the Formulation Phase



- Four general themes:
  - Structural - Storage
  - Structural - Conveyance
  - Nonstructural
  - Natural and Nature Base Features (NNBF) – Storage and Conveyance

HOW DO YOU EDIT JAMBOARD?

- Main editing tools (white bar with symbols below) are located on the left-hand of your screen.
- Move your cursor to it and left-click to pick a tool.



For this exercise, you will copy a measure from Page 7 and add it to any of the reaches.

- To copy shape, left click to select shape and hit Ctrl + C
- To paste shape, left click on page and hit Ctrl+V
- To add a note, use Sticky Note and/or Text Box

EXAMPLE FEATURES FOUND IN JAMBOARD

To copy shape, left click to select shape and hit Ctrl+C

Structural Measures Examples

- Reservoir/Storage
- Structure Change
- Levees and Floodwalls
- Pumps
- New Structure
- Channel Improvements

Nonstructural Measures Examples

- Flood Proofing
- House Raising
- Relocation
- Flood Warning
- Floodplain Management
- Operational Change

Natural and Nature-Based Features Examples

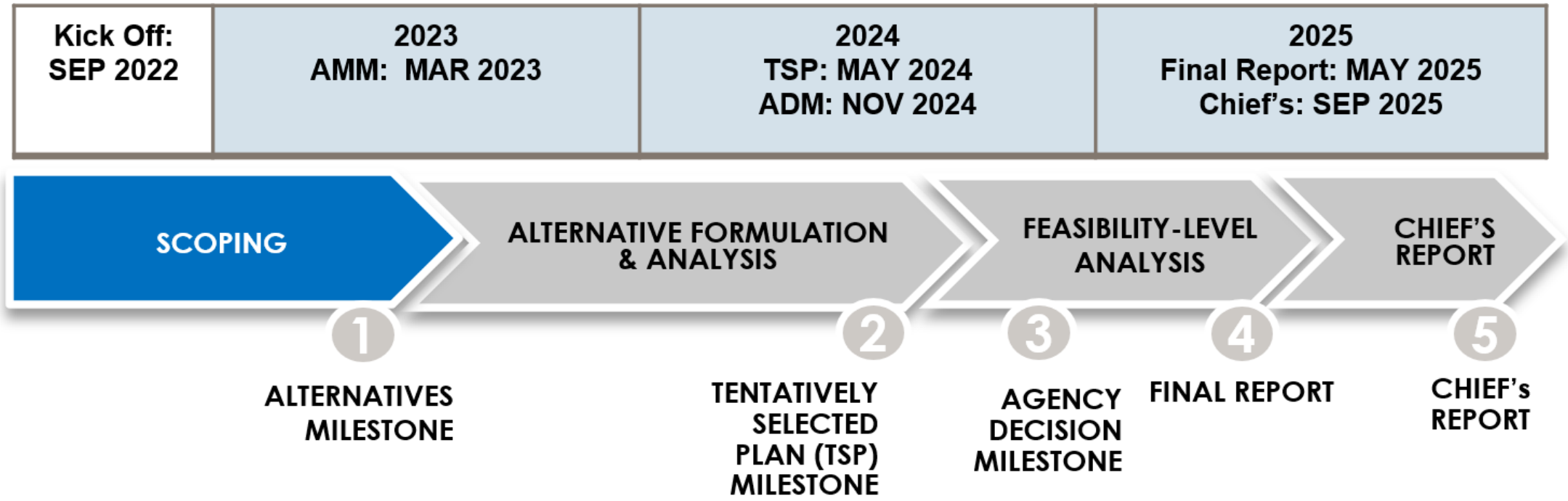
- Fresh Water Wetlands
- Floodplains Restoration
- Distributed Storage
- Raingarden
- Wetland Restoration

To paste shape, left click on page and hit Ctrl+V

FUTURE ENGAGEMENTS

Presenter: Tim Gysan

TIMELINE AND ENGAGEMENT OPPORTUNITIES



Note: Schedule is following 3x3x3 but will be subject to change based on team's discussions.

THANK YOU!

COMMENTS TO BE RECEIVED BY EMAIL AT
CSFFRSCOMMENTS@USACE.ARMY.MIL

VISIT OUR WEBSITES FOR MORE UPDATES AND STUDY DETAILS

USACE:
WWW.SAJ.USACE.ARMY.MIL/CSFFRS

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

Development of Preliminary Alternatives

Reach B: Little River and Nearby Basins

15 FEB 2023

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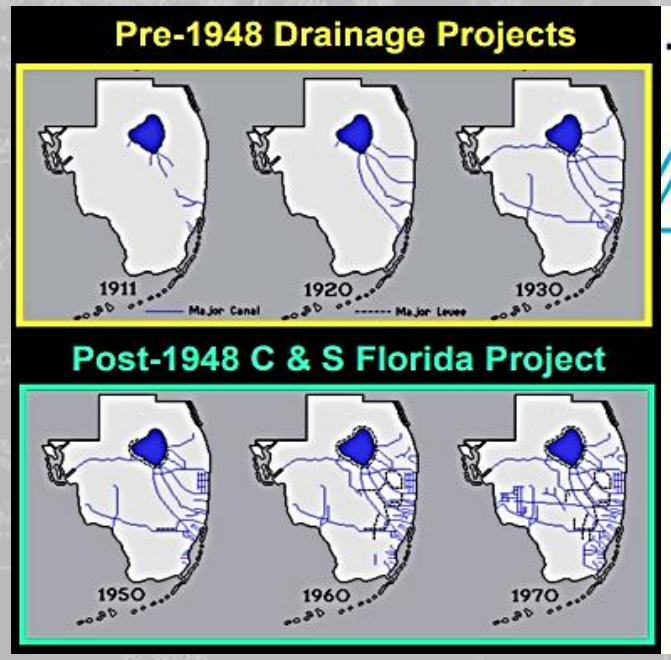

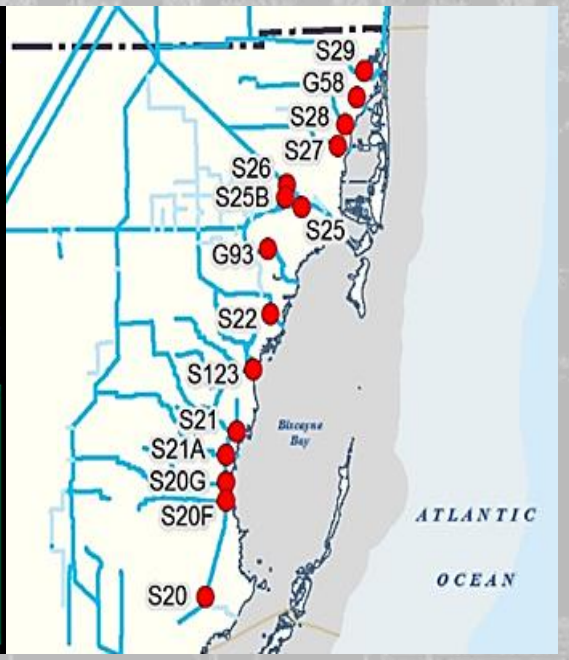

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SOUTH FLORIDA WATER MANAGEMENT DISTRICT

AGENDA

Meeting Purpose: Workshop will focus on development of preliminary alternatives for planning Reach B Little River and Nearby Basins .

<u>Day 1: Wednesday, 15 February 2023; 1:00 pm – 4:00 pm</u>

Welcome, purpose of the meeting	1:00 - 1:10pm
RECAP on planning process and conceptual measures	1:10 - 1:45am
Development of Preliminary / Draft Alternatives	1:45 - 3:45pm
Building alternatives (1.5 hrs)	
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Presenter: Zulamet Vega-Liriano

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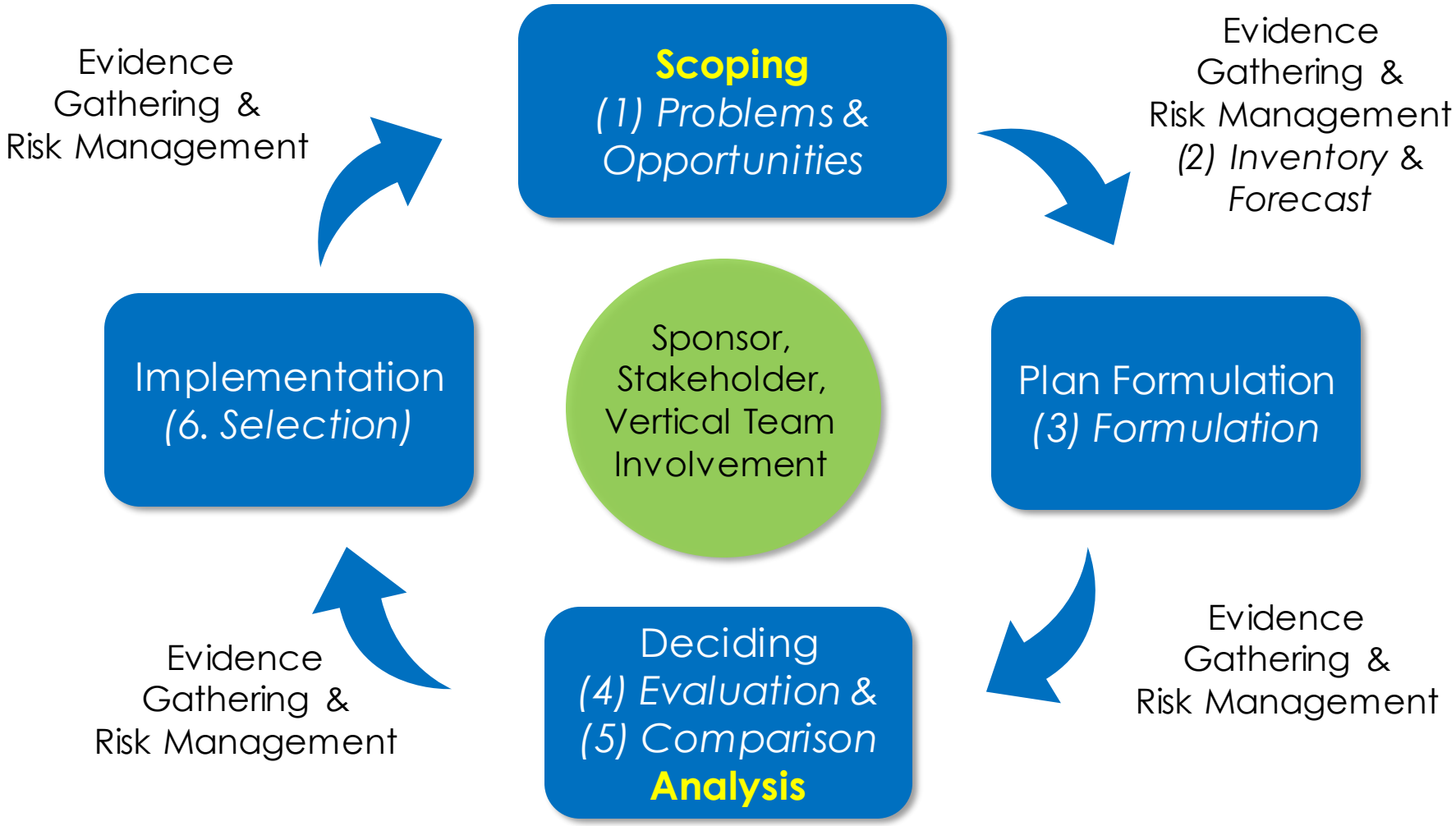

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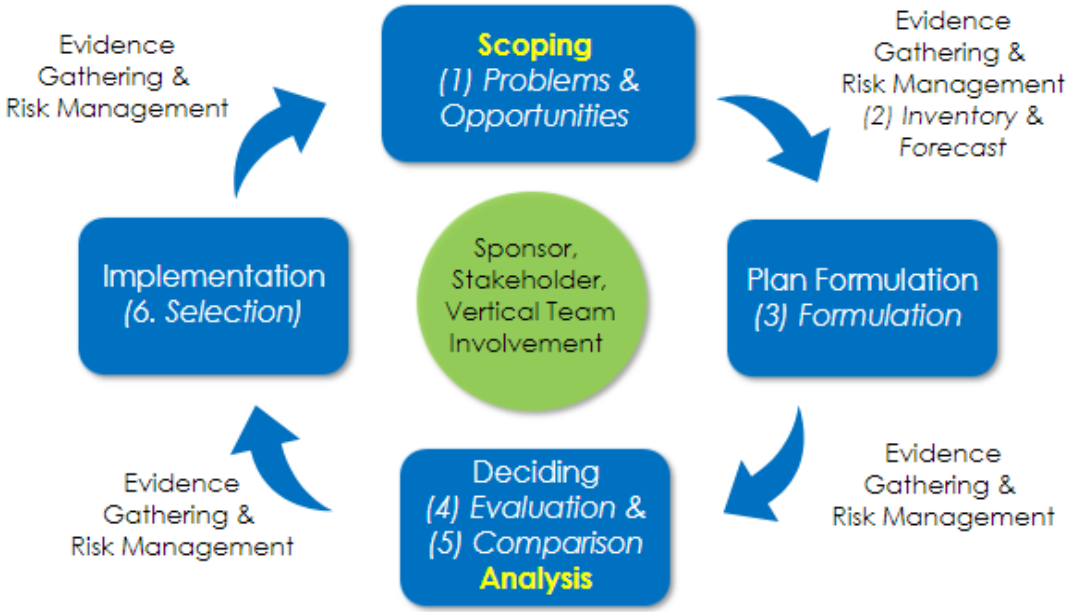

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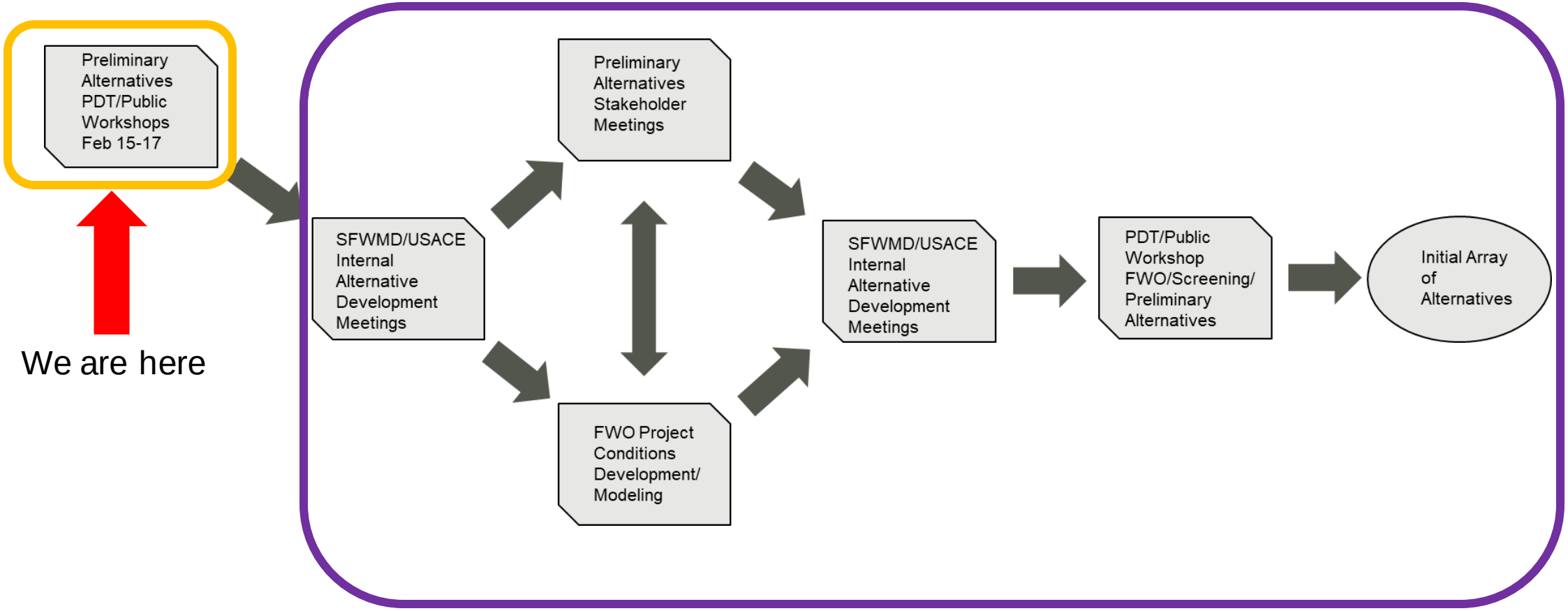

Scoping

Formulation Phase

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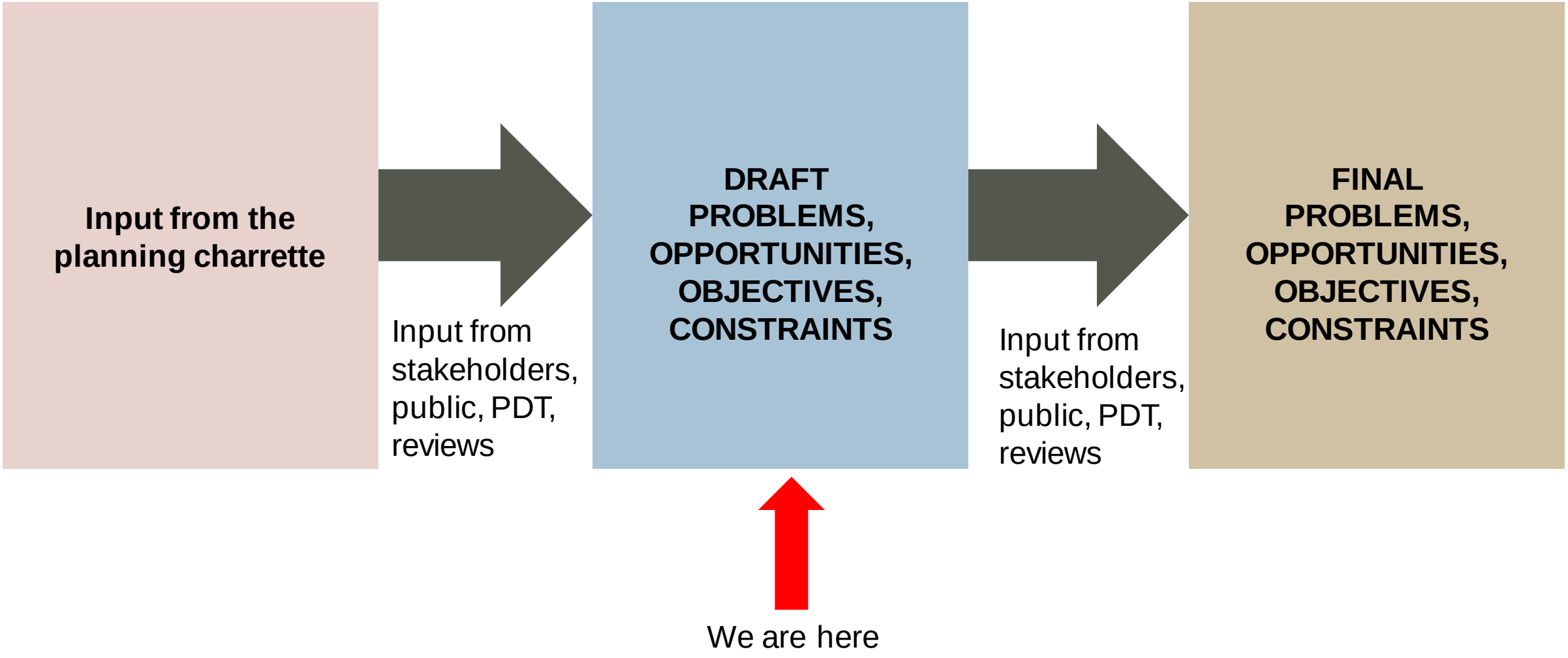

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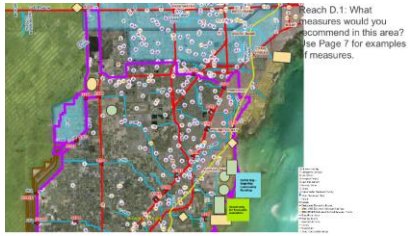

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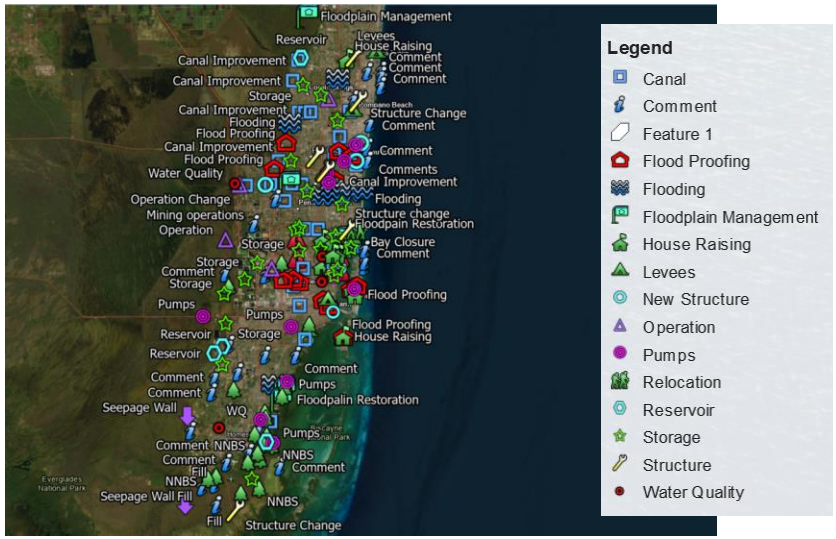
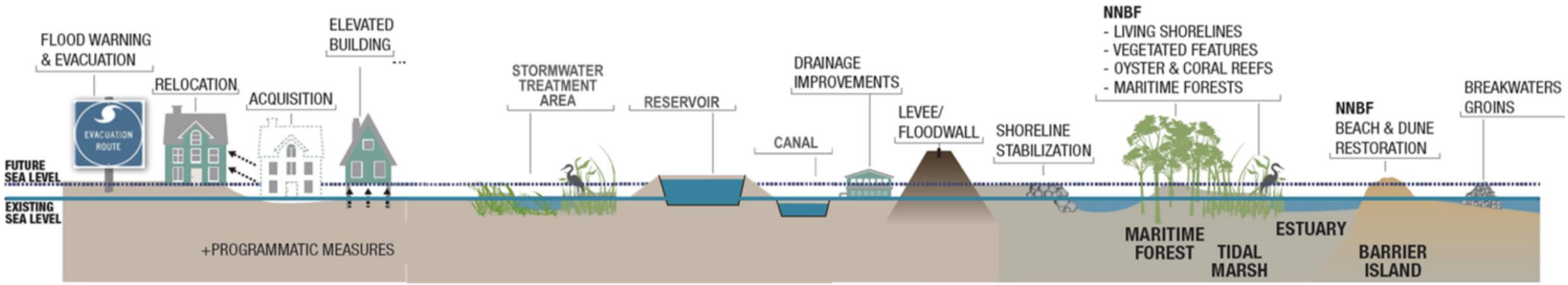


FLOOD RISK MANAGEMENT (FRM) MEASURES

Type of measures:

- **Structural (S)**
- **Non-Structural (NS)**
- **Natural and Nature-Based Features (NNBF)**

POTENTIAL MEASURES TO IMPROVE RESILIENCE AND SUSTAINABILITY



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- Reach B: Little River and Nearby Basins
- Reach C: Miami River and Nearby Basins
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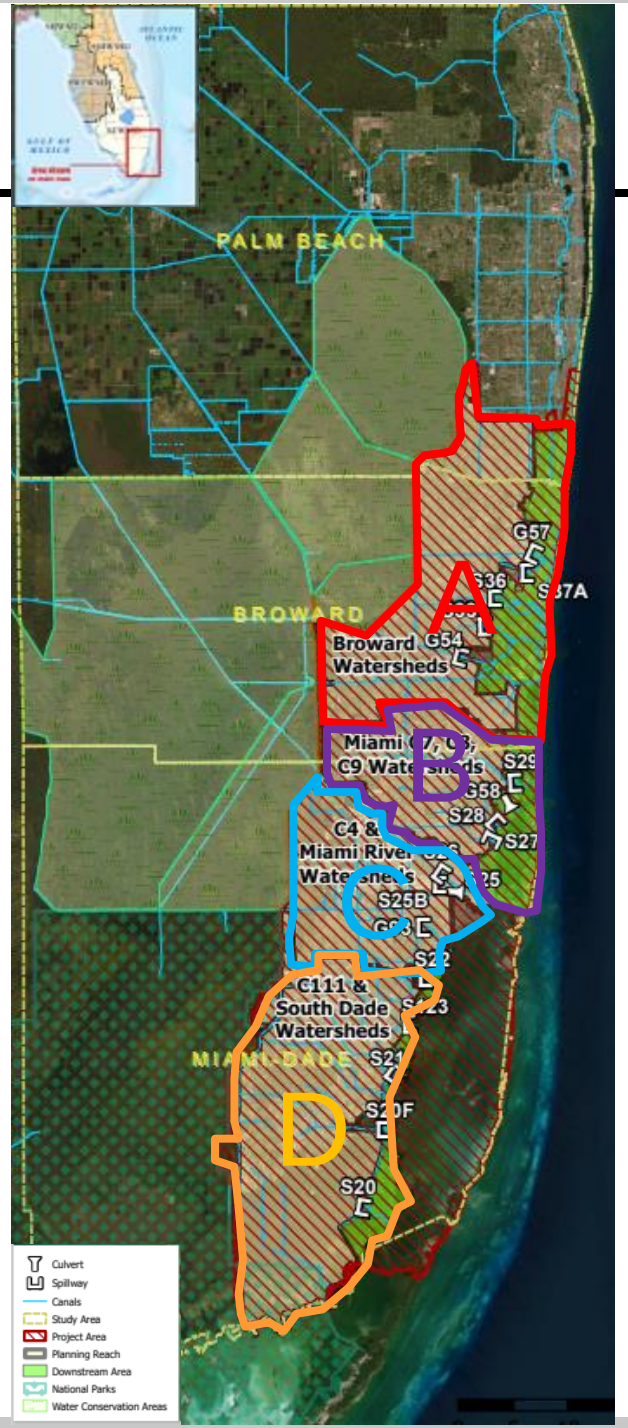
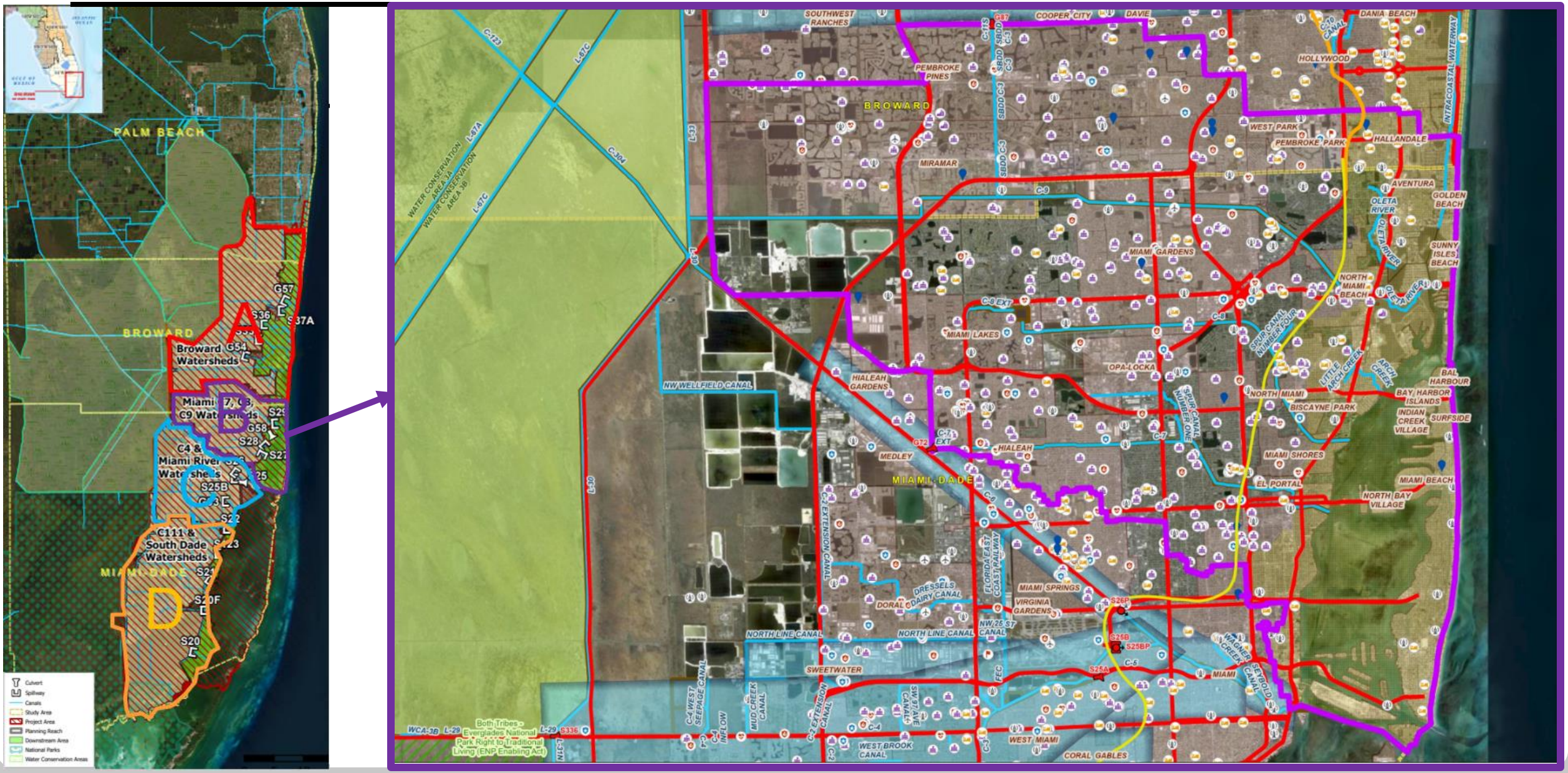


REACH B: LITTLE RIVER AND NEARBY BASINS

Presenter: Zulamet Vega-Liriano

REACH B: LITTLE RIVER AND NEARBY BASINS

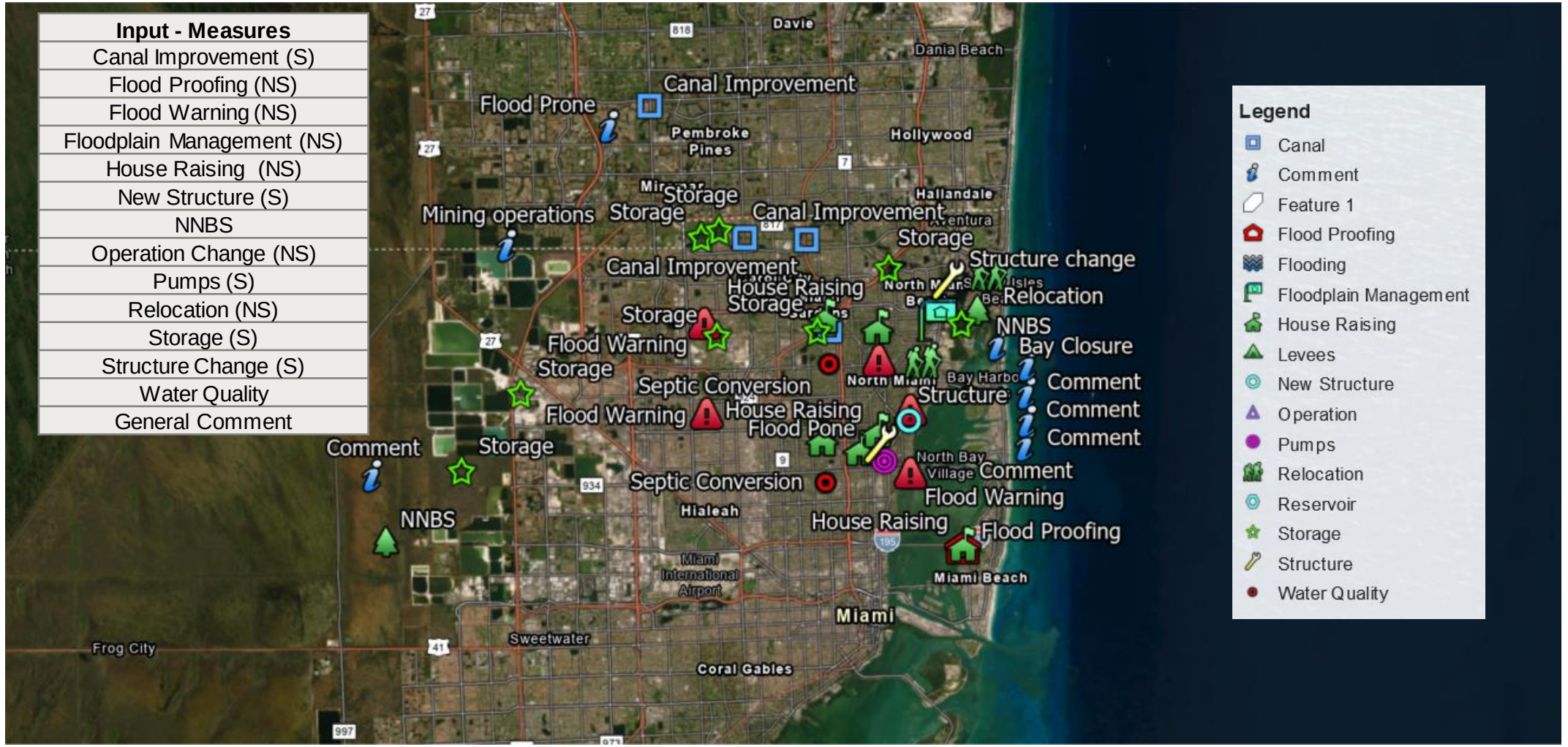


RECAP: CONCEPTUAL MANAGEMENT MEASURES – REACH B

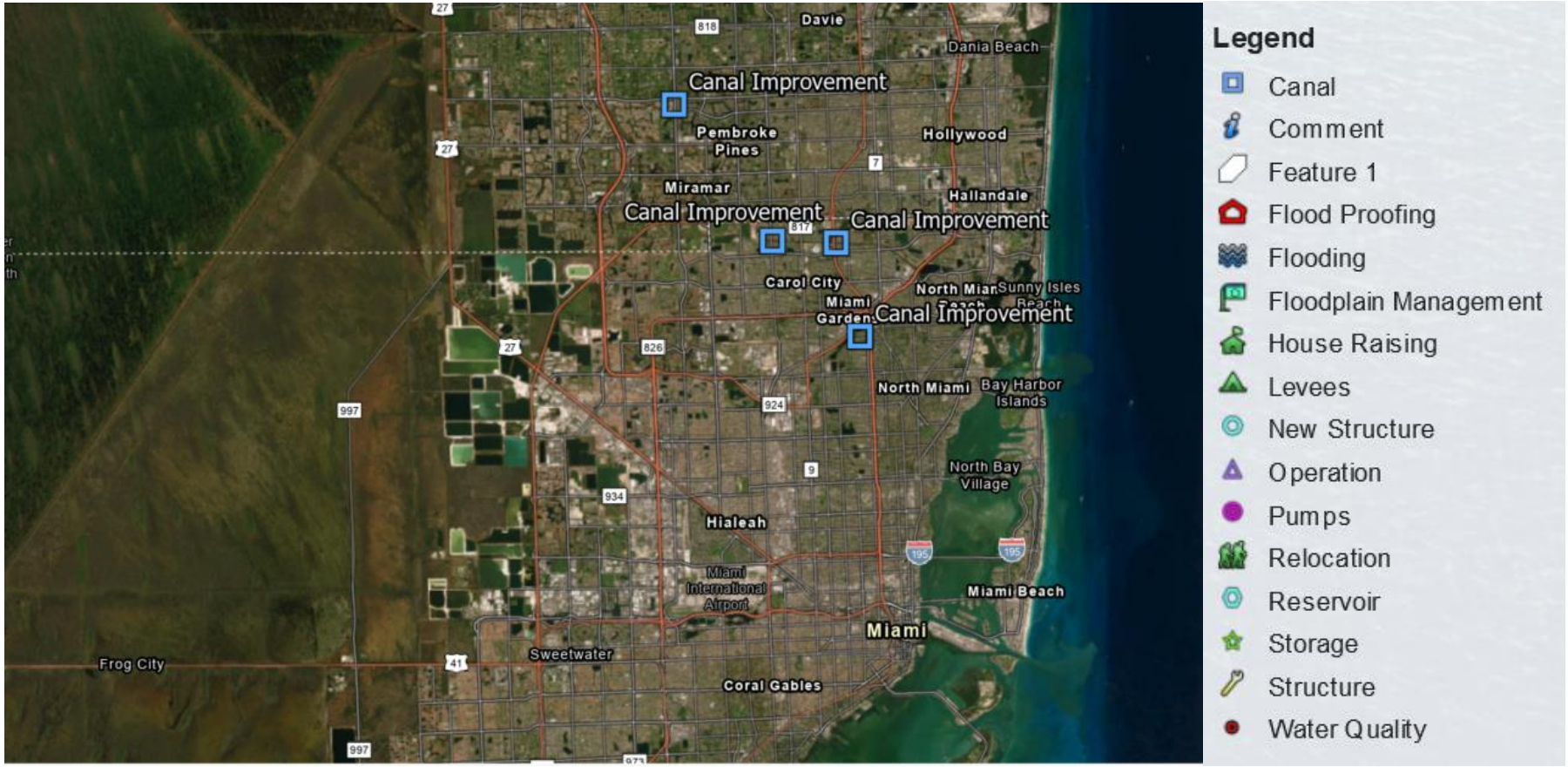
Presenter: Gustavo Suarez-Narvaez

COMBINED DRAFT INPUT FOR REACH B: LITTLE RIVER AND NEARBY BASINS

Input - Measures
Canal Improvement (S)
Flood Proofing (NS)
Flood Warning (NS)
Floodplain Management (NS)
House Raising (NS)
New Structure (S)
NNBS
Operation Change (NS)
Pumps (S)
Relocation (NS)
Storage (S)
Structure Change (S)
Water Quality
General Comment



COMBINED DRAFT INPUT FOR REACH B: LITTLE RIVER AND NEARBY BASINS (CONT.)

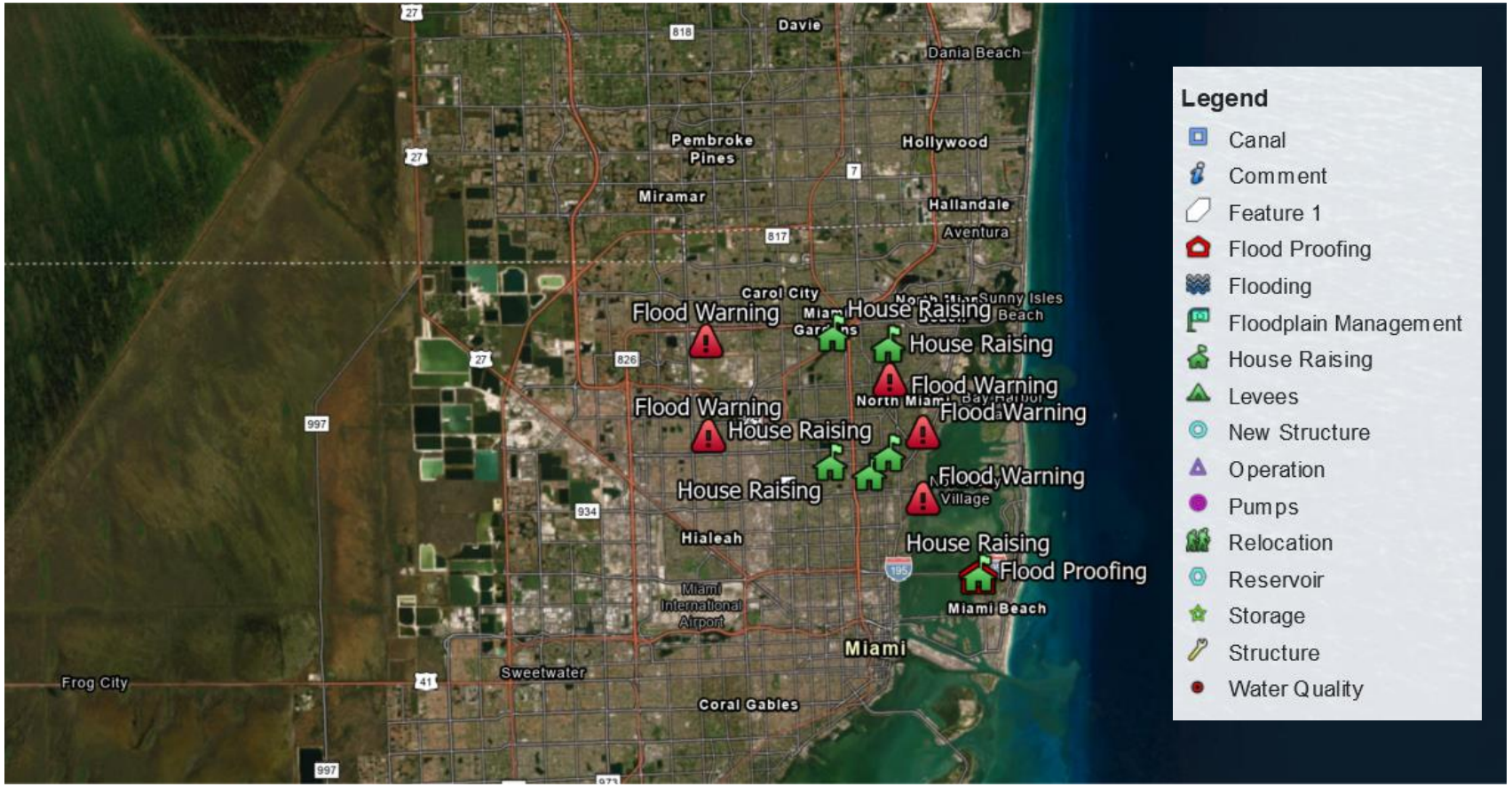


Canal Improvement (S)	C-9 In canal storage	C-3	C-8 Focus on widening vs. deepening	Canal improvement as part of CERP	C-7 Create water storage upstream of S-27 on the C-7 to prevent the multi day piled up of water that happens on the upstream side of the S-27 in the El Portal/Little River area	Secondary canal enhancement

COMBINED DRAFT INPUT FOR REACH B: LITTLE RIVER AND NEARBY BASINS (CONT.)

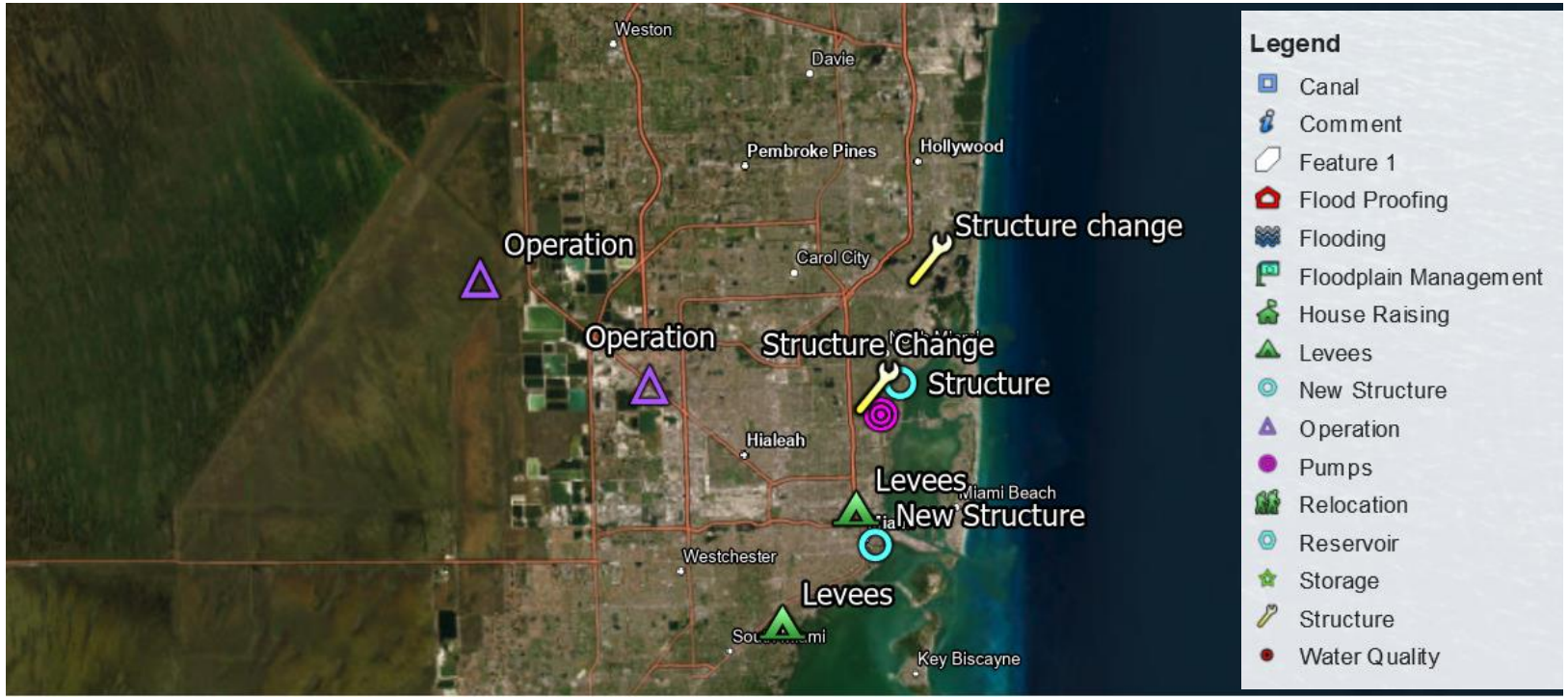
Project Name	Basin
Canal Conveyance Improvements	C-8
Flood Walls and Storm Surge Barrier Downstream of S28	C-8
Raise levees along C-8 canal and add gates / pumps on the secondary branches	C-8
Connect Western Mine Pits South of C9 Canal to the C9 Canal	C-9
Oleta River Storm Surge Barrier	C-9
Raise levees along C-9 Canal and add gates / pumps on the secondary branches	C-9
Increase Connectivity Between C-9 and C-11	C-9
Downstream C-7 Basin OBS: These projects were detailed back in 2018 and associated cost estimates are now outdated.	C-7
Elevation to 6 feet (NGDV29) for all buildings and roads OBS: These projects were detailed back in 2018 and associated cost estimates are now outdated.	C-7
Elevation to 7 feet for all buildings and roads OBS: These projects were detailed back in 2018 and associated cost estimates are now outdated.	C-7
Elevation to 8 feet for all buildings and roads OBS: These projects were detailed back in 2018 and associated cost estimates are now outdated.	C-7
All buildings elevated to the maximum 100-year flood levels under scenario SLR3, and all roads to the 10-year flood level under scenario SLR3 (scenario M3(x)). OBS: These projects were detailed back in 2018 and associated cost estimates are now outdated.	C-7

COMBINED DRAFT INPUT FOR REACH B: LITTLE RIVER AND NEARBY BASINS (CONT.)



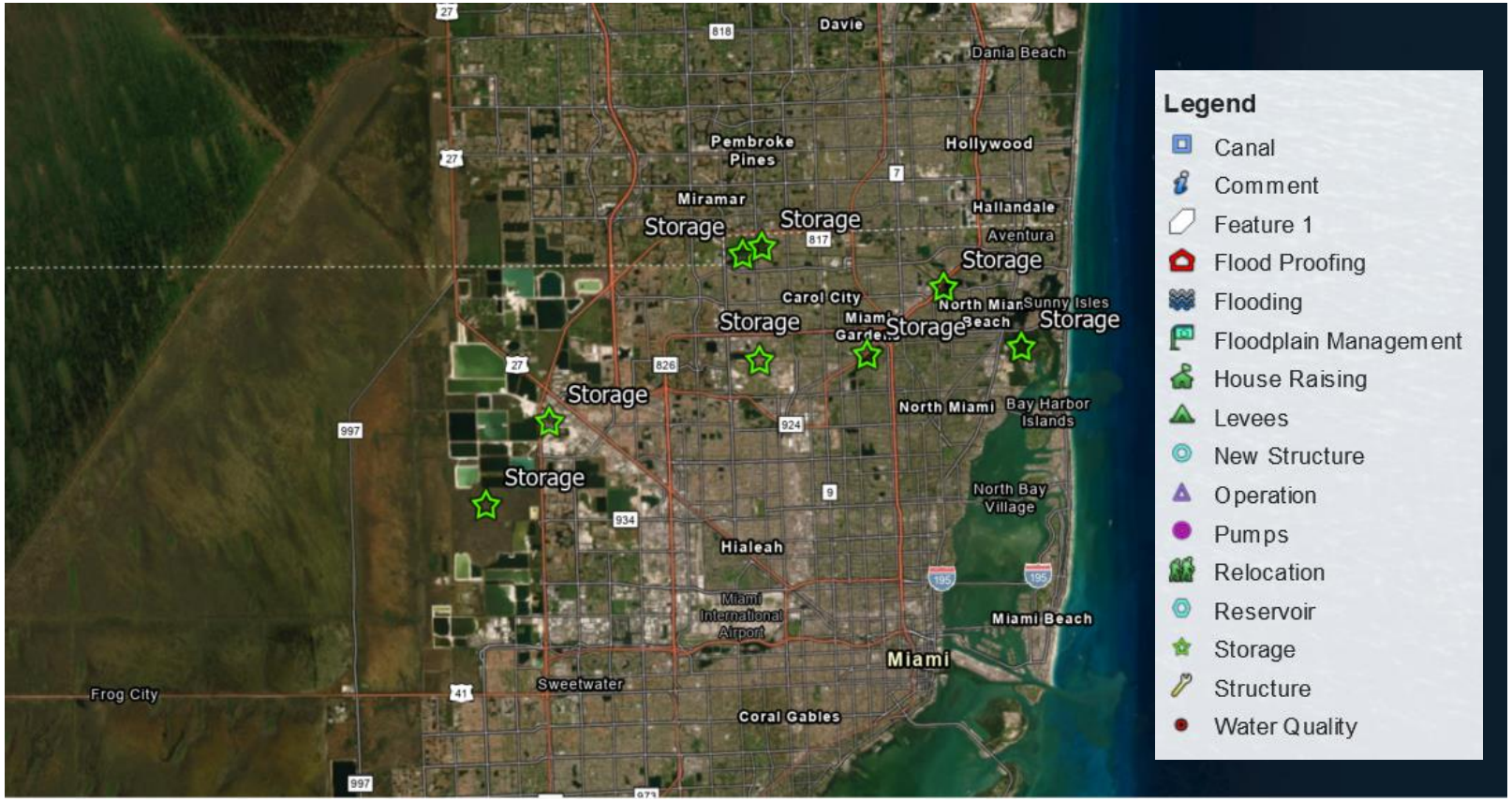
Flood Proofing (NS)	Miami Beach				
Flood Warning (NS)	Hialeah	North Miami	Biscayne Bay	Opa-Locka	
Floodplain Management (NS)	Little Arch Creek				
House Raising (NS)	Miami Beach	Golden Glades	North Miami	Little River	El Portal

COMBINED INPUT FOR REACH B: LITTLE RIVER AND NEARBY BASINS (CONT.)



Levees (S)	C-6 canal	C-7 Canal
New Structure (S)	C-8	C-6 Canal Add gate to the mouth of C-6 to limit storm surge
Operation Change (NS)	C-7 Take excess stormwater from the C-7 and C-8 during high rain events and send it WEST to add additional water to the BBSEER project (no send water south).	C-8 Capture excess stormwater during rain events from C-7 and C-8 basins and send that water west to add additional water to BBSEER to send south.
Pumps (S)	C-7 Add pumps to S-27	
Structure Change (S)	S-29	S-27 Move Structure Seaward

COMBINED DRAFT INPUT FOR REACH B: LITTLE RIVER AND NEARBY BASINS (CONT.)

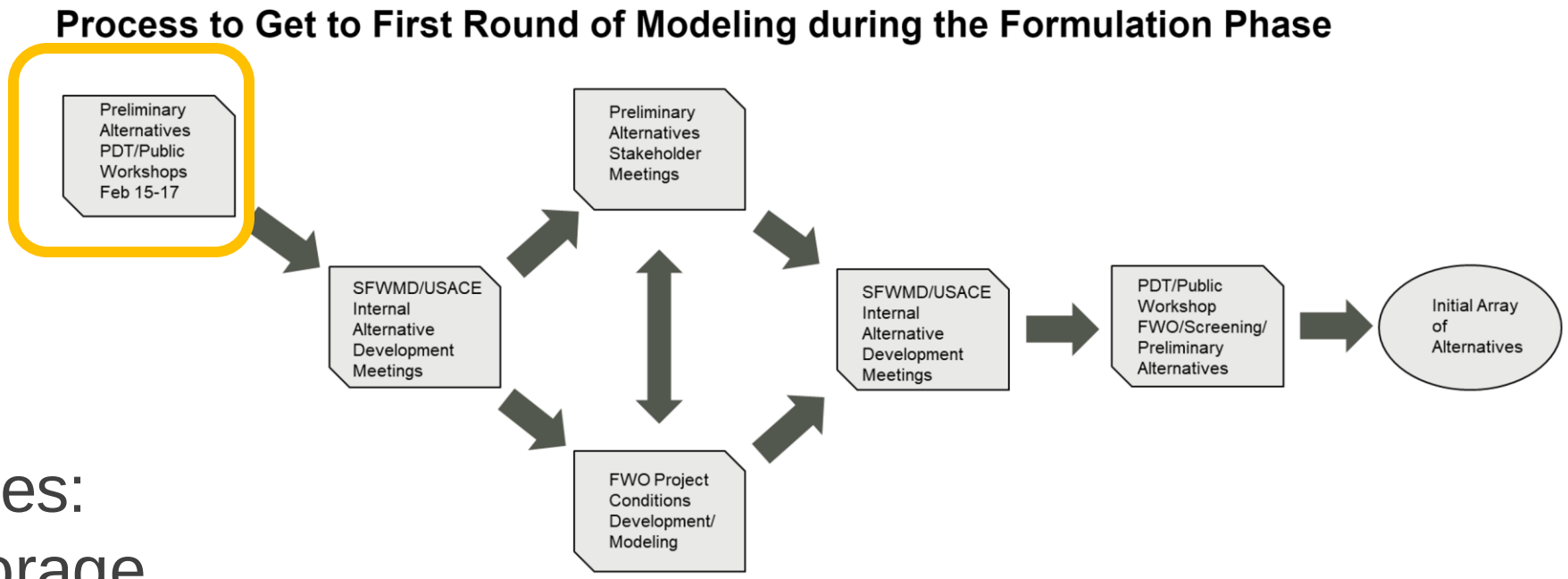


Storage (S)	Storage vs Disposal lined storage to prevent seepage Add freshwater wetlands in what is now the "Little Farm" property located in El Portal and City of Miami directly next to S-27 structure. This is currently vacant low-lying land.	Possible buffer lake	Storage in State Park

ALTERNATIVE DEVELOPMENT: PRELIMINARY INITIAL ARRAY OF ALTERNATIVES

Presenter: Zulamet Vega-Liriano

SCOPING: ALTERNATIVES FORMULATION



- Four general themes:
  - Structural - Storage
  - Structural - Conveyance
  - Nonstructural
  - Natural and Nature Base Features (NNBF) – Storage and Conveyance

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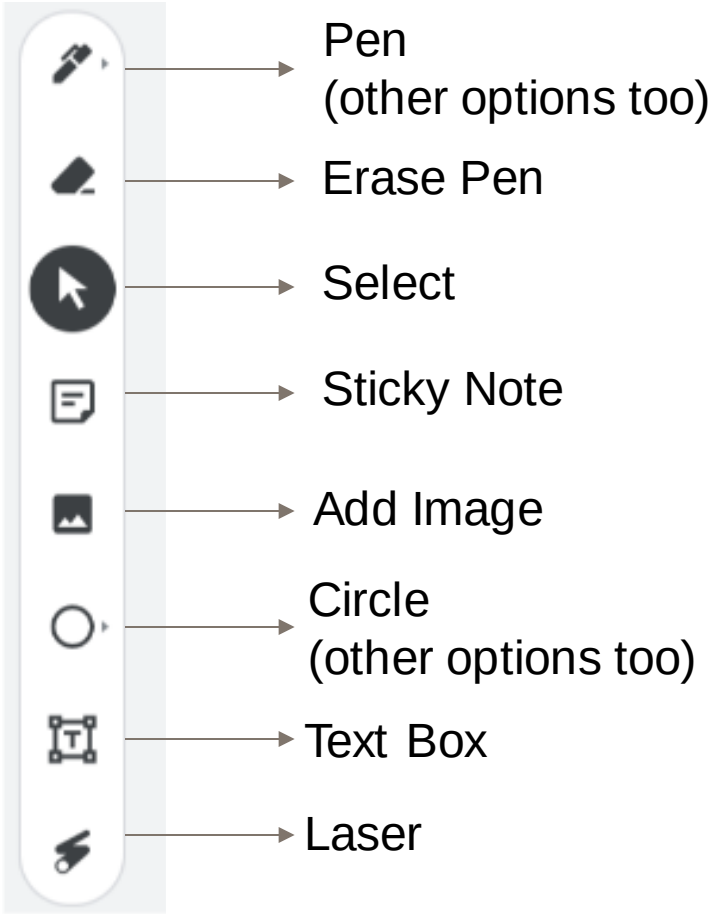

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EXAMPLE FEATURES FOUND IN JAMBOARD

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Structural Measures Examples

- Reservoir/Storage
- Structure Change
- Levees and Floodwalls
- Pumps
- New Structure
- Channel Improvements

Nonstructural Measures Examples

- Flood Proofing
- House Raising
- Relocation
- Flood Warning
- Floodplain Management
- Operational Change

Natural and Nature-Based Features Examples

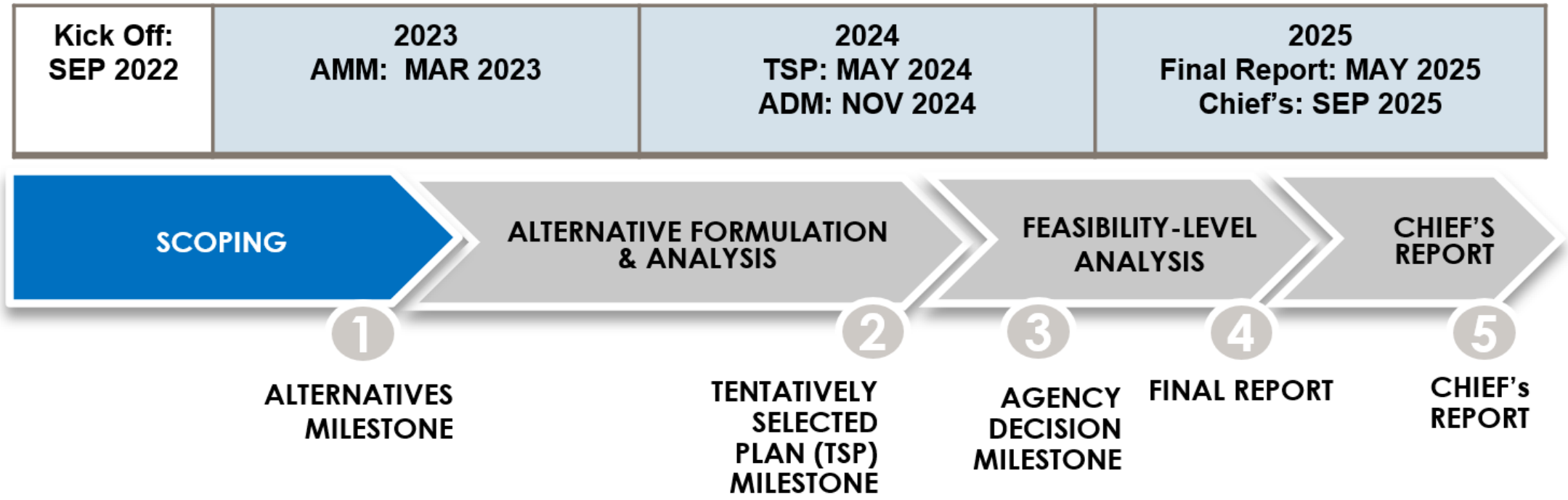
- Fresh Water Wetlands
- Floodplains Restoration
- Distributed Storage
- Raingarden
- Wetland Restoration

To paste shape, left click on page and hit Ctrl+V

FUTURE ENGAGEMENTS

Presenter: Tim Gysan

TIMELINE AND ENGAGEMENT OPPORTUNITIES



Note: Schedule is following 3x3x3 but will be subject to change based on team's discussions.

THANK YOU!

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CSFFRSCOMMENTS@USACE.ARMY.MIL

VISIT OUR WEBSITES FOR MORE UPDATES AND STUDY DETAILS

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SFWMD:
WWW.SFWMD.GOV/C&SF

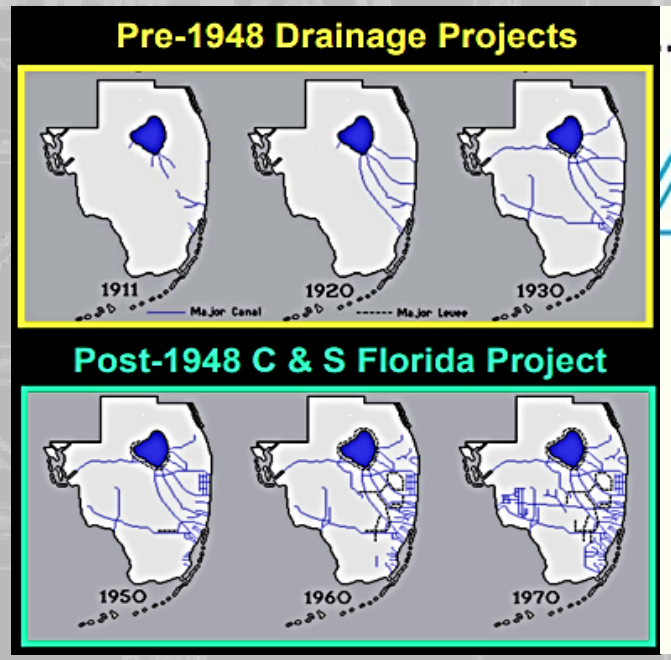
CENTRAL AND SOUTHERN FLORIDA (C&SF) FLOOD RESILIENCY STUDY

Development of Preliminary Alternatives

Reach C: Miami River and Nearby Basins

16 FEB 2023

Working Today to Build a Better Tomorrow



US Army Corps of Engineers®

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

AGENDA

Meeting Purpose: Workshop will focus on development of preliminary alternatives for planning Reach C Miami River and Nearby Basins.

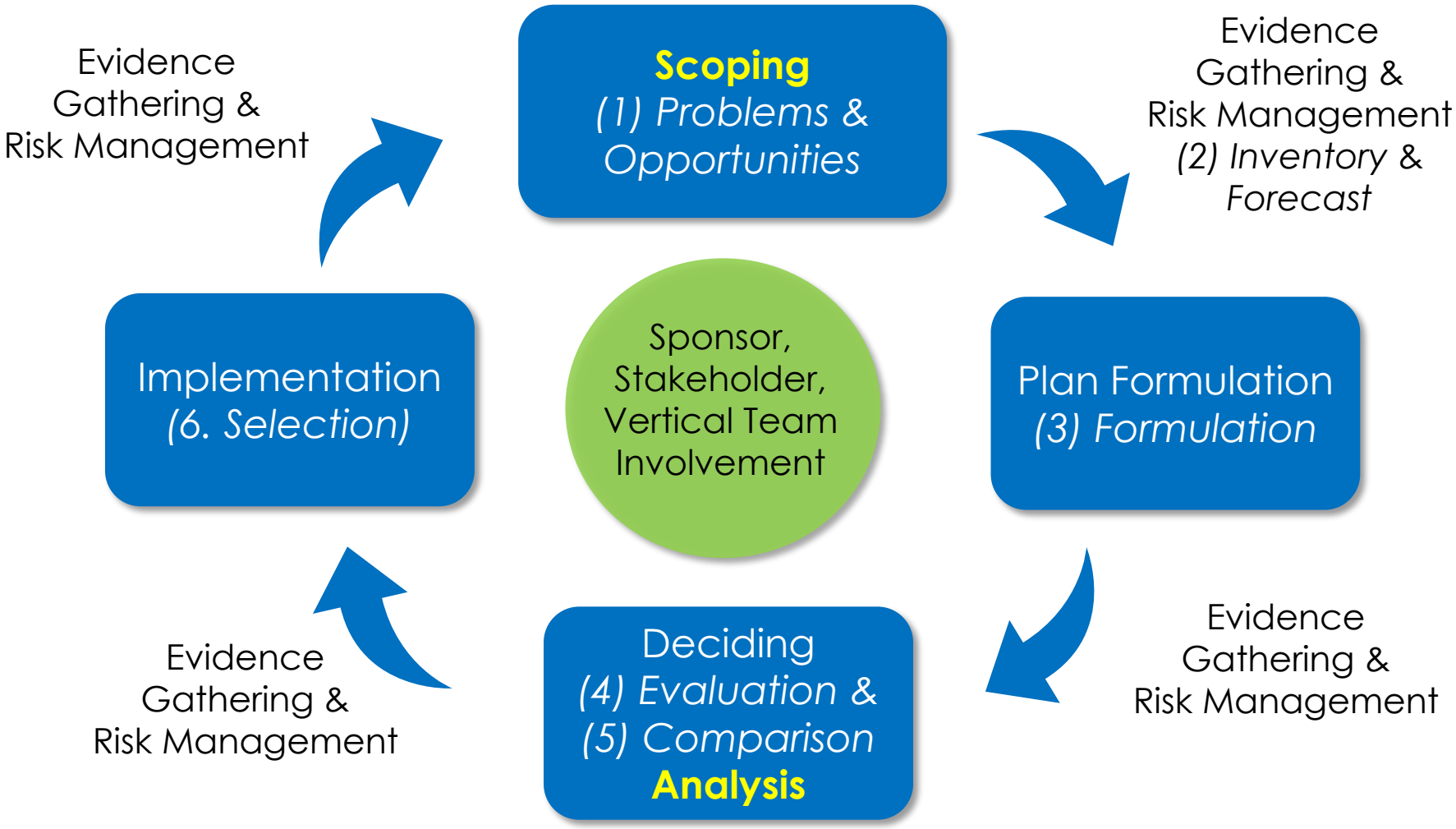
Day 2: Thursday, 16 February 2023; 9:00 am – 12:00 pm

Welcome, purpose of the meeting	9:00 - 9:10am
RECAP on planning process and conceptual measures	9:10 - 9:45am
Development of Preliminary / Draft Alternatives	9:45 - 11:45am
Building alternatives (1.5 hrs)	
Reporting/Discussion (0.5 hrs)	
Closing	11:45 – 12:00pm

RECAP: PLANNING PROCESS

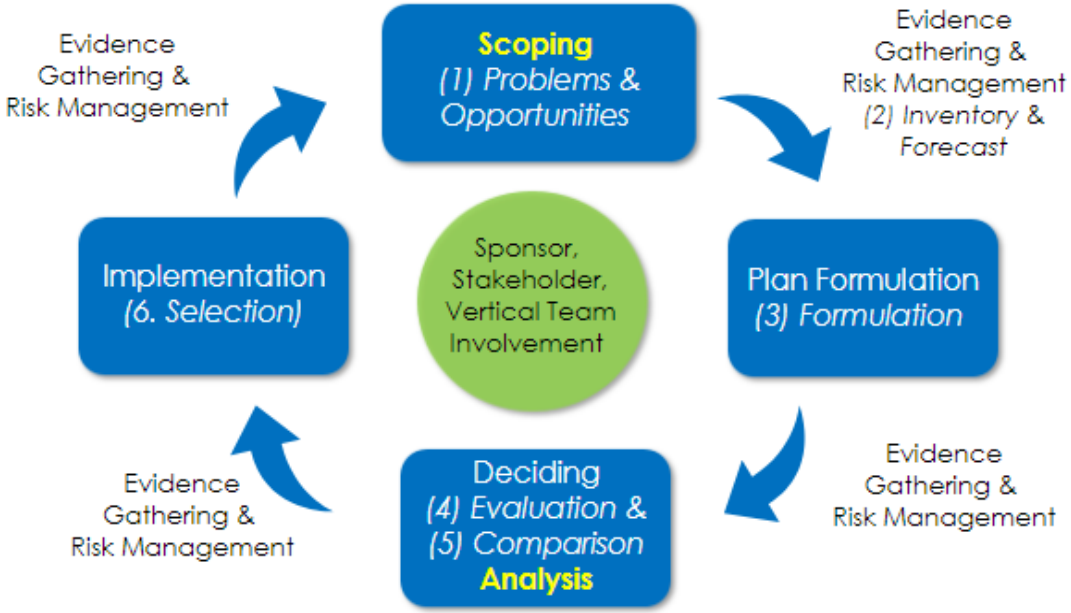
Presenter: Zulamet Vega-Liriano

RISK-INFORMED PLANNING PROCESS



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

WHERE ARE WE AT IN THE PROCESS



Scoping

★ Preliminary Array of Alternatives

Formulation

★ Initial Array of Alternatives

Alternative Evaluation

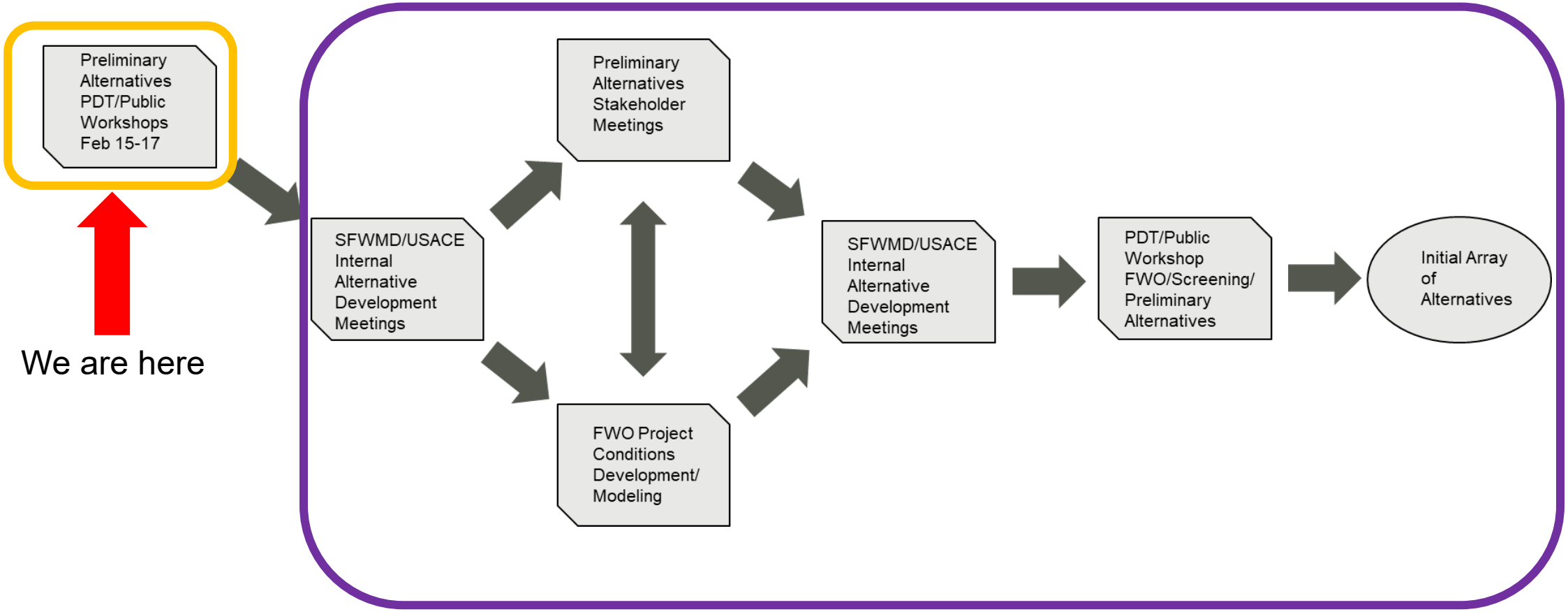
★ Focus Array of Alternatives

★ Tentative Selected Plan (TSP)

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

DEVELOPING INITIAL ALTERNATIVE ARRAY

Process to Get to First Round of Modeling



Scoping

Formulation Phase

CHALLENGES IN THE PROJECT AREA

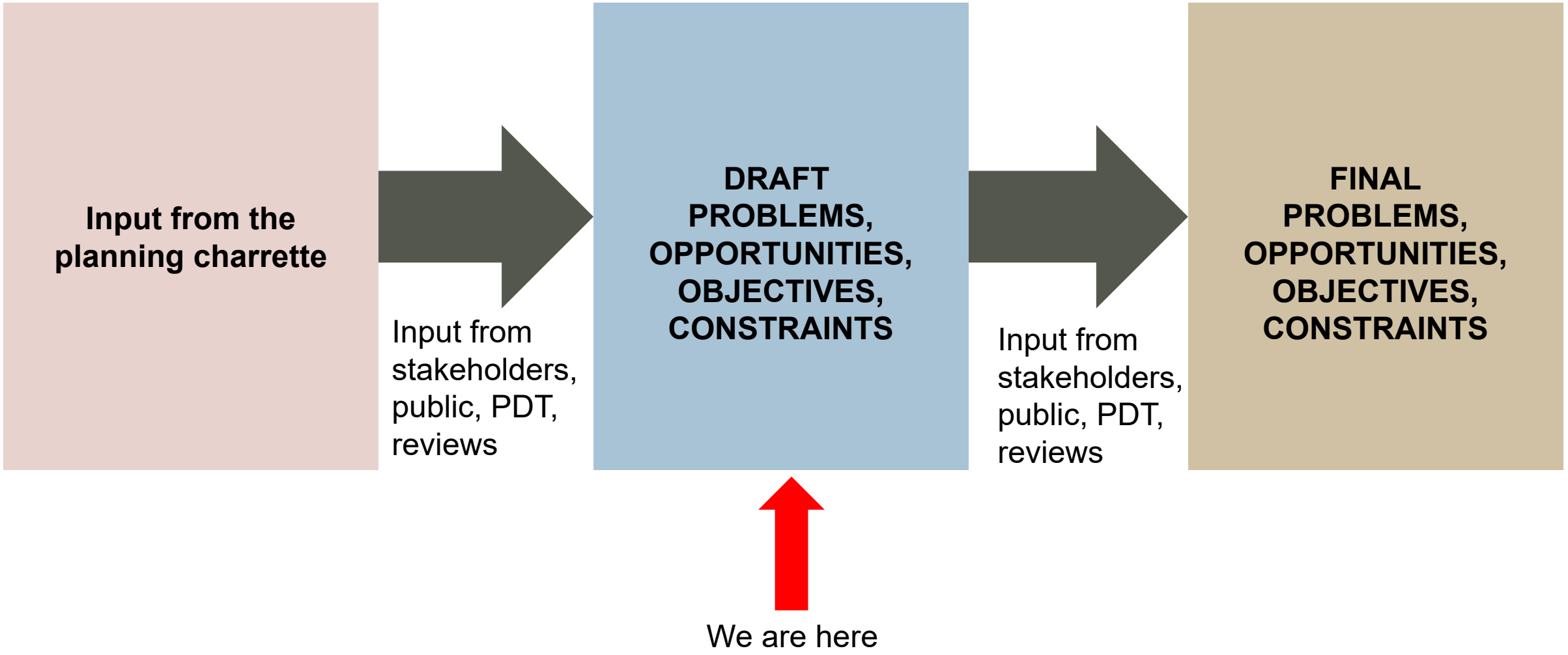
Flood Risk Management challenges:

- Flood risk due to a combination of factors such as runoff, storm surge, high tides, groundwater, and sea level rise.
- Life safety risk due to a combination of factors such as runoff, storm surge, high tides, groundwater, and sea level rise.

Additional challenges:

- Minimize negative impacts to other Federal water resources projects in the study area (integration) (i.e., Everglades, BBSEER, Miami Backbay)
- Land availability
- Social equity – Older developments sit in lower elevations
- Impacts to cultural and historical resources
- Avoid transferring flood risk from one community/basin to another.
- Impacts to navigation (Federal and non-Federal)
- Elevated tidal extreme conditions in south Florida make it difficult to discharge

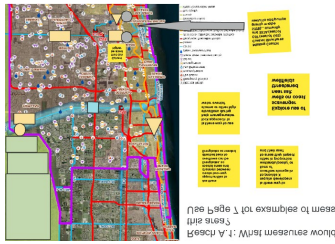
RECAP: PROBLEMS, OPPORTUNITIES, OBJECTIVES AND CONSTRAINTS

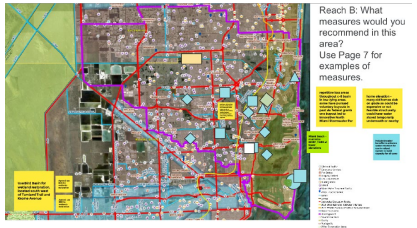


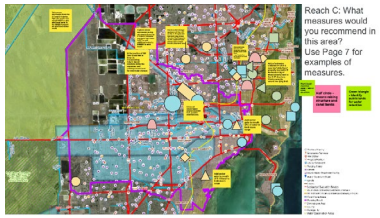
MEASURES INPUT DURING CHARRETTE

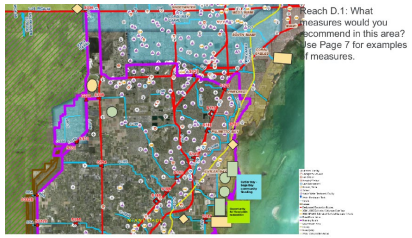
In person - Input

Virtual - Input

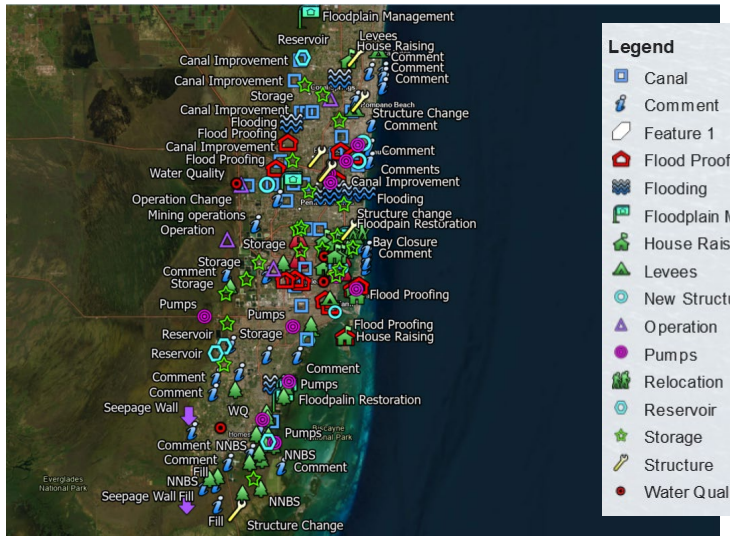








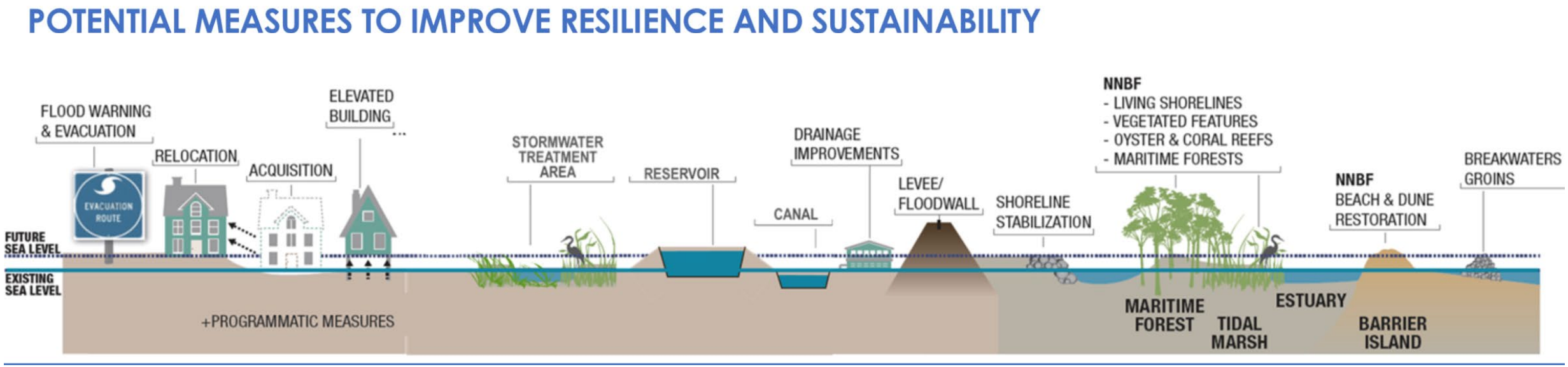
Combined - Input



FLOOD RISK MANAGEMENT (FRM) MEASURES

Type of measures:

- **Structural (S)**
- **Non-Structural (NS)**
- **Natural and Nature-Based Features (NNBF)**

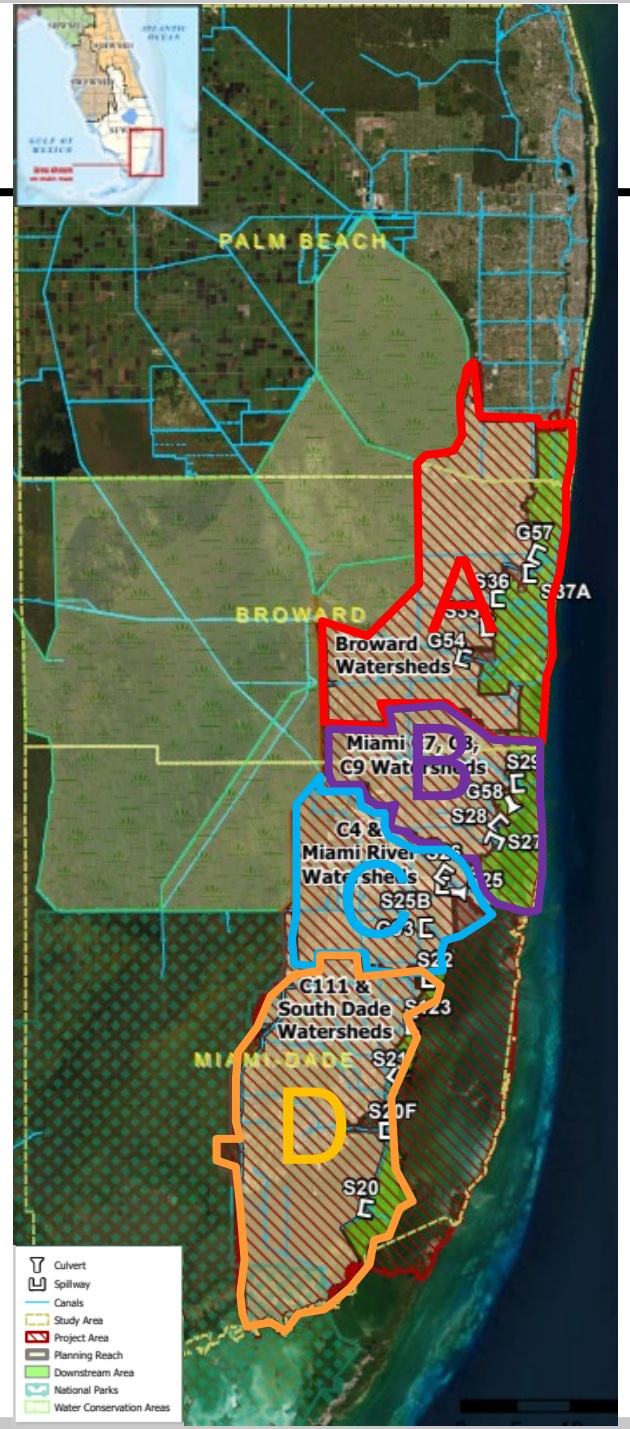


Graphic modified from https://ewn.el.erdc.dren.mil/nnbf/other/5_ERDC-NNBF_Brochure.pdf

PLANNING FOCUS AREAS

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

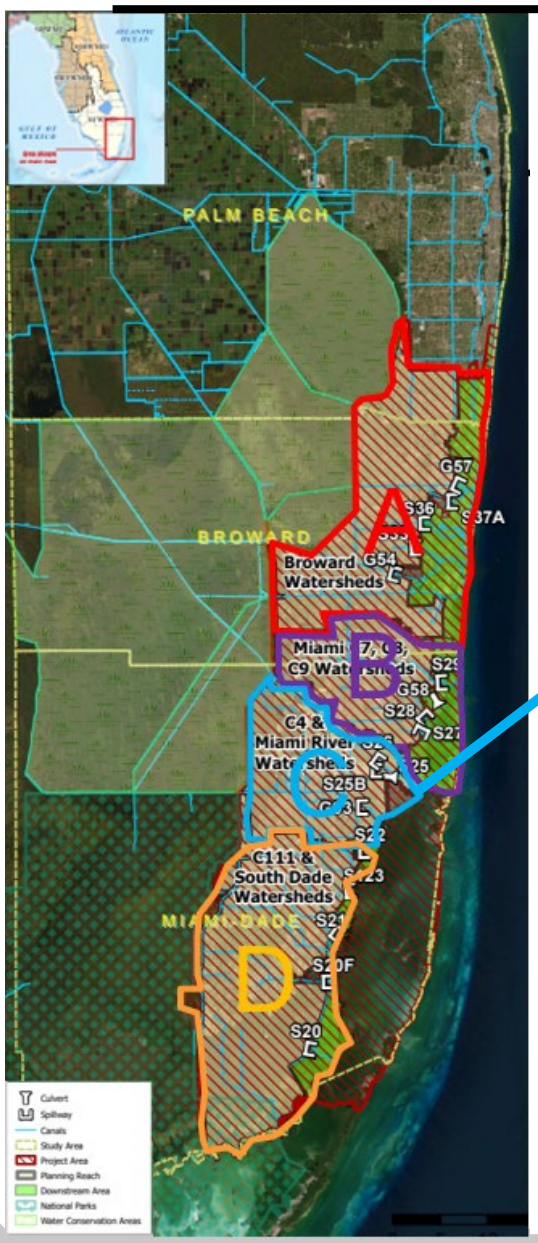
- Reach A: Broward and Hillsboro Basins
- Reach B: Little River and Nearby Basins
- Reach C: Miami River and Nearby Basins
- Reach D: South Miami Basins

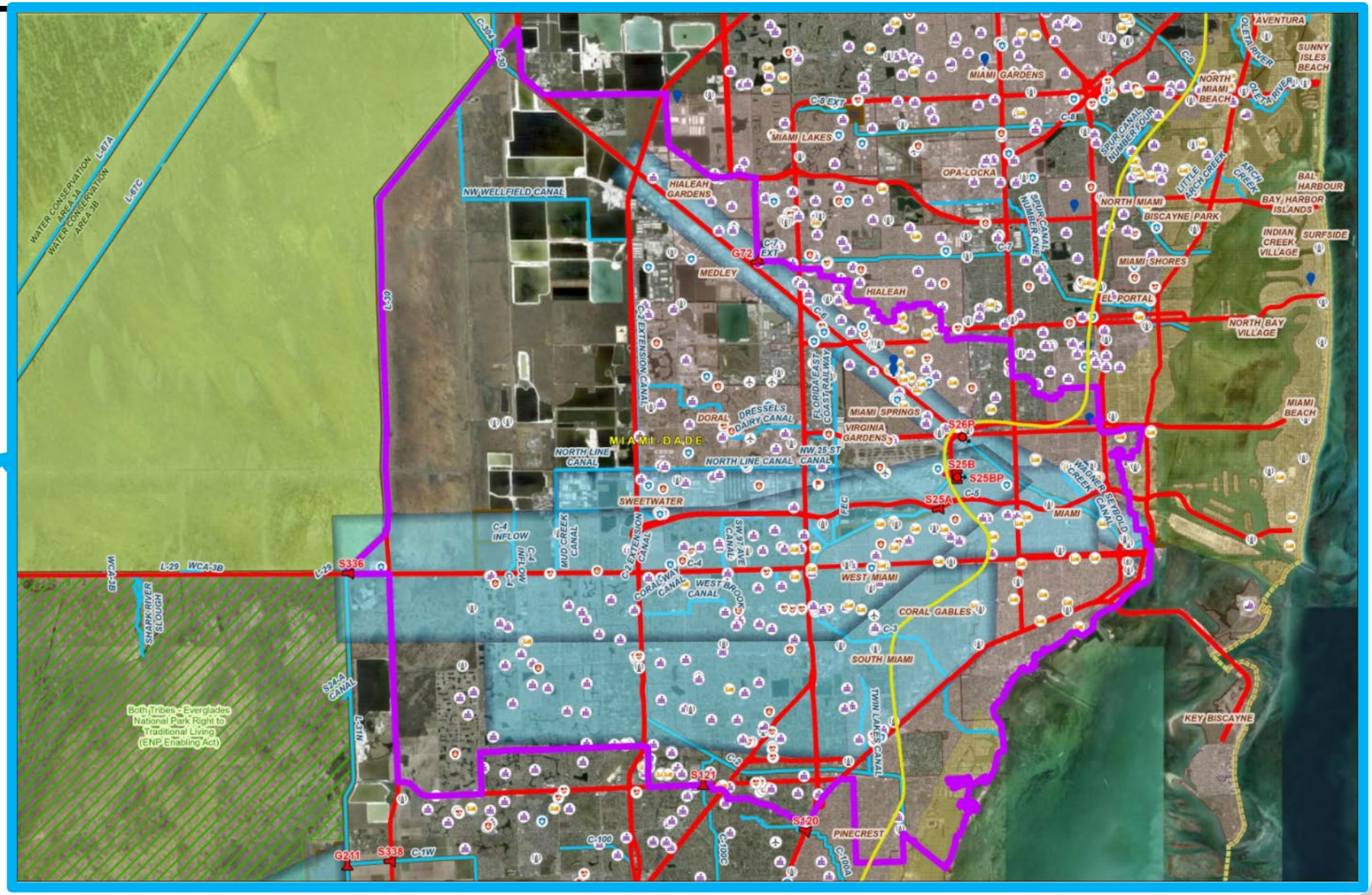


REACH C: MIAMI RIVER AND NEARBY BASINS

Presenter: Zulamet Vega-Liriano

REACH C: MIAMI RIVER AND NEARBY BASINS



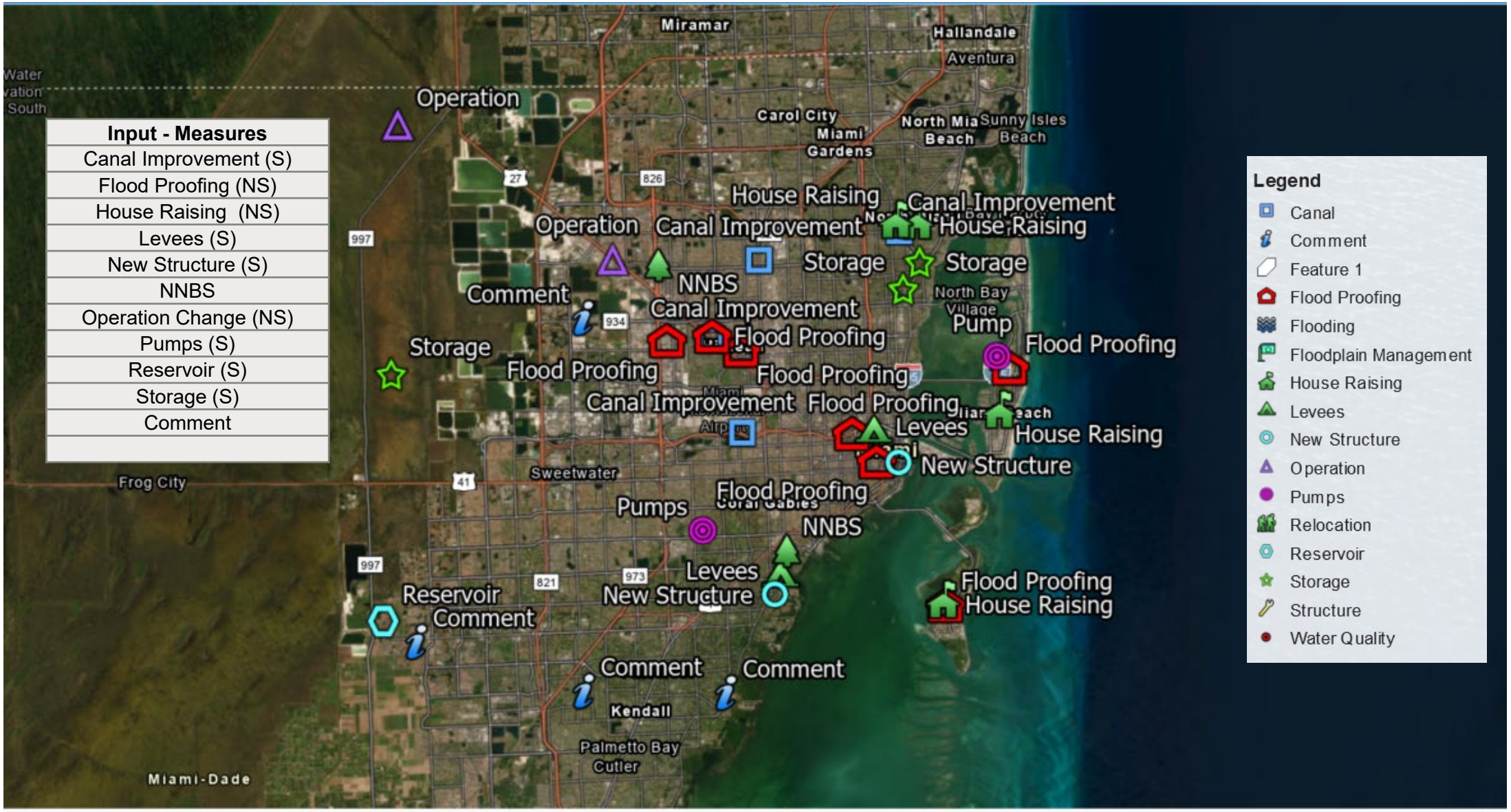


RECAP: CONCEPTUAL MANAGEMENT MEASURES – REACH C

Presenter: Gustavo Suarez-Narvaez

COMBINED DRAFT INPUT FOR REACH C: MIAMI RIVER AND NEARBY BASINS

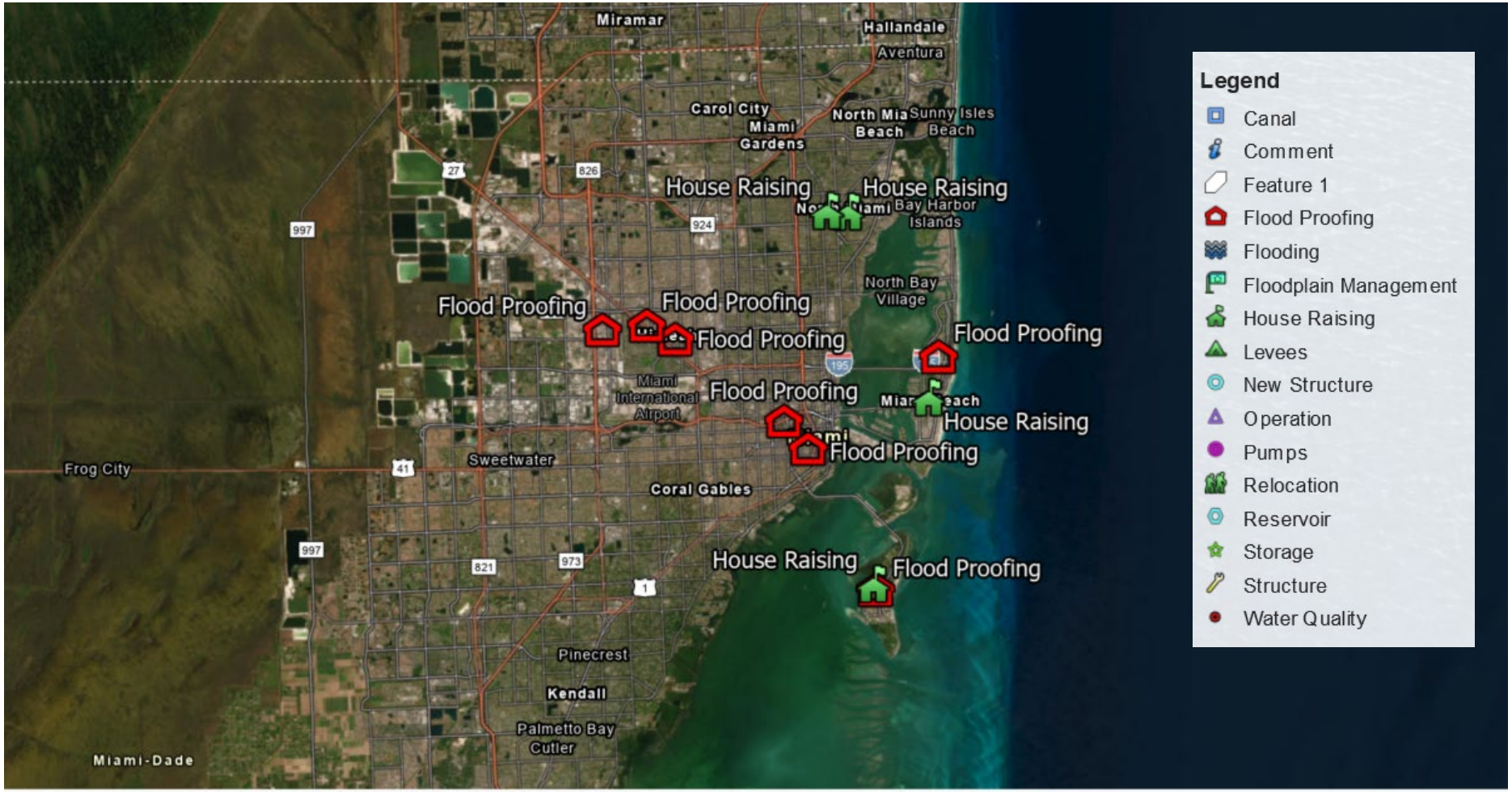
Input - Measures
Canal Improvement (S)
Flood Proofing (NS)
House Raising (NS)
Levees (S)
New Structure (S)
NNBS
Operation Change (NS)
Pumps (S)
Reservoir (S)
Storage (S)
Comment



COMBINED DRAFT INPUT FOR REACH C: MIAMI RIVER AND NEARBY BASINS (CONT.)

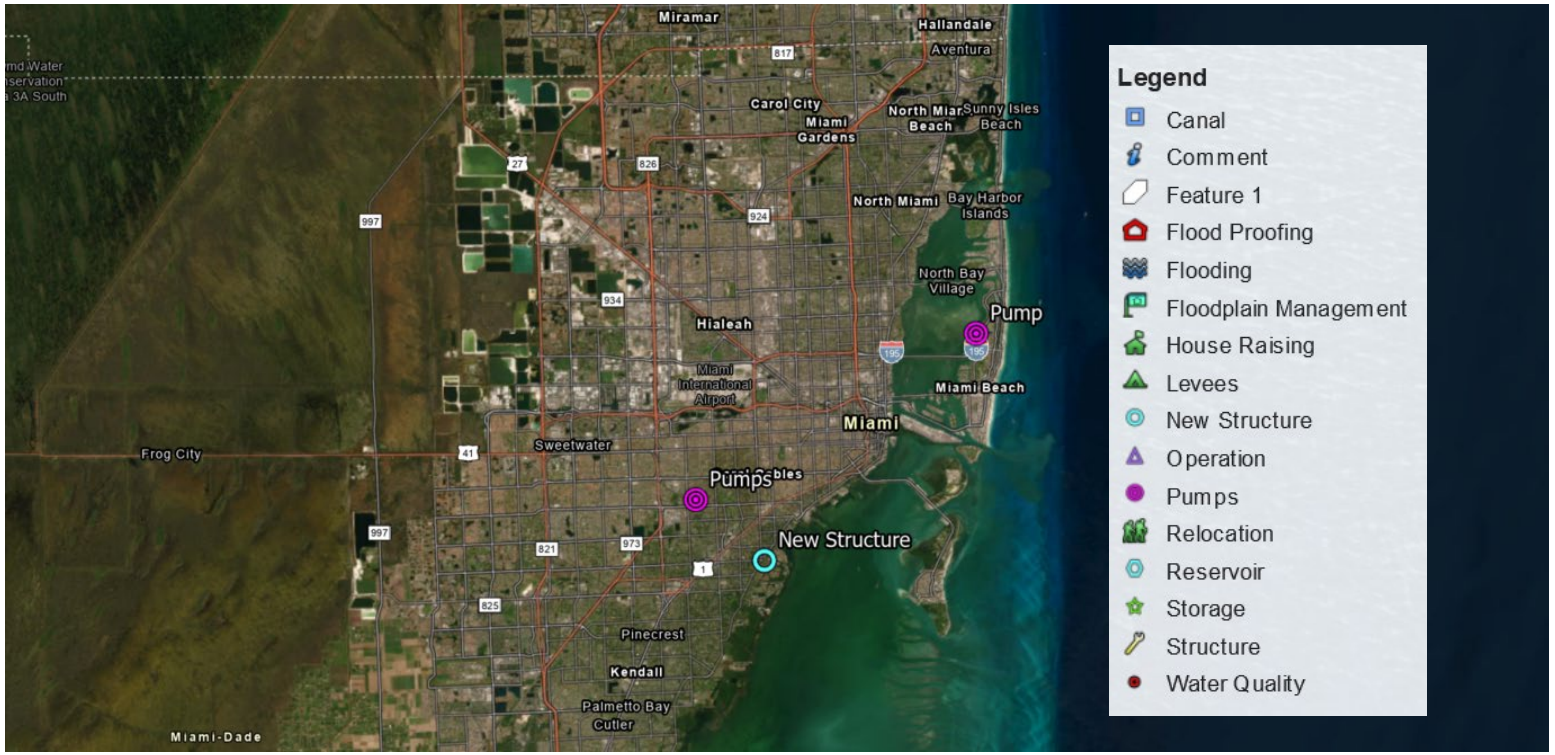
Canal Improvement (S)	C-5

COMBINED DRAFT INPUT FOR REACH C: MIAMI RIVER AND NEARBY BASINS (CONT.)



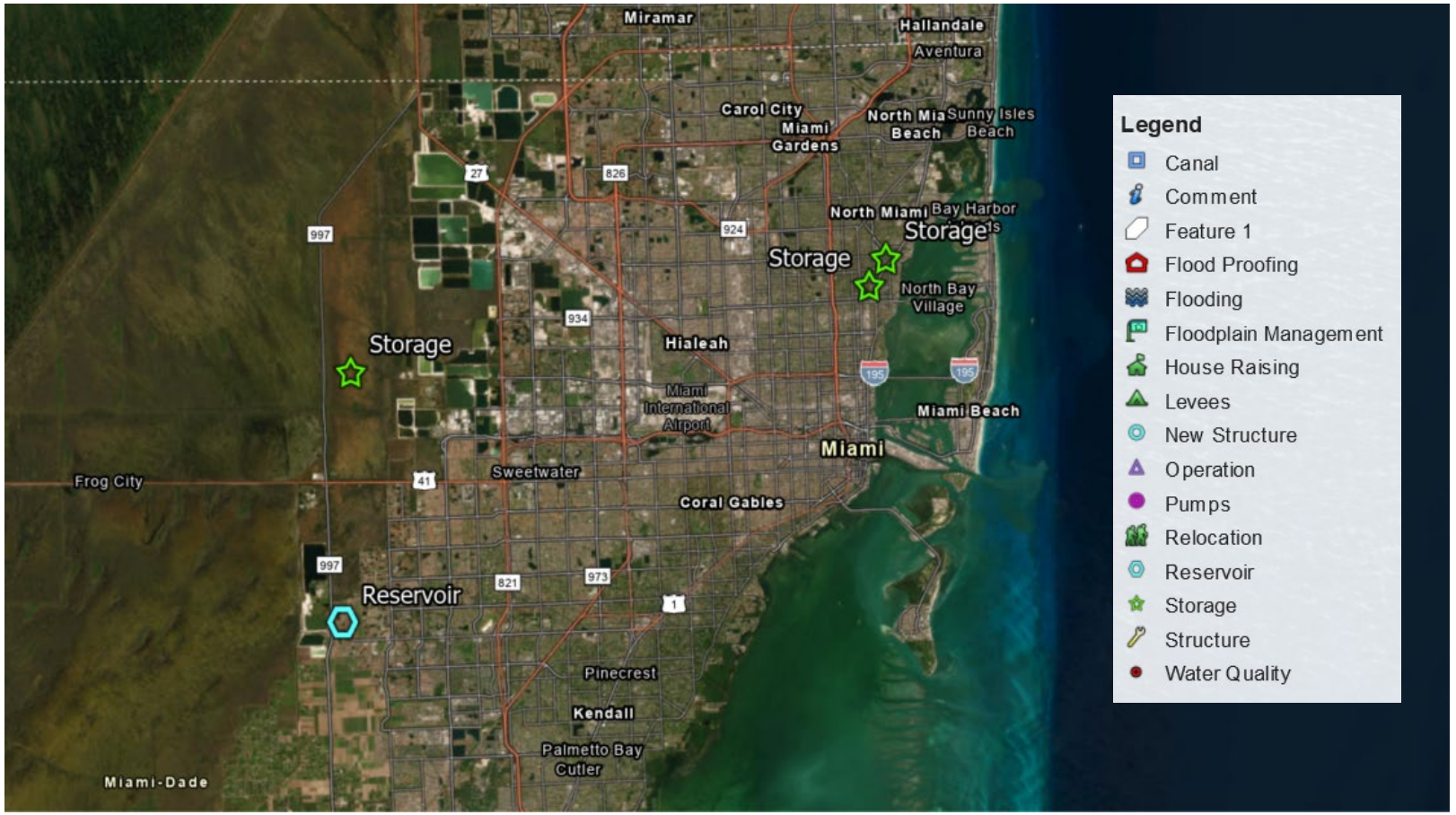
Flood Proofing (NS)	Key Biscayne	Miami Springs	Medley	Miami Beach	Little Havana	Brickell
House Raising (NS)	Miami Beach	North Miami	Miami Shores	Biscayne		

COMBINED DRAFT INPUT FOR REACH C: MIAMI RIVER AND NEARBY BASINS (CONT.)



New Structure (S)	C-3 canal Add gate to the mouth of C-3 to limit storm surge	
Pumps (S)	C-3	Miami Beach

COMBINED DRAFT INPUT FOR REACH C: MIAMI RIVER AND NEARBY BASINS (CONT.)



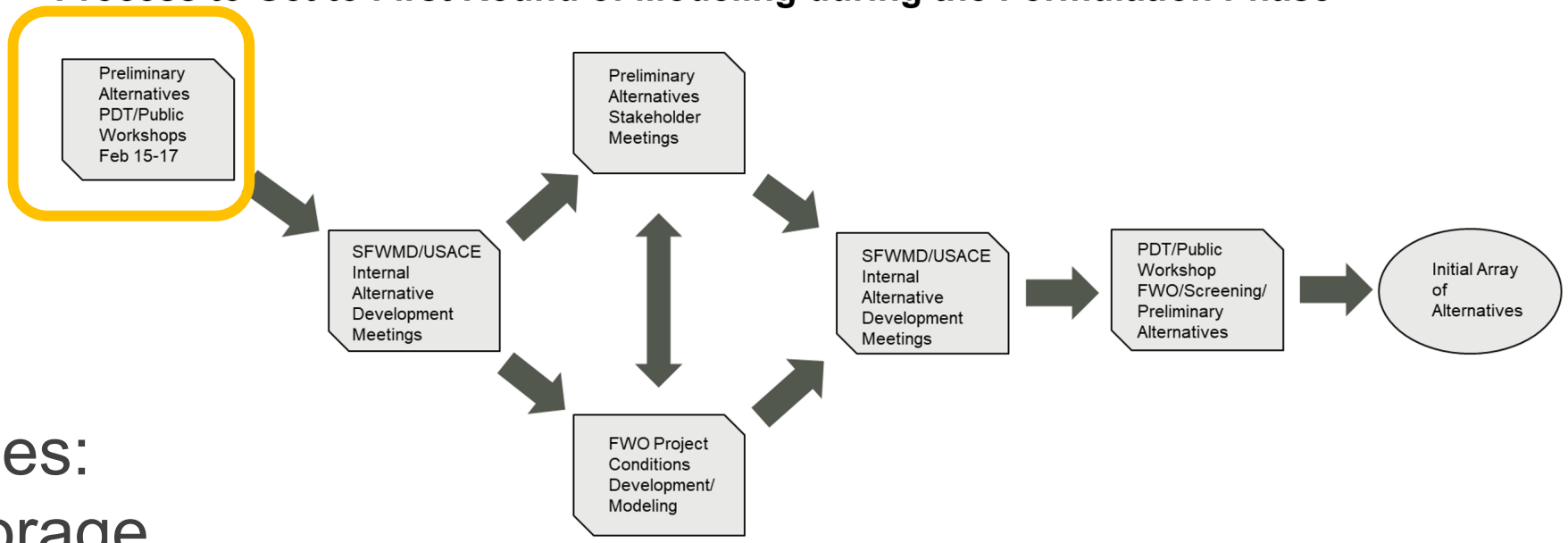
Reservoir (S)	North of SR-94		
Storage (S)	Add freshwater wetlands in what is now the "Little Farm" property located in El Portal and City of Miami directly next to S-27 structure. This is currently vacant low lying land. (Related to Reach B too)	Public lands for water retention	Water storage Recreational areas that can flood widening canals

ALTERNATIVE DEVELOPMENT: PRELIMINARY INITIAL ARRAY OF ALTERNATIVES

Presenter: Zulamet Vega-Liriano

SCOPING: ALTERNATIVES FORMULATION

Process to Get to First Round of Modeling during the Formulation Phase



- Four general themes:
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  - Structural - Conveyance
  - Nonstructural
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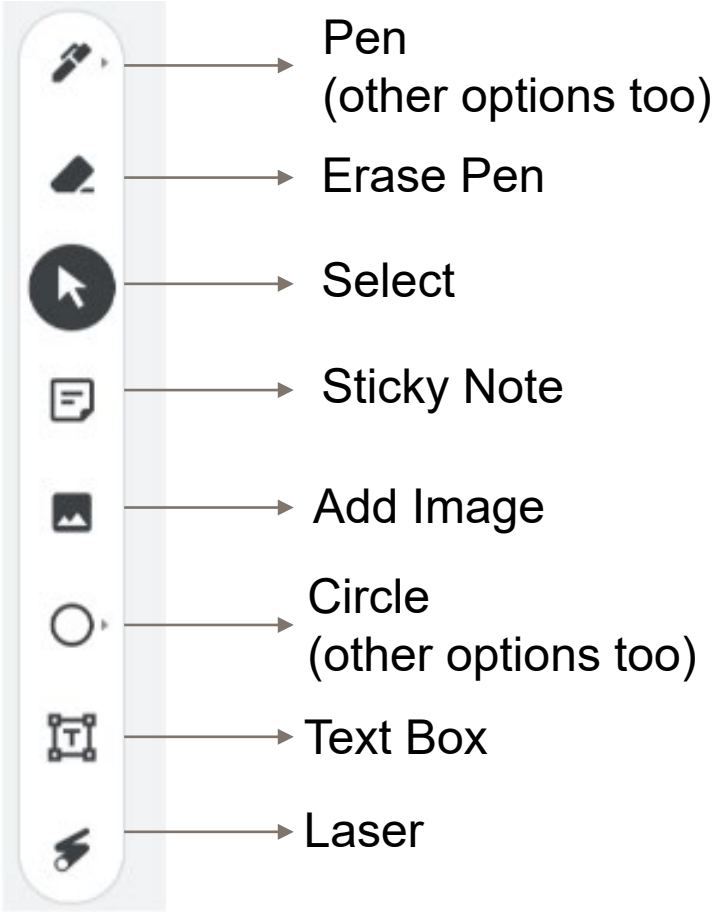

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EXAMPLE FEATURES FOUND IN JAMBOARD

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Structural Measures Examples

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- Structure Change
- Levees and Floodwalls
- Pumps
- New Structure
- Channel Improvements

Nonstructural Measures Examples

- Flood Proofing
- House Raising
- Relocation
- Flood Warning
- Floodplain Management
- Operational Change

Natural and Nature-Based Features Examples

- Fresh Water Wetlands
- Floodplains Restoration
- Distributed Storage
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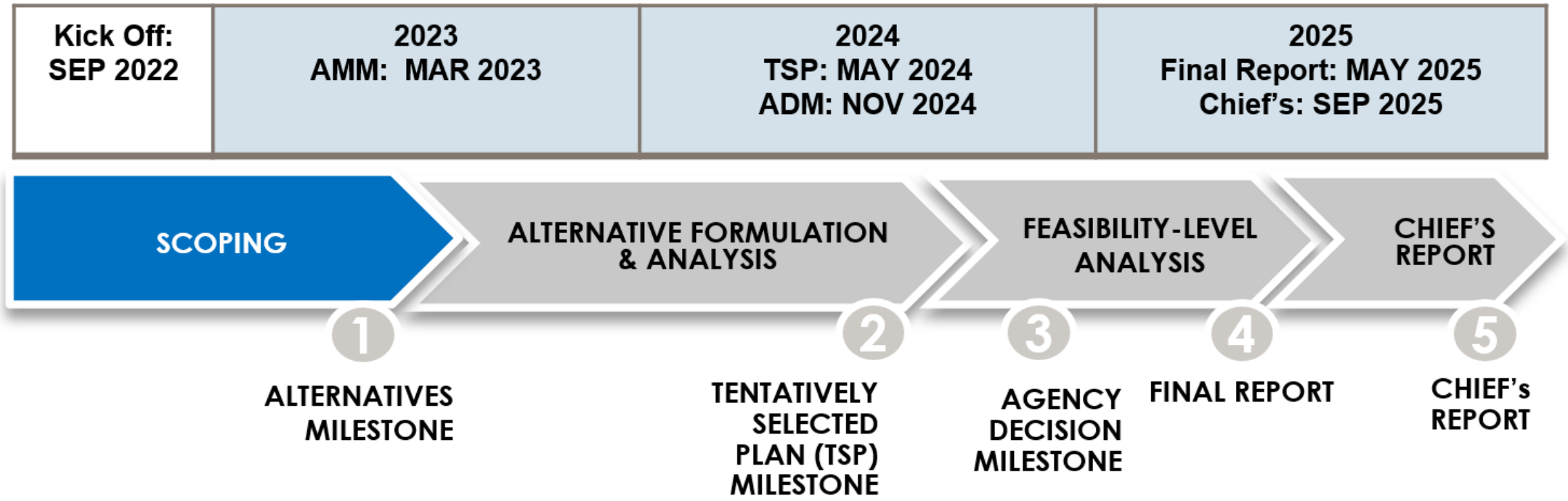
FUTURE ENGAGEMENTS

Presenter: Tim Gysan

TIMELINE AND ENGAGEMENT OPPORTUNITIES



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

Development of Preliminary Alternatives

Reach D: South Miami Basins

17 FEB 2023

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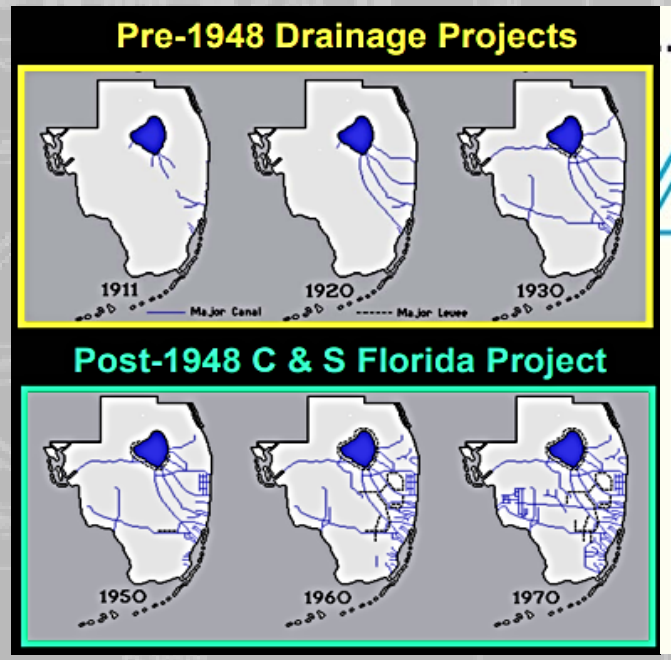


AGENDA

Meeting Purpose: Workshop will focus on development of preliminary alternatives for planning Reach D South Miami Basins.

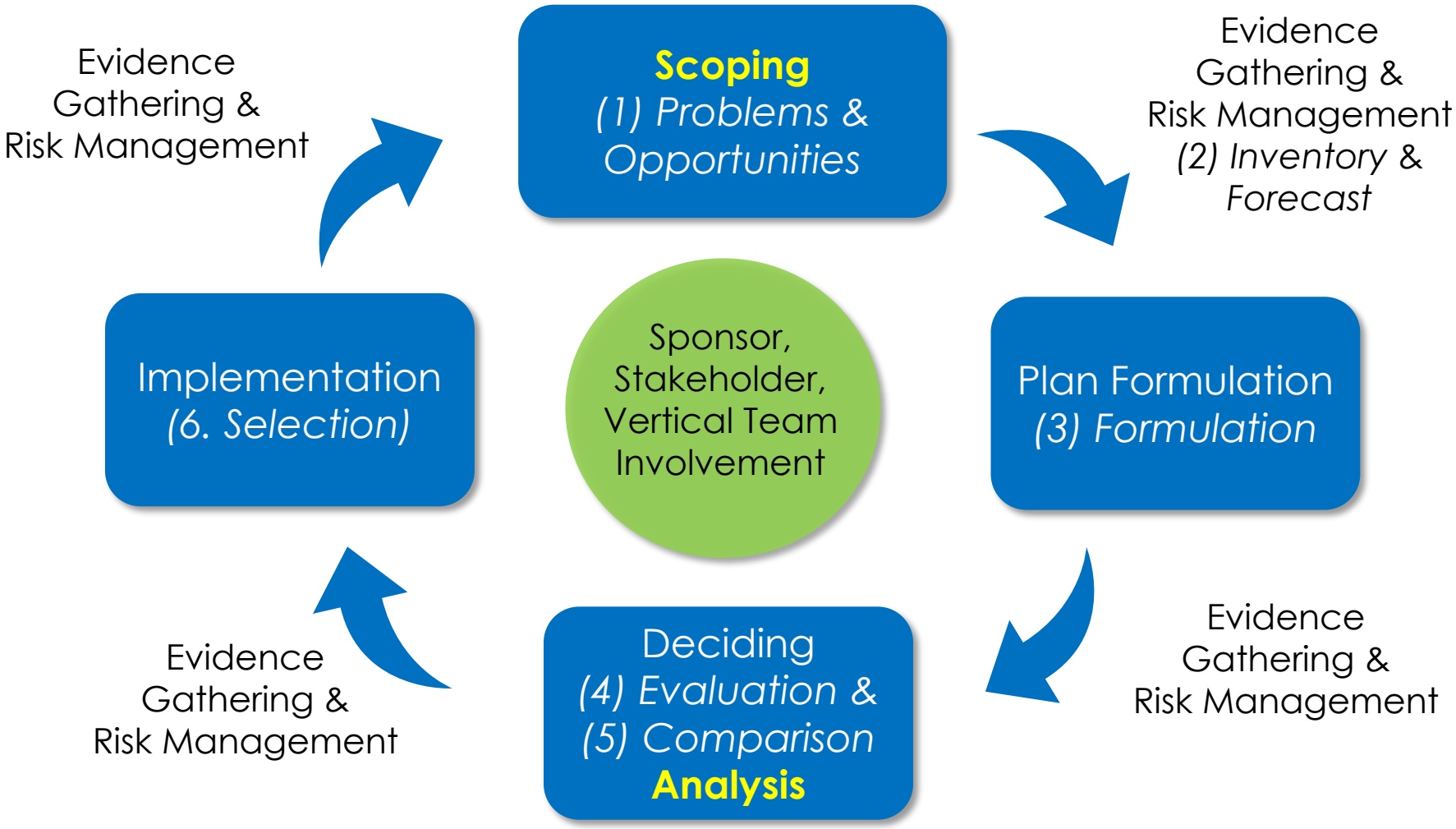
Day 3: Friday, 17 February 2023; 1:00 pm – 4:00 pm

Welcome, purpose of the meeting	1:00 - 1:10pm
RECAP on planning process and conceptual measures	1:10 - 1:45am
Development of Preliminary / Draft Alternatives	1:45 - 3:45pm
Building alternatives (1.5 hrs)	
Reporting/Discussion (0.5 hrs)	
Closing	3:45 – 4:00pm

RECAP: PLANNING PROCESS

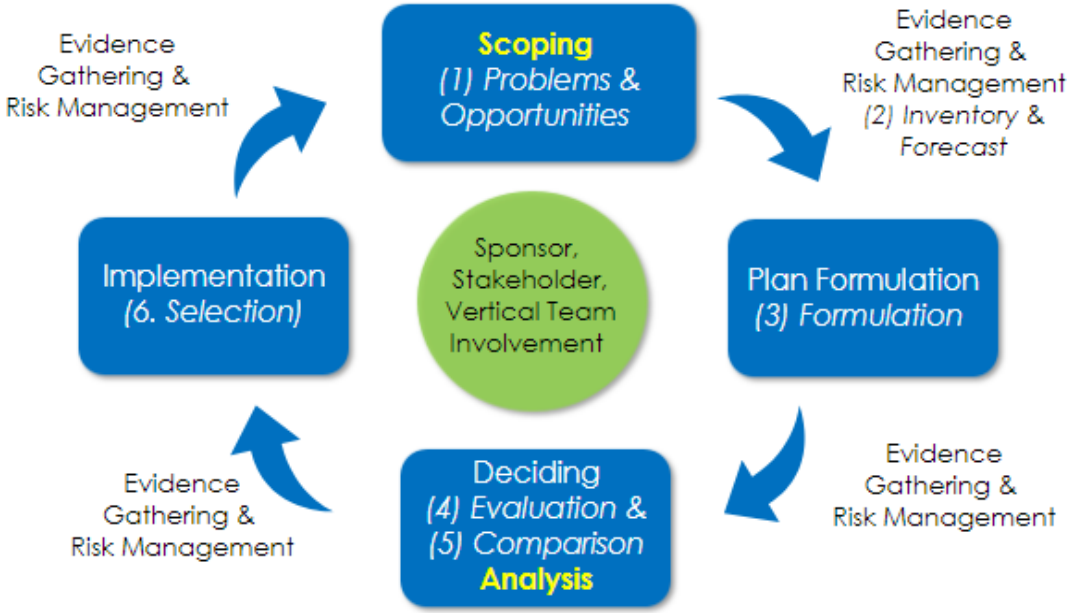
Presenter: Zulamet Vega-Liriano

RISK-INFORMED PLANNING PROCESS



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

WHERE ARE WE AT IN THE PROCESS



Scoping

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Formulation

★ Initial Array of Alternatives

Alternative Evaluation

★ Focus Array of Alternatives

★ Tentative Selected Plan (TSP)

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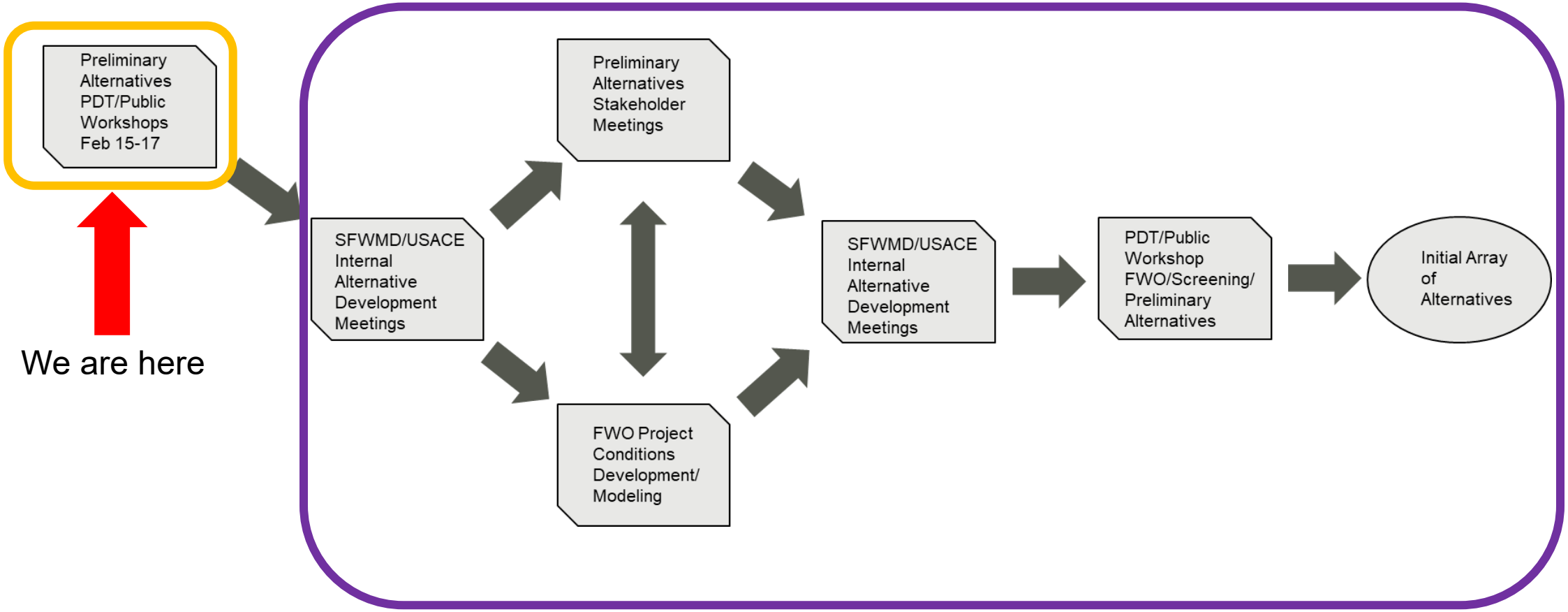
DEVELOPING INITIAL ALTERNATIVE ARRAY

Process to Get to First Round of Modeling



Scoping

Formulation Phase

CHALLENGES IN THE PROJECT AREA

Flood Risk Management challenges:

- Flood risk due to a combination of factors such as runoff, storm surge, high tides, groundwater, and sea level rise.
- Life safety risk due to a combination of factors such as runoff, storm surge, high tides, groundwater, and sea level rise.

Additional challenges:

- Minimize negative impacts to other Federal water resources projects in the study area (integration) (i.e., Everglades, BBSEER, Miami Backbay)
- Land availability
- Social equity – Older developments sit in lower elevations
- Impacts to cultural and historical resources
- Avoid transferring flood risk from one community/basin to another.
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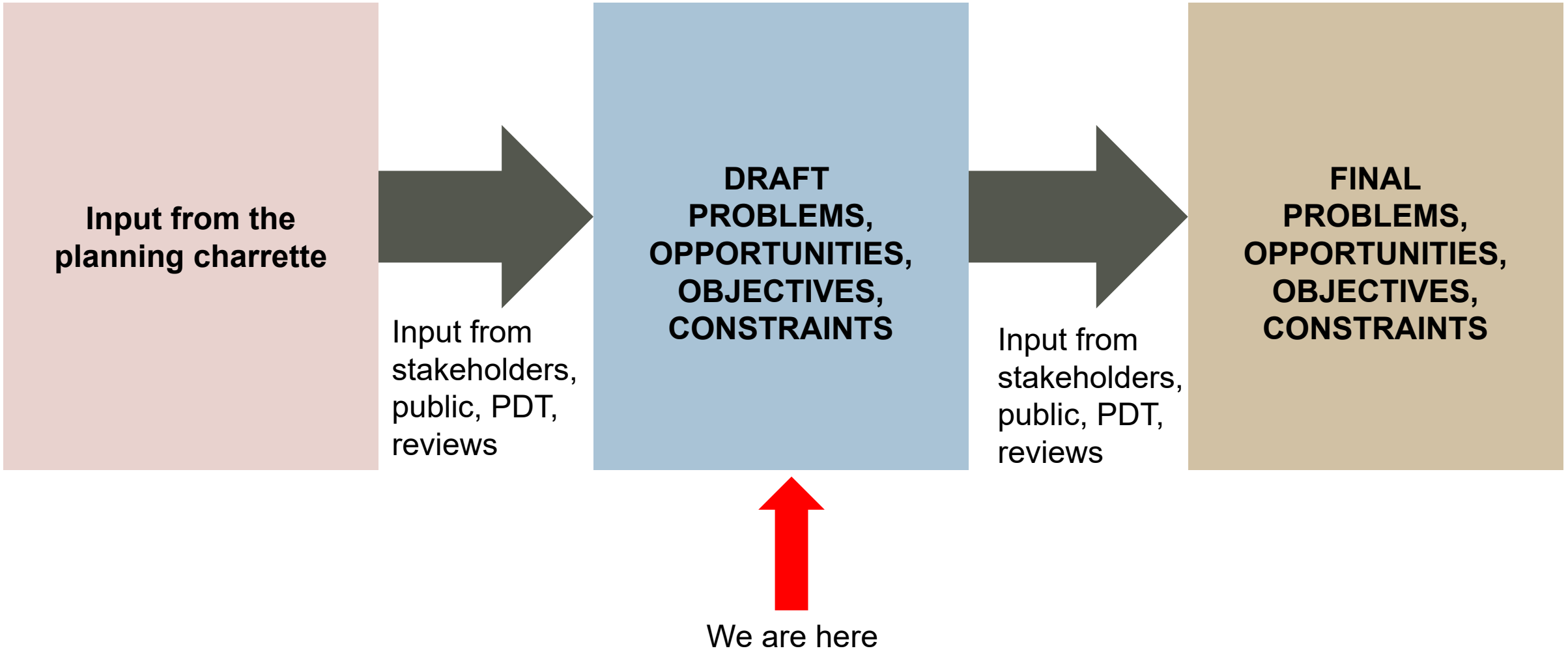
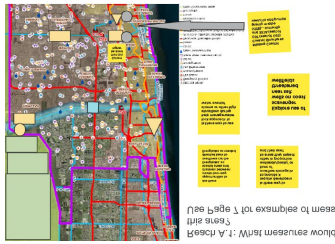
RECAP: PROBLEMS, OPPORTUNITIES, OBJECTIVES AND CONSTRAINTS

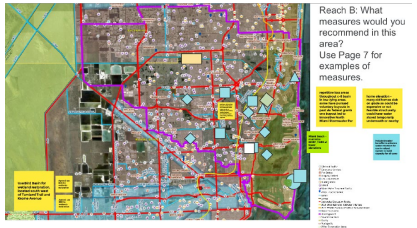


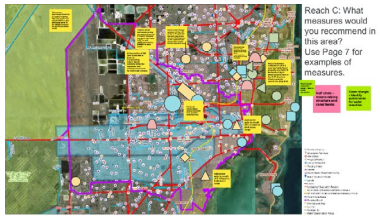
MEASURES INPUT DURING CHARRETTE

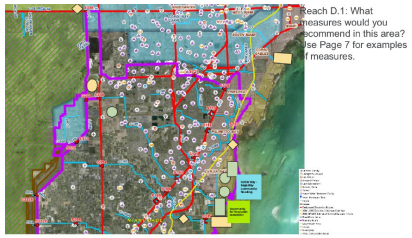
In person - Input

Virtual - Input

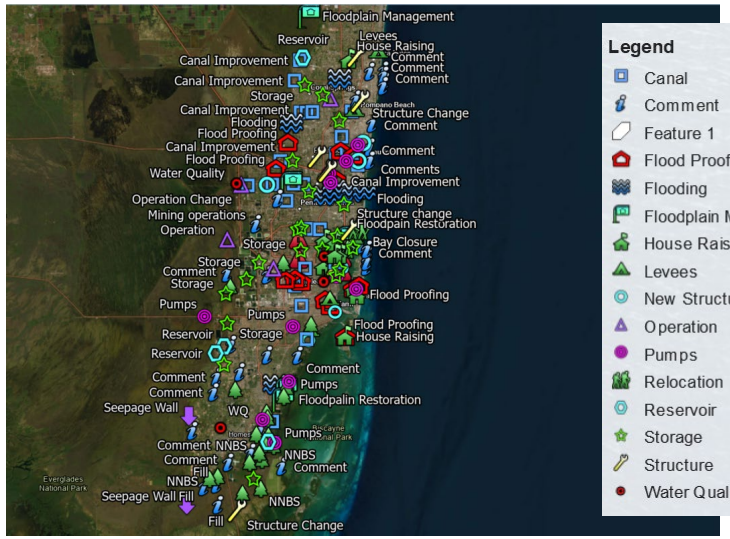








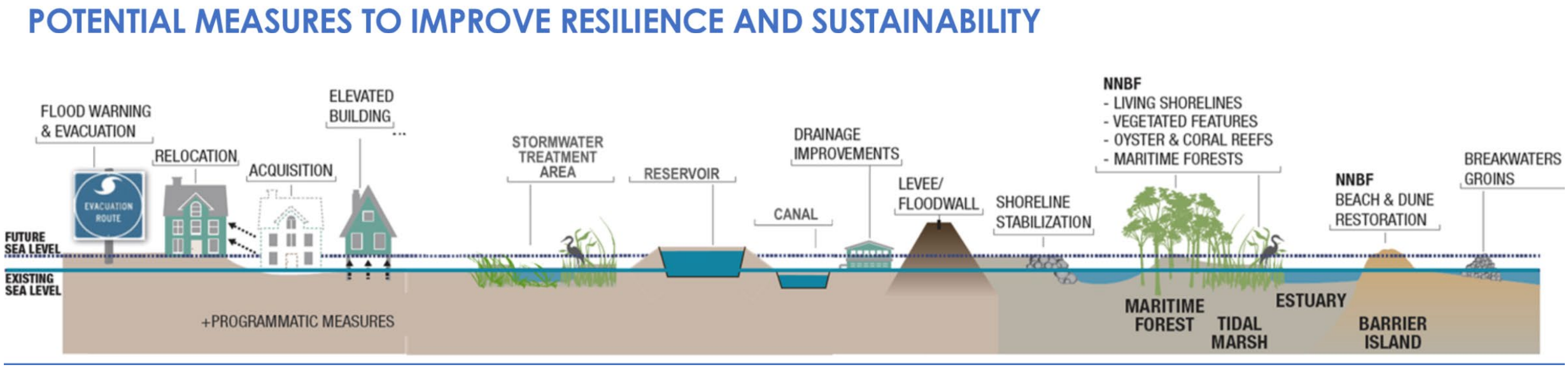
Combined - Input



FLOOD RISK MANAGEMENT (FRM) MEASURES

Type of measures:

- **Structural (S)**
- **Non-Structural (NS)**
- **Natural and Nature-Based Features (NNBF)**

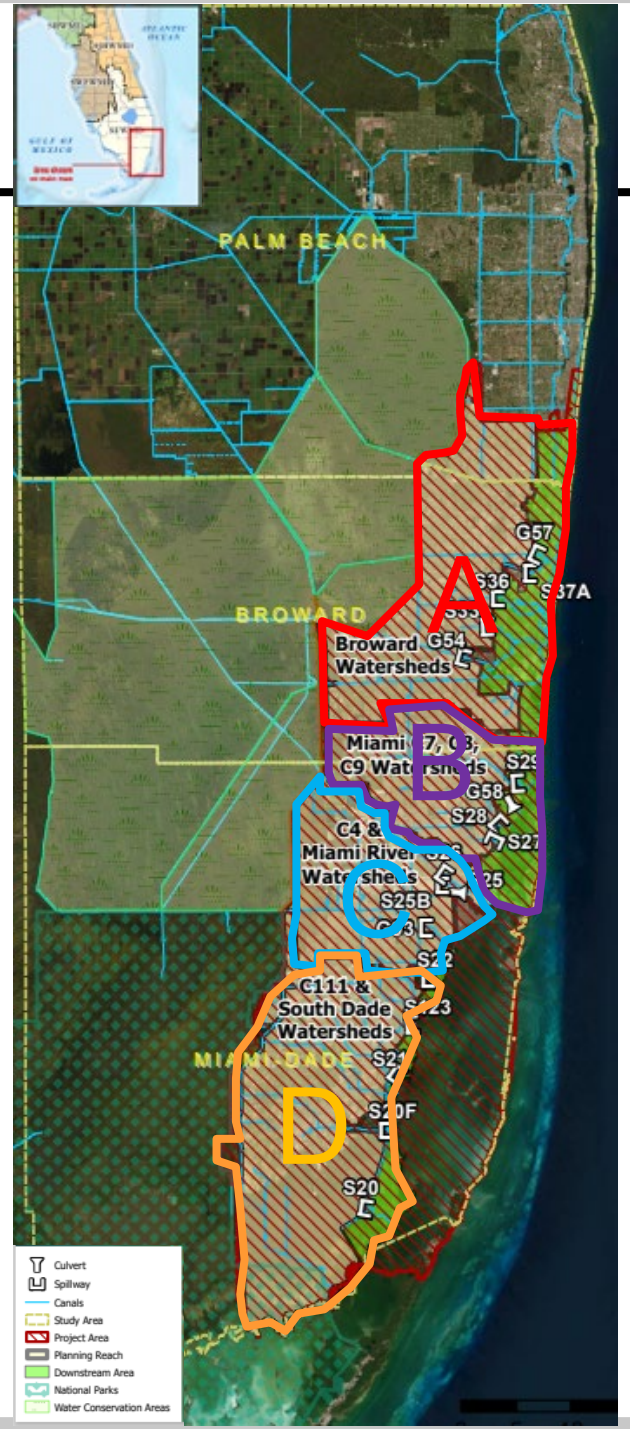


Graphic modified from https://ewn.el.erdc.dren.mil/nnbf/other/5_ERDC-NNBF_Brochure.pdf

PLANNING FOCUS AREAS

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

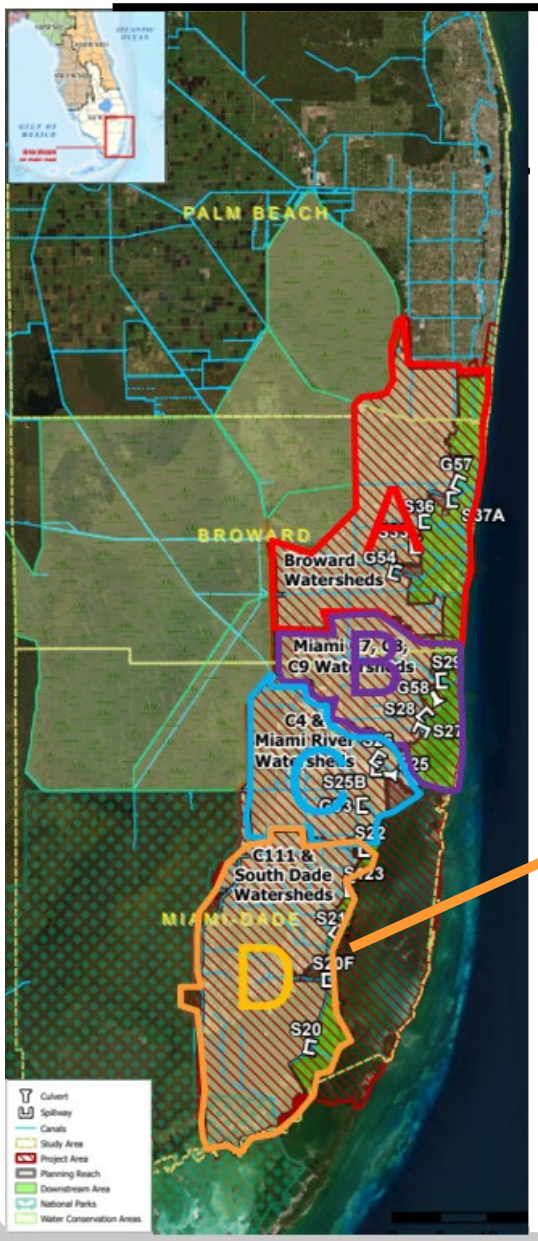
- Reach A: Broward and Hillsboro Basins
- Reach B: Little River and Nearby Basins
- Reach C: Miami River and Nearby Basins
- Reach D: South Miami Basins

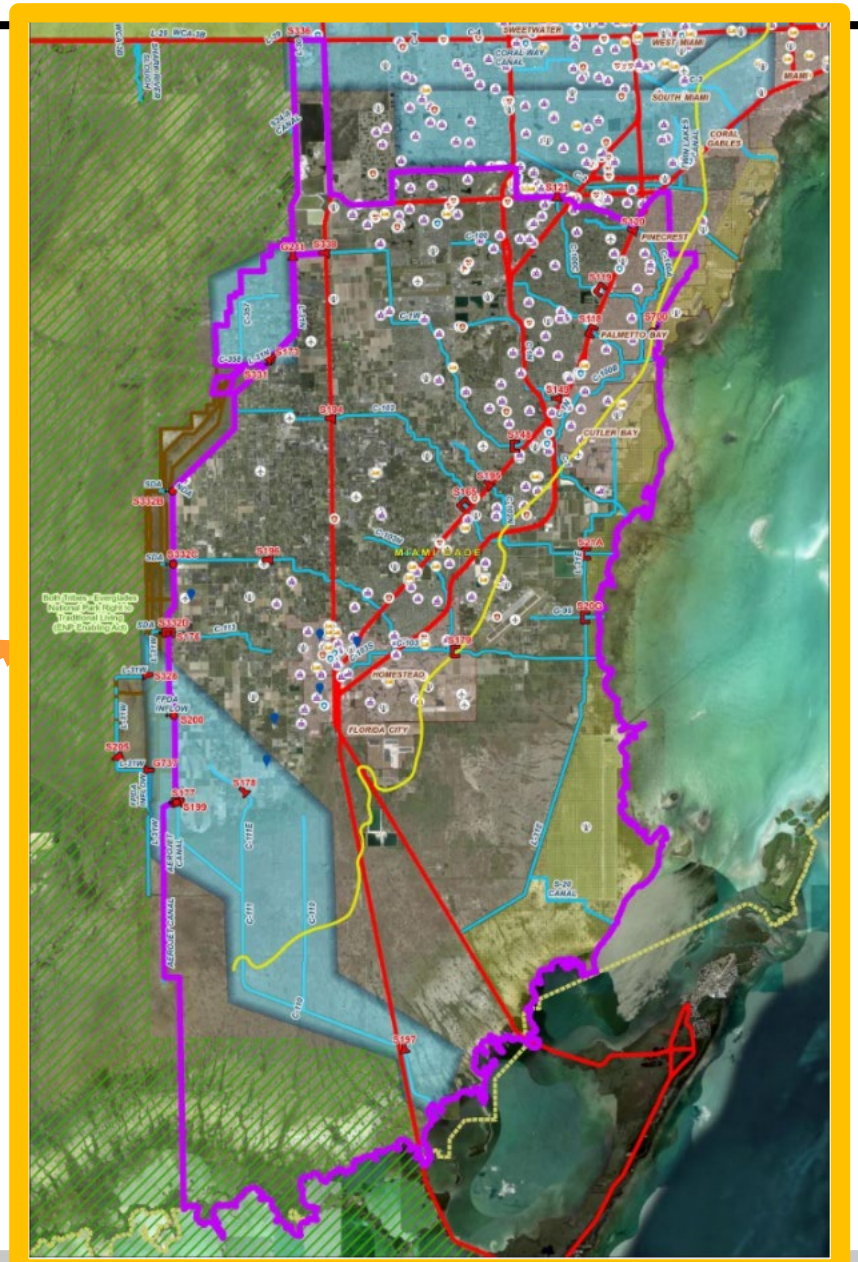


REACH D: SOUTH MIAMI BASINS

Presenter: Zulamet Vega-Liriano

REACH D: SOUTH MIAMI BASINS



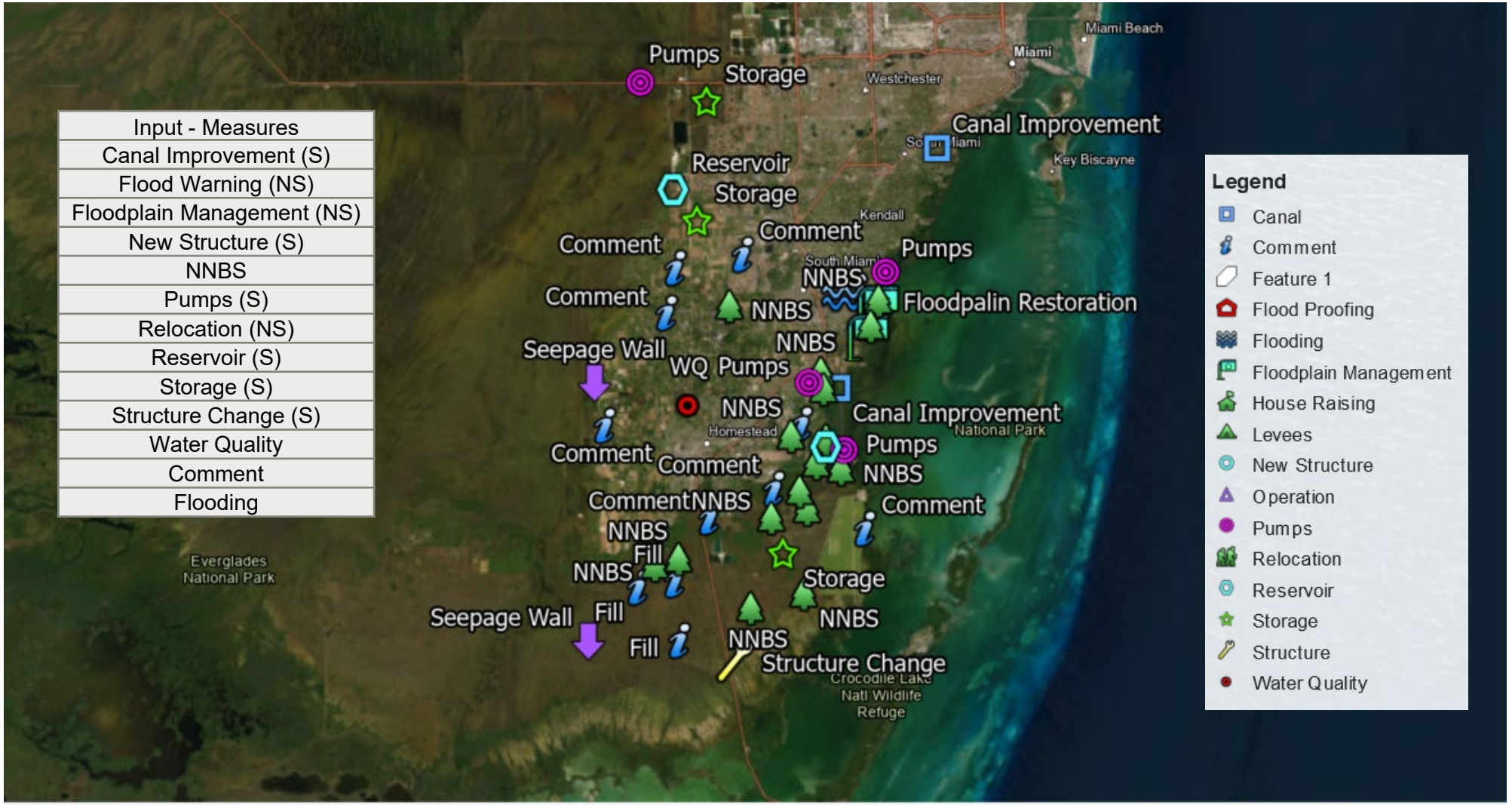


RECAP: CONCEPTUAL MANAGEMENT MEASURES – REACH D

Presenter: Zulamet Vega-Liriano

COMBINED DRAFT INPUT FOR REACH D: SOUTH MIAMI BASINS

Input - Measures
Canal Improvement (S)
Flood Warning (NS)
Floodplain Management (NS)
New Structure (S)
NNBS
Pumps (S)
Relocation (NS)
Reservoir (S)
Storage (S)
Structure Change (S)
Water Quality
Comment
Flooding



COMBINED DRAFT INPUT FOR REACH D: SOUTH MIAMI BASINS (CONT.)

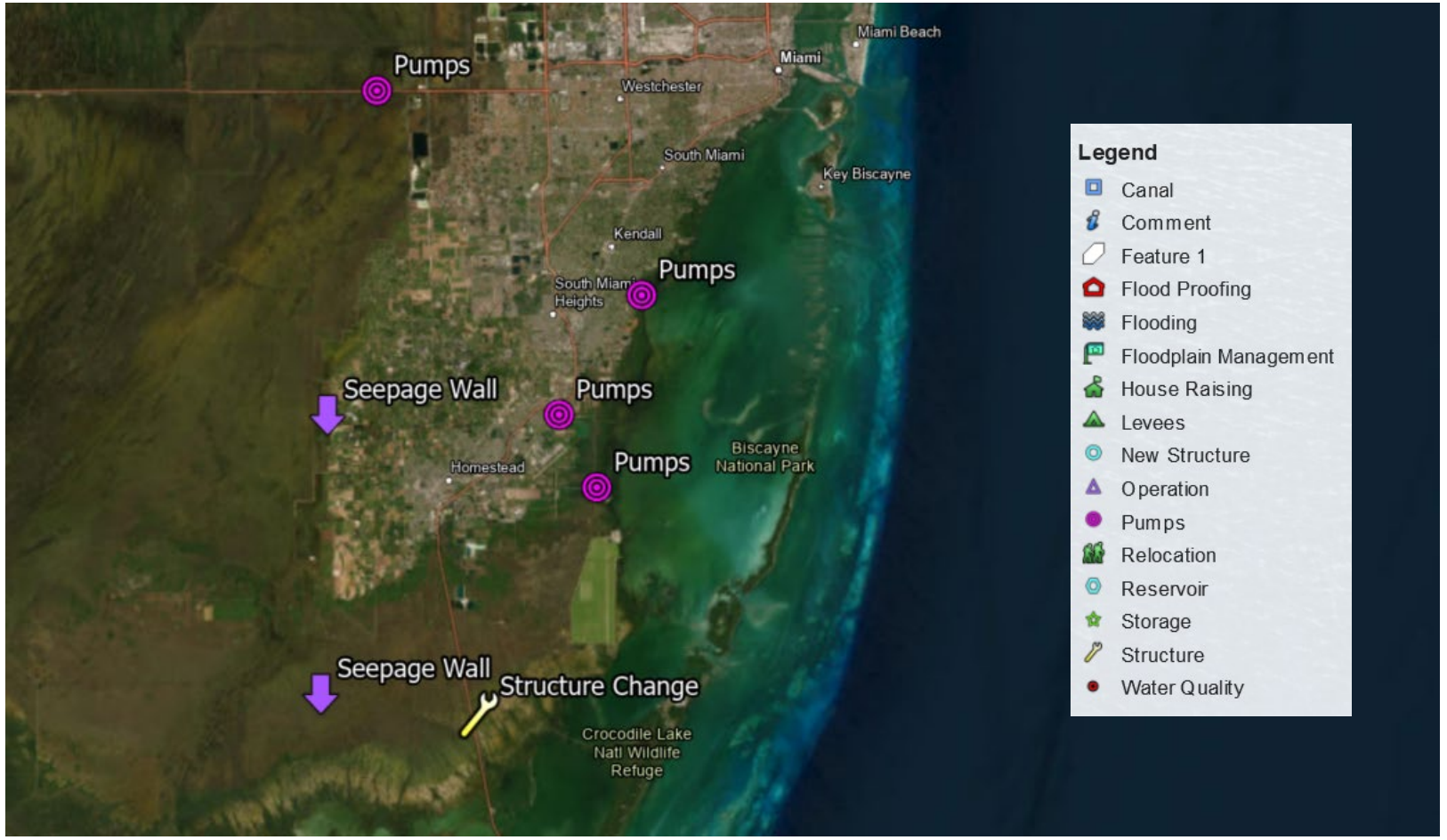
Canal Improvement (S)	C-103	C-102	C-3

COMBINED DRAFT INPUT FOR REACH D: SOUTH MIAMI BASINS (CONT.)

Additional Information:

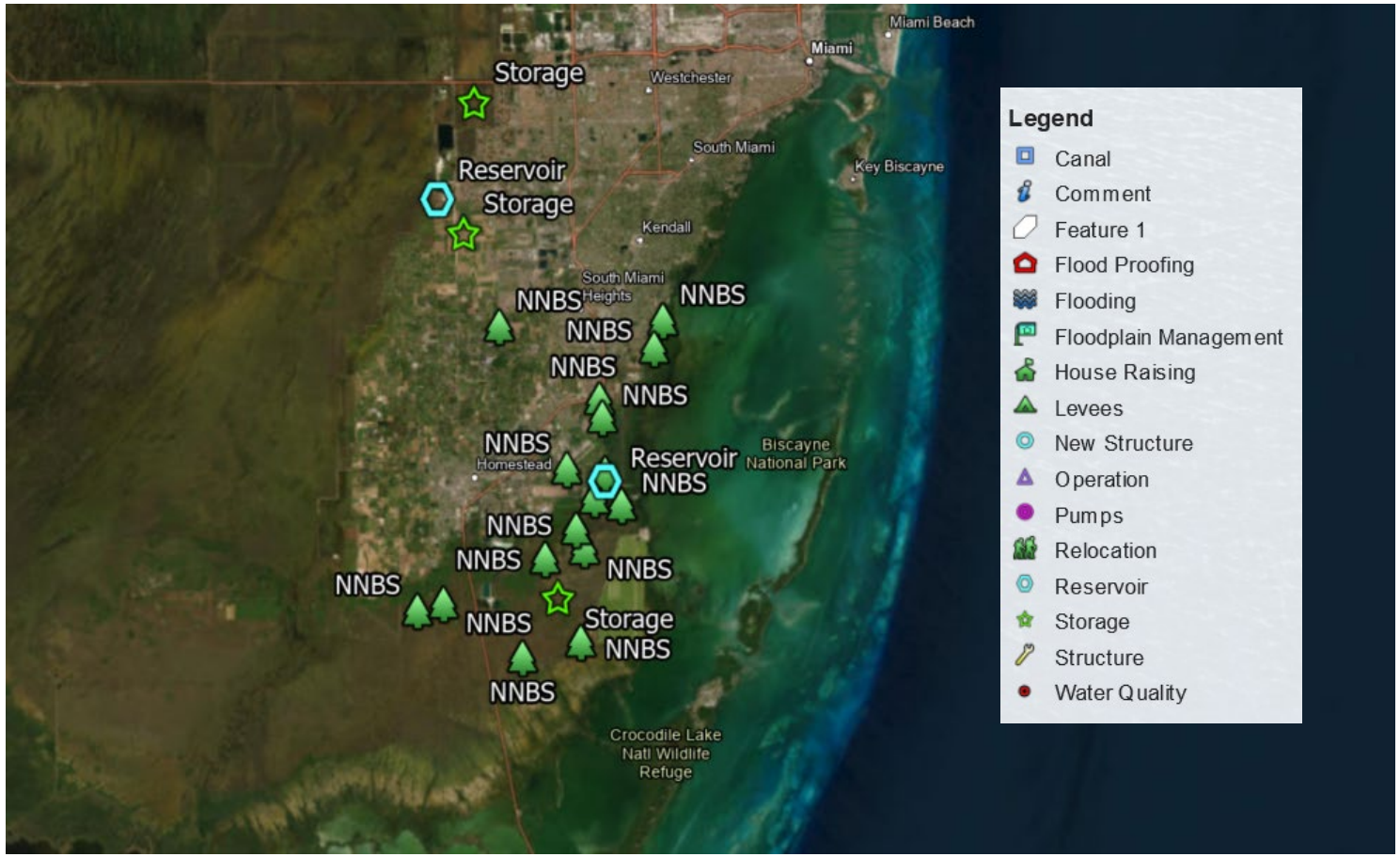
Project Name	Basin
Improvements in Primary Canals C-1W and C-1	South Miami-Dade
New tidal structure at the Goulds Canal outfall to Biscayne Bay	South Miami-Dade
Upgrades of inland structures S148 and S149	South Miami-Dade
Installation of backflow prevention measures and devices	
Installation of control structure at the crossing of Cutler Wetland C-1 Flow Way and the eastern levee.	South Miami-Dade
Improvements to elevation requirements of levees at the eastern boundary of the C-1 watershed.	
Development of local flood mitigation projects in collaboration with Miami-Dade County.	South Miami-Dade
Improvements in Primary Canals C-100, C-100A, C-100B.	
Upgrades of coastal Structure S123.	South Miami-Dade
Backflow prevention.	
Development of local flood mitigation projects in collaboration with Miami-Dade County.	South Miami-Dade
Improvements in Primary Canals C-102 and C-102N	
Backflow Prevention	South Miami-Dade
Installation of control structures at Levee L31E	South Miami-Dade
Retrofitting Levees	
Local Mitigation projects	South Miami-Dade
Improvements in Primary Canals C-103 and C-103N	
Backflow Prevention	South Miami-Dade
Installation of Control Structures at Levee L31E	
Retrofitting Levees	South Miami-Dade
Local Mitigation projects	

COMBINED DRAFT INPUT FOR REACH D: SOUTH MIAMI BASINS (CONT.)



Pumps (S)	C-100	C-103	L-29	C-102
Structure Change (S)	S-197 Remove S-197			
Seepage Wall	West			

COMBINED DRAFT INPUT FOR REACH D: SOUTH MIAMI BASINS (CONT.)



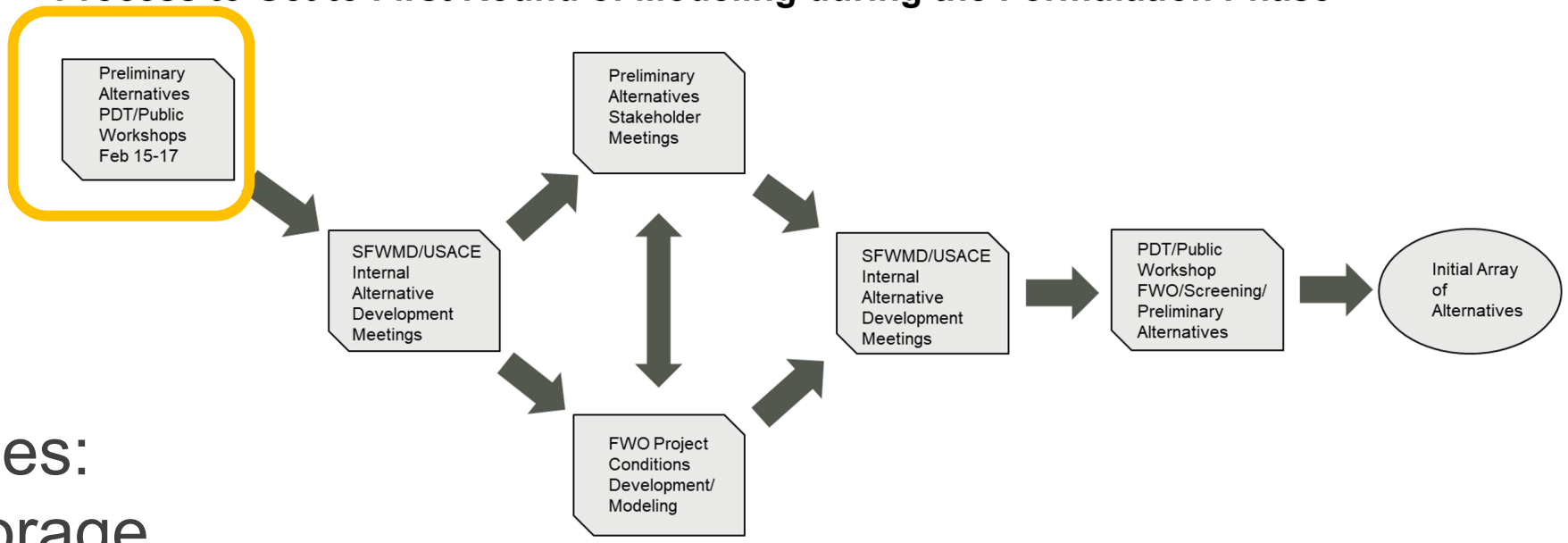
NNBS	Look for availability for green space	Create green space here new development	Advance mangroves	Create flow path (natural)
Reservoir (S)	West of SR-997	North of C-103		
Storage (S)	Easement for temporary flow way storage	Natural high volume flow way		

ALTERNATIVE DEVELOPMENT: PRELIMINARY INITIAL ARRAY OF ALTERNATIVES

Presenter: Zulamet Vega-Liriano

SCOPING: ALTERNATIVES FORMULATION

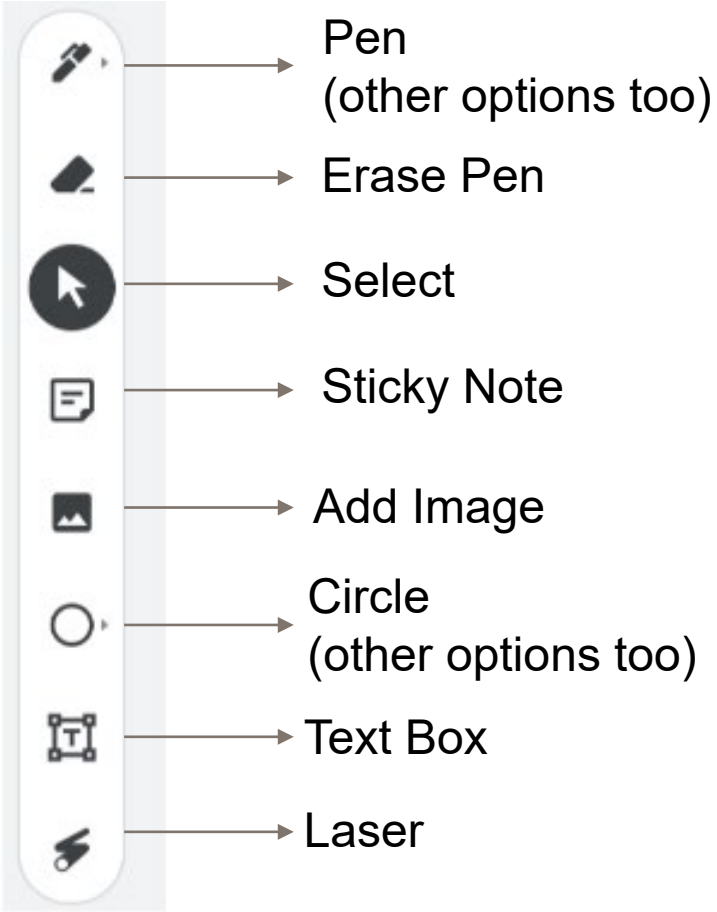
Process to Get to First Round of Modeling during the Formulation Phase



- Four general themes:
  - Structural - Storage
  - Structural - Conveyance
  - Nonstructural
  - Natural and Nature Base Features (NNBF) – Storage and Conveyance

HOW DO YOU EDIT JAMBOARD?

- Main editing tools (white bar with symbols below) are located on the left-hand of your screen.
- Move your cursor to it and left-click to pick a tool.



For this exercise, you will copy a measure from Page 7 and add it to any of the reaches.

- To copy shape, left click to select shape and hit Ctrl + C
- To paste shape, left click on page and hit Ctrl+V
- To add a note, use Sticky Note and/or Text Box

EXAMPLE FEATURES FOUND IN JAMBOARD

To copy shape, left click to select shape and hit Ctrl+C

Structural Measures Examples

- Reservoir/Storage
- Structure Change
- Levees and Floodwalls
- Pumps
- New Structure
- Channel Improvements

Nonstructural Measures Examples

- Flood Proofing
- House Raising
- Relocation
- Flood Warning
- Floodplain Management
- Operational Change

Natural and Nature-Based Features Examples

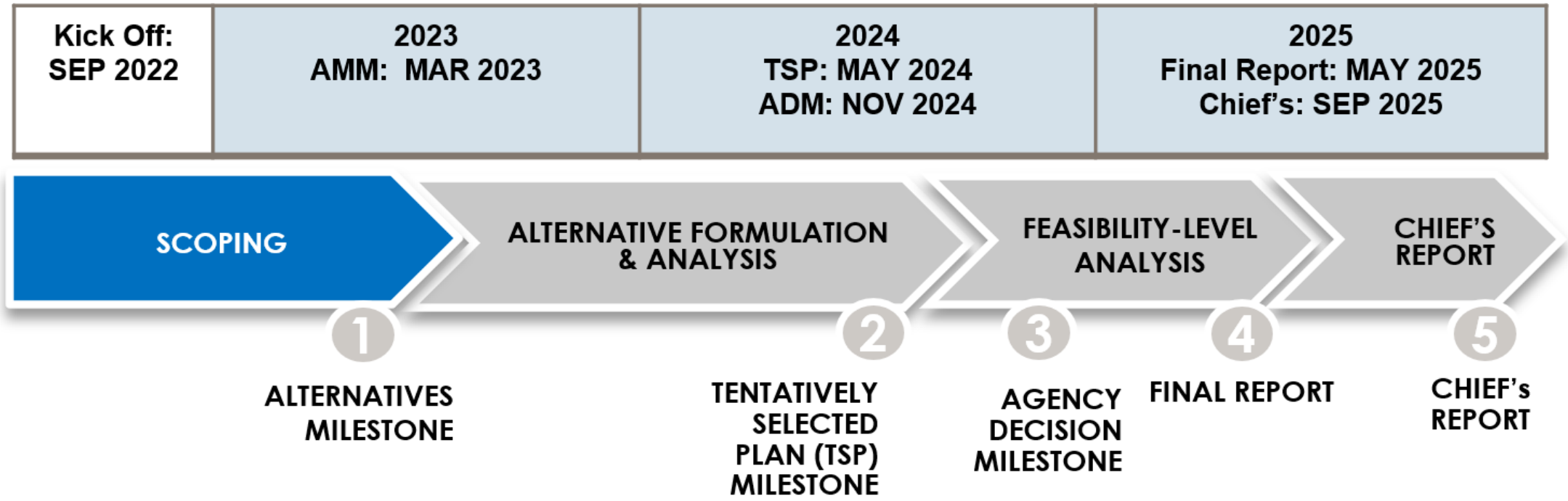
- Fresh Water Wetlands
- Floodplains Restoration
- Distributed Storage
- Raingarden
- Wetland Restoration

To paste shape, left click on page and hit Ctrl+V

FUTURE ENGAGEMENTS

Presenter: Tim Gysan

TIMELINE AND ENGAGEMENT OPPORTUNITIES



Note: Schedule is following 3x3x3 but will be subject to change based on team's discussions.

THANK YOU!

COMMENTS TO BE RECEIVED BY EMAIL AT
CSFFRSCOMMENTS@USACE.ARMY.MIL

VISIT OUR WEBSITES FOR MORE UPDATES AND STUDY DETAILS

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