C-111 SPREADER CANAL
Western Project and Design Test

Integration of Science and Engineering into Innovative Ecosystem Restoration Concepts

National Conference on Ecosystem Restoration
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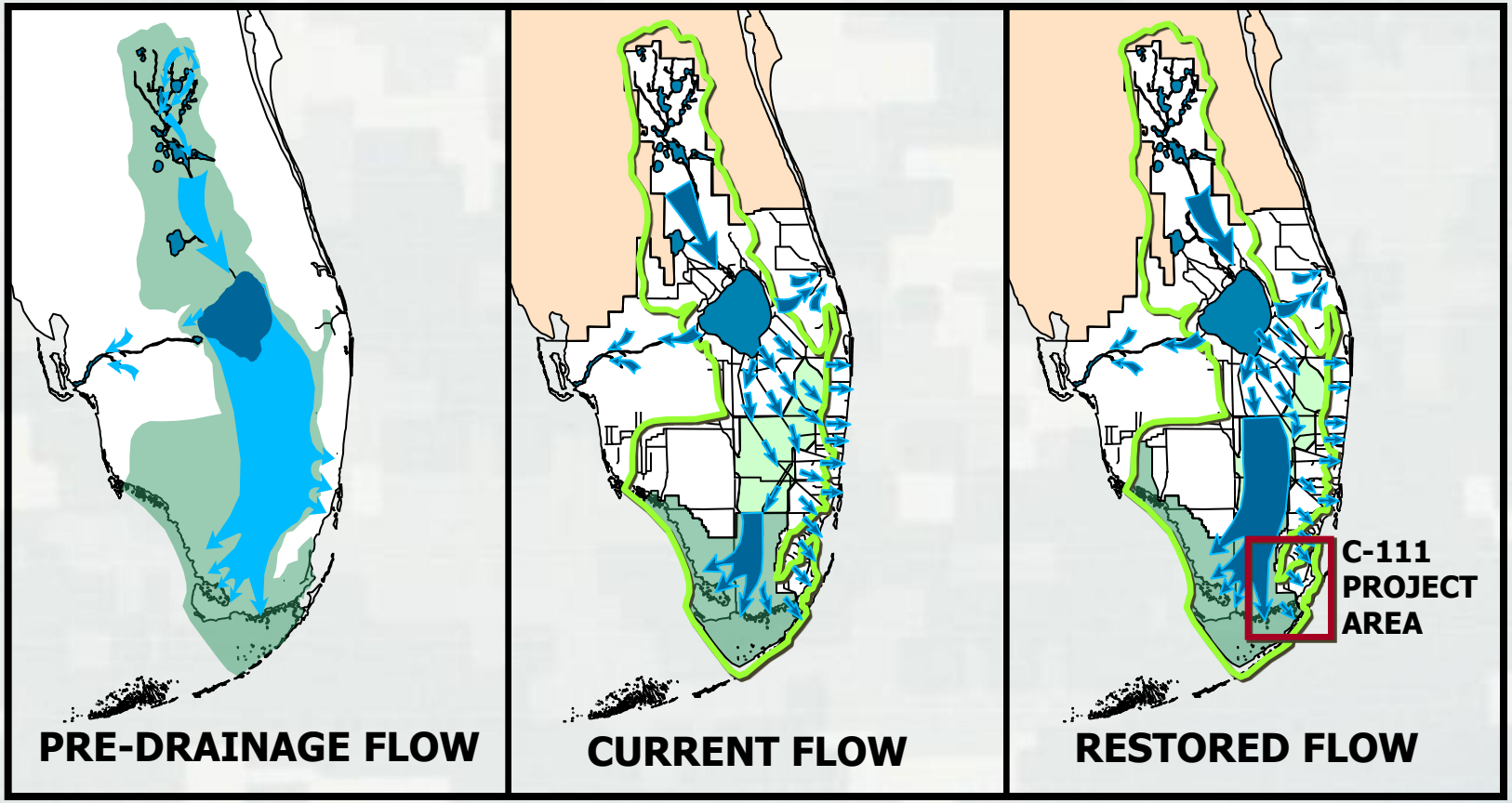
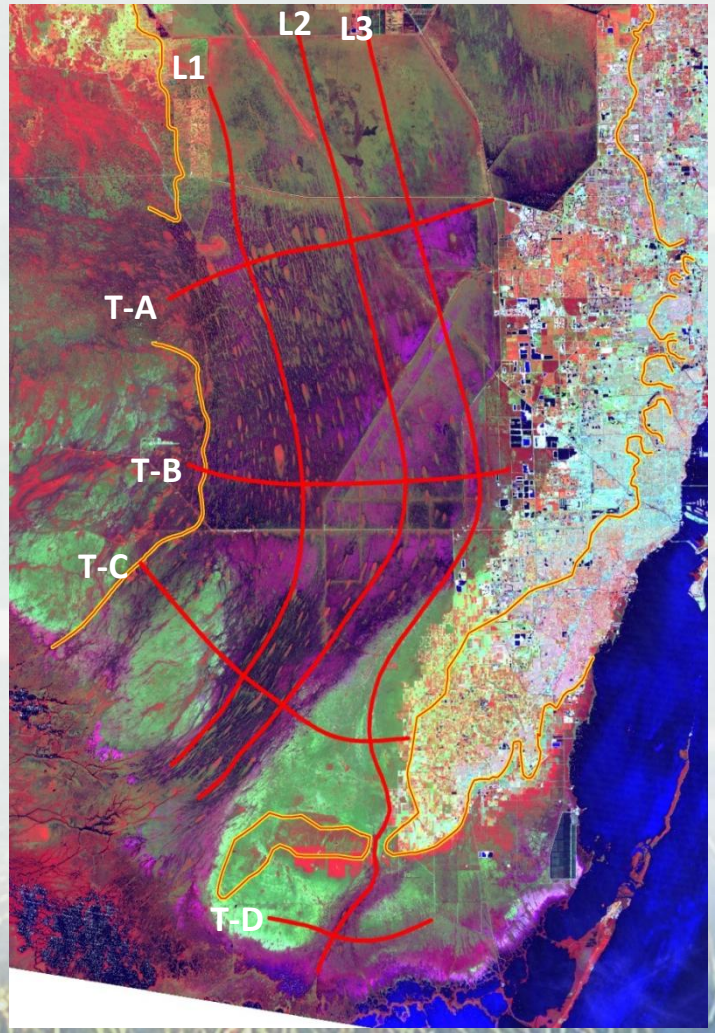


Comprehensive Everglades Restoration Plan

C-111 Spreader Canal Western Project and Design Test

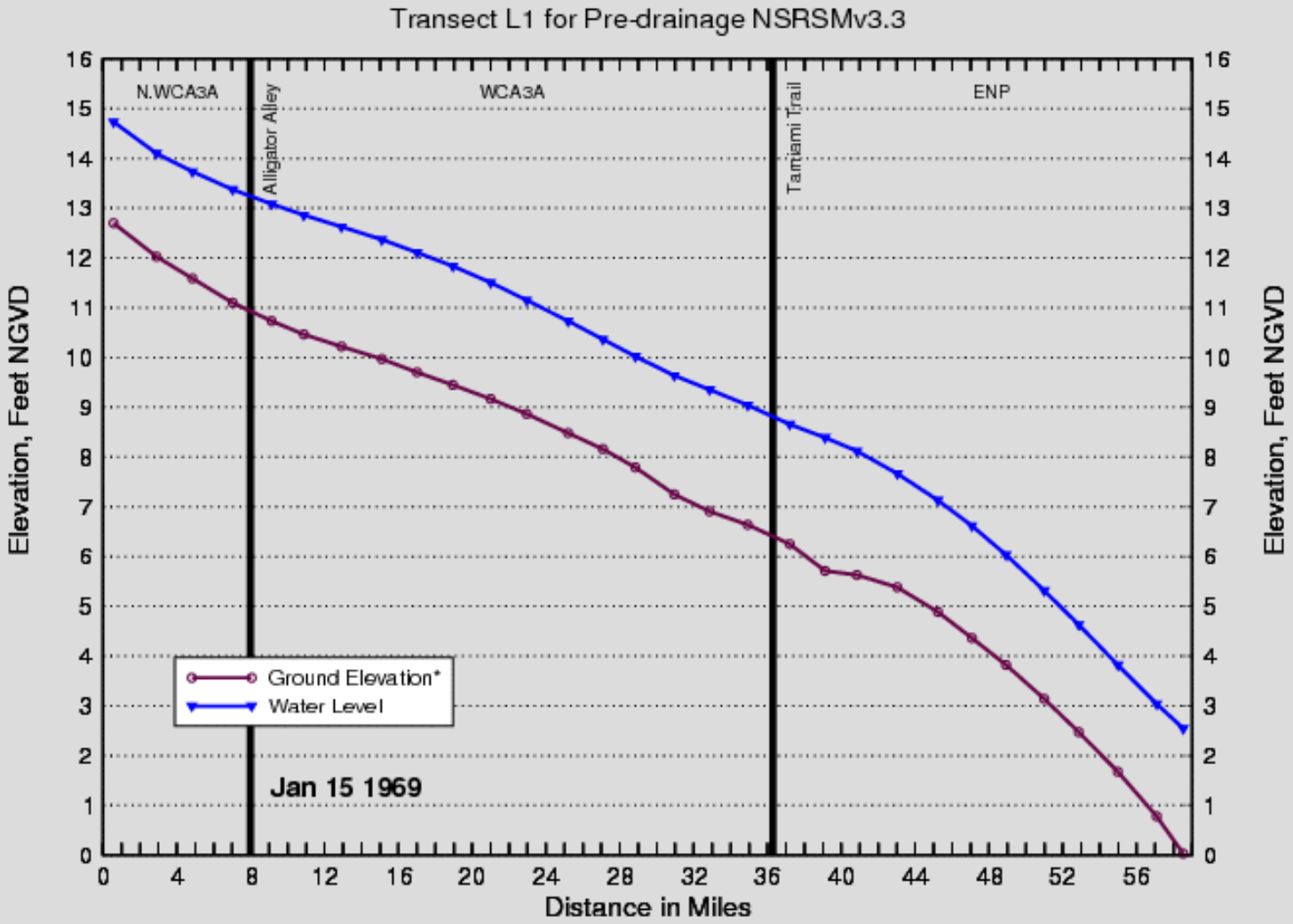
“Ever Views”

A View of Water Stage Levels in the Everglades



Pre-drainage Conditions

Water Depth Viewing Window



* Within the ridge & slough landscape, ground elevation = slough bottom.
For other landscapes, ground elevation = average model ground surface.

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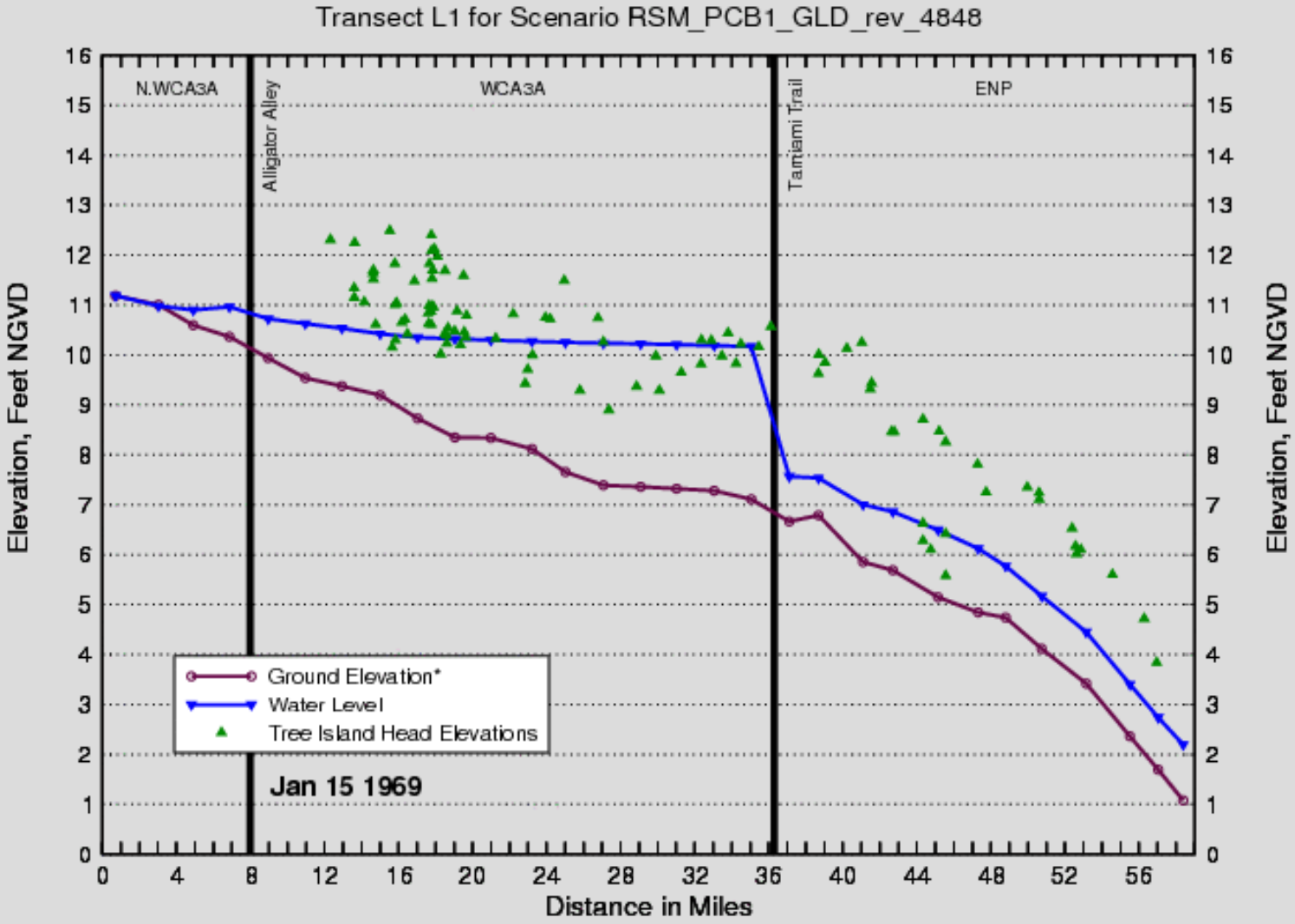
Filename: depth_transects_L1_NSRSMv3.3_ANIM.agr

Current Conditions

Water Depth Viewing Window



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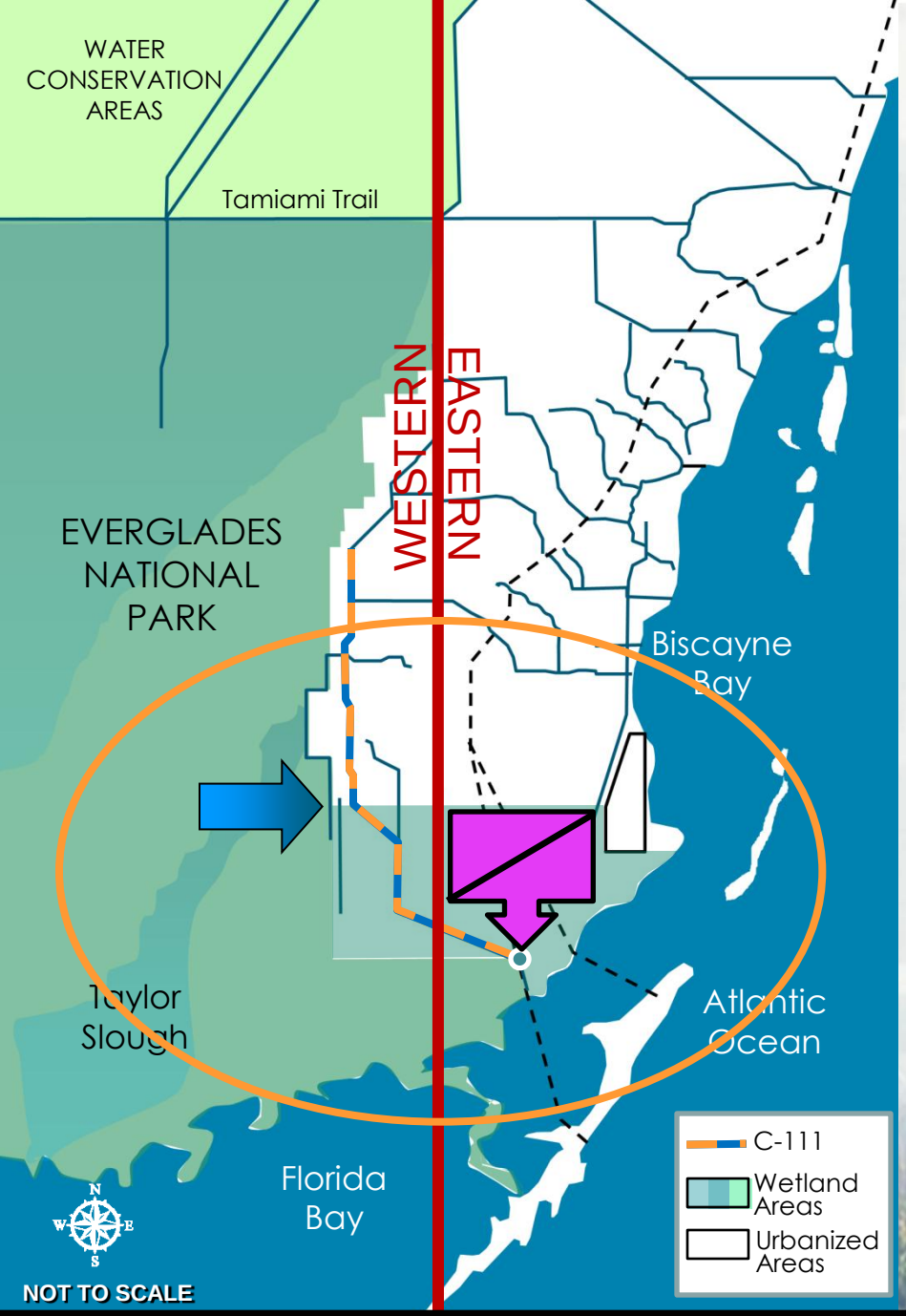


C-111 Project Area

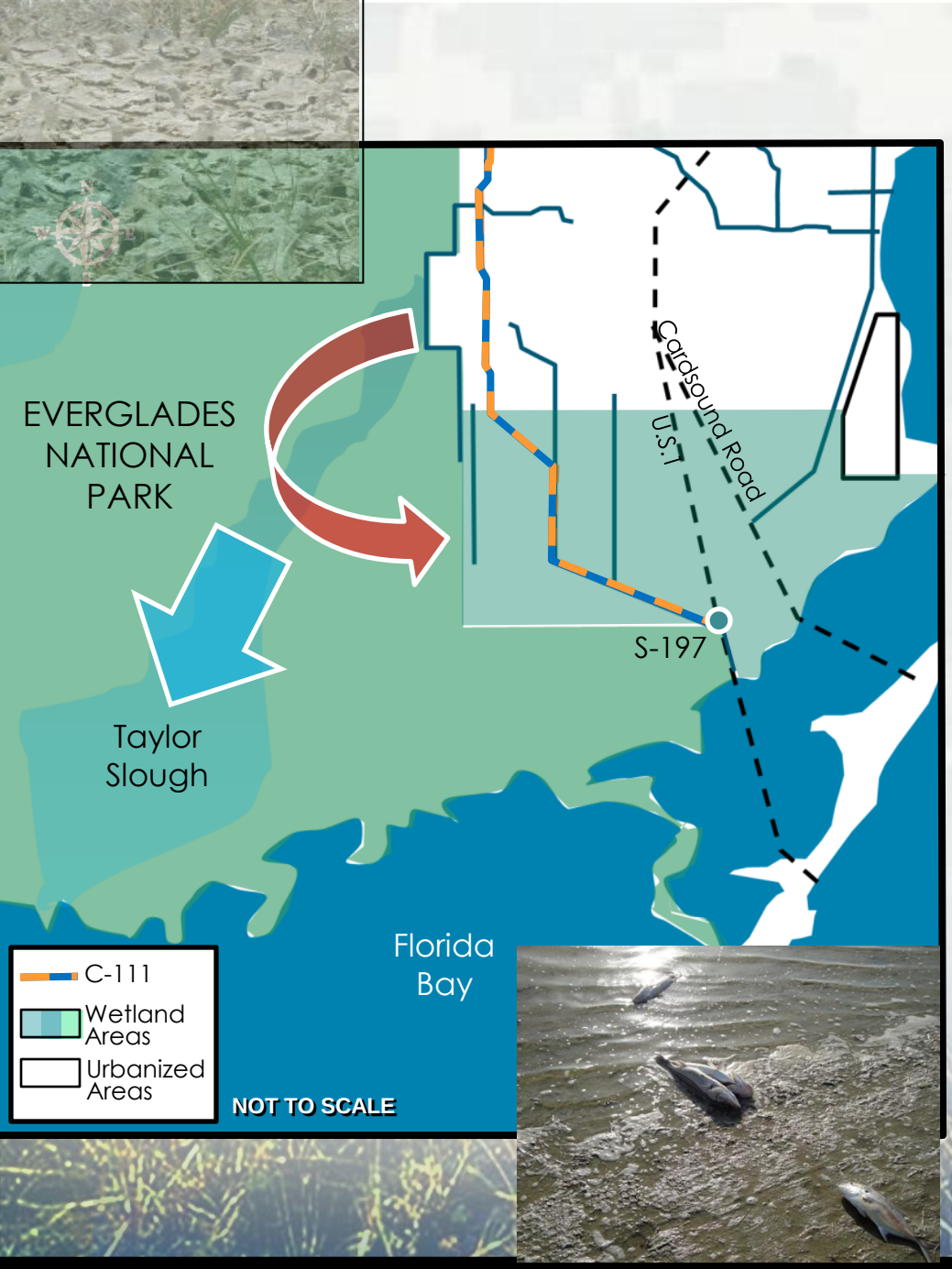
- **C-111 is southernmost canal of C&SF system and serves a 100 square-mile basin**
- **Provides flood protection and drainage for agricultural areas west and south of Homestead**
- **Challenges:**
  - ►**Water is seeping out of Everglades National Park into the C-111 Canal.**
  - ►**There is poor distribution of freshwater into wetlands in the eastern project site**

Western Project: South Florida Landscape

- Minimal Relief (less than 3-feet in project area)
- Less than 1 foot of soil on top of limestone
- Limestone is extremely porous and easily drained by canals

Western Project

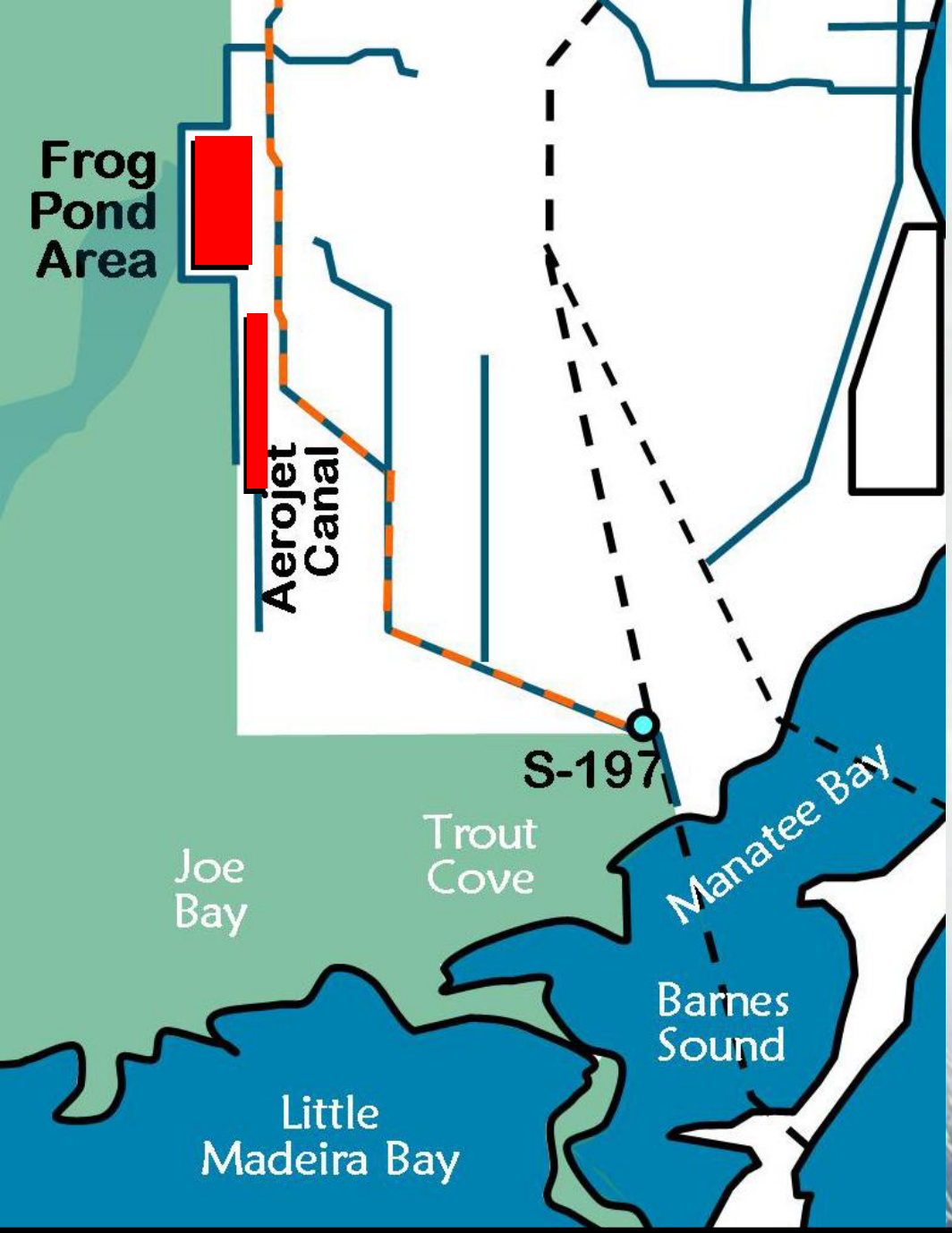
- **Focus restoration on reducing seepage out of Everglades National Park, allowing water to follow its natural flow path.**



Current seepage

Historical/Desired flow

Problem: We can't just block flows to the east completely!



C-111

ROADS

EXISTING STRUCTURE

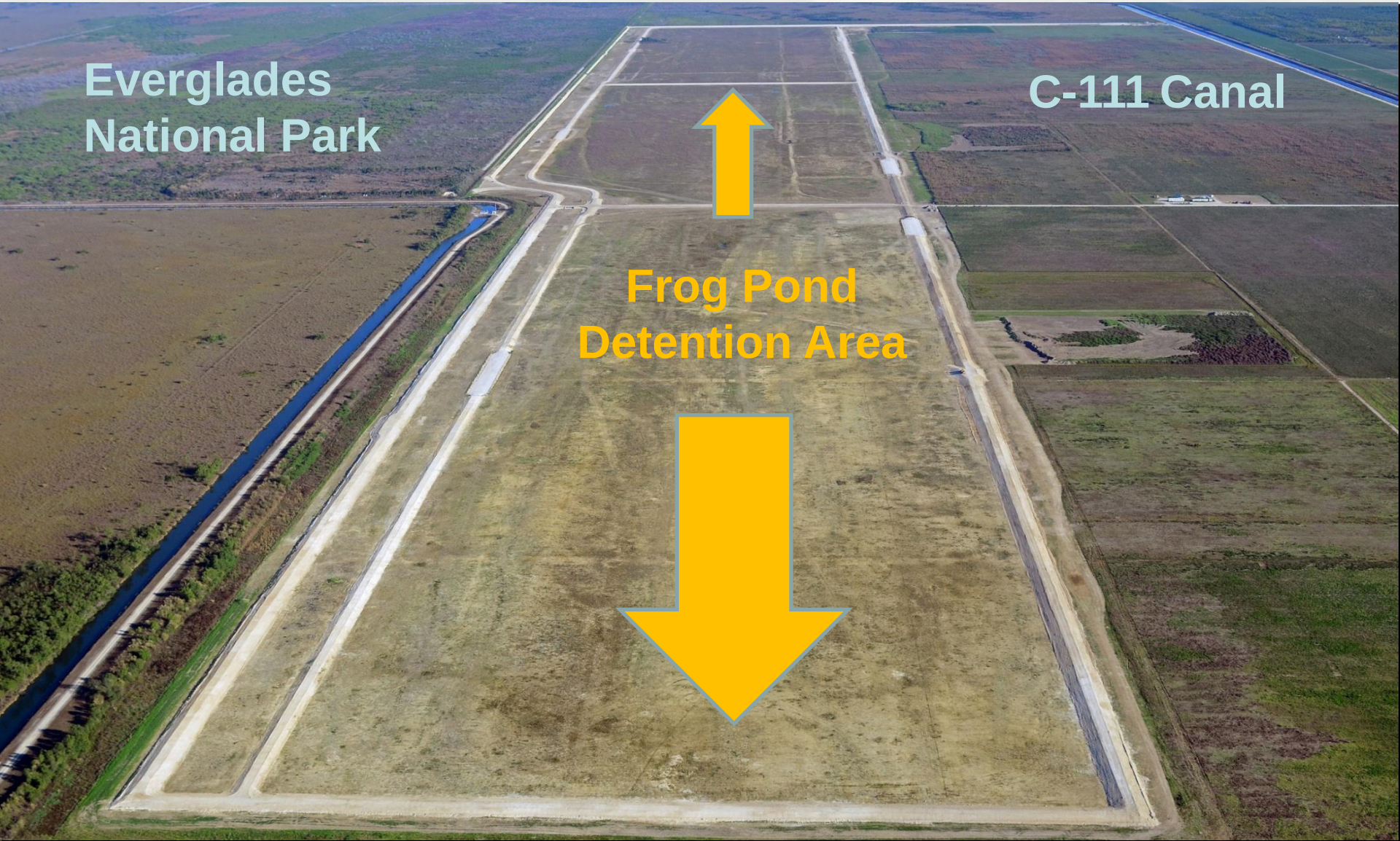
ENP

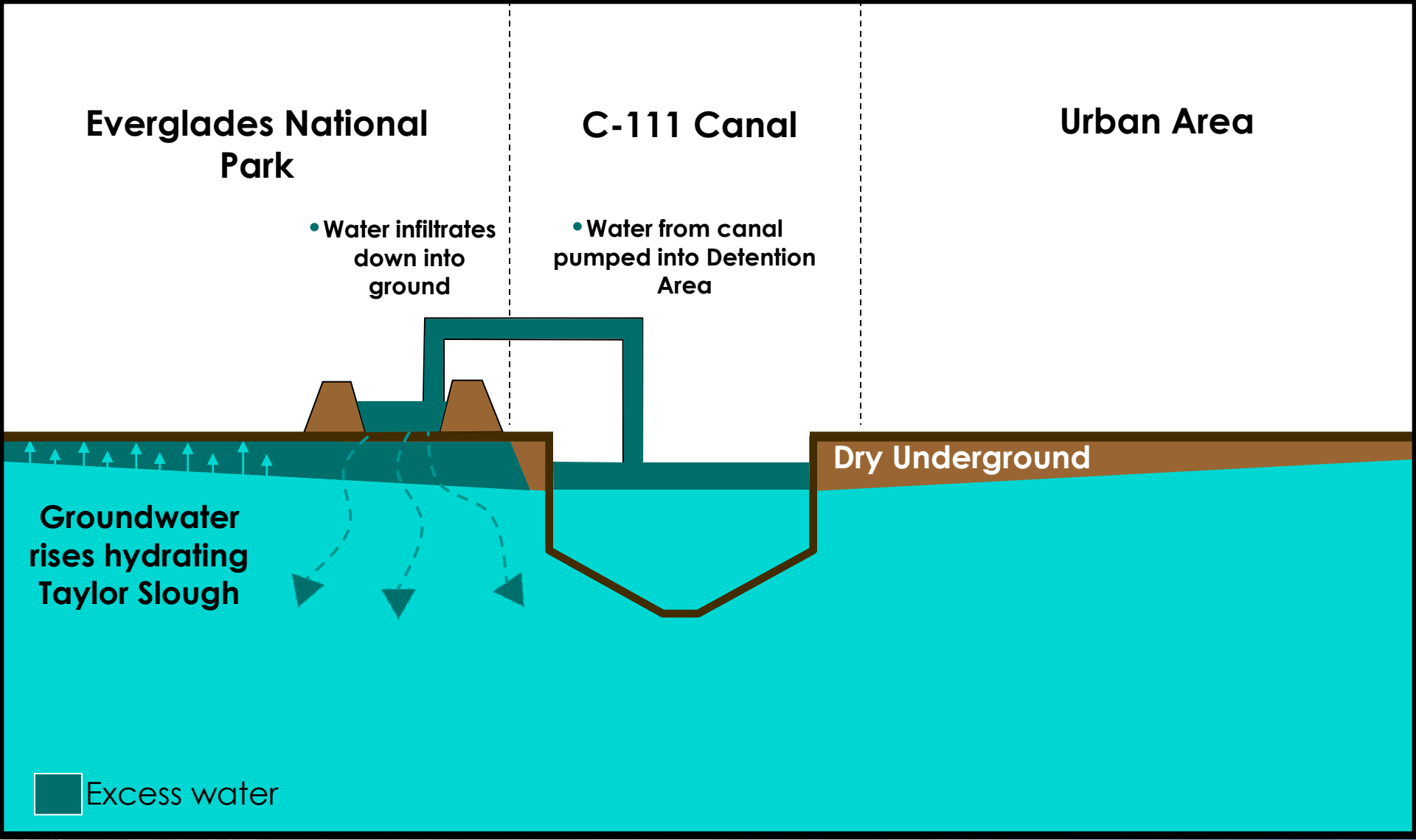
PROJECT FEATURES

Hydraulic Ridge

NOT TO SCALE

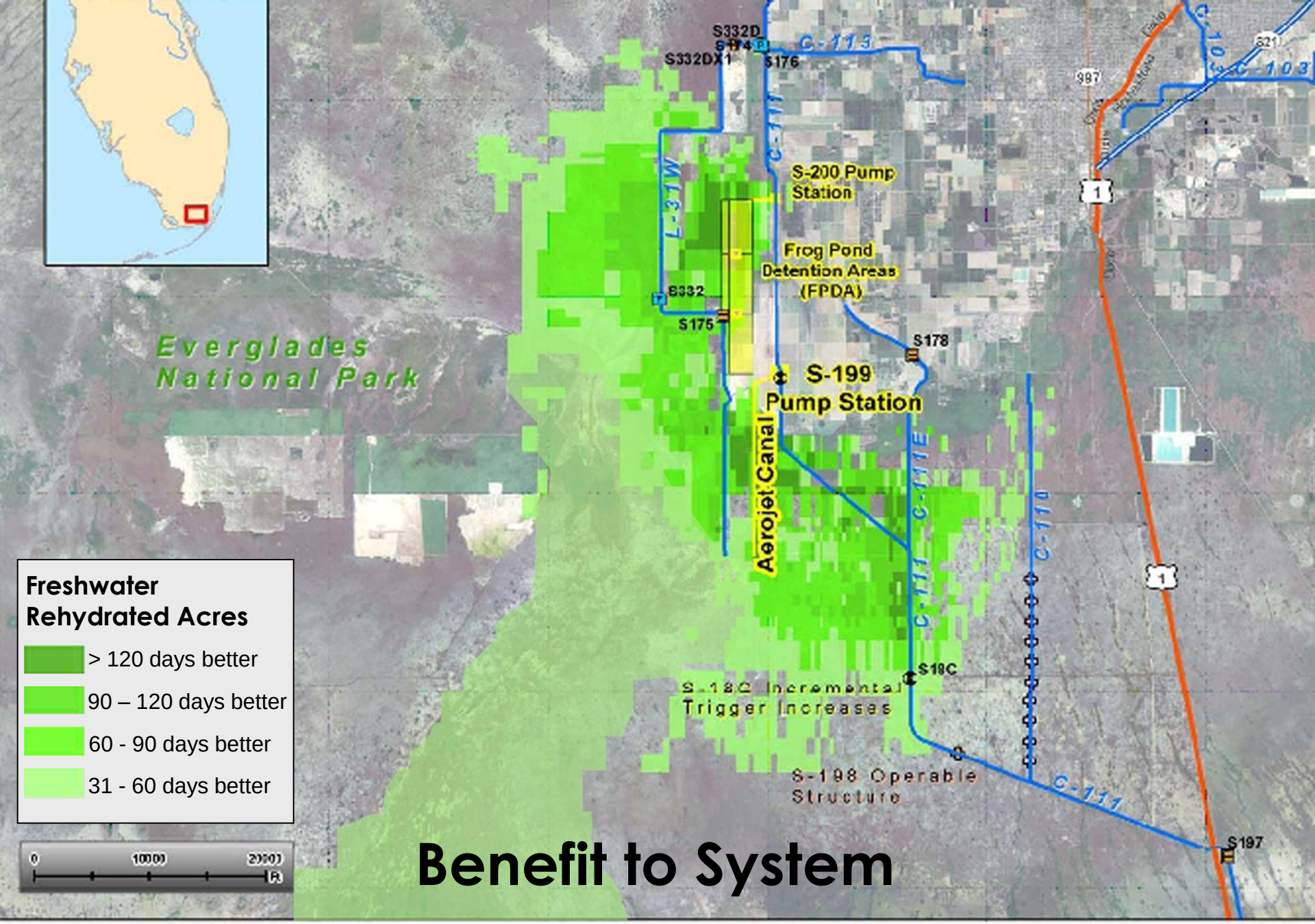
Frog Pond Detention Area





Hydraulic Ridge Concept

Detention area used to infiltrate water into ground and artificially raise groundwater table



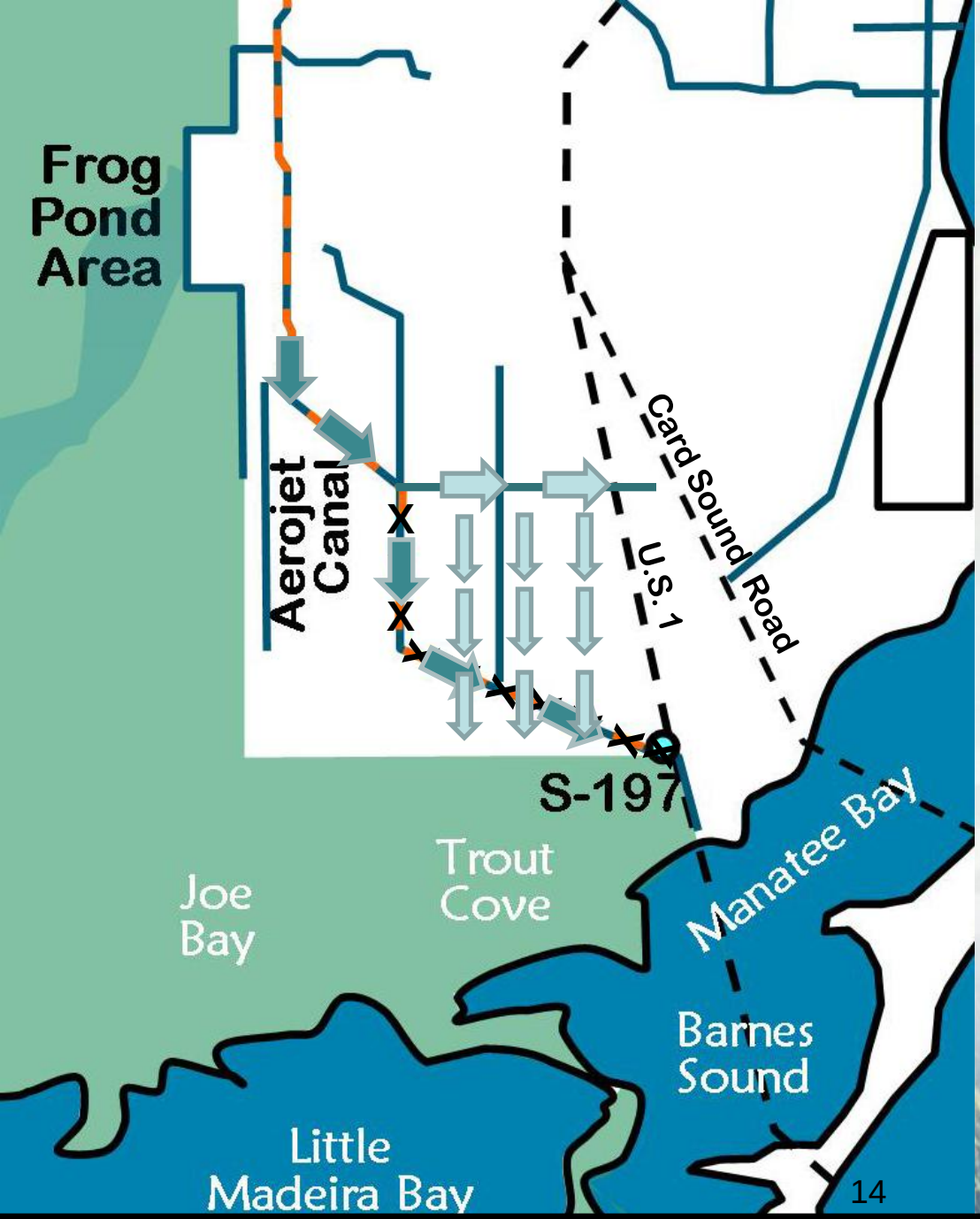
Benefit to System

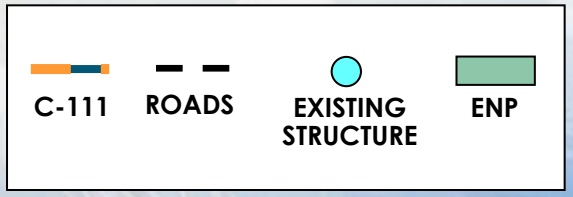
Benefits to System

- Rehydrated sawgrass freshwater habitat
- Increased nesting success for water dependent birds
- Restoration of nursery habitat in Florida Bay
- Approximately 240,000 acres of benefited area

Existing System and Restudy Concept

- C-111 constructed to relieve flooding
- Canal acts like a sump and is draining the Park
- Restudy conceptualized backfilling C-111 and constructing a new canal to redistribute the water - surface water

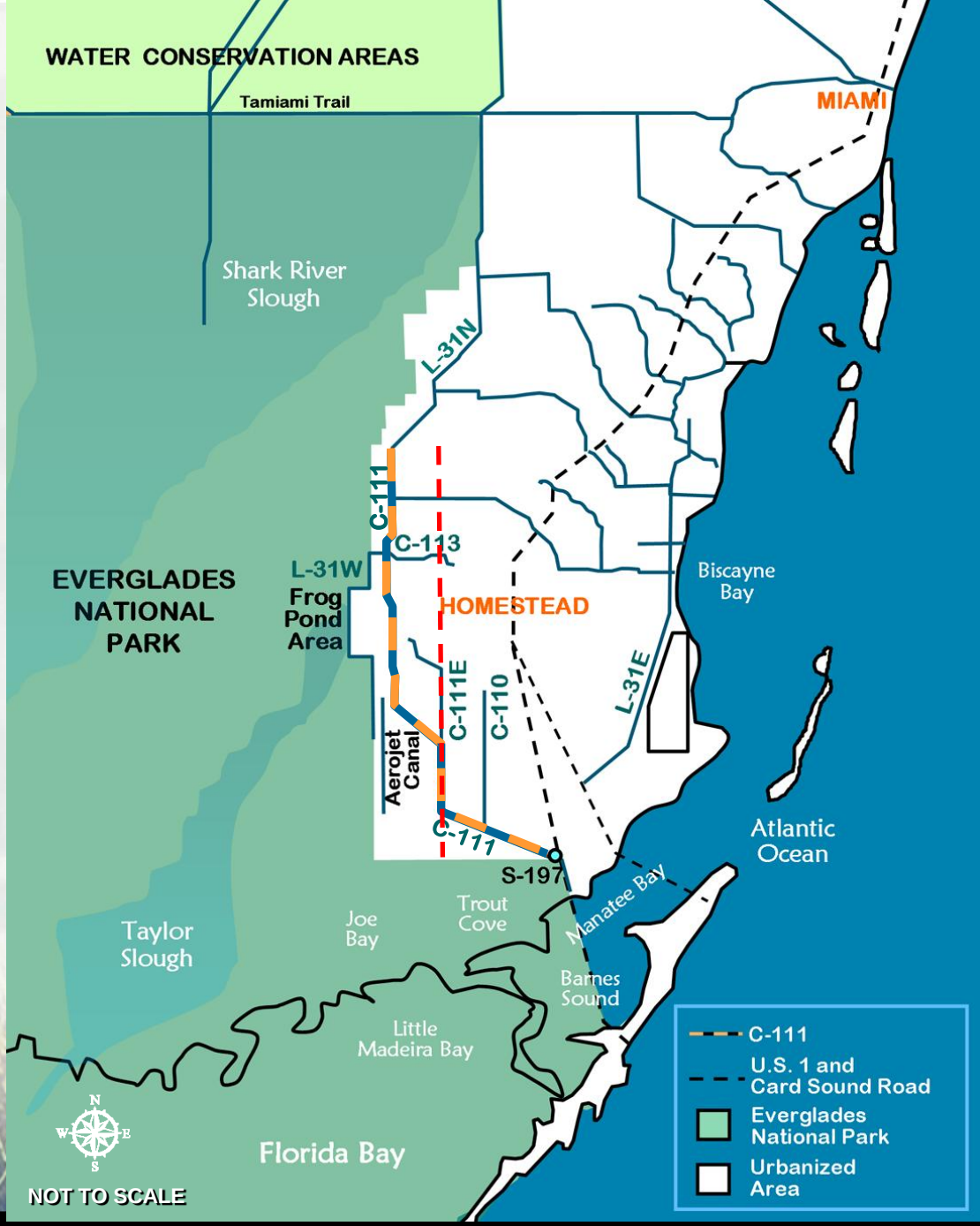




C-111 Spreader Canal Design Test

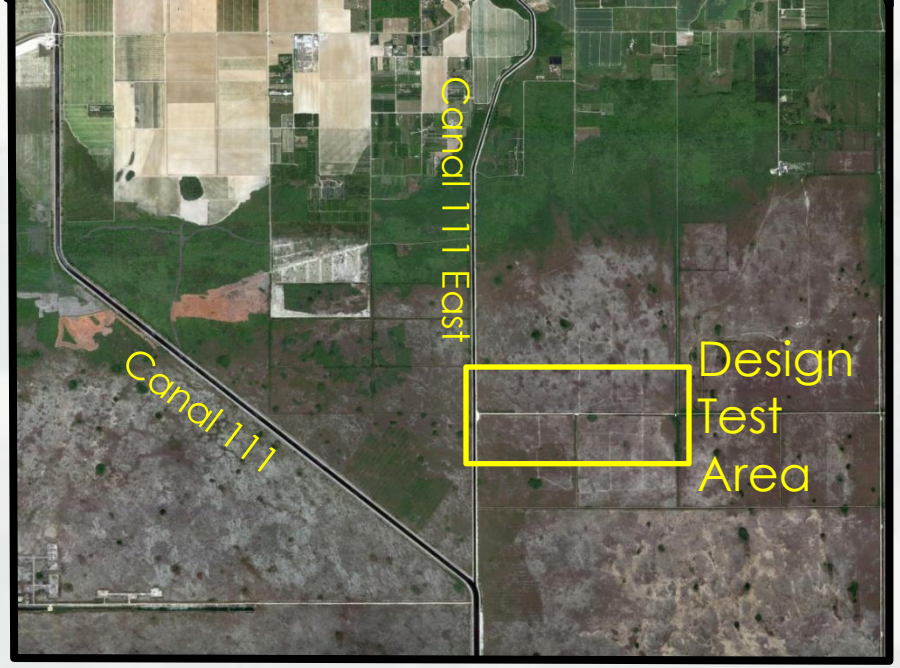
Background

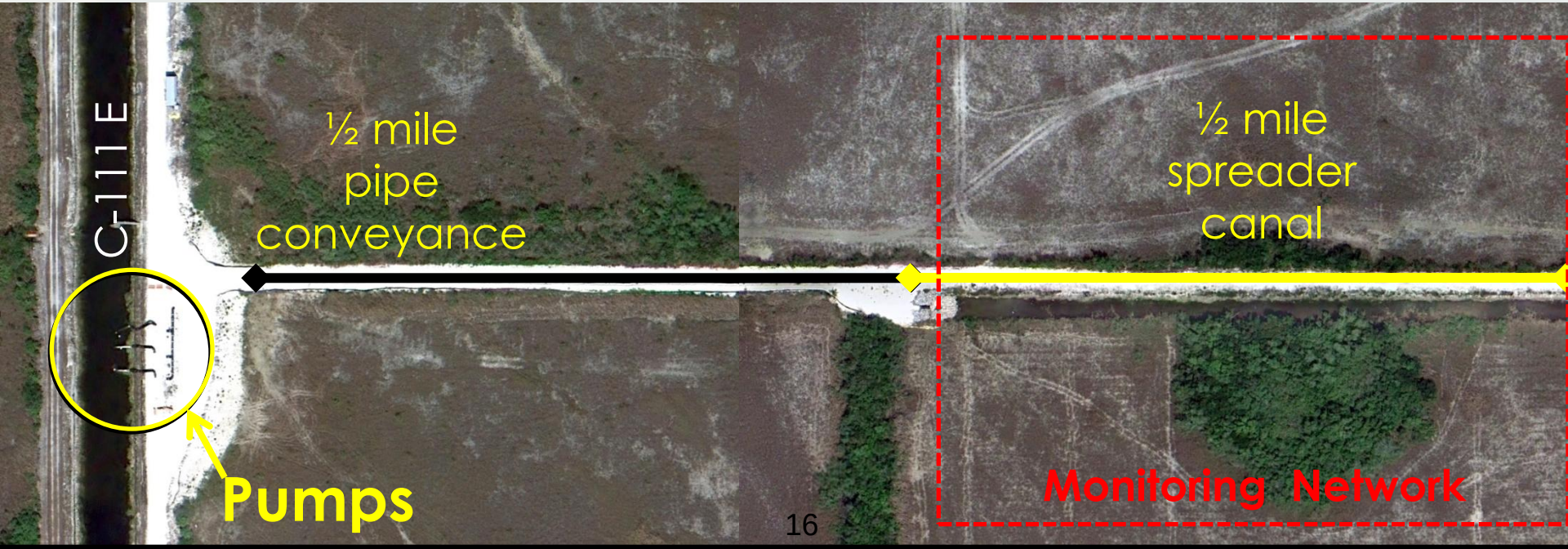
- Critical uncertainties have to be resolved before advancing with the Eastern project
  - How long should the canal be?
  - What size should the pump station be?
  - Will there be flooding?
  - How much restoration can be accomplished?
- PDT developed a small scope effort to gather data to assist future plan formulation efforts

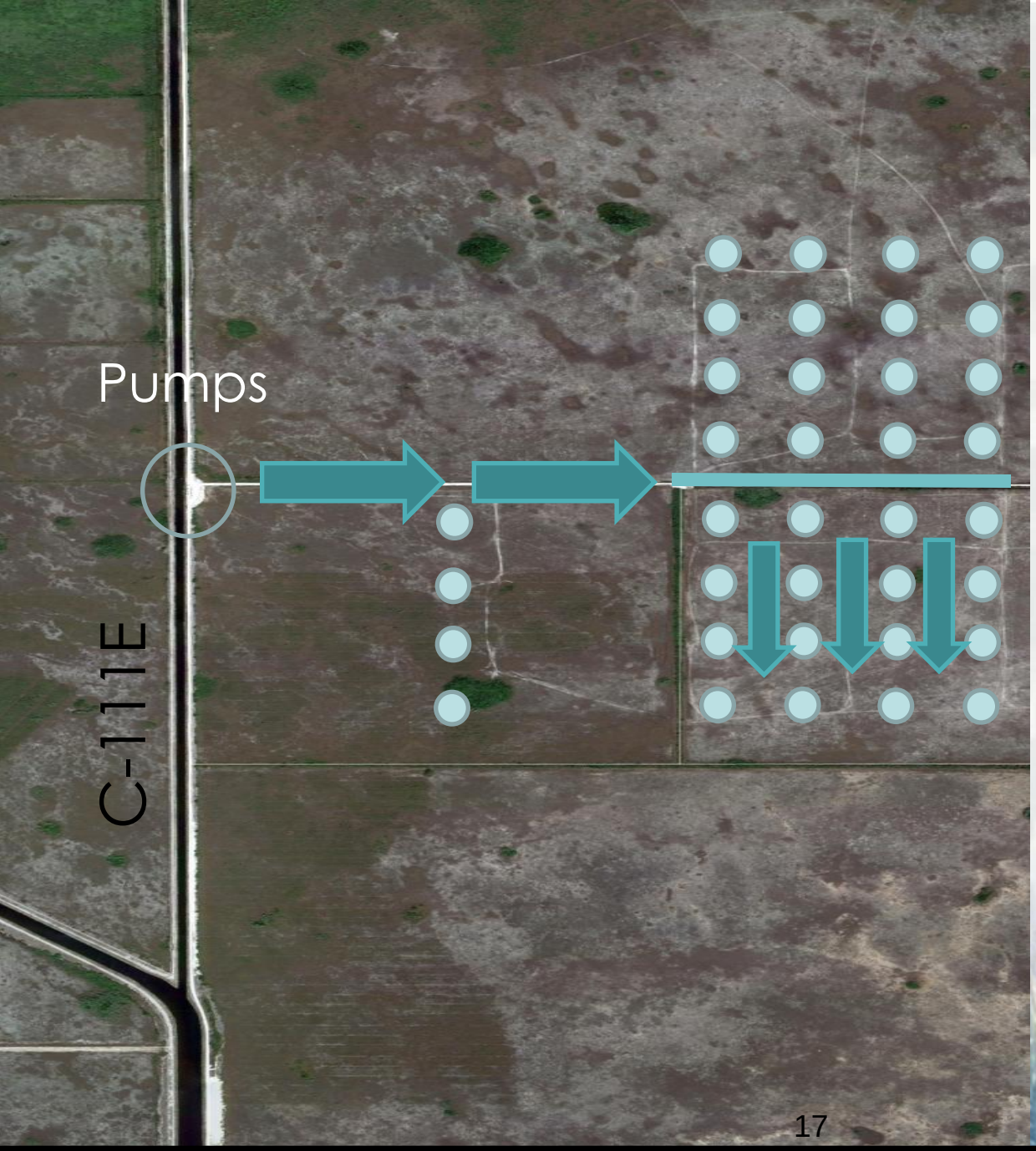


Design Test

- 3 - 25 cfs pumps
- ½ mile of conveyance
- ½ mile of spreader canal
- Monitoring network north and south of the canal
- Incremental adaptive operations

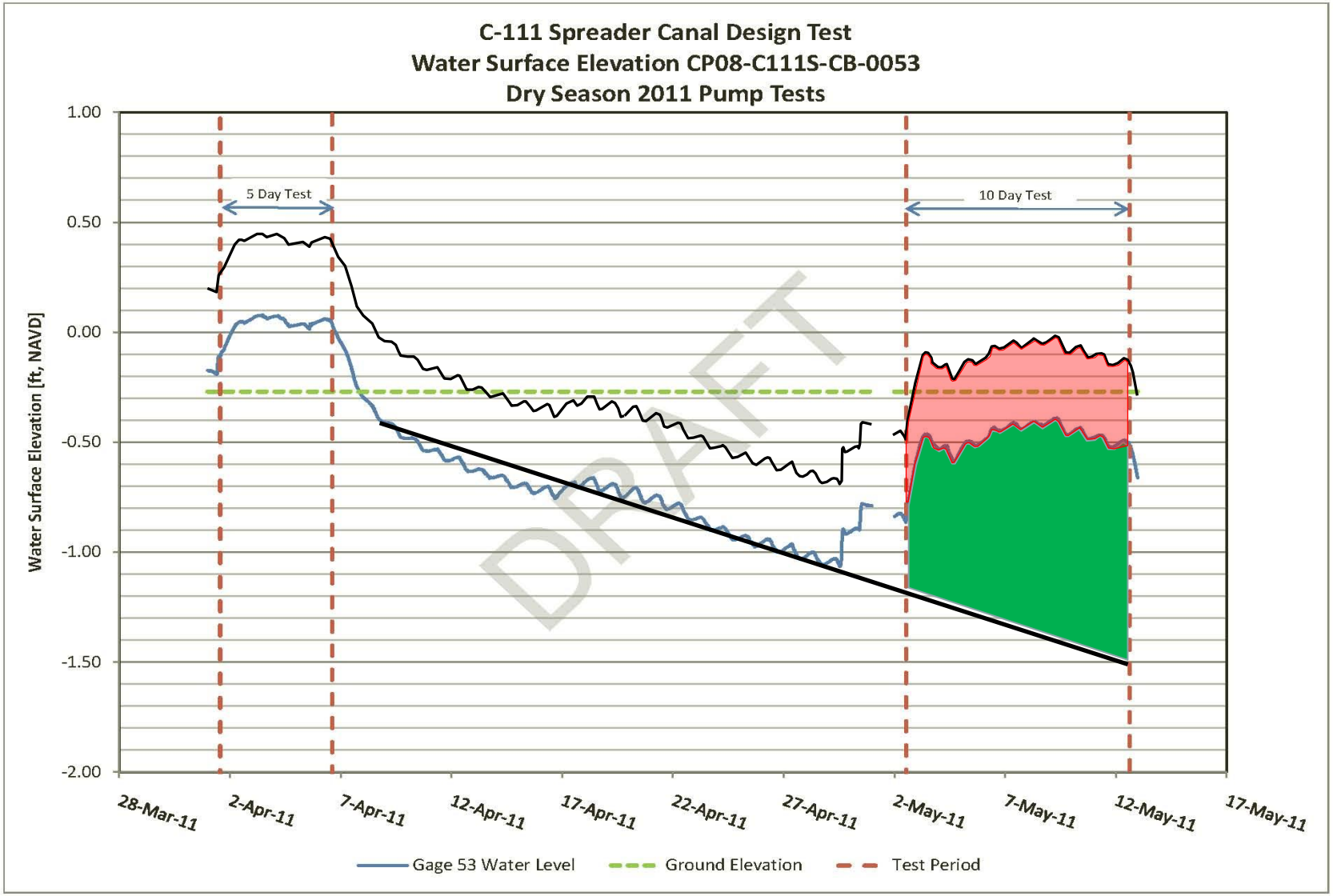






Monitoring Network

- A network of piezometers, flowmeters, and alarm gages were installed
- Monitored groundwater and surface water changes
- Flowmeters monitored the direction and velocity
- Alarm gages were put in to ensure we didn't affect any private land


C-111 Spreader Canal Design Test
Water Surface Elevation CP08-C111S-CB-0053
Dry Season 2011 Pump Tests
Water Surface Elevation [ft, NAVD]
1.00
0.50
0.00
-0.50
-1.00
-1.50
-2.00
5 Day Test
10 Day Test
DRAFT
28-Mar-11
2-Apr-11
7-Apr-11
12-Apr-11
17-Apr-11
22-Apr-11
27-Apr-11
2-May-11
7-May-11
12-May-11
17-May-11
Gage 53 Water Level
Ground Elevation
Test Period

Results
What Did We Learn?

- We could fill the canal, even in the dry season
- Backwater effects were minimal in both the dry and wet season
- Surface water in the wet season, but the overall stage change was minimal
- Dry season operations yielded significant results, in some cases 12 inches of stage increase
- Future CERP Projects may stop recession below ground surface elevations