ELM PEER Review Meeting

ELM Modeling Strategy For CERP Projects

Background
&
Pertinent Information

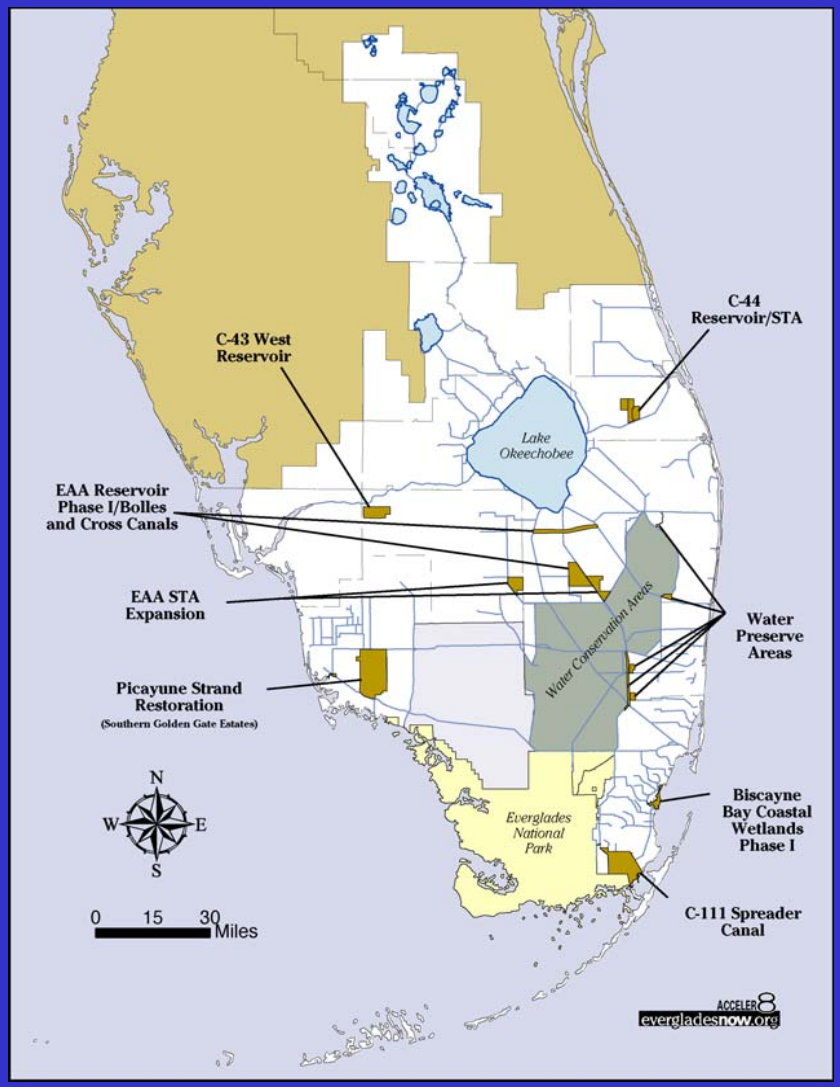
Dewey Worth

Dir. CERP Project Management

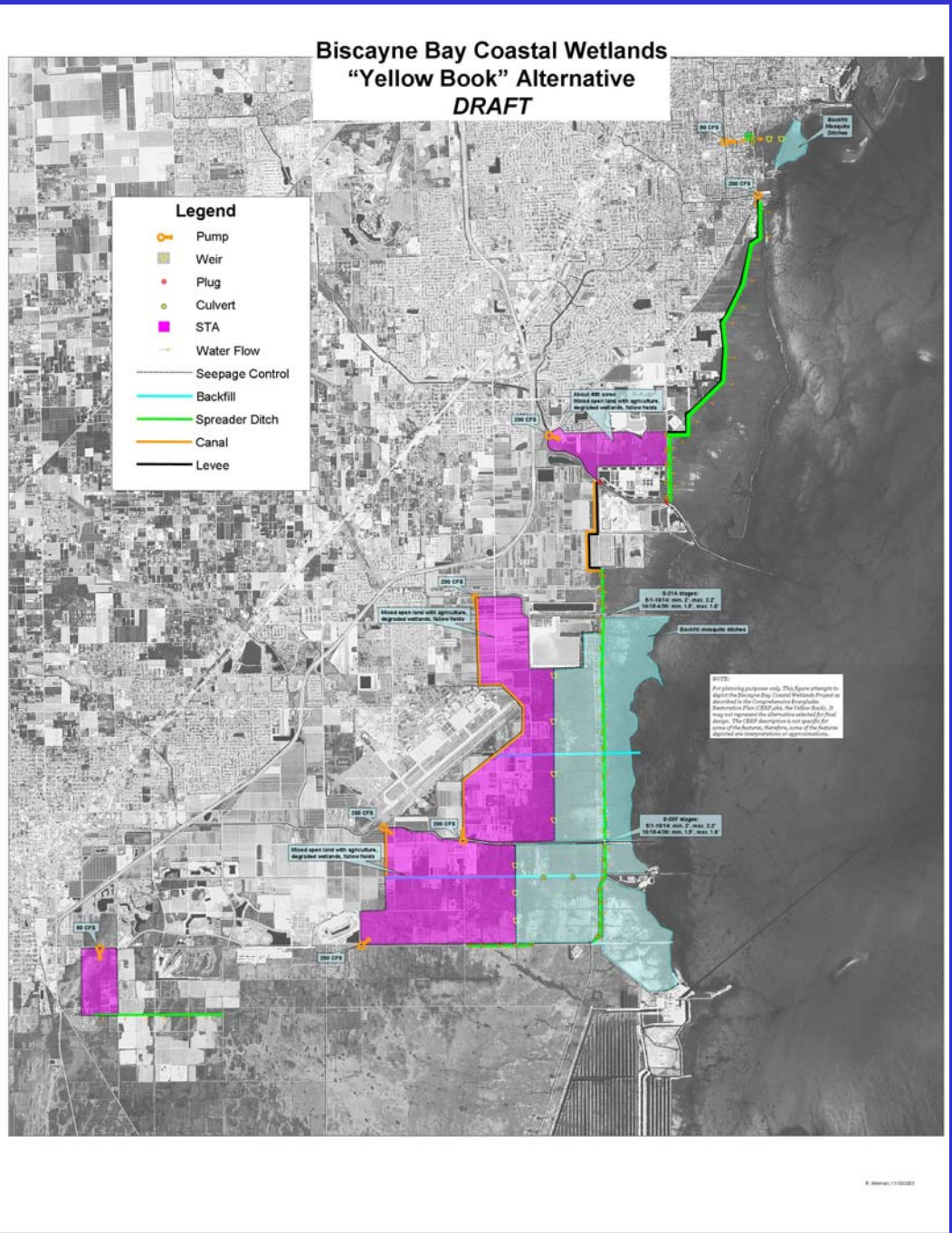
Project Needs

- An Array of Alternatives - YB is only one of a possible restoration alternatives that could deliver required environmental improvements
- Benefit Comparisons - Quantifying benefits requires models or other means to "measure" differences among plans – agencies advocate using best models as part of the "best available science" doctrine

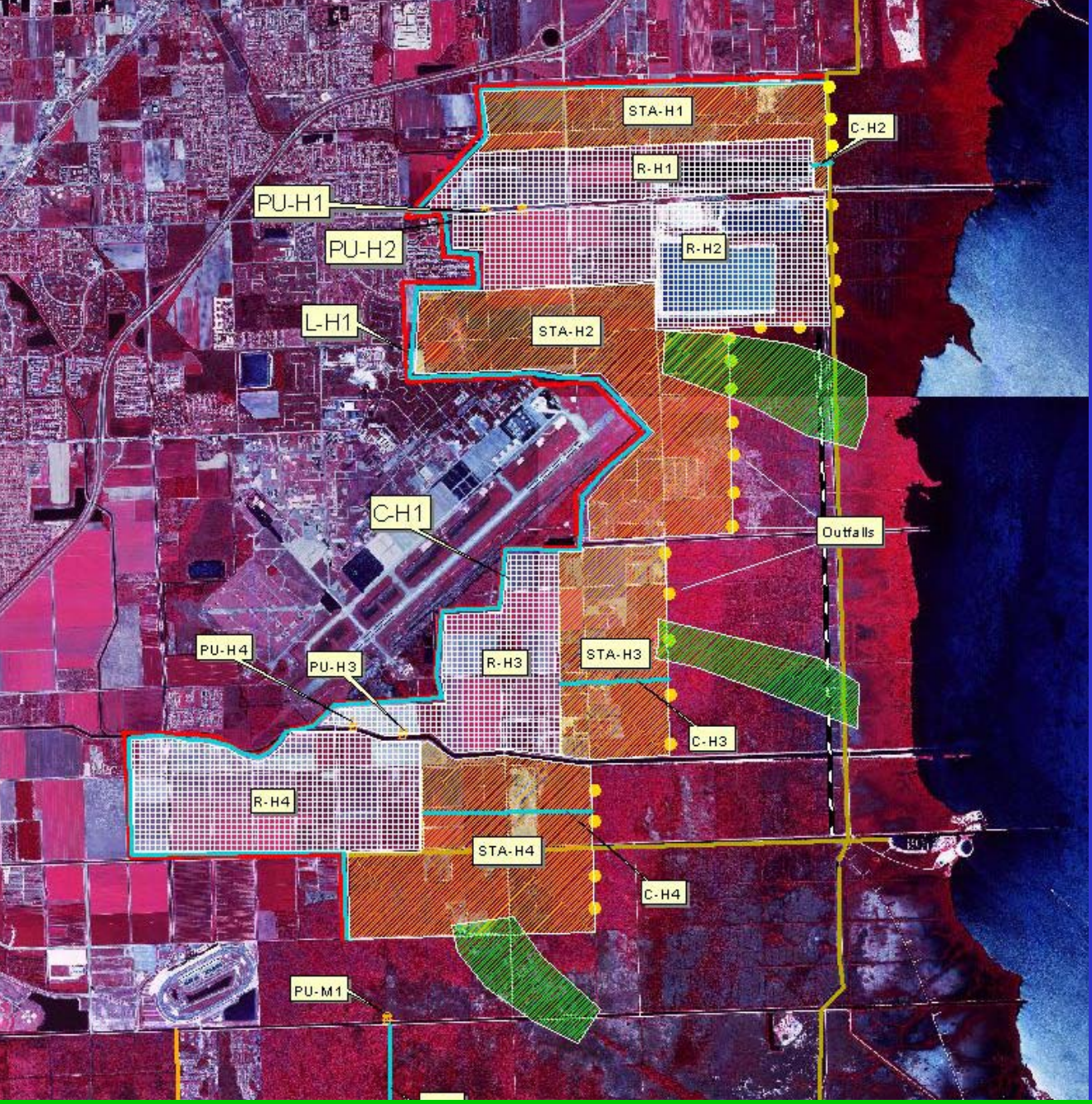
Acceler8



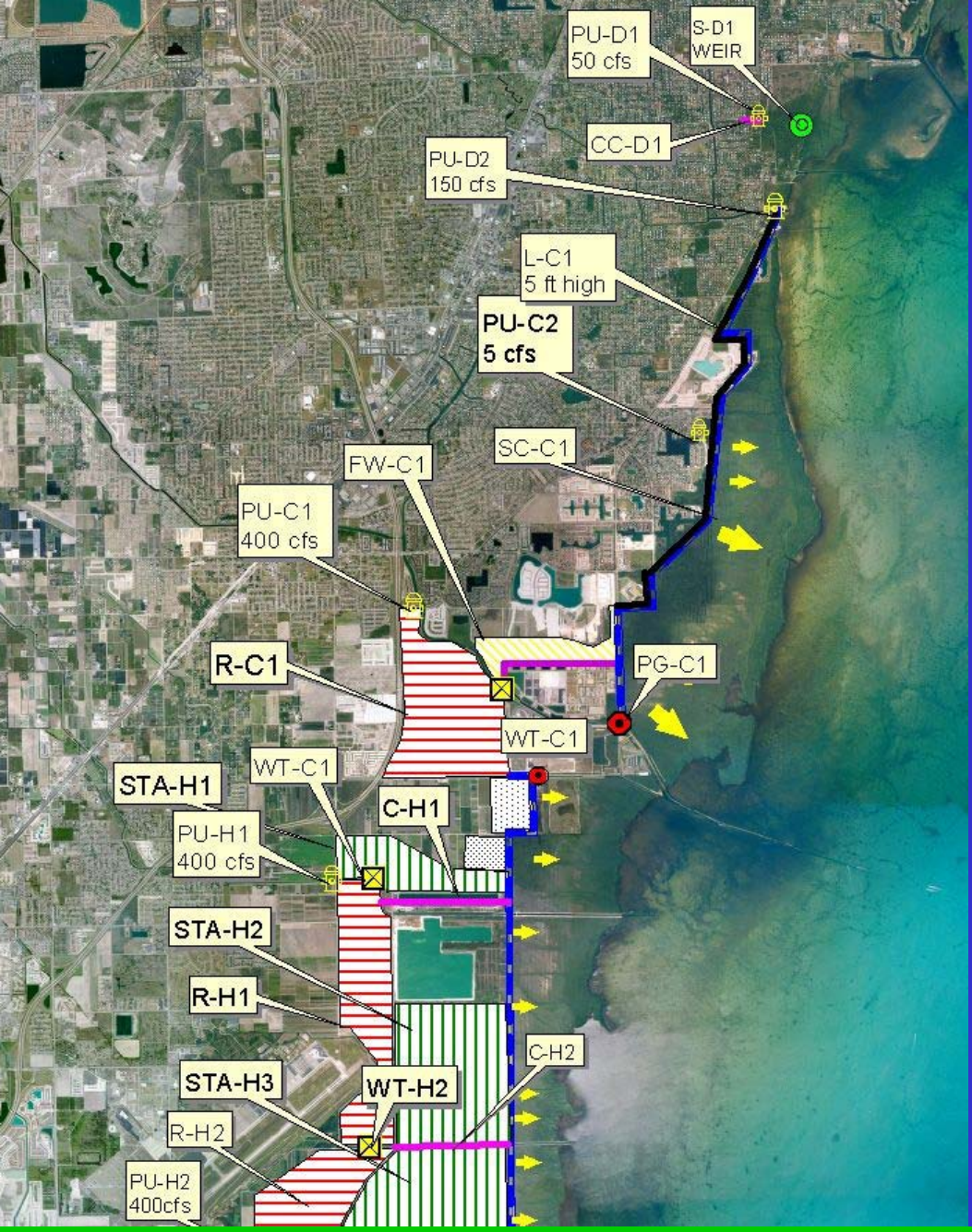
- **Everglades Restoration Accelerated Projects (Acceler8)**
- **Approved by the Governor's Office in November 2004.**
- **Cost : $1.5 billion**
- **Funding: Certificates of Participation (COP's) Authorized under Florida Statute 373.584.**



- Extensive Area was projected for Water Quality Treatment
- Water Redistribution will require additional canals and spreader swales
- Lands adjacent to the Bay are necessary to restore the creeks and convey flows to the Bay

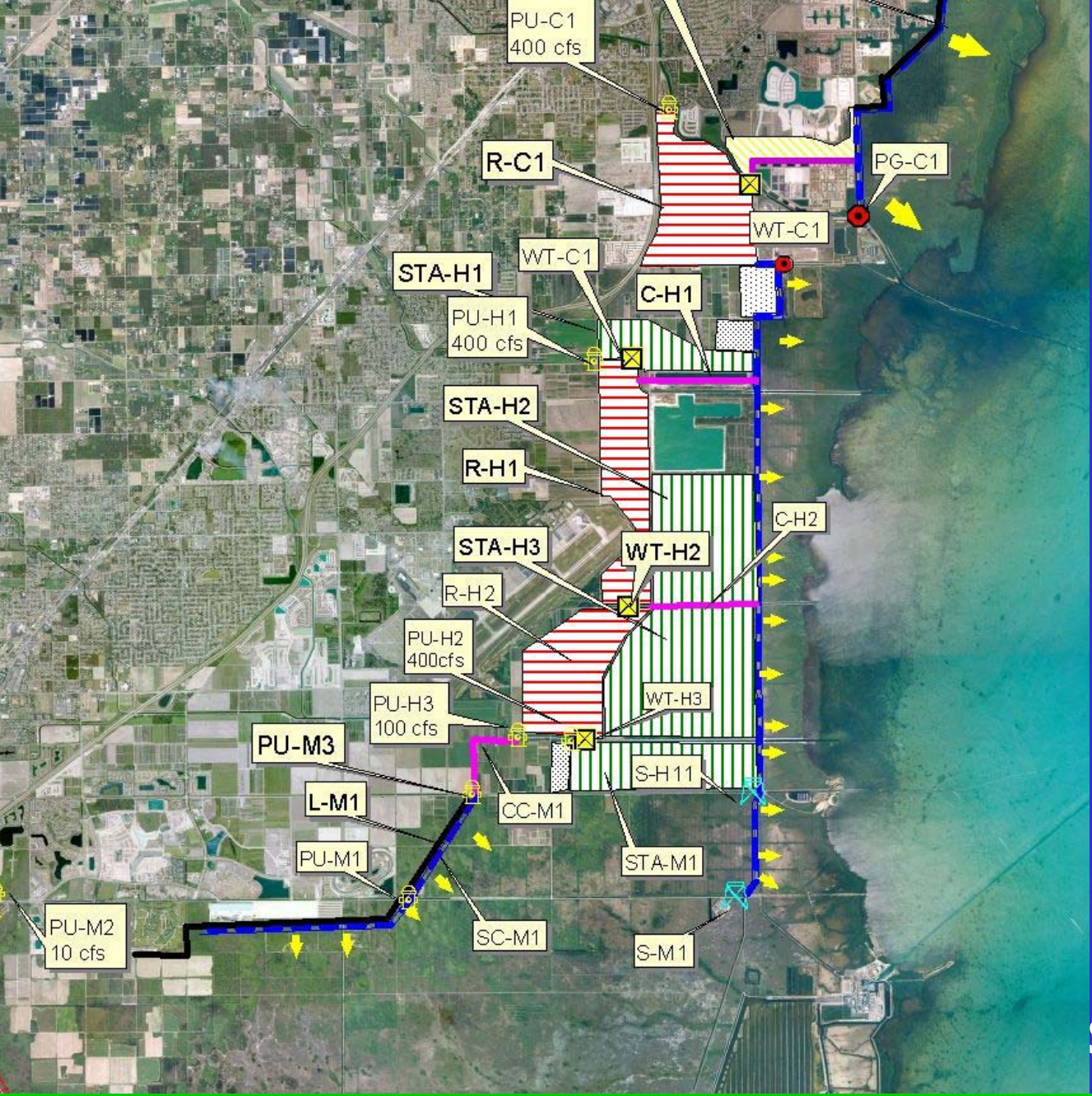


Alternative E
Sub-component 3



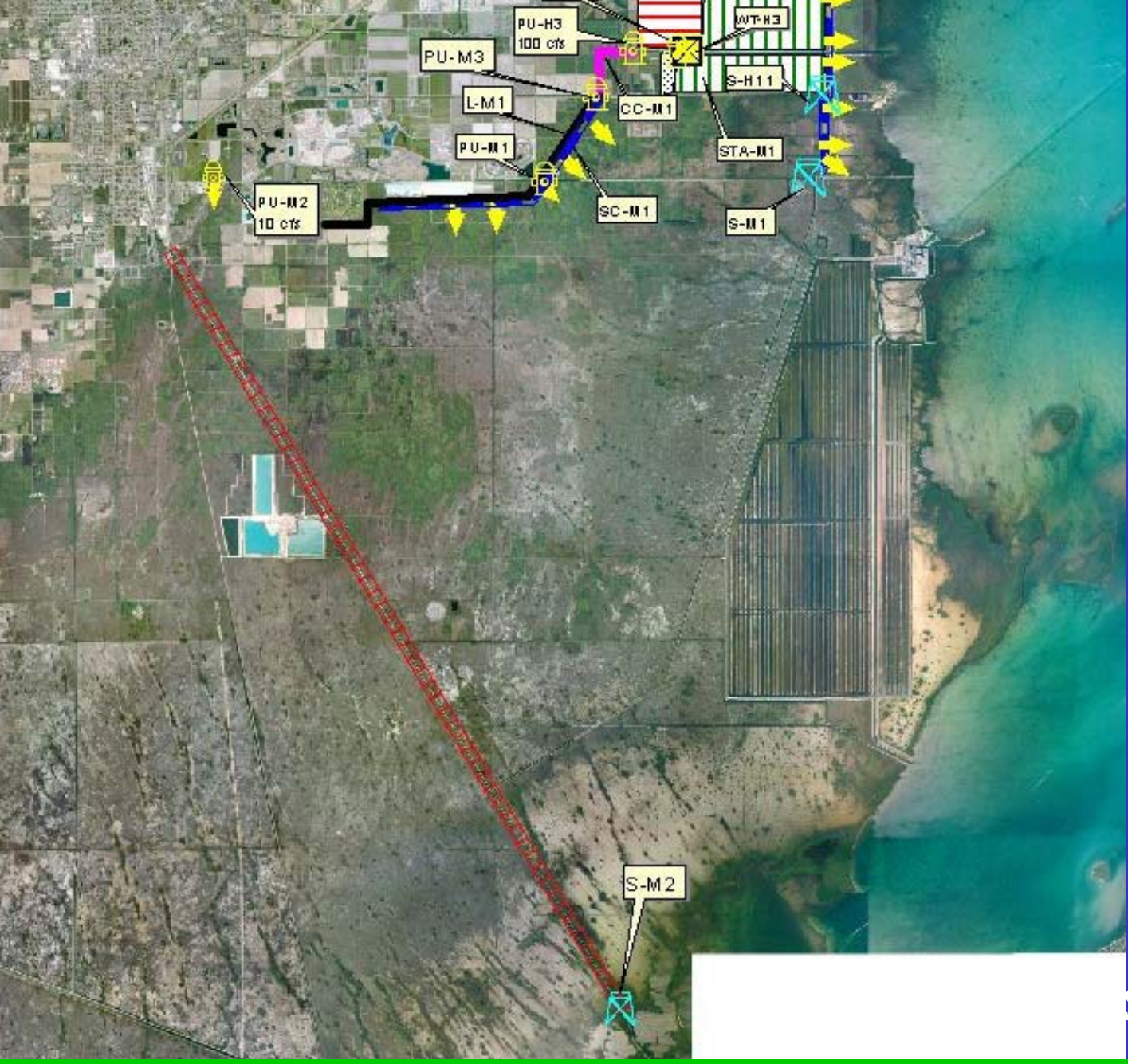
Alternative J
Sub-component 1

Biscayne Bay Coastal Wetlands



Alternative J
Sub-components 2&3

Biscayne Bay Coastal Wetlands



Alternative J
Sub-component 4

Plan Comparisons – Efficiency

- **Restoration plans must demonstrate cost effectiveness**

Modeling

Models to Support Decisions

Calculating Habitat Units

- **Habitat Units:** Σ Benefits $\times$ Affected Acreage gives realized spatial extent of project performance
- Do alternatives affect different amounts of project acreage?
  - If no, Habitat Units comparable to Benefits
  - If yes, Habitat Units may vary independently of Ecosystem Benefits

Modeling

HU Accounting

TABLE 6-8: SUMMARY OF SYSTEM-WIDE FORMULATION/EVALUATION

Category of Benefits and Costs	Future W/O Plan	System-wide Evaluation IRL with other CERP Features (Step 1)					Incremental Effects (Step 3)
		Alternative 2	Alternative 3	Alternative 4	Alternative 5	Alternative 6 (Rec Plan)	Recommended Plan
Watershed Habitat (HUs)	23,352	23,352	94,961	109,353	89,960	89,960	66,608
Wetlands (HUs)	8,277	8,277	39,614	54,827	53,665	53,665	45,388
Uplands (HUs)	15,075	15,075	54,447	54,826	36,295	36,295	21,220
Estuarine Habitat (HUs)	27	217	2,221	3,569	4,015	4,461	4,434
Submerged Aquatic Vegetation (HUs)	0	44	445	711	800	922	922
Oyster (HUs)	0	8	461	738	830	889	889
Benthic (HUs)	27	265	1,325	2,120	2,385	2650	2623
Agricultural Water Supply (Average Annual)	0	$6,127,000	$6,124,000	$5,992,000	$6,027,000	$6,149,000	$6,149,000
Other CERP Ecosystem Restoration Benefits (HUs*)	1,383,000	2,183,000	2,183,000	2,182,000	2,183,000	2,182,000	0
COSTS** (Oct 2001 Price Levels)	$0	$7,400,000,000	$8,280,000,000	$8,420,000,000	$8,320,000,000	$8,340,000,000	$996,000,000

*Central and Southern Florida Project Comprehensive Review Study and Integrated Feasibility Report and Programmatic Environmental Impact Assessment, 1999, Section 7. 5.

**Costs for CERP features other than IRL were updated to October 2001 price levels using OMB published escalation factors. Total CERP inclusive of Alternatives 2-6 are rounded to the nearest $10 million

Modeling

Hydrologic Model → **Alternatives Evaluation**

Ecological & Other Models

- Fish
- Mammals
- Cattail Expansion
- Tree Island Gains
- Exotics
- Birds
- Periphyton

	Alt 1	Alt 2	Alt 3
Hydroperiod	Good	Better	Best
Depth	Good	Better	Best
Distribution	Good	Better	Best
Wetland HU	**12,000**	**13,000**	**14,000**
Quality Factor	0.9	0.8	0.7
Adjusted HU	10,800	10,400	9,800

WQ Project Considerations

For Category "A" Projects

a) Characterizing existing water quality conditions

b) Forecast base-year WQ

c) Forecast Future W/O Project

d) Develop WQ performance measures

e) Identify WQ constraints

f) Develop WQ evaluation criteria

g) Formulate Alternatives to improve WQ

h) Evaluate & compare WQ differences among alternative plans

i) Select least cost plan that meets WQ restoration objectives

j) Optimize design of the selected plan to maximize WQ improvement

WQ Priority

For Category "B" Projects

a) Characterizing existing water quality conditions, including baseline sampling

b) Forecast base-year WQ

c) Forecast Future W/O Project

d) Develop WQ evaluation criteria

e) Identify WQ constraints

f) Select least cost plan that meets WQ restoration objectives

g) Optimize design of the selected plan to maximize WQ improvement to the extent that project objectives are not compromised

WQ & Hydrology Equal

For Category "C" Projects

a) Characterizing existing water quality conditions, including baseline sampling

b) Forecast base-year WQ

c) Forecast Future W/O Project

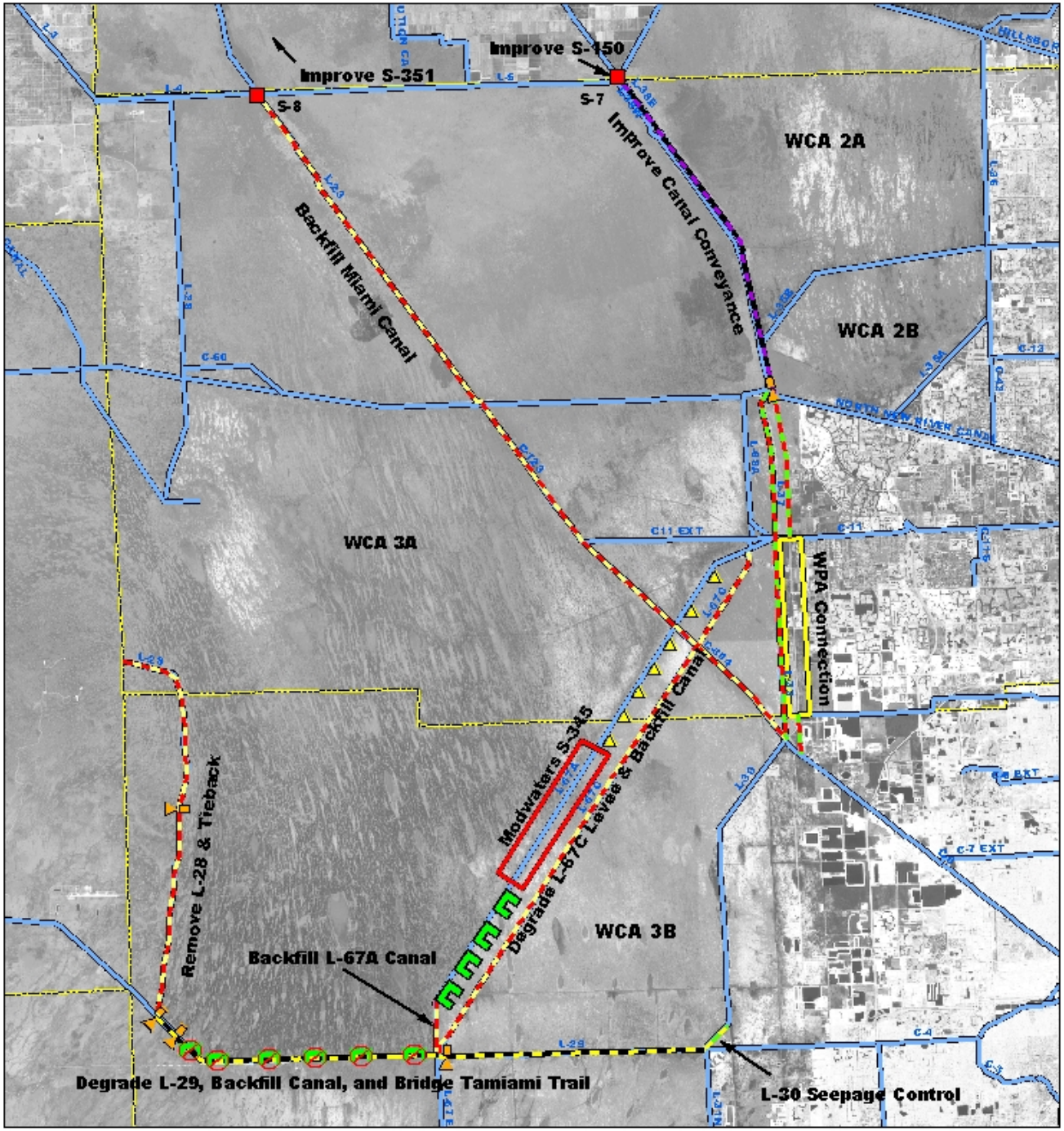
d) Identify WQ constraints

e) Develop WQ evaluation criteria

f) Identify least cost measures to meets WQ constraints

g) Select least cost plan to meet restoration objectives

Hydrology Priority



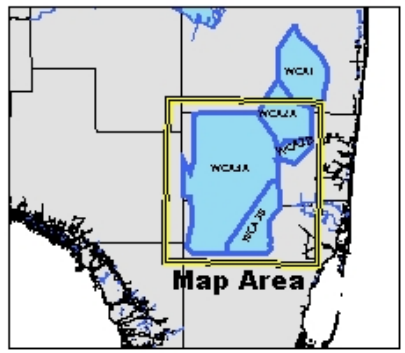
WCA 3A
De-compartmentalization Project
Conceptual Design Schematic

- Remove Culvert/Weir
- Existing Structure
- S-345 Structures
- S-345 Weirs
- Structure
- Existing Canals
- Addition of NNR from other WPA Elements
- Degrade L-29 & Bridge Tamiami Trail
- Backfill Canal
- Improve Canal
- Seepage Control
- WPA Componet
- County Boundaries

N, W, E, S

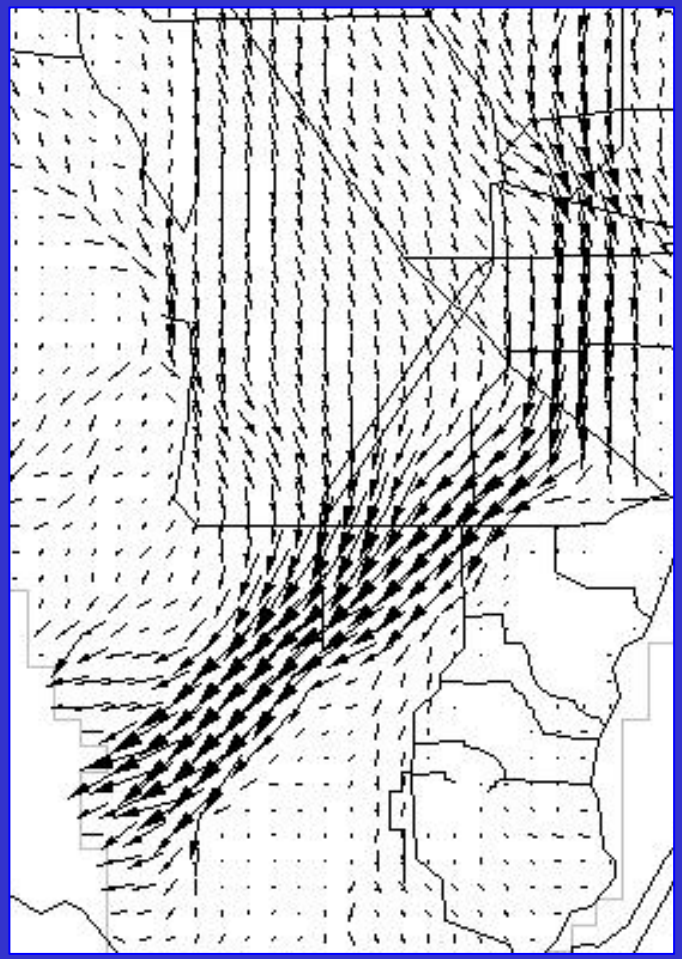
5 Miles

SOUTH FLORIDA WATER MANAGEMENT DISTRICT

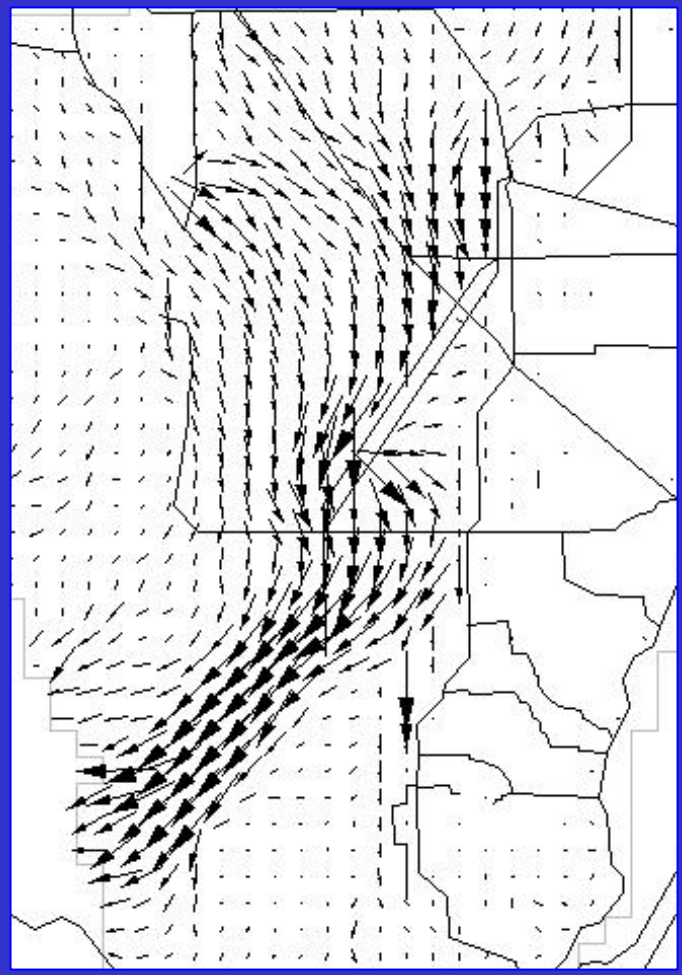


Mean annual overland flow patterns for NSMv4.5 and Alt D13R

NSM45



D13R



Numeric targets for direction, magnitude and acceptable variations are unknown

Models not calibrated to parameters relating to overland flow rates or volume

- How will WQ gradients be influenced by different degrees of “decompartmentalization”?
- Can the incremental differences or changes in WQ be simulated between alternatives and are they meaningful in a model world perspective (error and uncertainty)?
- Can spatial changes in WQ performance be a meaningful comparison among alternative plans?
- Can macro scale changes in the biota be linked qualitatively with spatial differences in WQ?
- Is any of this better than BPJ?