CENTRAL EVERGLADES PLANNING PROJECT

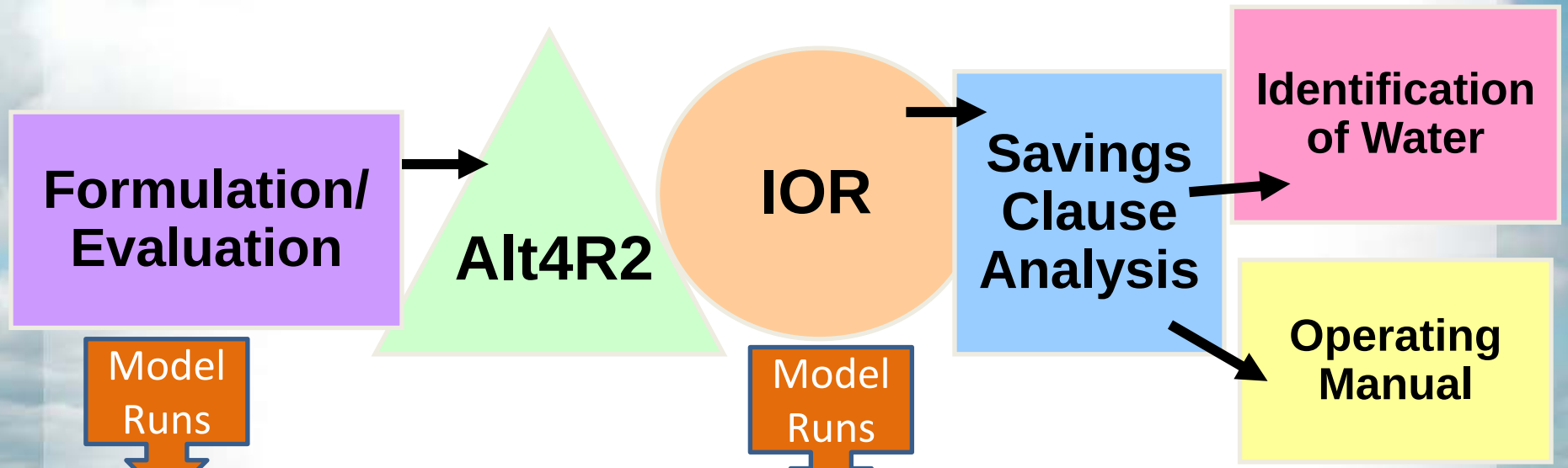
CEPP Final Modeling Results (ALT4R2)

PRESENTED BY

CEPP Modeling Team

July 8th, 2013

Relationship Among PIR Tasks



ECB
FWO
Alt 1-4
Alt4R, R1 & R2

2012 EC
IORBL1
Alt4R2

CEPP RSM Scenarios

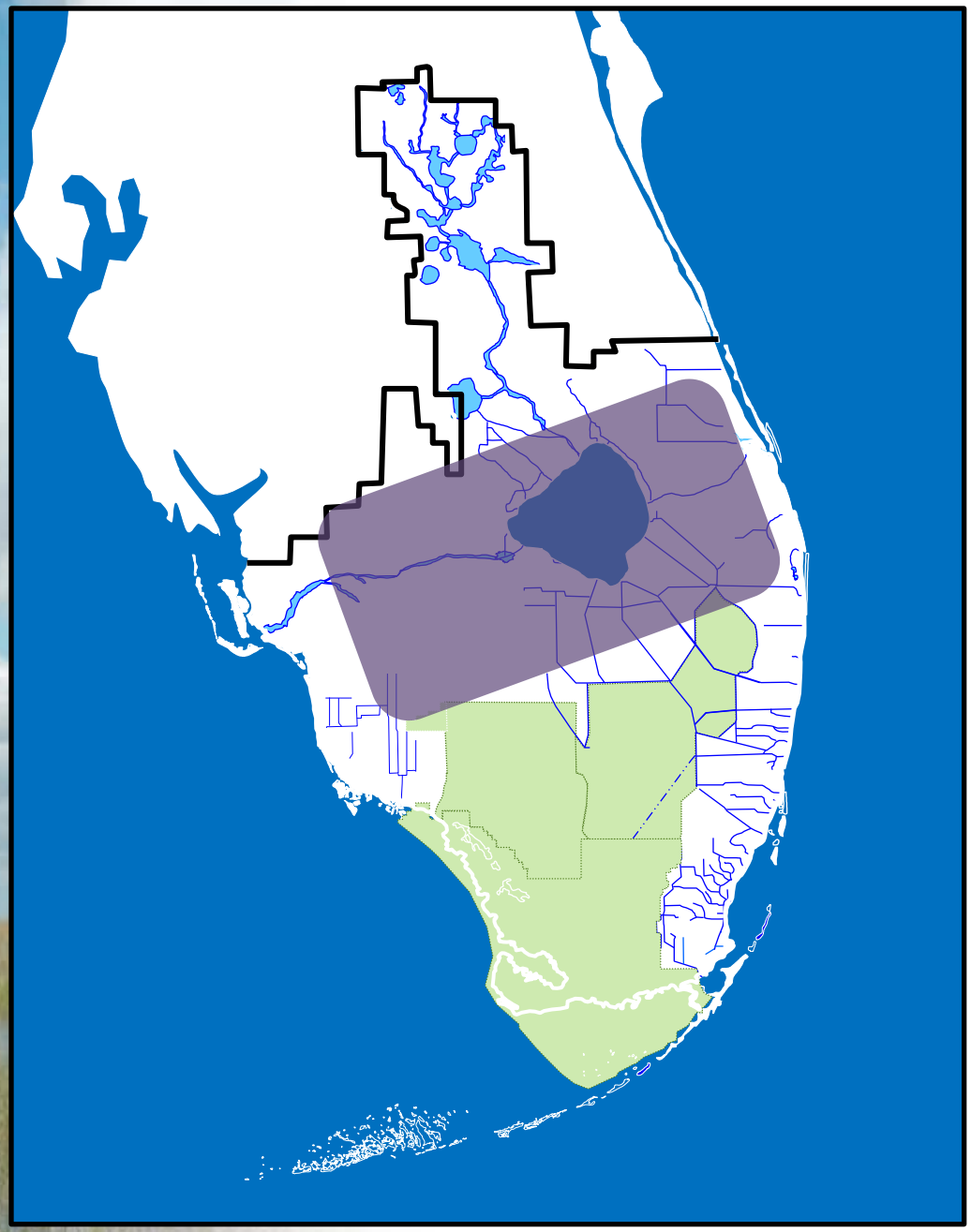
- CEPP Final Baselines - released 12/13/2012
  - 2010 / 2011 Existing Condition Baseline (ECB)
  - 2050 Future Without Project Baseline (FWO)
- CEPP Tentatively Selected Plan - released 2/28/2013
  - Alternative 4R (ALT4R)
- Updated CEPP Tentatively Selected Plan - released 6/25/2013
  - Alternative 4R2 (ALT4R2)
- Presentation Goal: Show key system hydrologic performance of updated Tentatively Selected Plan ALT4R2 including changes relative to previously presented outcomes of ALT4R.

General Trends

- In general, ALT4R2 maintains the majority of the system benefit identified in ALT4R and demonstrates a substantial hydrologic improvement over the baselines.
- Many areas that were identified as potentially impacted in earlier evaluations (e.g. LOSA, WCA2B, WCA3B, LEC, Biscayne Bay, etc…) are improved and maintaining performance relative to the baselines.

Optimization of Alternative 4R

Habitat Units							Habitat Unit Lift (ALT – FWO)	
Planning Regions	Zones	Maximum Acreage	ECB	FWO	ALT 4R	ALT 4 R2	ALT 4R	ALT 4 R2
Northern Estuaries	CE-1	70,979	2,839	34,070	39,038	39,038	4,968	4,968
	SE-1	14,994	2,099	2,399	5,098	8,247	2,699	5,848
Total			**4,938**	**36,469**	**44,136**	**47,285**	**7,667**	**10,816**
Greater Everglades	3A-NE	123,475	44,451	29,634	92,606	91,372	62,972	61,738
	3A-MC	78,208	32,847	27,373	54,746	54,746	27,373	27,373
	3A-NW	70,387	30,970	30,266	54,198	54,198	23,932	23,932
	3A-C	137,233	108,414	105,669	109,786	111,159	4,117	5,490
	3A-S	82,437	69,247	68,423	68,423	68,423	0	0
	3B	85,688	55,697	48,842	58,268	59,125	9,426	10,283
	ENP-N	125,123	57,557	55,054	98,847	98,847	43,793	43,793
	ENP-S	238,592	124,068	126,454	169,400	169,400	42,946	42,946
	ENP-SE	135,104	79,711	81,062	85,116	83,764	4,054	2,702
Total			**602,962**	**572,777**	**791,390**	**791,034**	**218,613**	**218,527**
Florida Bay	FB-W	157,952	23,693	20,534	39,488	41,068	18,954	20,534
	FB-C	82,048	8,205	8,205	13,948	14,769	5,743	6,564
	FB-S	97,728	16,614	14,659	27,364	28,341	12,705	13,682
	FB-EC	87,936	21,984	20,225	33,416	34,295	13,191	14,070
	FB-NB	12,672	2,154	2,028	2,661	2,661	633	633
	FB-E	37,760	9,440	8,685	9,818	9,818	1,133	1,133
Total			**82,090**	**74,336**	**126,695**	**130,952**	**52,359**	**56,616**



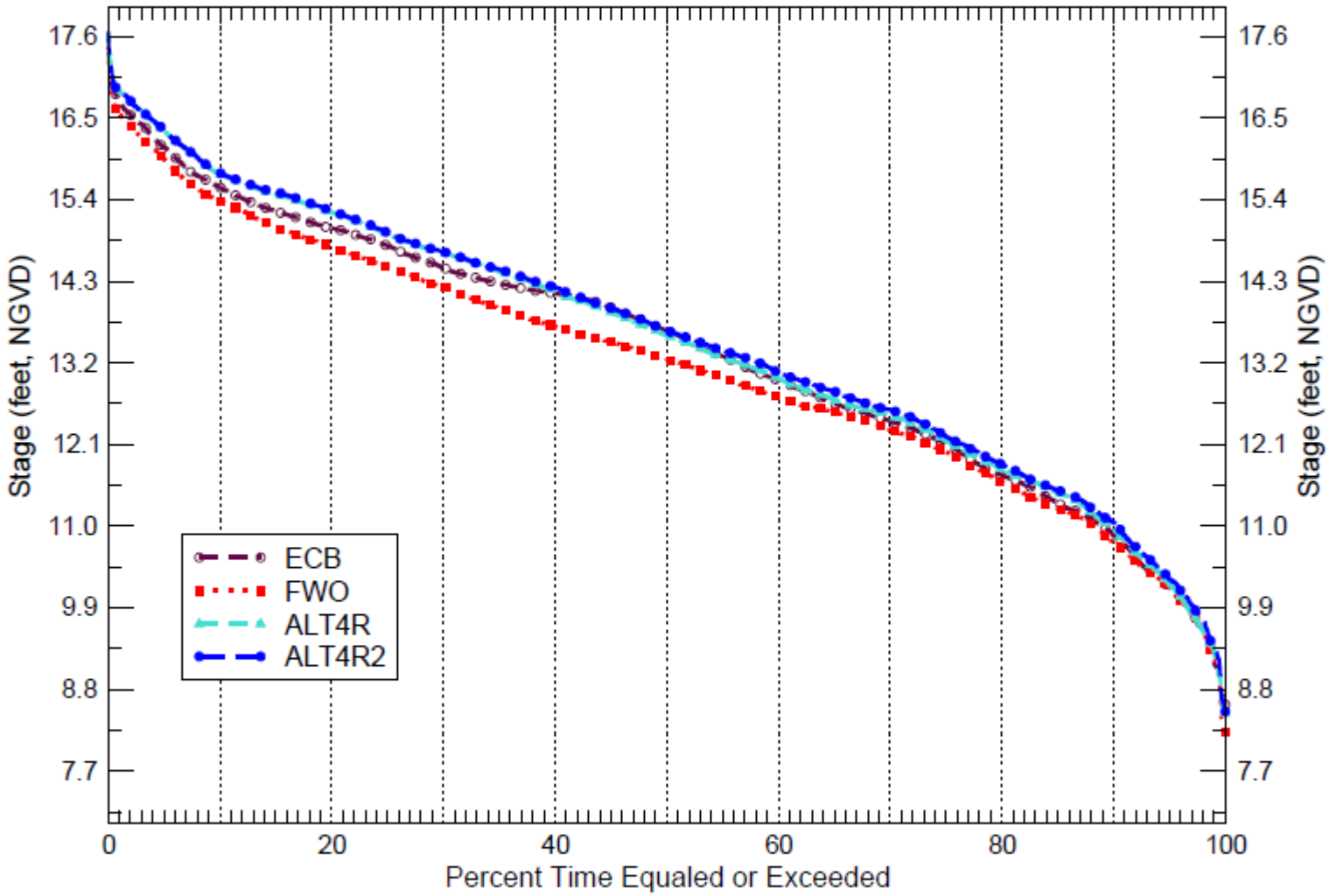
Geographic Area:

- Lake Okeechobee, Northern Estuaries (NE) and Lake Okeechobee Service Area (LOSA)

Key System Changes:

- ALT4R2 allows water in St Lucie Reservoir to backflow to Lake O. and uses revised Lake O. schedule release recommendations to balance Lake / Water Supply / Estuary objectives.
- Improved or equal LOSA water supply relative to ALT4R and baselines.
- Improved St. Lucie low and high flows relative to ALT4R.
- Maintained Lake O. , Caloosahatchee Estuary and Everglades flows relative to ALT4R

Stage Duration Curves for Lake Okeechobee



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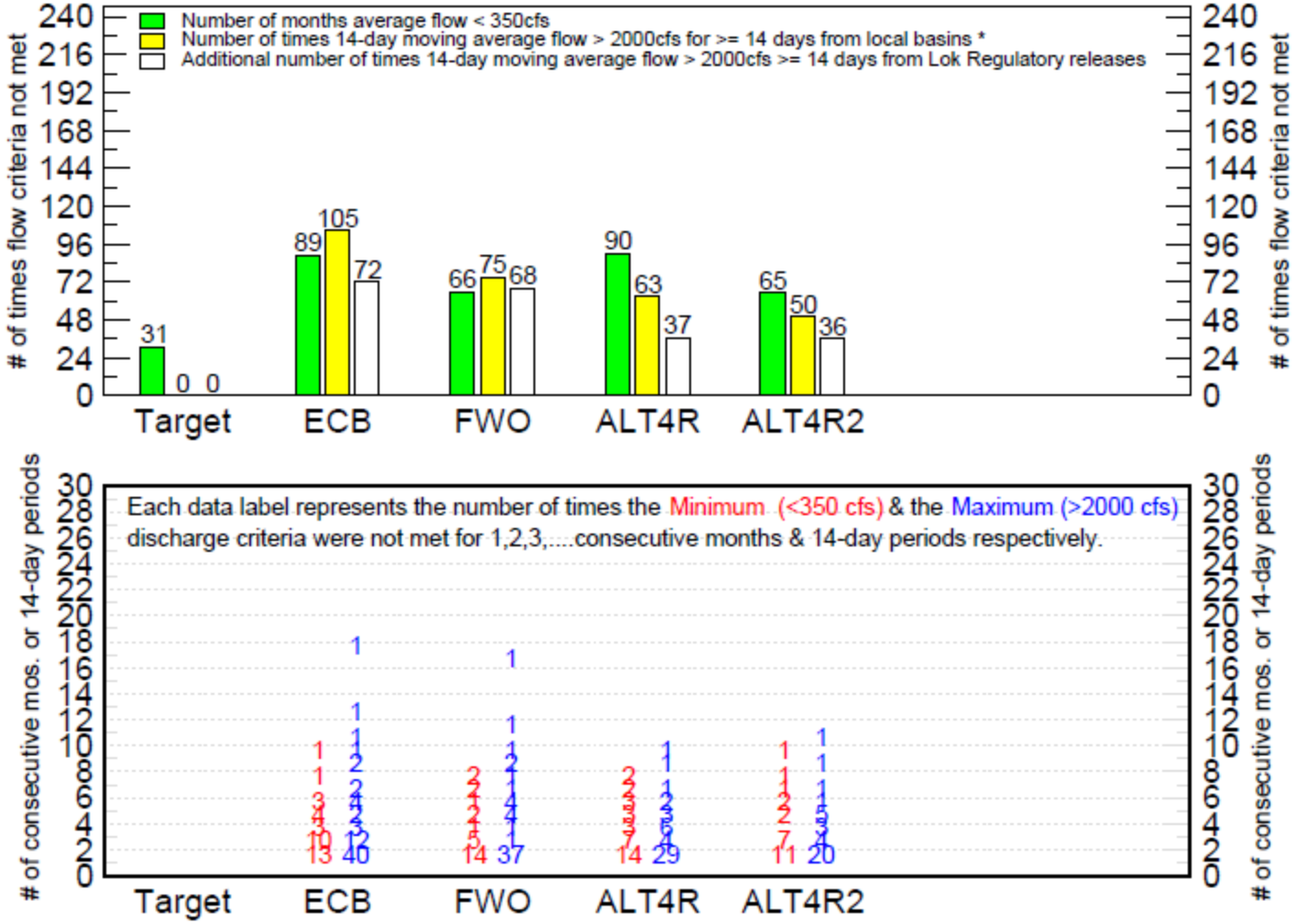
SFWMM P.O.S. 1965 - 2005

Number of times Salinity Envelope Criteria NOT Met for the St. Lucie Estuary (mean monthly flows 1965 - 2005)



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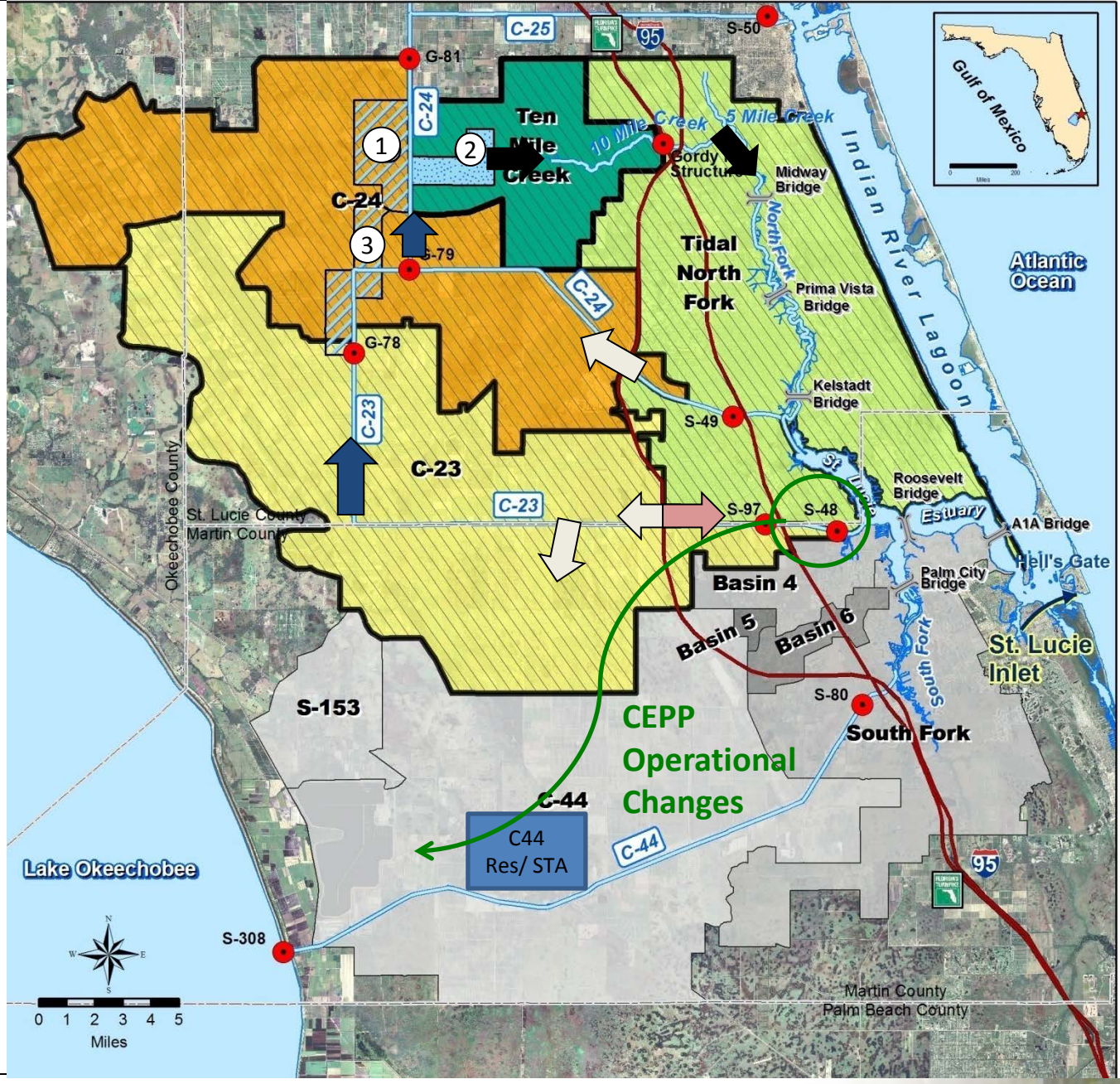
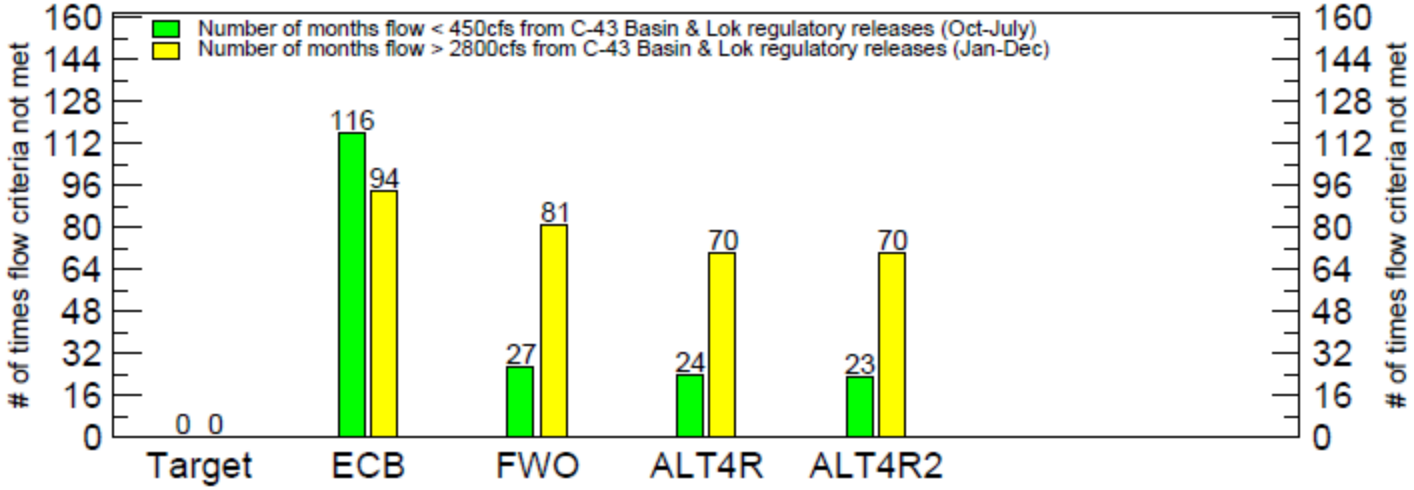
RECOVER Performance Measure

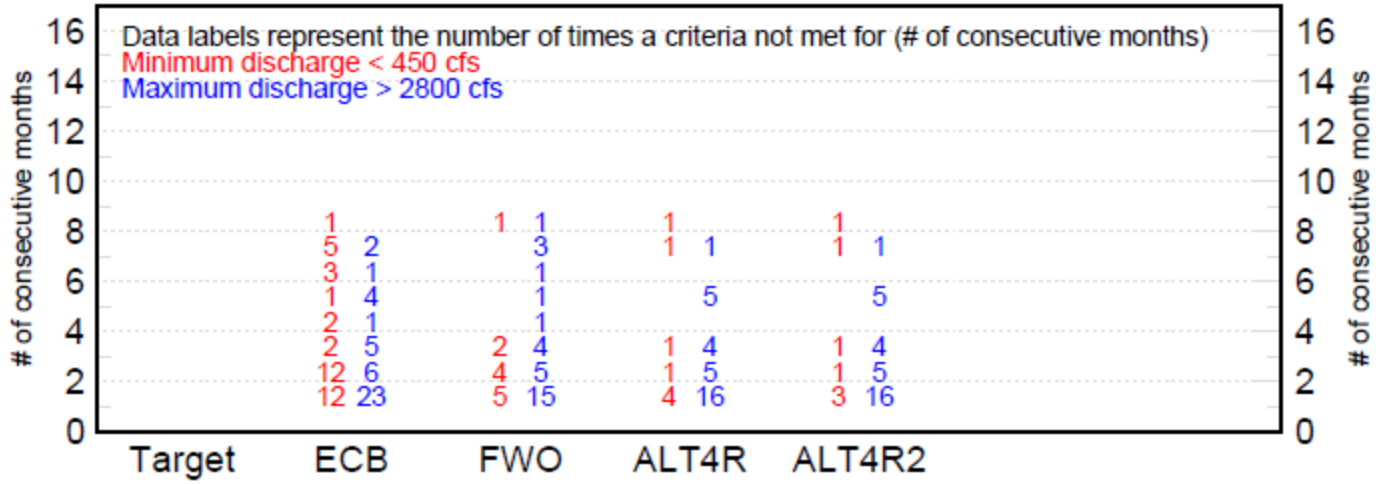
Watershed Basins Contributing to North Fork of St. Lucie River – Future Flow Paths

- Water Reservation Basins
- Non-contributing Basins
- Water Control Structures
- Major Canals
- Bridges
- Open Water
- Major Highways
- County Boundaries
- STAs
- Reservoirs
- (1) C-23/24 North Reservoir
- (2) C-23/24 STA
- (3) C-23/24 South Reservoir



Number of times Salinity Envelope Criteria NOT Met for the Calooshatchee Estuary (mean monthly flows 1965 - 2005)





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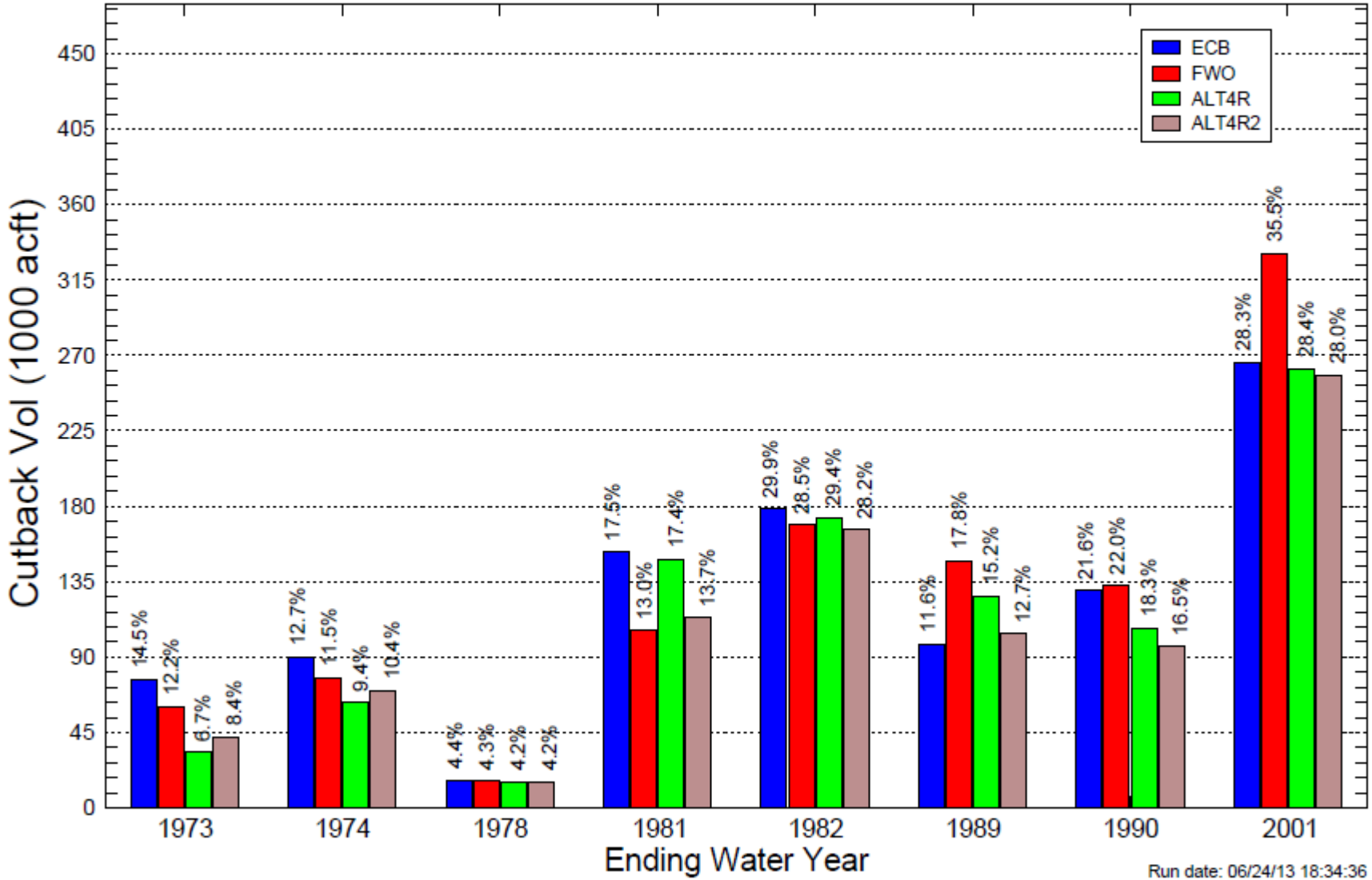
RECOVER Performance Measure

Water Year (Oct-Sep) LOSA Demand Cutback Volumes

for the 8 Years in Simulation Period with Largest Cutbacks



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Script used: losa_cutback_yrs.scr
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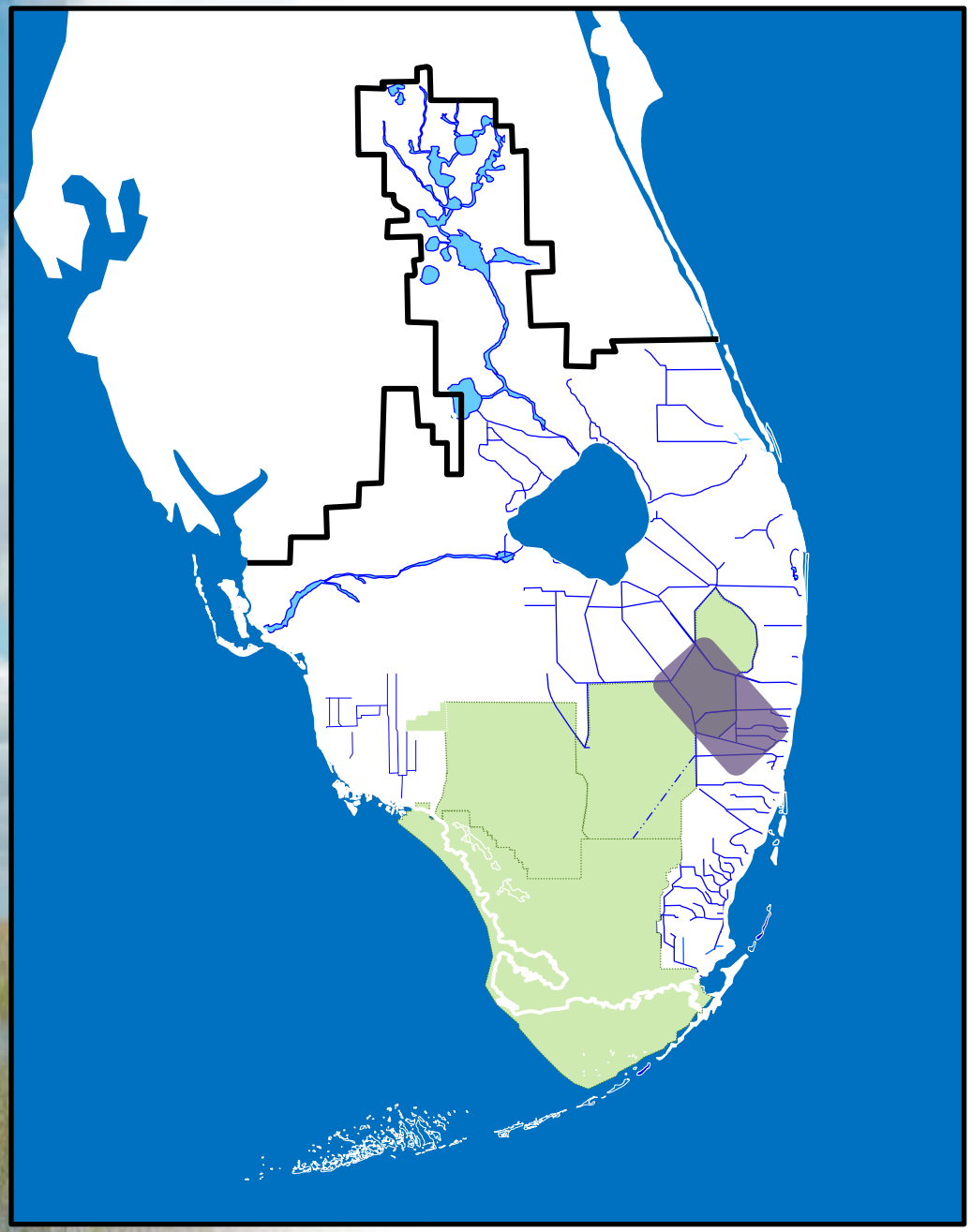
Additional Everglades Delivery

	ECB	FWO	ALT4R	ALT4R2	Diff (ALT4R2-FWO)
STA2	234.5	381.0	374.2	383.7	(2.7)
STA34	538.5	382.2	596.2	596.2	(214.0)

Total Additional Water in ALT4R2 = +216.7
Total Additional Water in ALT4R = +207.2

All values are average annual discharges in kac-ft

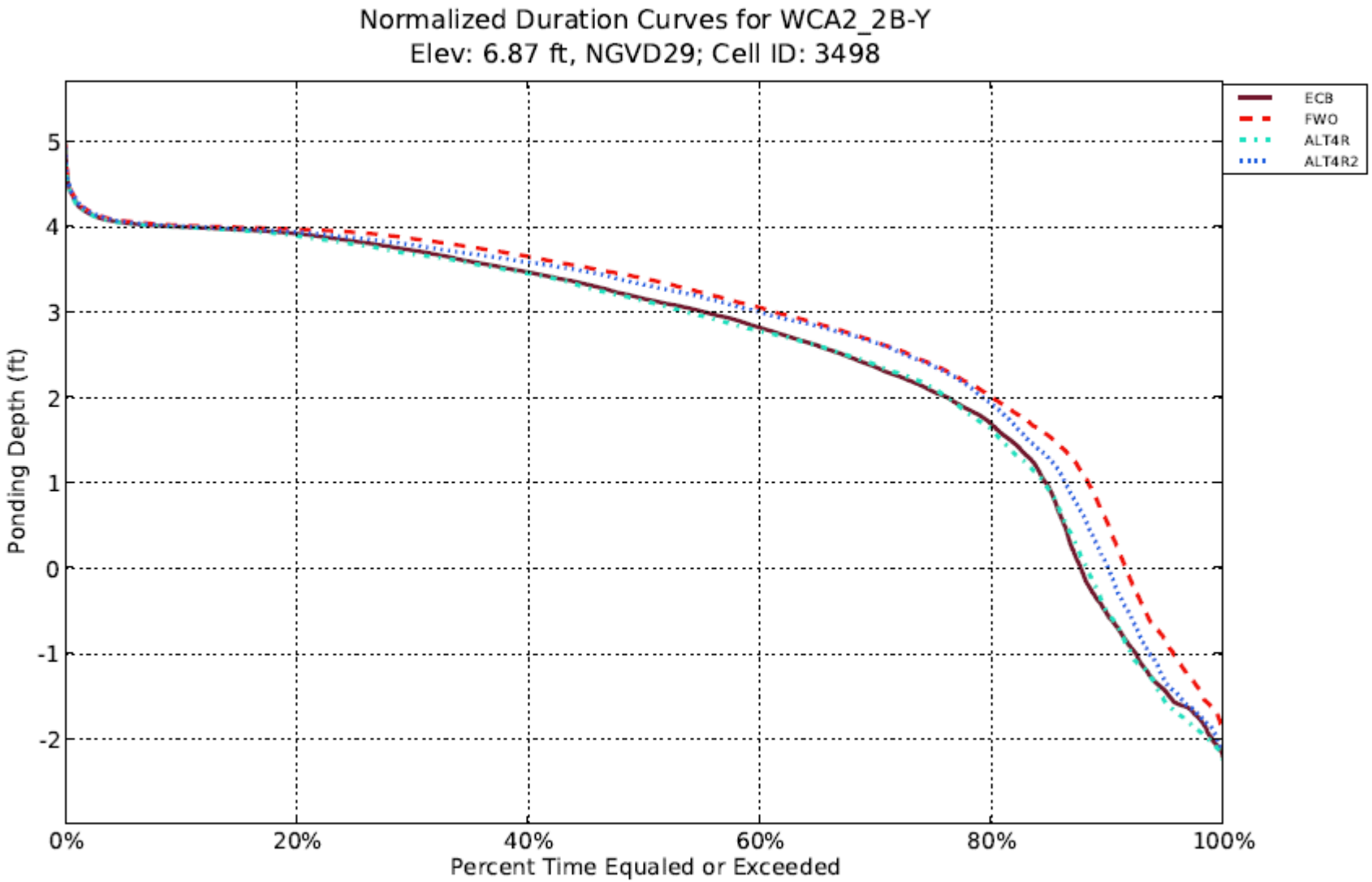


Geographic Area:

- Water Conservation Area 2 (WCA2A & WCA2B) and adjacent LEC Service Area 2 (SA2)

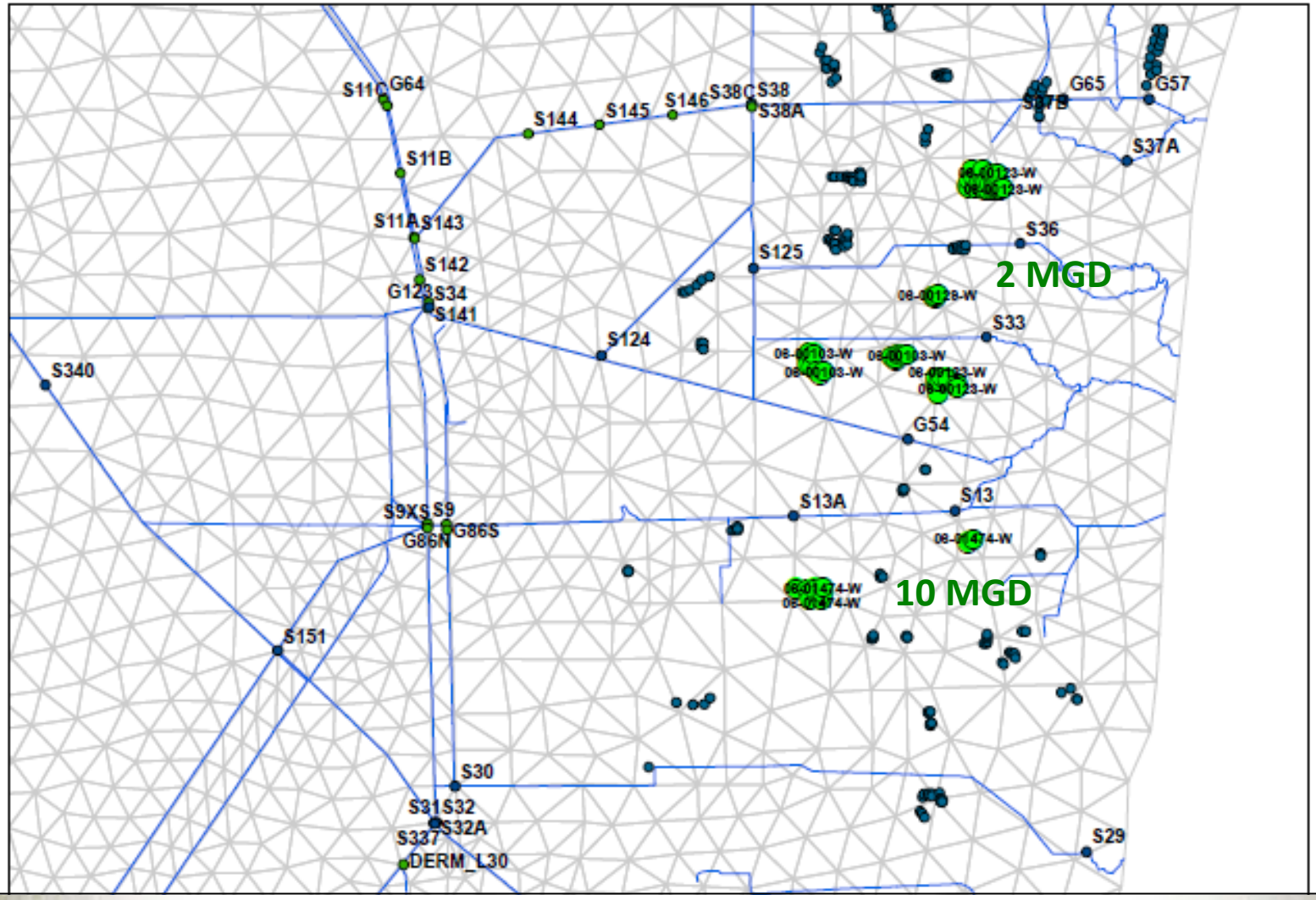
Key System Changes:

- Reduced frequency & magnitude of CEPP L-6 Diversion operations in ALT4R2 relative to ALT4R.
- CEPP similar to ECB (lower highs) in WCA2A & WCA2B;
- Adjacent LEC areas perform similarly to baselines.
- An additional 12 MGD LEC SA2 utility pumpage is assumed in CEPP ALT4R2.


Normalized Duration Curves for WCA2_2B-Y
Elev: 6.87 ft, NGVD29; Cell ID: 3498
ECB
FWO
ALT4R
ALT4R2
Ponding Depth (ft)
5
4
3
2
1
0
-1
-2
0%
20%
40%
60%
80%
100%
Percent Time Equaled or Exceeded

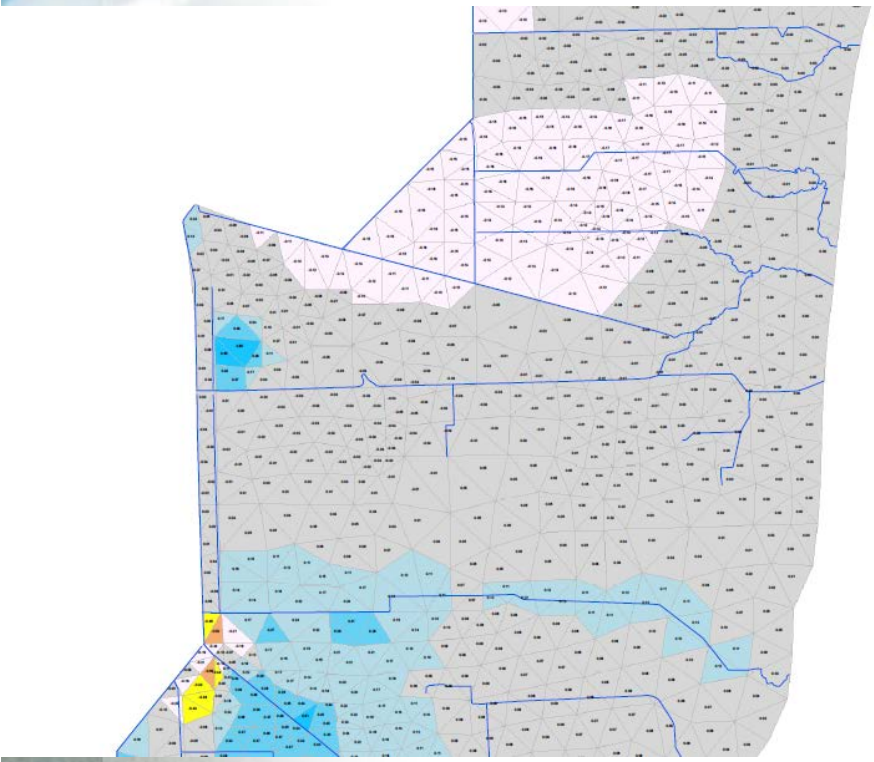
Additional Pumpage Well Locations

LEC-SA2



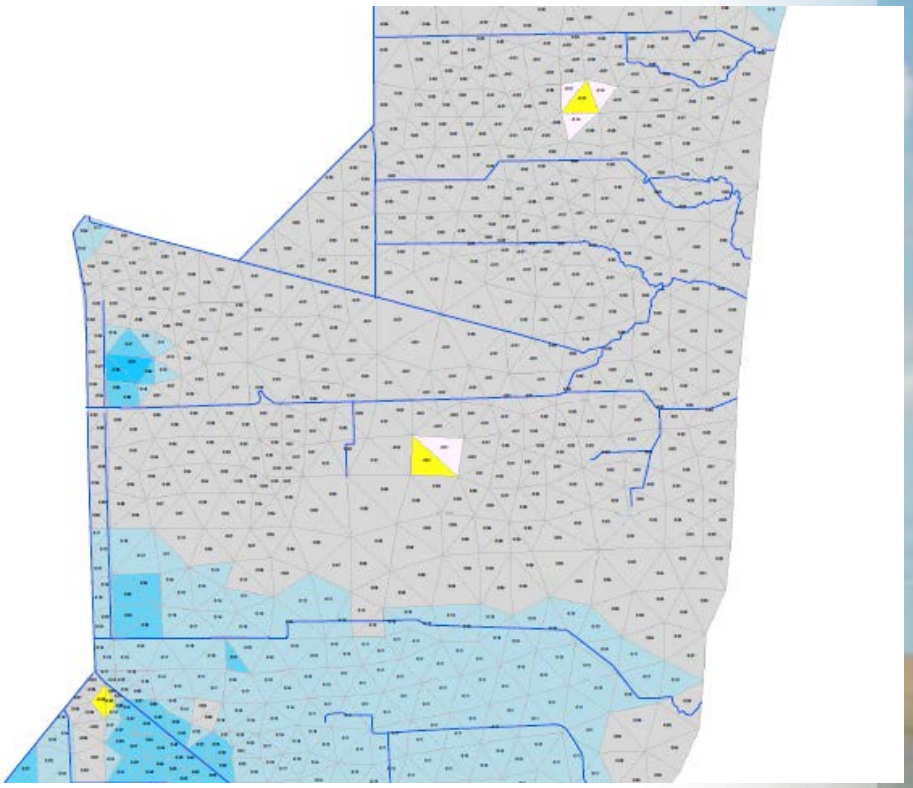
ALT4R

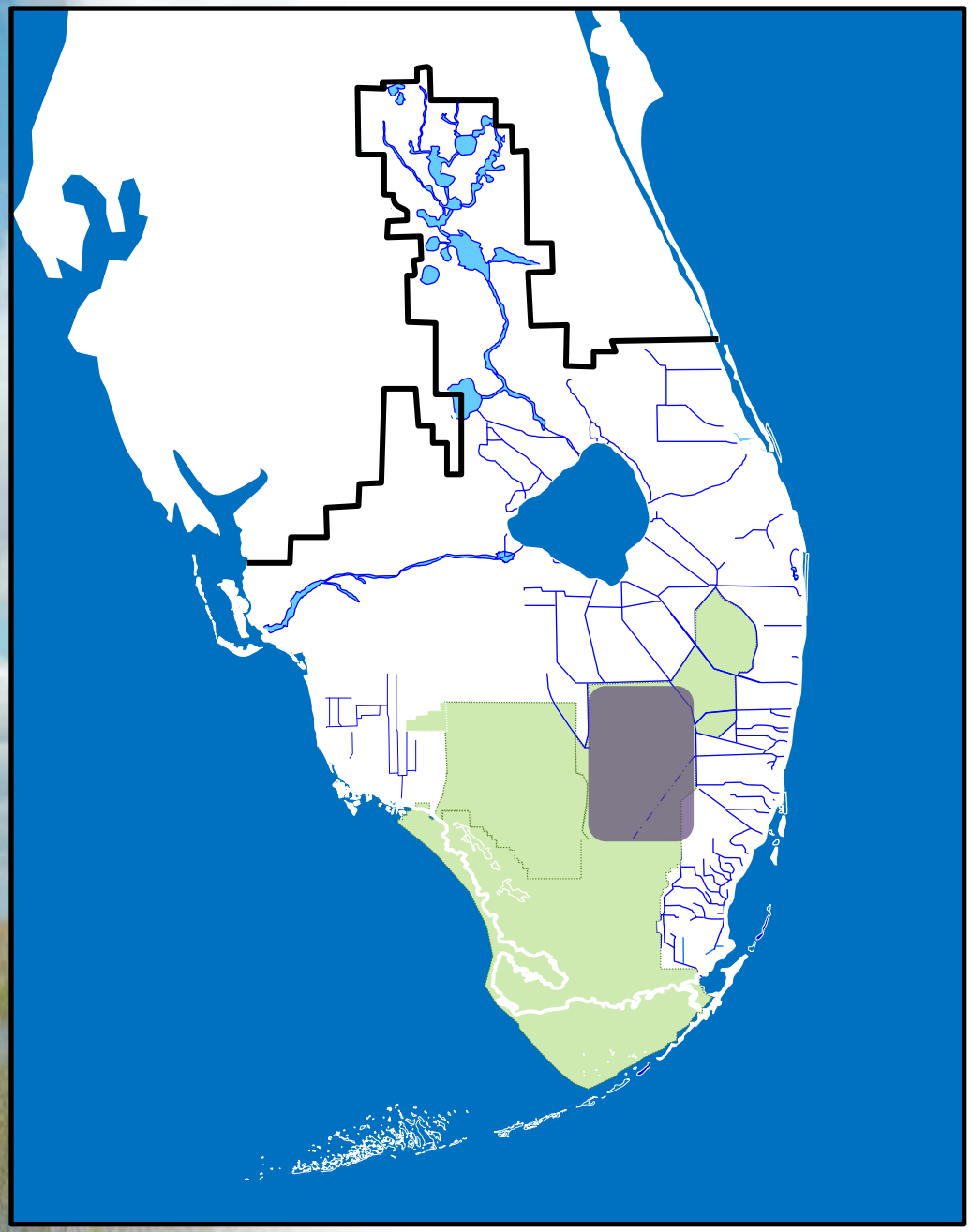
April 1989 Difference to ECB



ALT4R2

April 1989 Difference to ECB





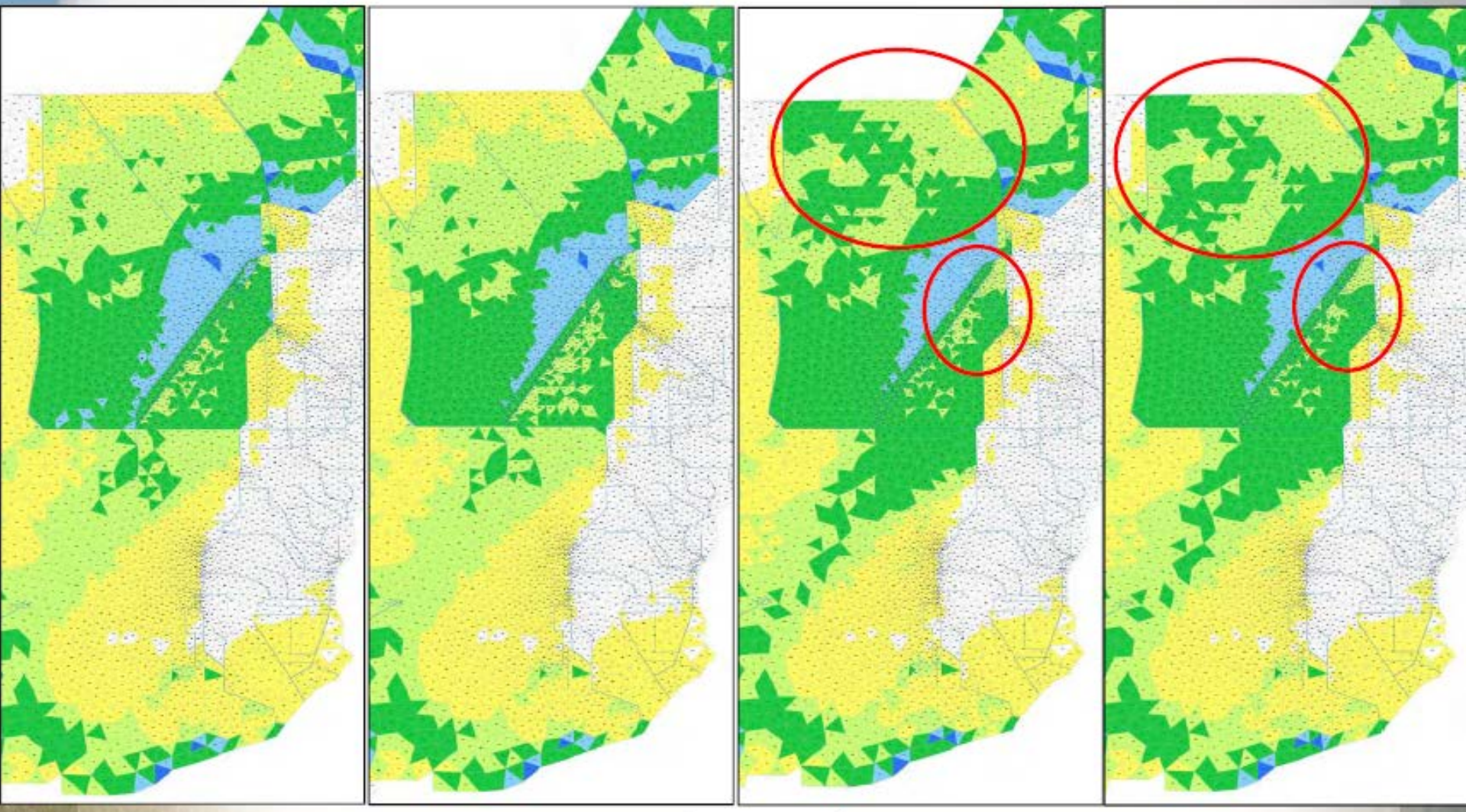
Geographic Area:

- Water Conservation Areas 3A & 3B (WCA3A & WCA3B)

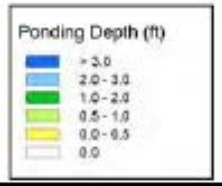
Key System Outcomes:

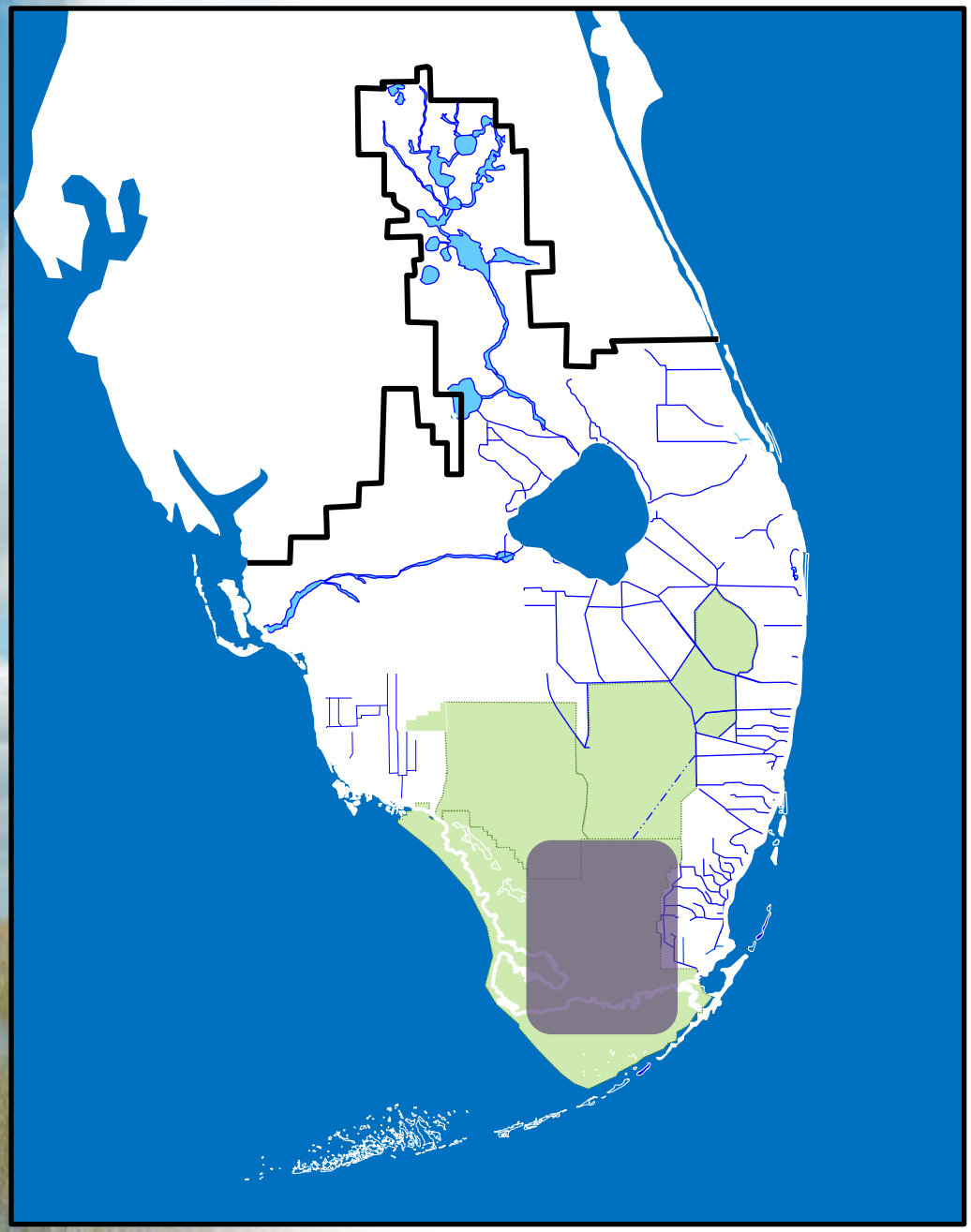
- ALT4R2 increase stages and hydroperiods in northern WCA3A relative to baselines (similar to ALT4R); performance in northeastern 3A similar to defined sawgrass targets.
- ALT4R2 similar to FWO (lower highs) and ALT4R in central & southern WCA3A.
- ALT4R2 maintains or improves WCA3B conditions relative to both ALT4R and baselines.

ECB FWO ALT 4R ALT 4R2



Annual Average Ponding Depth 1965 2005



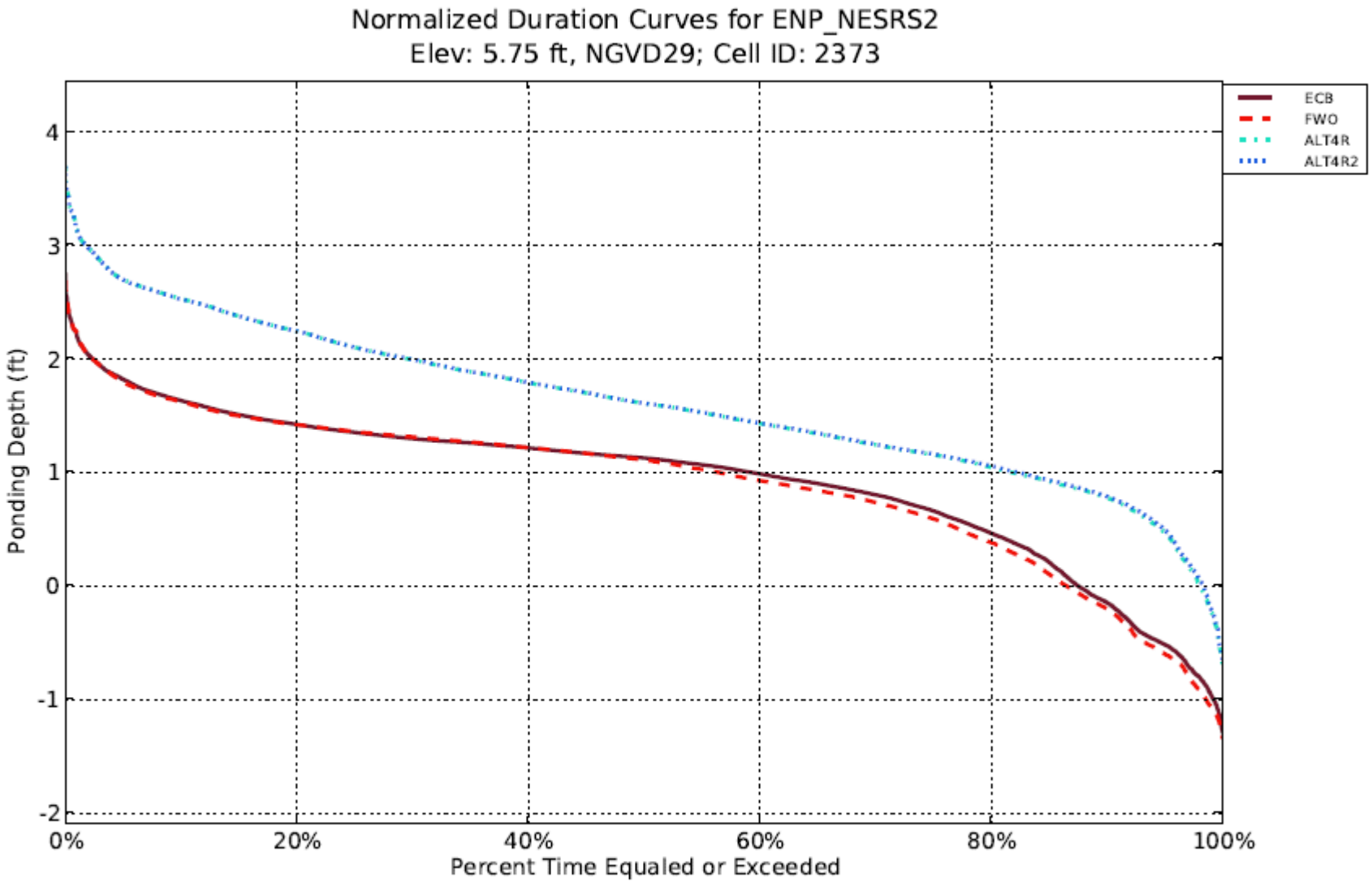


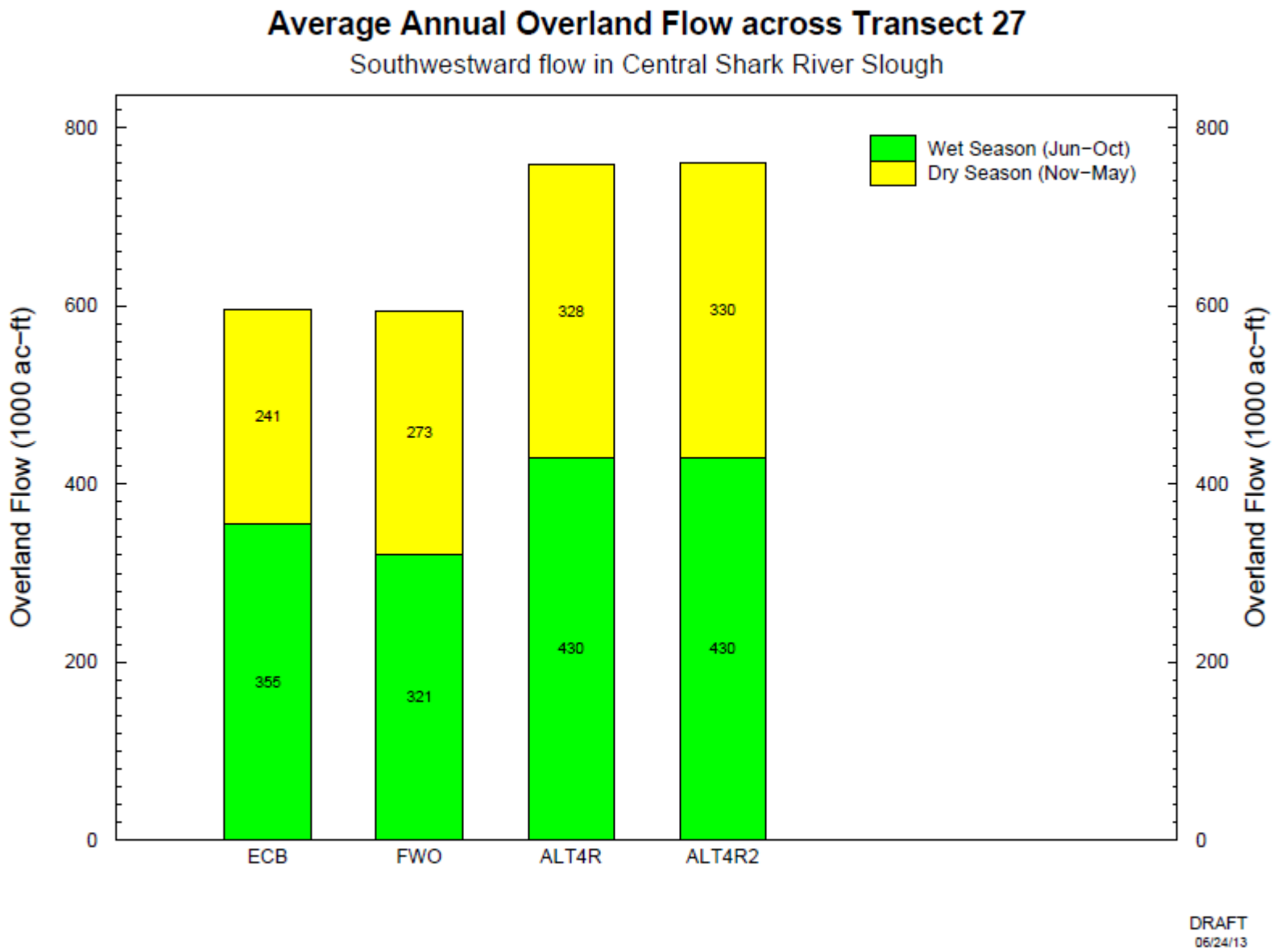
Geographic Area:

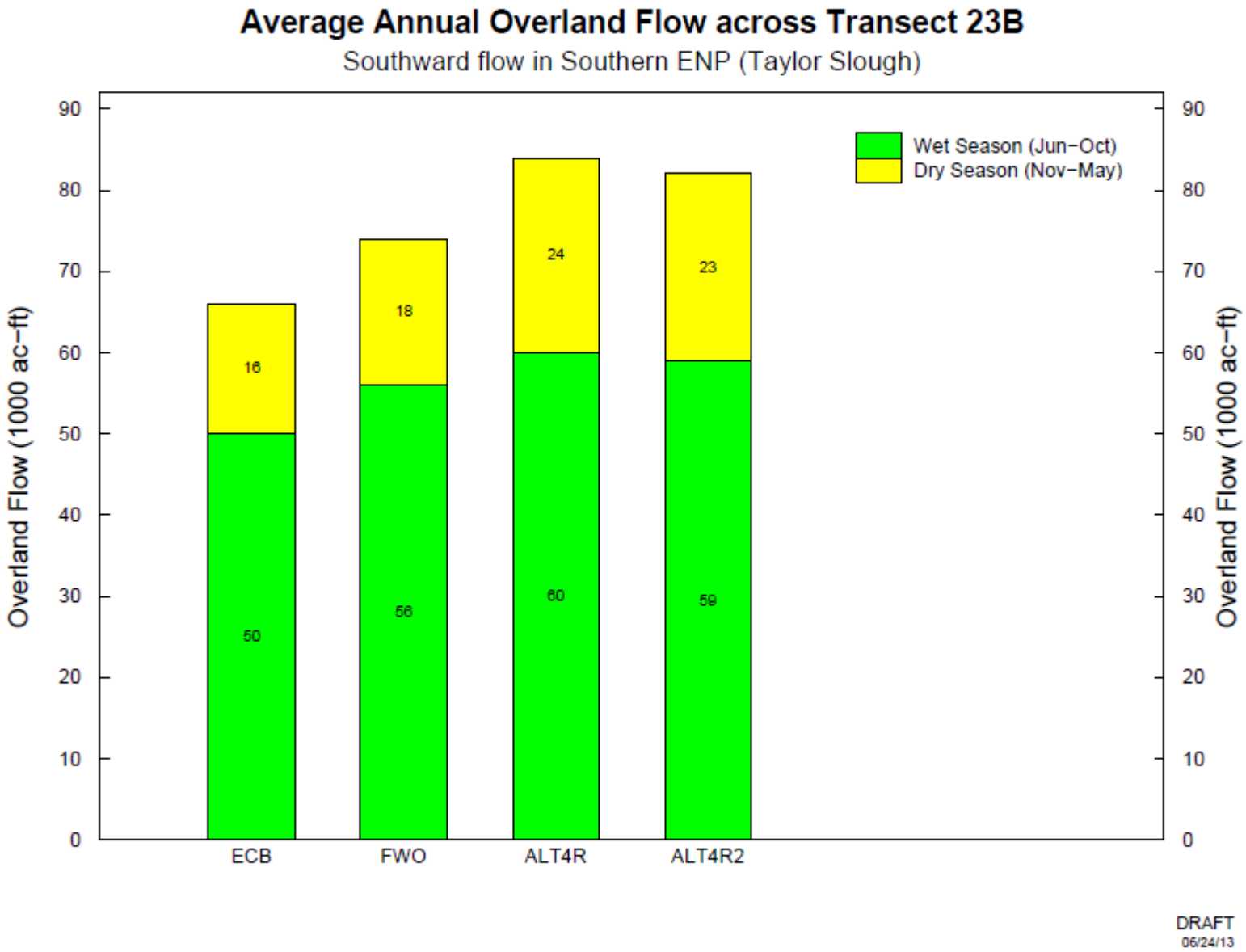
- Everglades National Park (ENP)

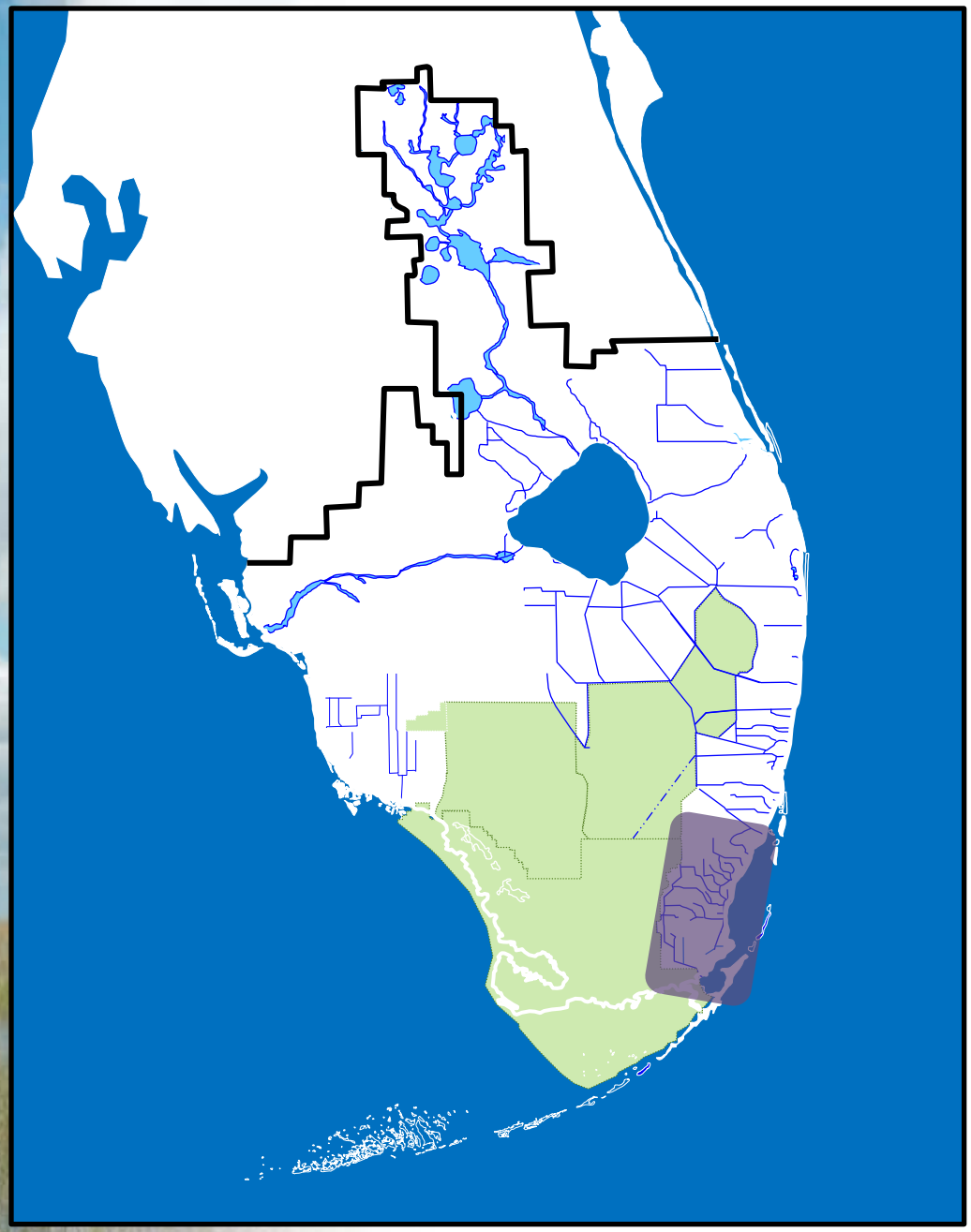
Key System Outcomes:

- CEPP ALT4R2 is similar to ALT4R and significantly increase stages and hydroperiods in Shark River Slough relative to baselines.
- CEPP ALT4R2 is similar to ALT4R and shows large flow increases into eastern ENP at Tamiami Trail relative to baselines.
- Slightly drier conditions in Taylor Slough in ALT4R2 relative to ALT4R due to diversion of some water toward Biscayne Bay.


Normalized Duration Curves for ENP_NESRS2
Elev: 5.75 ft, NGVD29; Cell ID: 2373
ECB
FWO
ALT4R
ALT4R2
Ponding Depth (ft)
4
3
2
1
0
-1
-2
0%
20%
40%
60%
80%
100%
Percent Time Equaled or Exceeded


Average Annual Overland Flow across Transect 27
Southwestward flow in Central Shark River Slough
Wet Season (Jun–Oct)
Dry Season (Nov–May)
Overland Flow (1000 ac–ft)
0
200
400
600
800
241
273
328
330
355
321
430
430
ECB
FWO
ALT4R
ALT4R2
DRAFT
06/24/13


Average Annual Overland Flow across Transect 23B
Southward flow in Southern ENP (Taylor Slough)
Wet Season (Jun–Oct)
Dry Season (Nov–May)
Overland Flow (1000 ac–ft)
0
10
20
30
40
50
60
70
80
90
16
50
18
56
24
60
23
59
ECB
FWO
ALT4R
ALT4R2
DRAFT
06/24/13



Geographic Area:

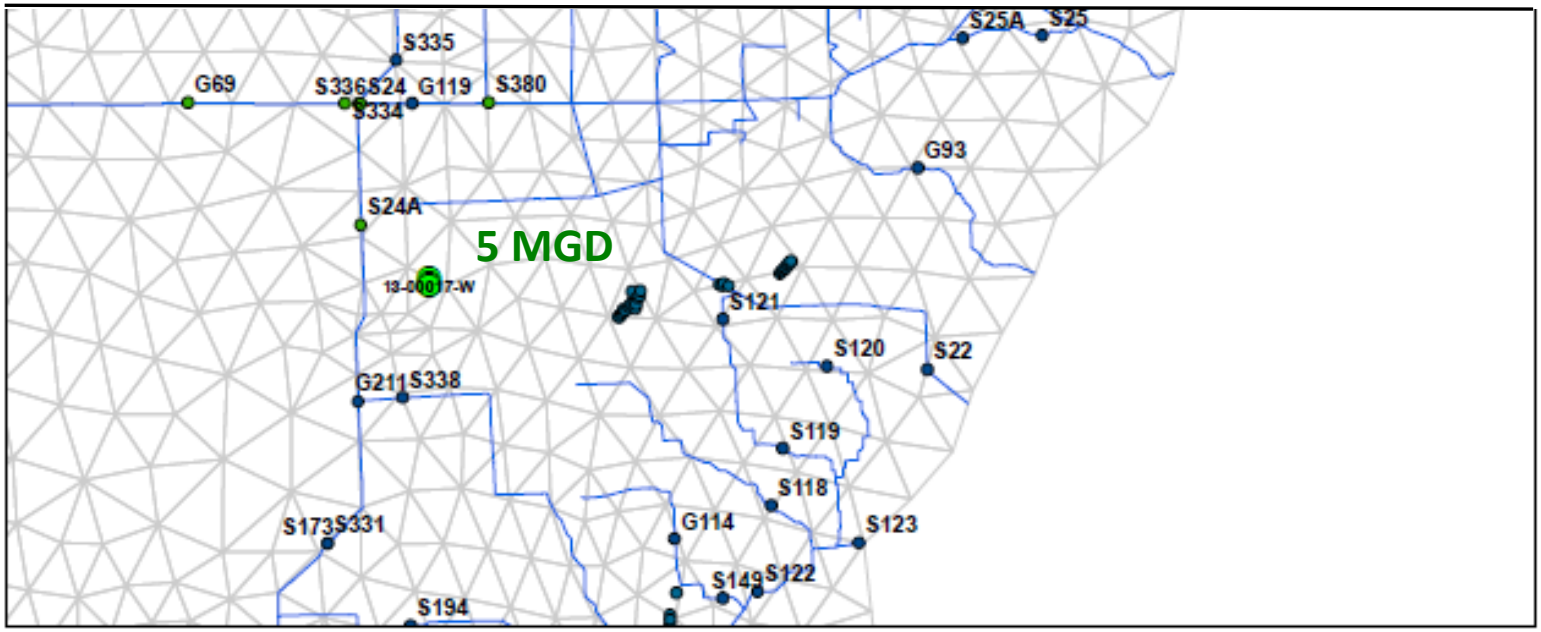
- LEC Service Area 3 (SA3), C111 Buffer Areas and Biscayne Bay

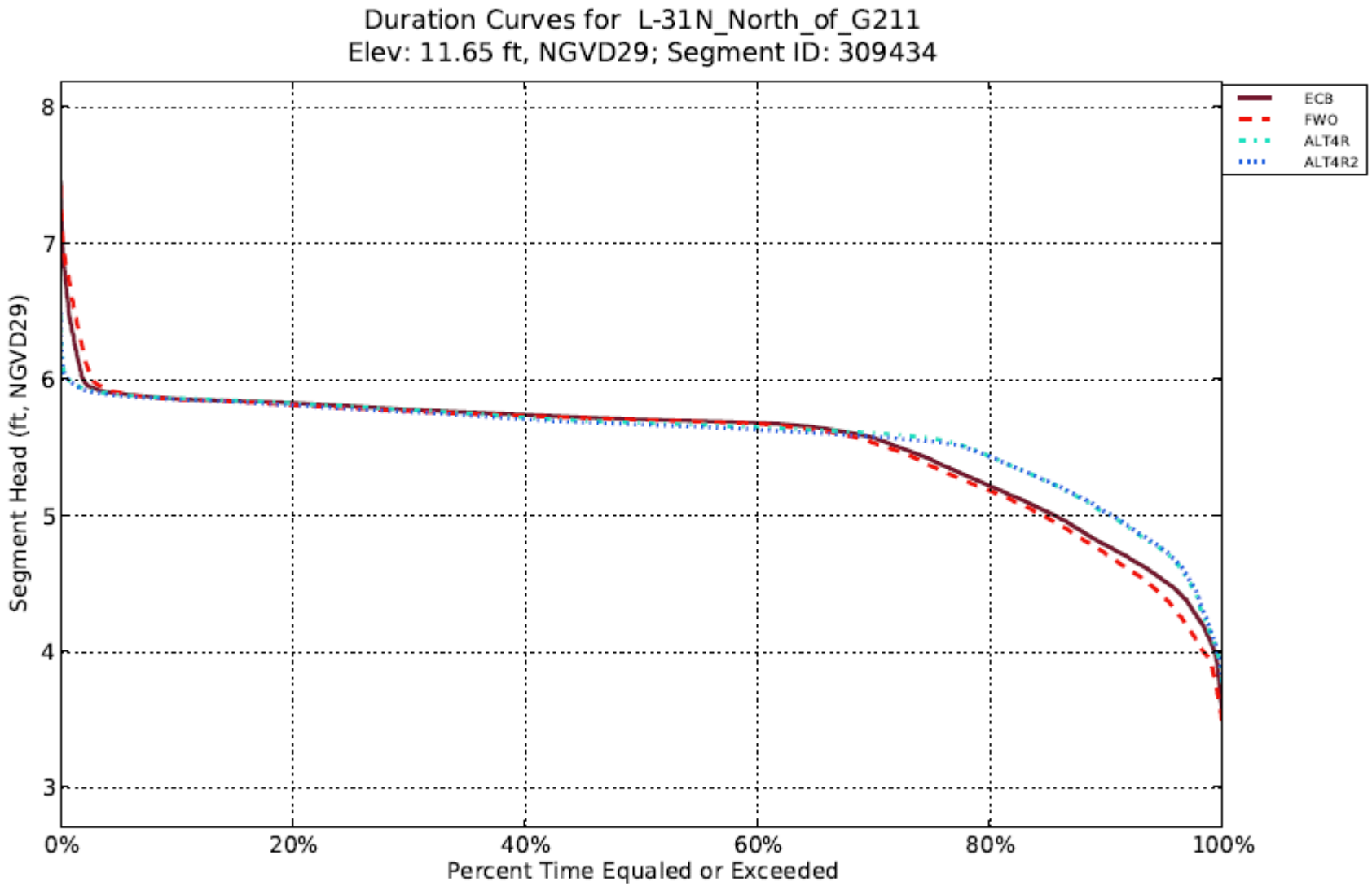
Key System Outcomes:

- Flood control is generally similar to baseline conditions with some local improvements observed.
- ALT4R2 increases surface water discharges throughout LEC east of ENP and toward Biscayne Bay, relative to ALT4R.
- An additional 5 MGD LEC SA3 utility pumpage is assumed in CEPP ALT4R2.

Additional Pumpage Well Locations

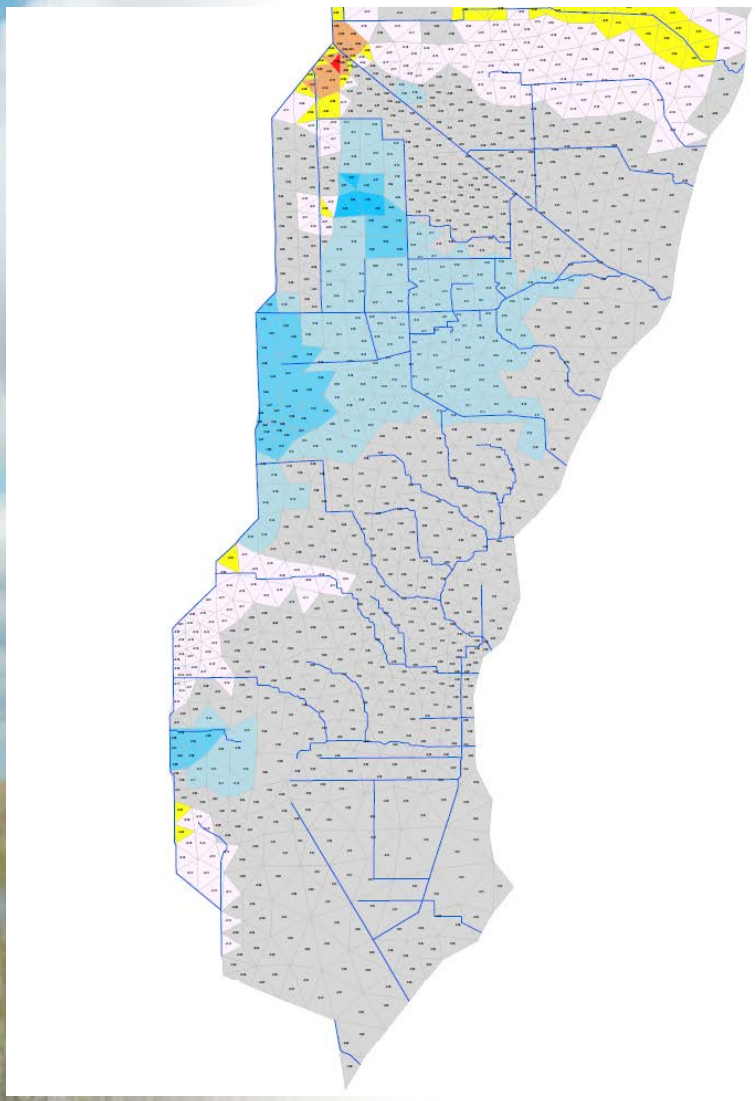
LEC-SA3




Duration Curves for L-31N_North_of_G211
Elev: 11.65 ft, NGVD29; Segment ID: 309434
Segment Head (ft, NGVD29)
8
7
6
5
4
3
0%
20%
40%
60%
80%
100%
Percent Time Equaled or Exceeded
ECB
FWO
ALT4R
ALT4R2

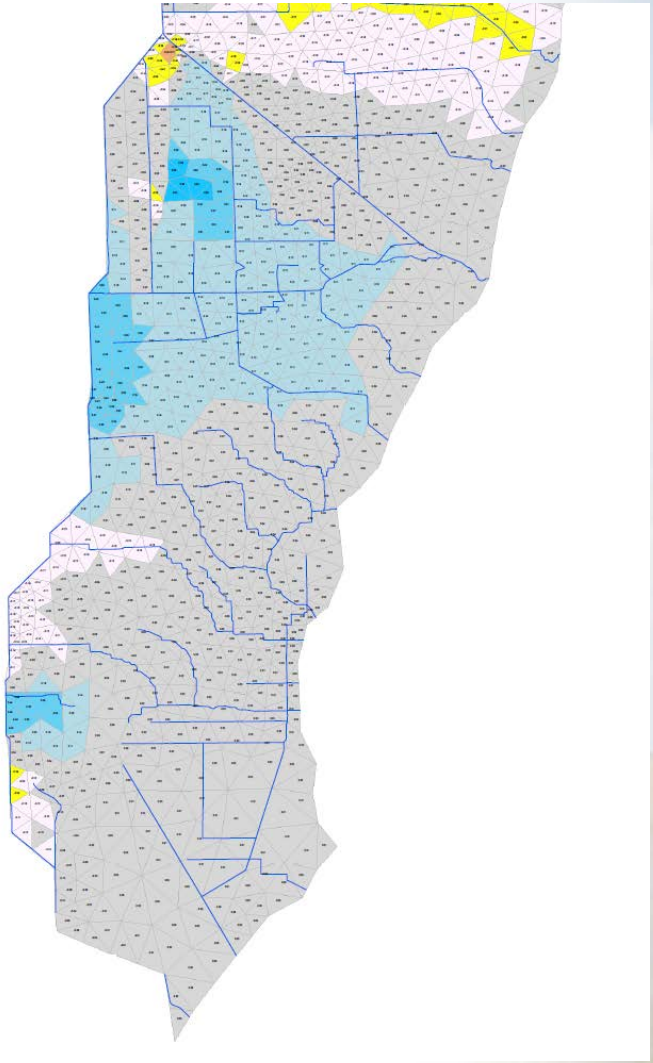
ALT4R

April 2001 Difference to ECB



ALT4R2

April 2001 Difference to ECB



Biscayne Bay Flows

	ECB	ECB	FWO	FWO	FWO	ALT4R	ALT4R	ALT4R	ALT4R2	ALT4R2	ALT4R2
Structure	Mean	% within PM	Mean	% dif ECB	% within PM	Mean	% dif ECB	% within PM	Mean	% dif ECB	% within PM
S29	282.8	68%	372.3	32%	79%	374.5	32%	81%	310.8	10%	73%
S28	90.9	--	93.2	3%	--	93.0	2%	--	90.8	0%	--
S27	115.2	--	114.5	-1%	--	115.1	0%	--	115.1	0%	--
S26	124.6	--	116.4	-7%	--	124.5	0%	--	124.9	0%	--
S25B	109.3	--	102.4	-6%	--	103.3	-5%	--	105.6	-3%	--
S25	9.7	--	9.6	-2%	--	9.6	-2%	--	9.7	-1%	--
G93	28.4	--	26.7	-6%	--	26.8	-6%	--	27.8	-2%	--
S22	121.2	12%	113.9	-6%	11%	115.3	-5%	12%	117.7	-3%	12%
S123	17.5	21%	17.3	-1%	21%	17.5	0%	22%	17.7	1%	22%
S21	101.3	67%	101.9	1%	66%	106.3	5%	64%	115.3	14%	65%
S21A	58.2	46%	60.6	4%	46%	60.8	5%	45%	62.8	8%	44%
S20G	0.4	--	0.3	-1%	--	0.3	0%	--	0.4	0%	--
S20F	145.7	43%	154.7	6%	43%	152.7	5%	44%	154.9	6%	42%
S20	6.6	--	6.6	0%	--	6.6	0%	--	6.6	0%	--
S197	22.8	3%	9.2	-60%	1%	11.2	-51%	1%	11.3	-50%	2%
Sum	1234.5		1299.6			1317.7			1271.2		

DISCUSSION