IRL-S / C-44 Overview

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Office of Everglades Policy and Coordination
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Presentation Outline

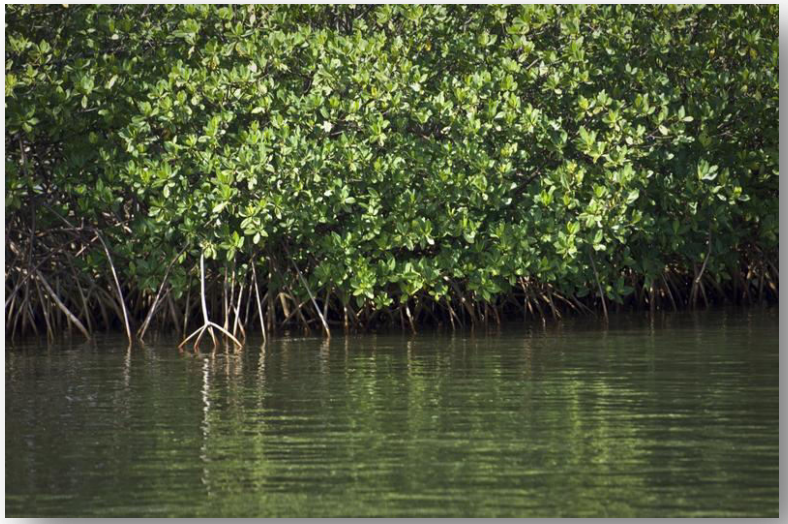
- Indian River Lagoon South (IRL-S)
  - Status and Purpose
  - Plan Components
  - C-44 Description
  - C-44 Construction Status
  - Monitoring & Operation Plan

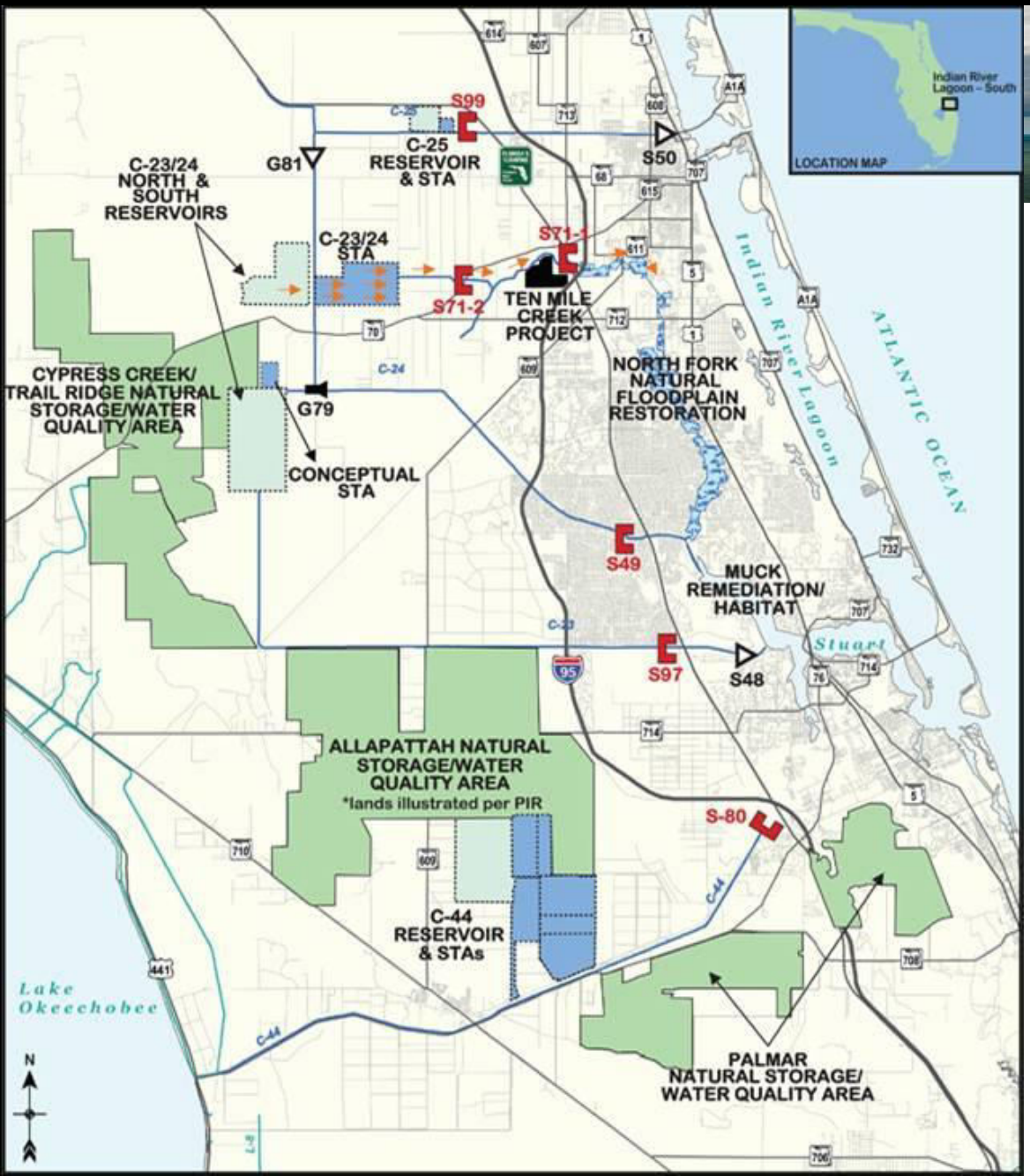
IRL-S Project Milestones

- Project Implementation Report (PIR) complete - August 2004
- Project authorized – Water Resources Development Act (WRDA) 2007
- Water reservations rule (for North Fork, St. Lucie River) - Adopted February 11, 2010
- Project Partnership Agreement (PPA) - September 2010
- PPA Amendment - August 2014

IRL-S Project Purpose

- Improve habitat quality in estuarine ecosystems
- Improve functional quality of wetland ecosystems
- Improve water quality
- Maintain existing level of flood control
- Maintain or improve water supply for urban and agricultural use
- Maintain a healthy ecosystem that supports recreational and commercial interests





IRL-S Footprint

IRL-S Footprint/C-44 Basin

1. C-44 Reservoir
2. C-44 Stormwater Treatment Area (East)
3. C-44 Stormwater Treatment Area (West)
4. Pal-mar Complex – Natural Storage and Water Quality Area

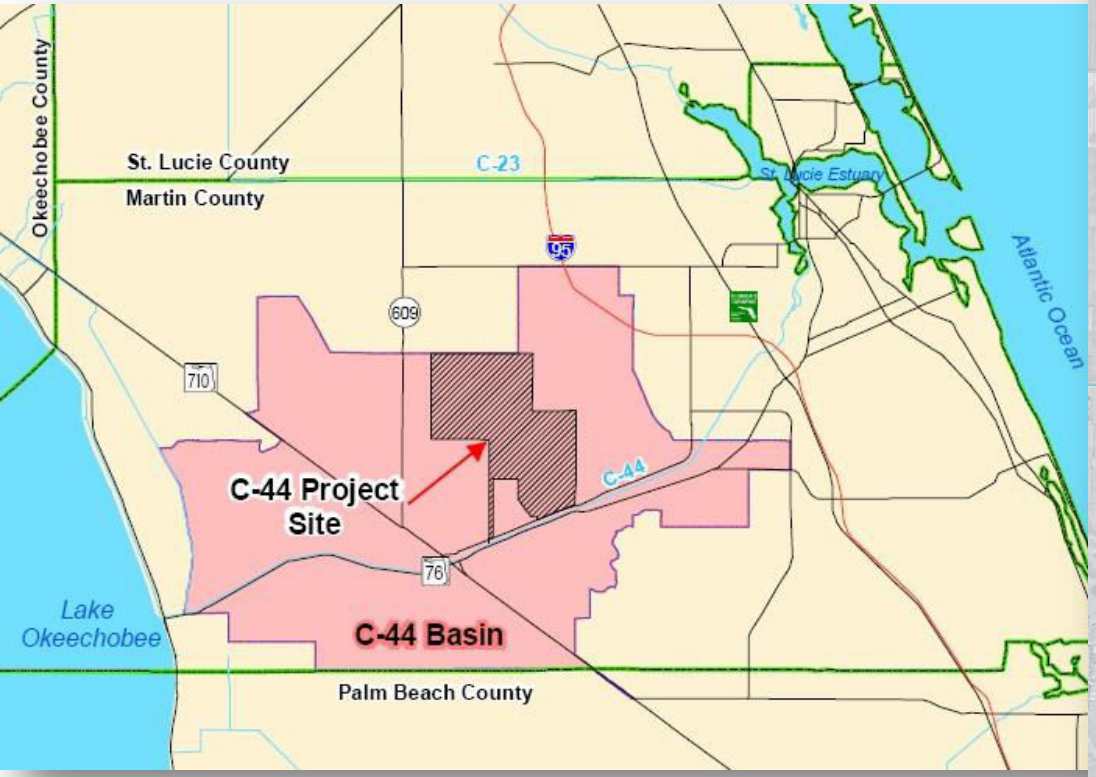
C-23/C-24 Basins

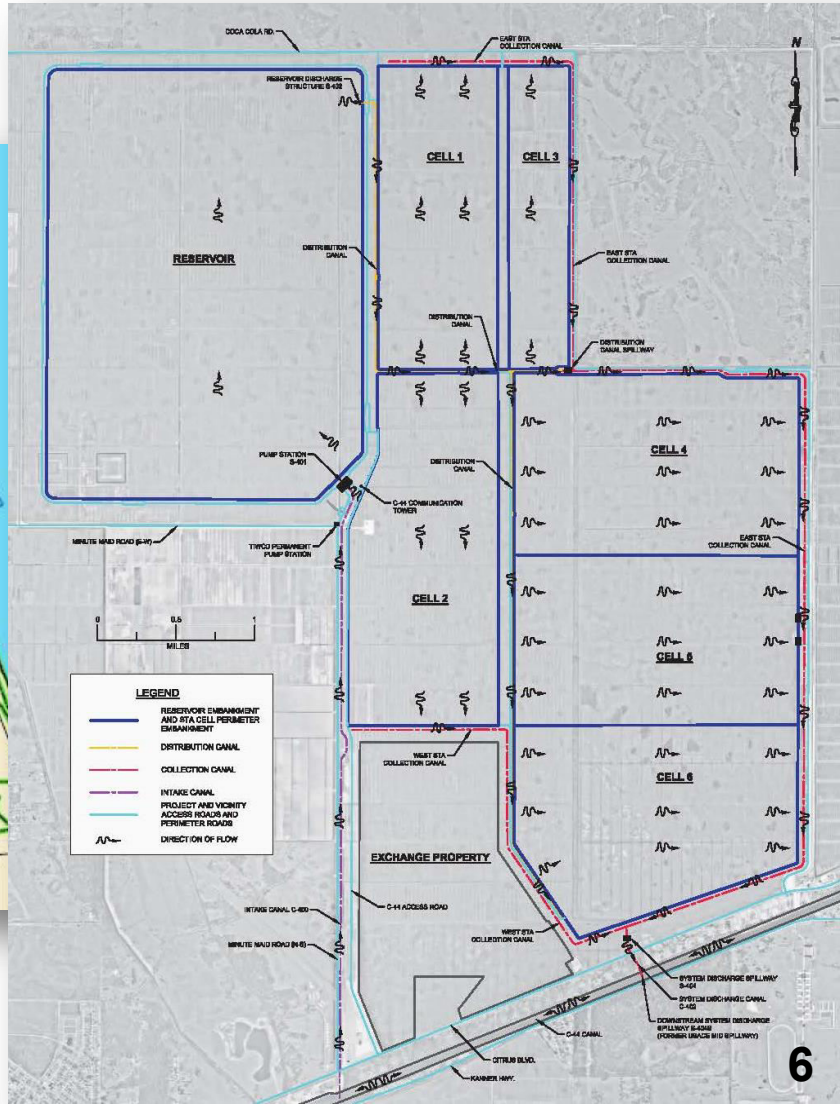
5. C-23/C-24 - North Reservoir
6. C-23/C-24 - South Reservoir
7. C-23/C-24 - Stormwater Treatment Area
8. Allapattah Complex – Natural Storage and Water Quality Area
9. Cypress Creek/Trail Ridge Complex Natural Storage and Water Quality Area

C-25, North Fork & South Fork Basins

10. C-25 Reservoir
11. C-25 Stormwater Treatment Area
12. North Fork Natural Floodplain Restoration
13. Muck Remediation & Artificial Habitat

C-44 RSTA Project Location and Footprint





C-44 Reservoir/STA Project Goals

- Implement three (3) components of the Indian River Lagoon-South (IRL-S) Project Implementation Report (PIR) Recommended Plan
- Reduce C-44 Basin runoff peaks to the St. Lucie Estuary
- Reduce nutrient loads from C-44 Basin runoff to the St. Lucie Estuary

C-44 Reservoir/STA (RSTA)

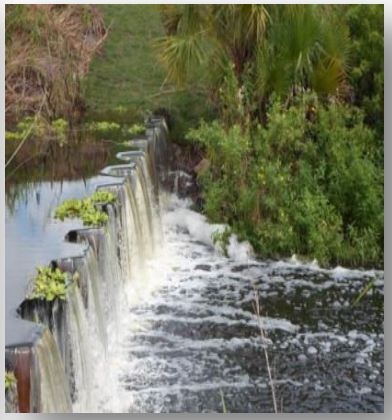
- 3,400 acre reservoir water depth of 15 feet
  - 50,600 acre-feet of storage
- 6,300 acre STA with emergent vegetation
- 1,100 cubic feet per second (cfs) capacity
  - Pump station located four miles north of the C-44 Canal
- Project currently under construction
  - Both SFWMD and USACE are actively constructing components

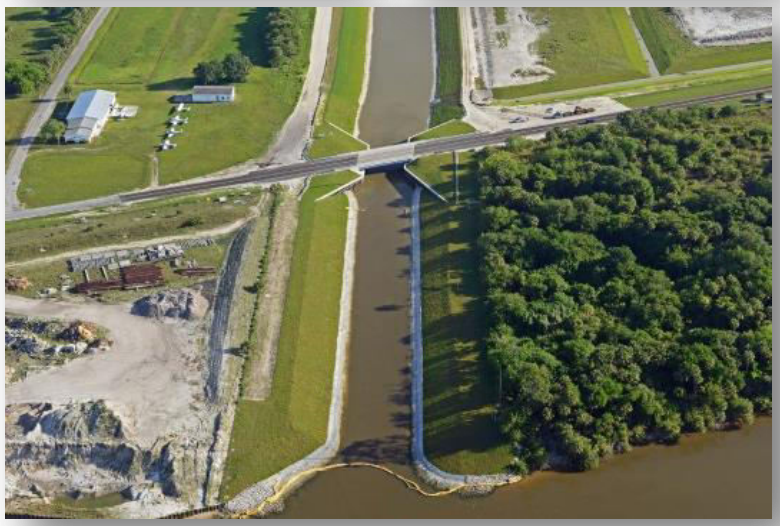
C-44 RSTA Completed Construction

- Relocations
  - Troup Indiantown Water Control District (TIWCD) canals and temporary pump station
  - Florida Power & Light power lines
- Tree Clearing
  - 12,000 acres of citrus trees removed
- TIWCD permanent pump station has not yet been constructed

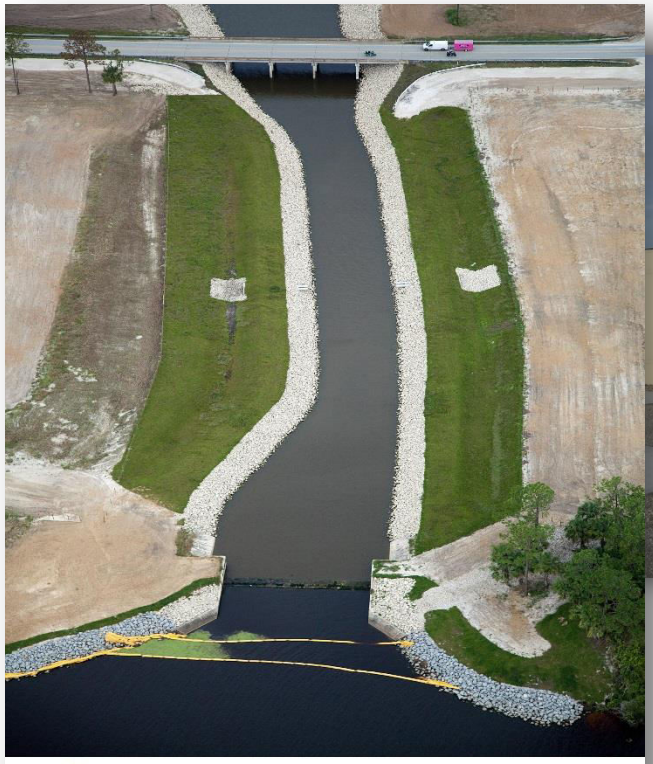
C-44 RSTA Completed Construction (Cont.)

- Contract 1 -USACE
  - Intake canal and access road
  - Citrus Boulevard Bridge and turn lanes
  - East Access Road, Canal and Spillway
  - $36.8 million
- Communication Tower -SFWMD
  - Replaces backbone Indiantown Tower
  - 300’ height
  - $6.4 million
- Reservoir Impacted Soils Removal -SFWMD
  - Remove soils impacted by copper from the reservoir footprint
  - $2,098,225
- Interim System Discharge Spillway
  - Increase groundwater stages throughout 2/3 of the property
  - $167,300

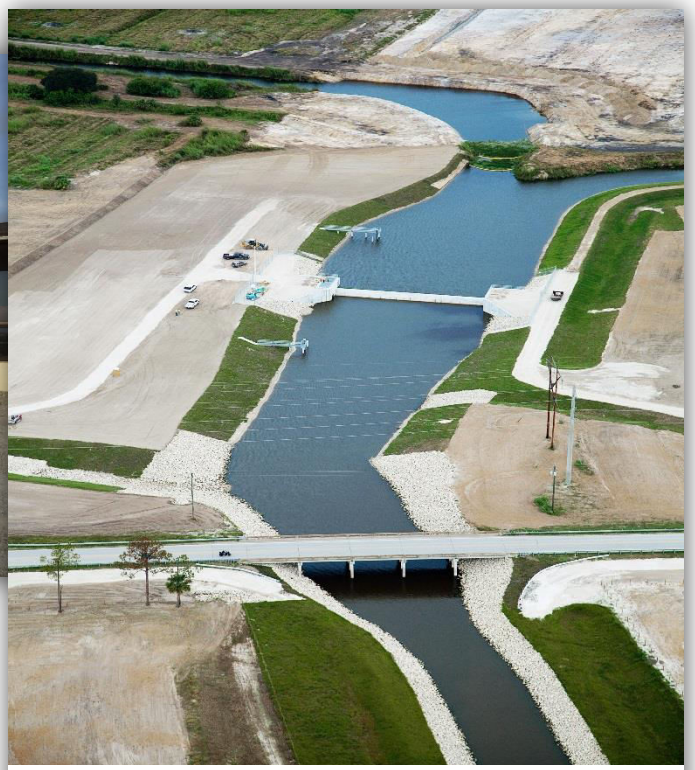




C-44 RSTA Completed Construction (Cont.)



C-44 Canal, looking north/northwest



Citrus Blvd., looking north

- System Discharge S-404 and Construction Trailer - $5,295,437

C-44 RSTA Construction Status

Currently Under Construction by SFWMD

- Stormwater Treatment Area (Blue Goose Construction, Inc.)
  - $100,792,387
  - October 2014 - August 2017

Stormwater Treatment Area Construction

C-44 RSTA Construction Status

Currently Under Construction by SFWMD

- Reservoir Pump Station (Harry Pepper & Associates, Inc.)
  - $40,289,146
  - Apr. 2015 - Sept. 2018

Pump Station Construction

Pump Station Construction

Pump Station Construction

Pump Station Construction

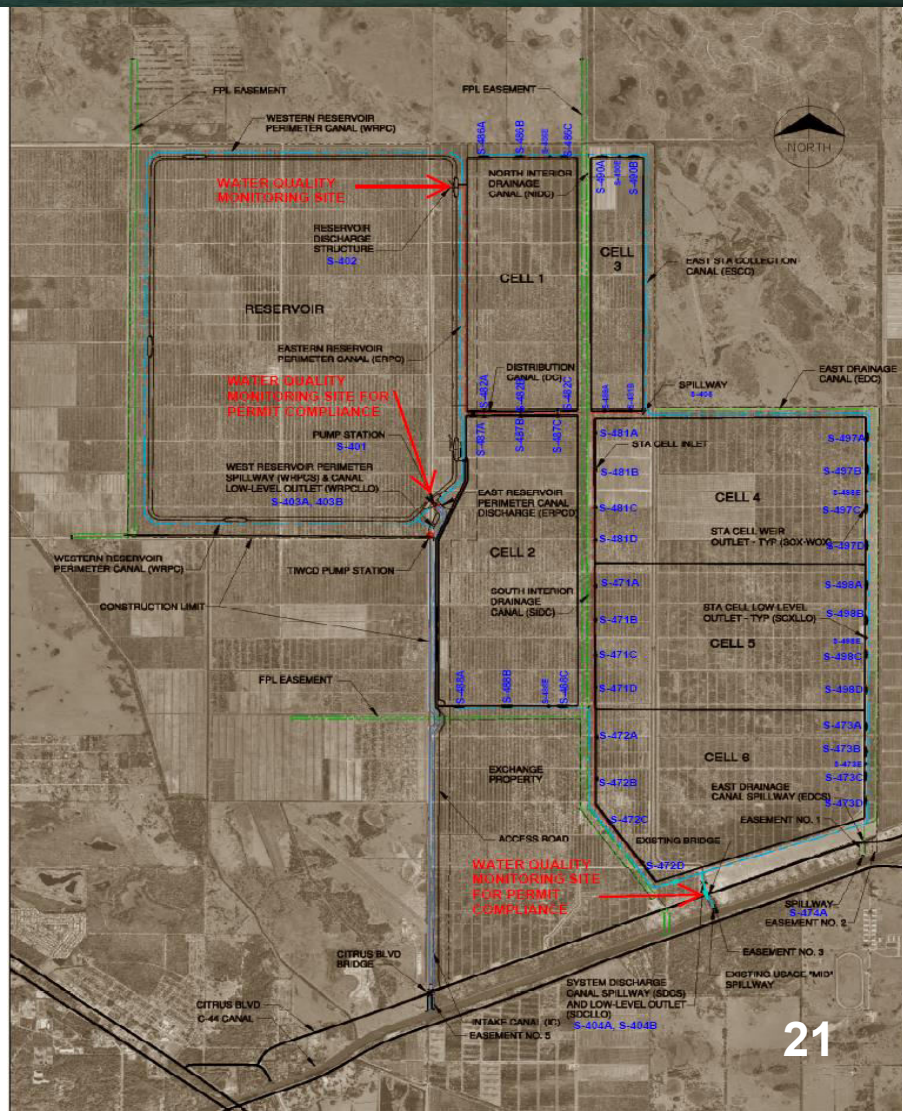
C-44 RSTA Construction Status

- Contract 2 (Reservoir)
  - Awarded September 2015
  - Notice to Proceed October 2015
  - 51 month construction period (through February 2020)

Operation

- Pump Station can remove up to 1,100 cfs from the C-44 Canal
- Discharge structure normally releases 600 cfs to STA
- STA normal operating depth is 1.5’
- Each STA cell is independent
- Cells 1 & 3 flow from south to north
- Cell 2 flows from north to south
- Cells 4, 5 and 6 flow from west to east
- System discharge can discharge up to 1,800 cfs (to accommodate probable maximum storm)

Water Control Structures and Monitoring Locations



Impact to St. Lucie Estuary

- Reduce the number of high flow events
  - <18 months of mean monthly flows between 2,000 and 3,000 cfs
  - <5 months of mean monthly flows >3,000 cfs
- Theoretical contribution of flows over S-80 to the high flow event is 735 cfs
  - Operate C-44 RSTA Intake Pump Station so that flows at S-80 are ≤ 735 cfs
- C-44 contributes ~ 24.5% of flows to SLE (C-44 BODR 2006)

Water Budget Component Annual Summary
(Table 7.6 from BODR)

Table 7.6
Water Budget Component Annual Summary (Case #4)

Year	Rainfall (in)	ET (in)	Average 2000Base SFWMM Lake O Stage (ft)	C-44 Flow from WaSh Model (2005) (acre-ft)	C-23 Flow from WaSh Model (2005) (acre-ft)	Irrigation Demand on Reservoir (acre-ft)	Seepage from Reservoir (acre-ft)	Seepage from STA (acre-ft)	Net Rain/ET Res (acre-ft)	Net Rain/ET STA (acre-ft)	C44 Inflows Pumped into the Reservoir (acre-ft)	C23 Runoff Diverted into C44 Reservoir (acre-ft)	Release from Reservoir into STA (acre-ft)	Release from Reservoir for Irrigation Demand (acre-ft)	Overflow (acre-ft)	Change in Reservoir Storage (acre-ft)	Average Reservoir Depth (ft)	Change in STA Storage (acre-ft)	Average STA Depth (ft)	Release from STA into C-44 (acre-ft)	S-80 Flow (acre-ft)
1968	56	55	14.05	252317	220109	41455	10018	2060	-339	-618	121855	60911	159586	10220	949	2332	7.9	116	1.2	158143	211736
1969	65	53	15.36	198960	151294	16679	8494	1724	-3275	-5971	139002	72873	184186	7339	937	14193	6.7	250	1.0	188433	175970
1970	61	55	16.43	241076	228377	22369	12269	2010	-1778	-3243	158604	86797	243941	15724	684	-25438	9.6	2592	1.2	241900	325057
1971	56	55	12.79	137347	92604	39037	5978	1883	-395	-721	113272	53829	138170	2754	0	20594	4.7	-2626	1.1	140281	0
1972	49	54	12.70	148647	119659	28500	7611	1681	1381	2518	120817	68276	184866	10668	0	-15433	6.0	-496	1.0	180668	0
1973	53	54	12.28	175098	124098	29149	8488	1749	298	543	152386	64160	200664	6254	0	842	6.7	-6	1.0	198372	0
1974	50	56	13.22	117700	69382	36513	6140	1565	1476	2691	101824	46911	141239	3786	0	-3906	4.8	2024	0.9	134810	90678
1975	47	56	13.49	65803	48633	33040	3724	1841	2620	4778	60982	31737	88463	1173	0	-3262	2.9	632	1.1	81097	0
1976	51	55	12.75	106325	64485	35314	4661	1435	1182	2155	97268	41851	124457	5438	0	3382	3.7	-653	0.8	121655	0
1977	53	54	12.09	99166	97759	42848	3730	1329	246	448	80844	38956	94330	2319	0	19174	3.0	-1508	0.8	94685	0
1978	61	53	14.46	122155	75102	15181	5887	1675	-2154	-3927	111884	48300	158232	1983	0	-3763	4.6	3861	1.0	156239	101668
1979	50	52	15.91	148380	158794	19572	8857	1929	535	976	92248	67368	154150	5719	92	-9737	7.0	-4178	1.1	155490	202727
1980	44	55	15.55	26618	28102	35156	3249	2222	3094	5642	25316	26371	49542	4097	0	-8295	2.5	4551	1.3	36620	37923
1981	38	56	11.80	37339	50902	65269	2145	1520	5127	9350	29398	22161	45818	1877	0	-1834	1.7	-400	0.9	35492	0
1982	71	53	13.24	247747	157791	9302	11148	2022	-5195	-9473	172856	70632	207655	2309	133	27438	8.8	-3619	1.2	219743	186161
1983	66	53	15.25	257892	147255	12097	11425	1965	-3737	-6814	147066	66295	196621	9738	906	-1593	9.0	1200	1.1	200127	303876
1984	54	55	15.52	147023	96719	18850	7500	1695	155	283	125126	67205	184336	10472	0	-10131	5.9	-1621	1.0	183701	205598
1985	48	54	13.15	50346	95385	39811	3999	1645	1909	3481	37656	56742	94838	4188	0	-10536	3.1	2025	1.0	87301	8454
1986	53	54	13.22	71715	96454	26721	4844	1831	382	697	71499	63955	125406	3030	0	1791	3.8	-1523	1.1	125290	0
1987	46	54	13.39	74053	74617	37062	3907	2035	2081	3794	53843	37614	82348	2474	0	648	3.1	-726	1.2	76519	23822
1988	43	54	14.65	65256	62862	40164	4998	2011	2986	5445	61482	48060	96212	11726	0	-6379	3.9	3785	1.2	84639	67169
1989	44	56	12.09	43731	18222	41686	2357	1712	3493	6369	40124	14287	43782	2735	0	2043	1.9	475	1.0	35238	0
1990	46	54	11.55	105214	77663	35964	4640	1943	2130	3883	81335	32580	98916	7360	0	870	3.7	-2332	1.1	95541	0
1991	60	53	14.09	154141	89660	2806	7549	1610	-1888	-3443	140611	68839	201020	1211	0	1557	5.9	-1934	0.9	204983	101815
1992	65	54	14.93	212940	178058	16467	9078	2350	-3334	-6079	79907	45502	111183	1599	1872	5010	7.1	450	1.4	114912	219216
1993	57	54	15.41	234216	150617	20363	11330	1884	-815	-1487	156482	85219	210669	17457	357	2702	8.9	-213	1.1	210273	281496
1994	80	53	15.24	404717	242491	5901	13530	2159	-7806	-14234	154889	83877	191249	5901	2986	32906	10.7	4193	1.3	198508	365422
1995	65	54	15.88	364708	245631	10055	13100	2140	-3026	-5517	127418	60613	192072	5933	4429	-24477	10.3	-3966	1.2	200264	393764
1996	49	54	16.00	126880	124780	29585	7338	1726	1598	2914	109958	65774	167483	16961	0	-17649	5.7	2437	1.0	159738	176661
1997	49	55	14.63	133033	86356	18943	6088	1835	1881	3431	120211	55923	143586	12701	0	11877	4.8	-2609	1.1	141425	89294
1998	61	53	15.92	250849	140068	24702	10284	1993	-2159	-3937	138956	48258	166608	7798	130	4553	8.1	116	1.2	168551	280574
1999	54	54	15.45	241868	170294	35400	9354	1837	-5	-9	117356	41943	147683	5979	1717	-5429	7.4	-201	1.1	145855	246407
2000	42	55	14.21	133791	75708	44937	5637	1729	3924	6840	107251	34746	129396	17102	0	-13146	4.4	3071	1.0	117433	33531
Annual Average	**54**	**54**	**14**	**157,486**	**116,968**	**28,209**	**7,253**	**1,841**	**18**	**23**	**104,537**	**53,896**	**144,203**	**6,849**	**460**	**-276**	**5.7**	**96**	**1.1**	**142,240**	**125,122**

*See Table 7.4 for Model Constants

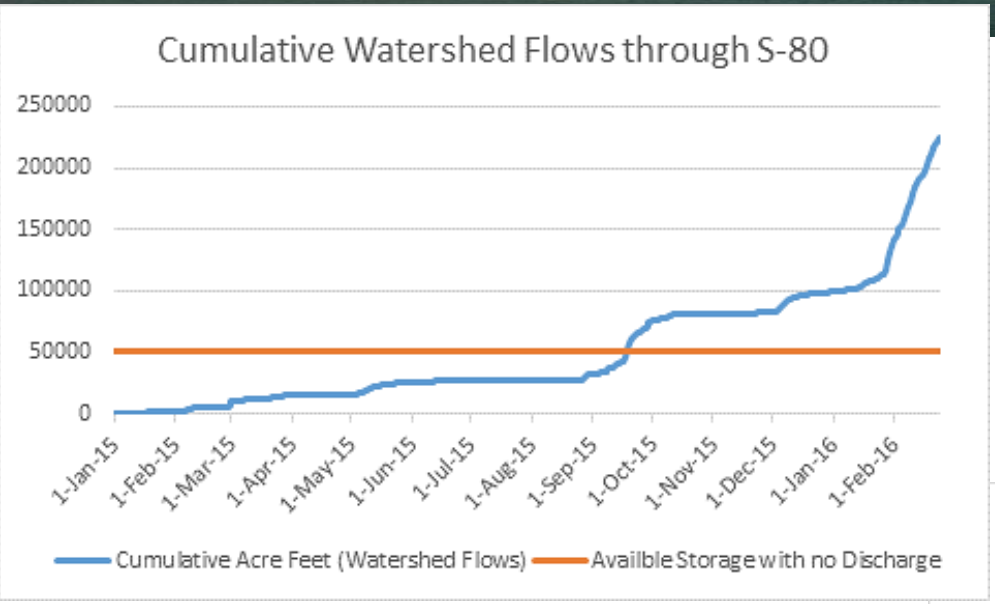
Average Daily Pumped Inflow

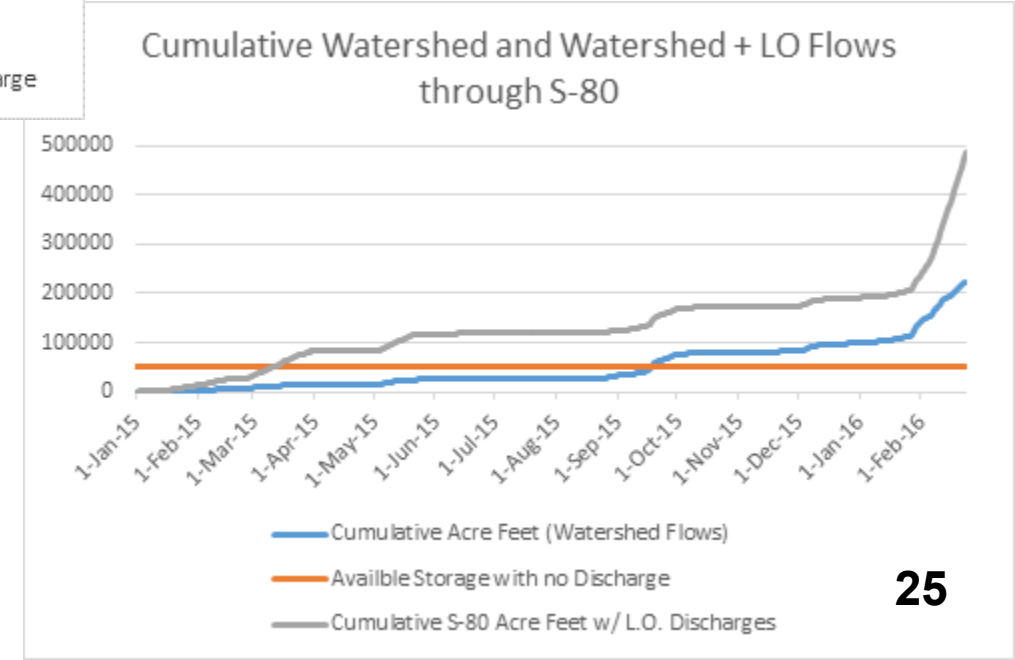
- Design included incorporation of the southern diversion (up to 250 cfs from the C-23 Canal)
- Capture 65% of Basin flows

Table 7.7
Average Daily Pumped Inflow Rates (cfs) to Reservoir
Based on Monthly Averages for POR 1968 - 2000
Case 4

Probability of Exceedance	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0%	635	761	596	501	577	1035	726	633	764	761	674	512
3%	577	632	429	431	458	841	678	620	748	657	546	404
9%	256	503	390	280	319	686	506	577	722	576	351	319
25%	230	160	237	175	203	476	413	379	628	459	281	196
50%	160	72	72	28	59	258	264	304	370	283	151	131
75%	57	30	7	0	0	44	98	185	228	162	102	64
100%	0	0	0	0	0	0	0	15	51	37	6	3

Recent S-308 and S-80 Flows





Questions?