

Comparison of the South Florida Water Management Model (SFWMM) with the Simple Refuge Stage Model (SRSM) for the A.R.M. Loxahatchee National Wildlife Refuge

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ACKNOWLEDGMENTS

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Background – **SFWMM**

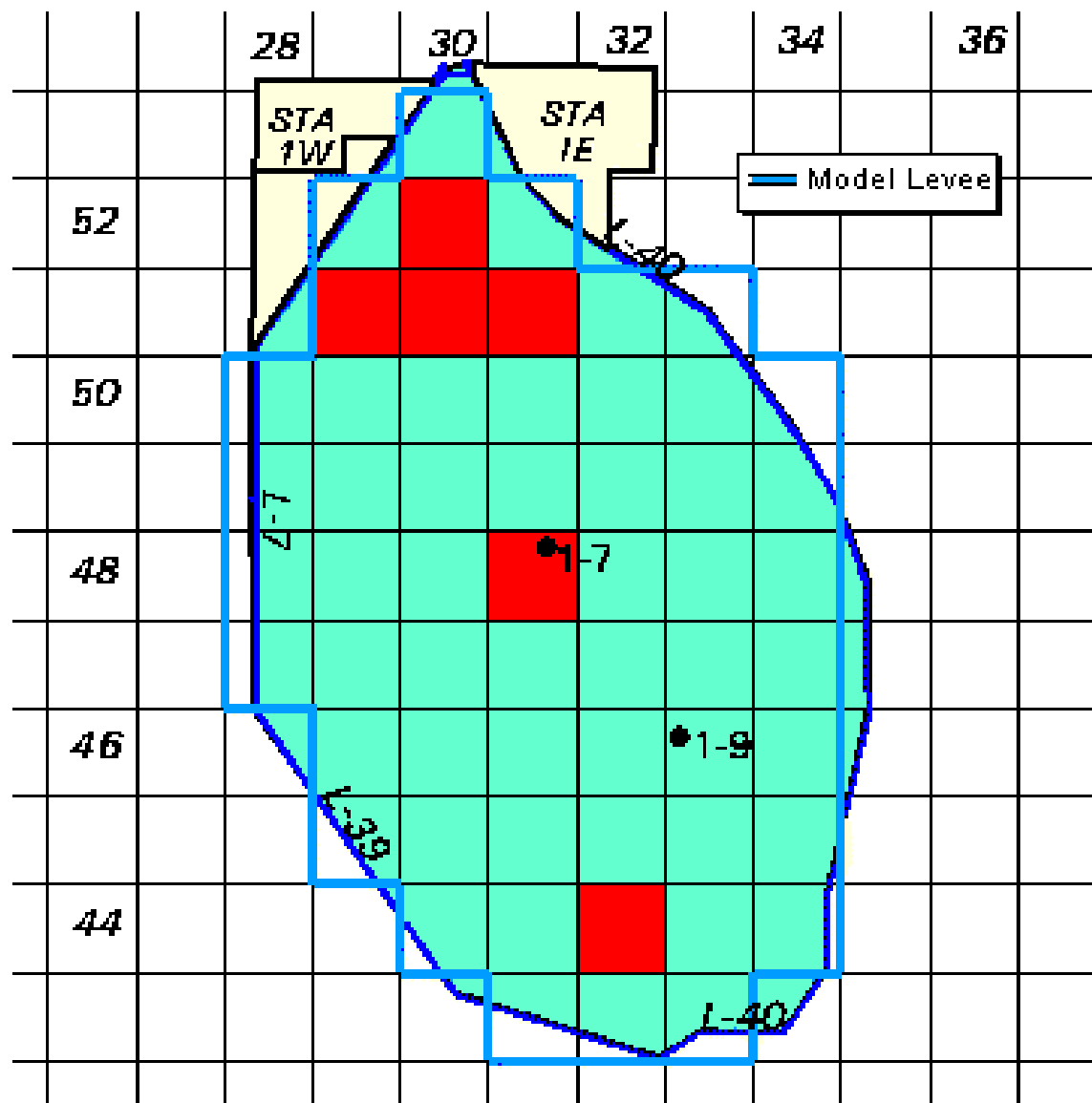
South Florida Water Management Model

- Model domain is South Florida
- 2x2 mile grid with other features
- User specifies – rain, ETP
- Calibration uses historic flows
- Model outputs – stages, flows
- Often applied in comparing alternatives
- Regulatory flows calculated in predictive mode

SFWMM – WCA-1

Source: SFWMD

Loxahatchee National Wildlife Refuge (Water Conservation Area 1)

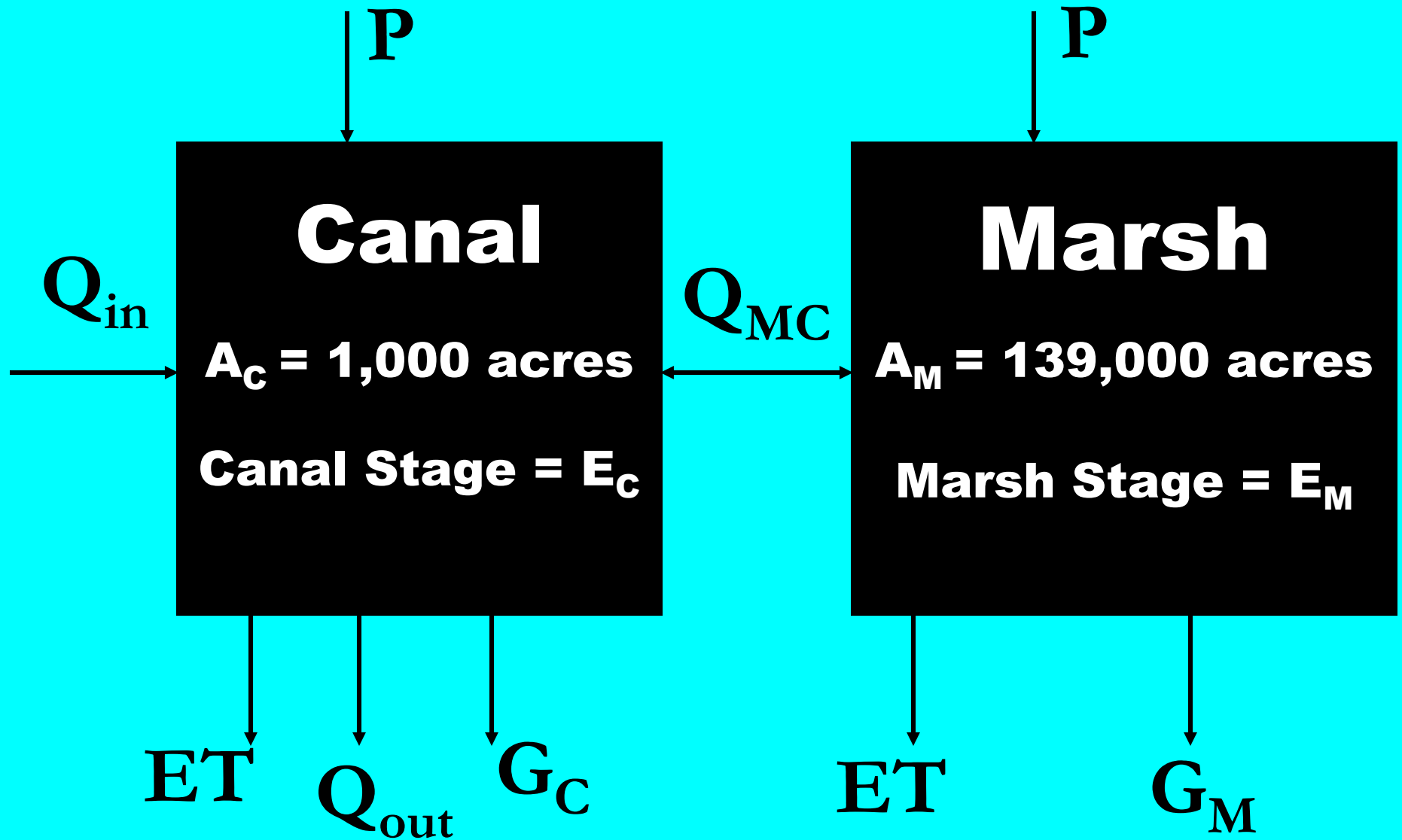


Background – **SRSM**

Simple Refuge Stage Model

- Model domain is WCA-1
- Based on water budget
- 2 compartments – Canal & Marsh
- Constant surface area
- Flow between canal & marsh calculated
- Originally in Excel; Now Madonna
- User specifies – rain, ETP, inflow, water supply
- Model outputs – stage, regulatory outflow

SRSM Water Budget



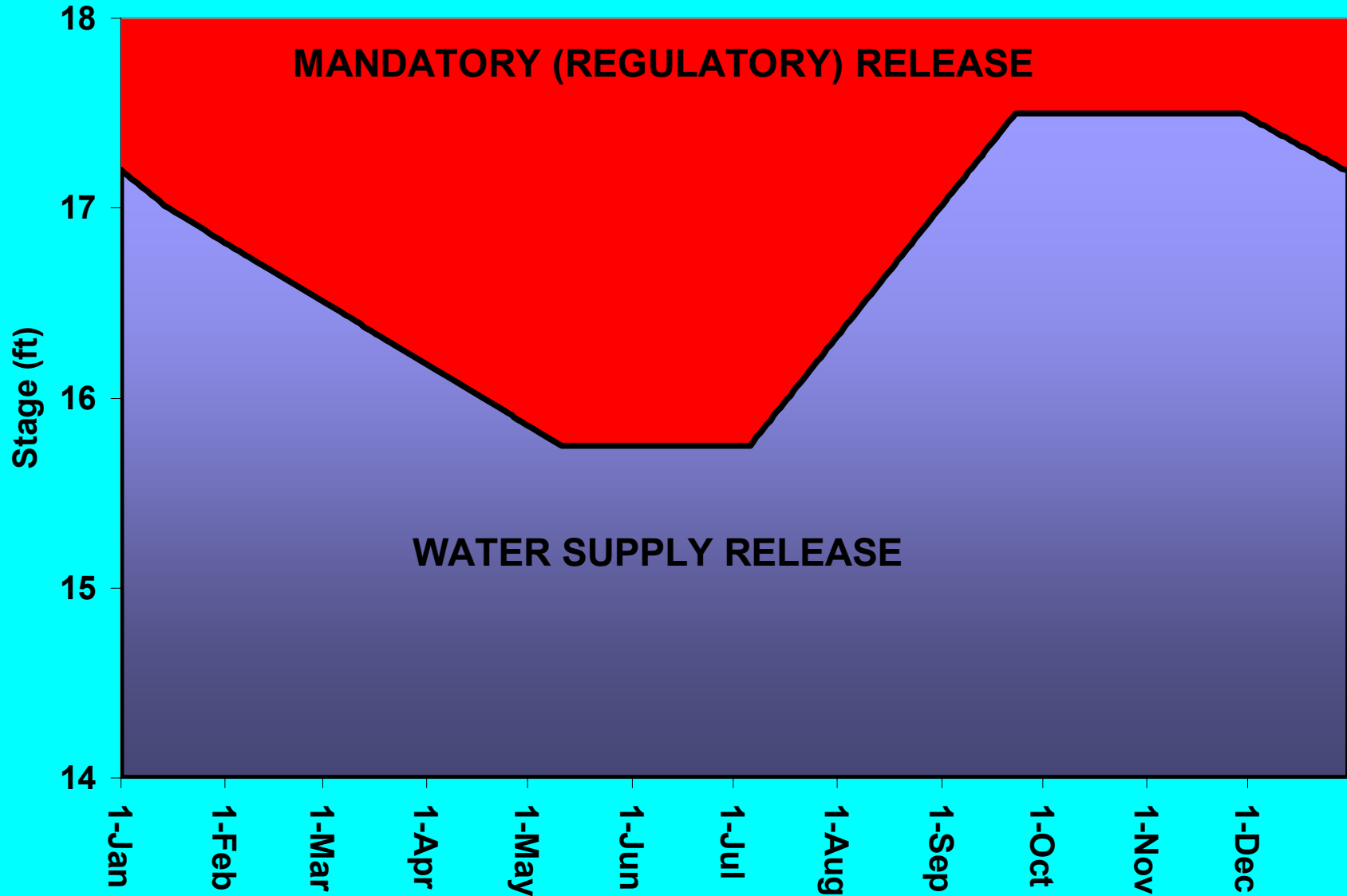
OBJECTIVES

- Set up SRSM run as similar as possible to a SFWMM simulation
- Compare model projections over the 36-year period of simulation
- Examine sensitivity of Refuge stage to inflow, outflow, & management assumptions using SRSM

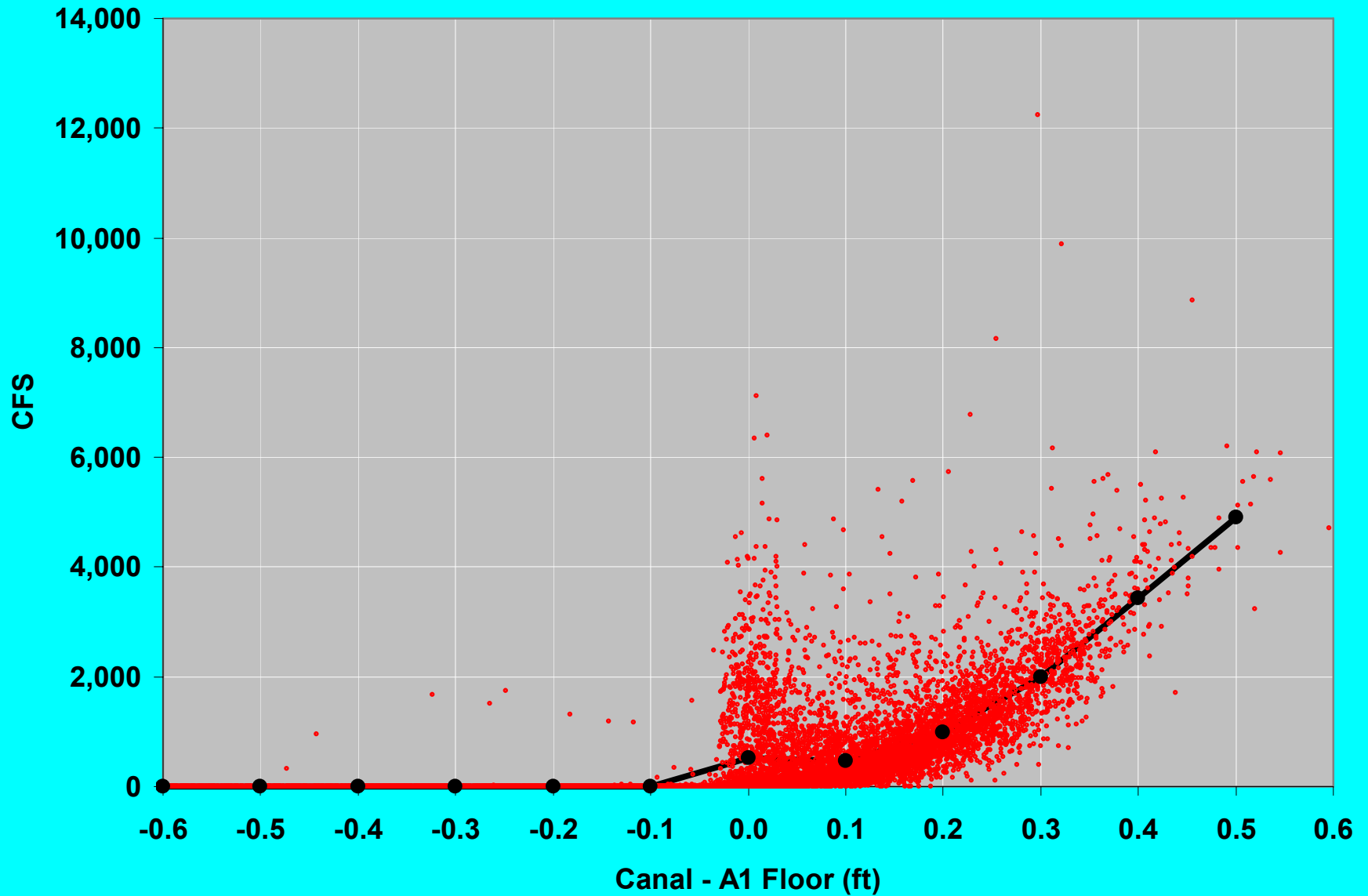
SRSM IMPLEMENTATION

- SFWMD provided input & output files for SFWMM ECP Base model run
- Used historic rainfall & ET data
- Inflow was from SFWMM
- Outflows
 - Regulatory release
 - Water supply

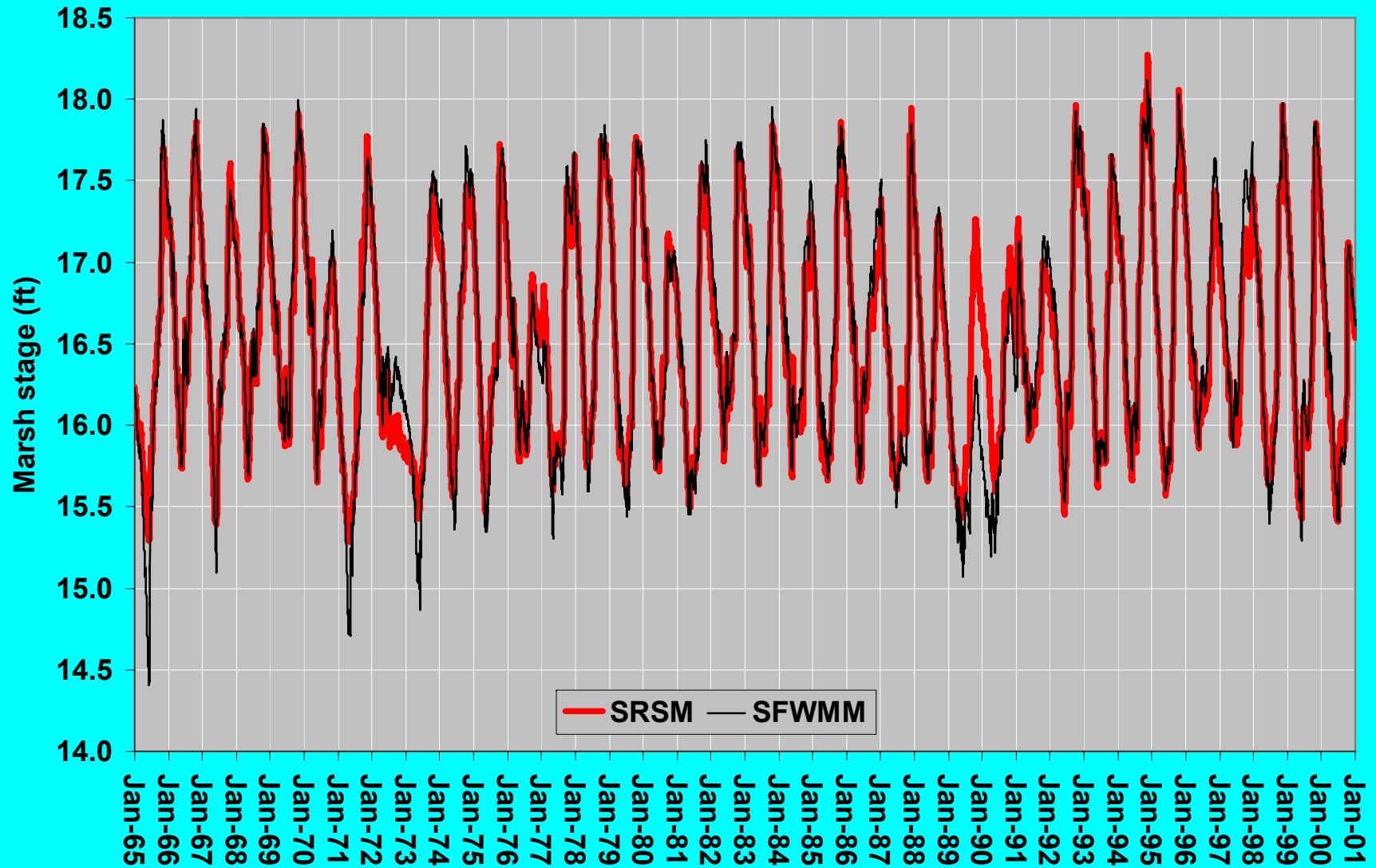
Outflow – Regulation Schedule



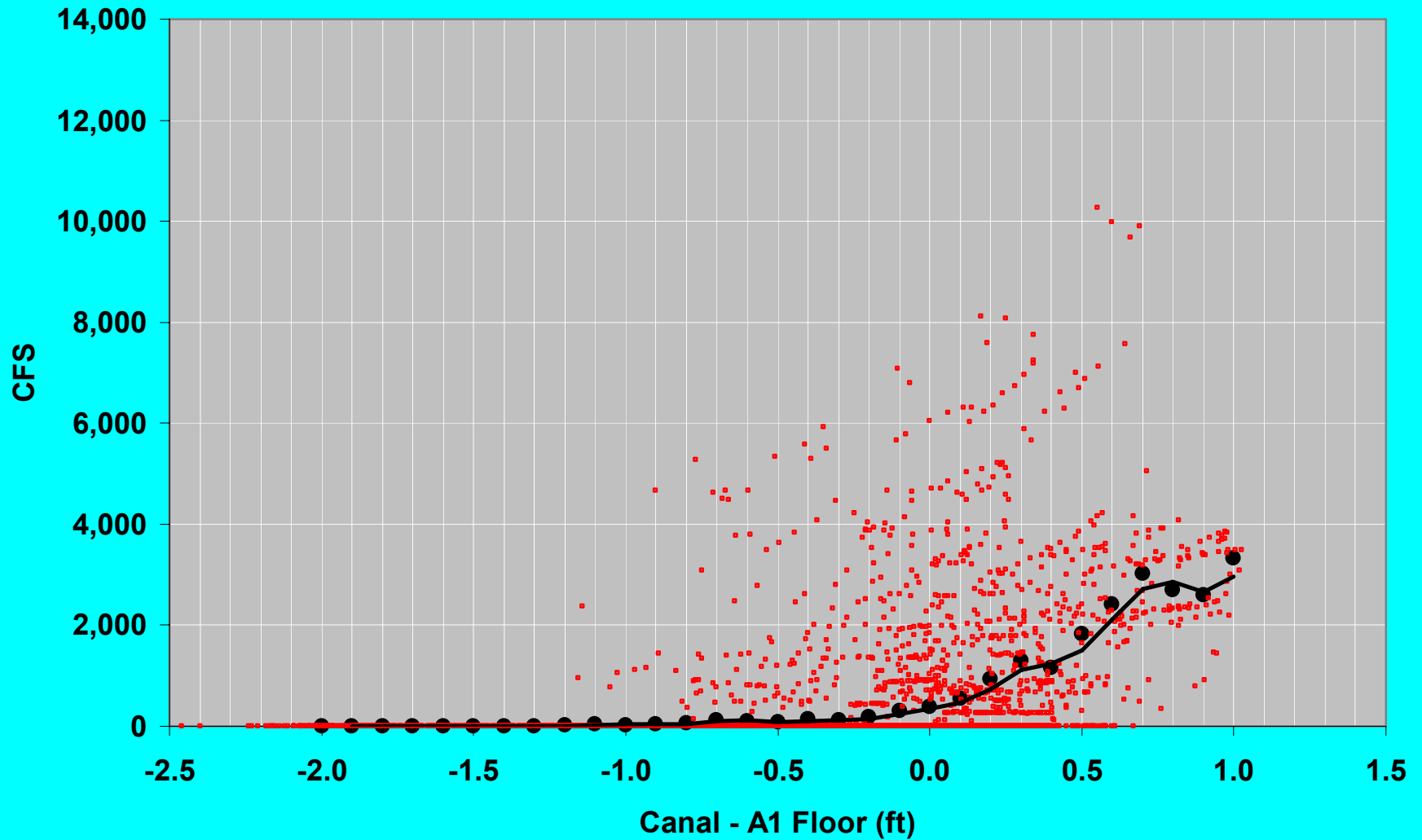
SFWMM S-10 CFS



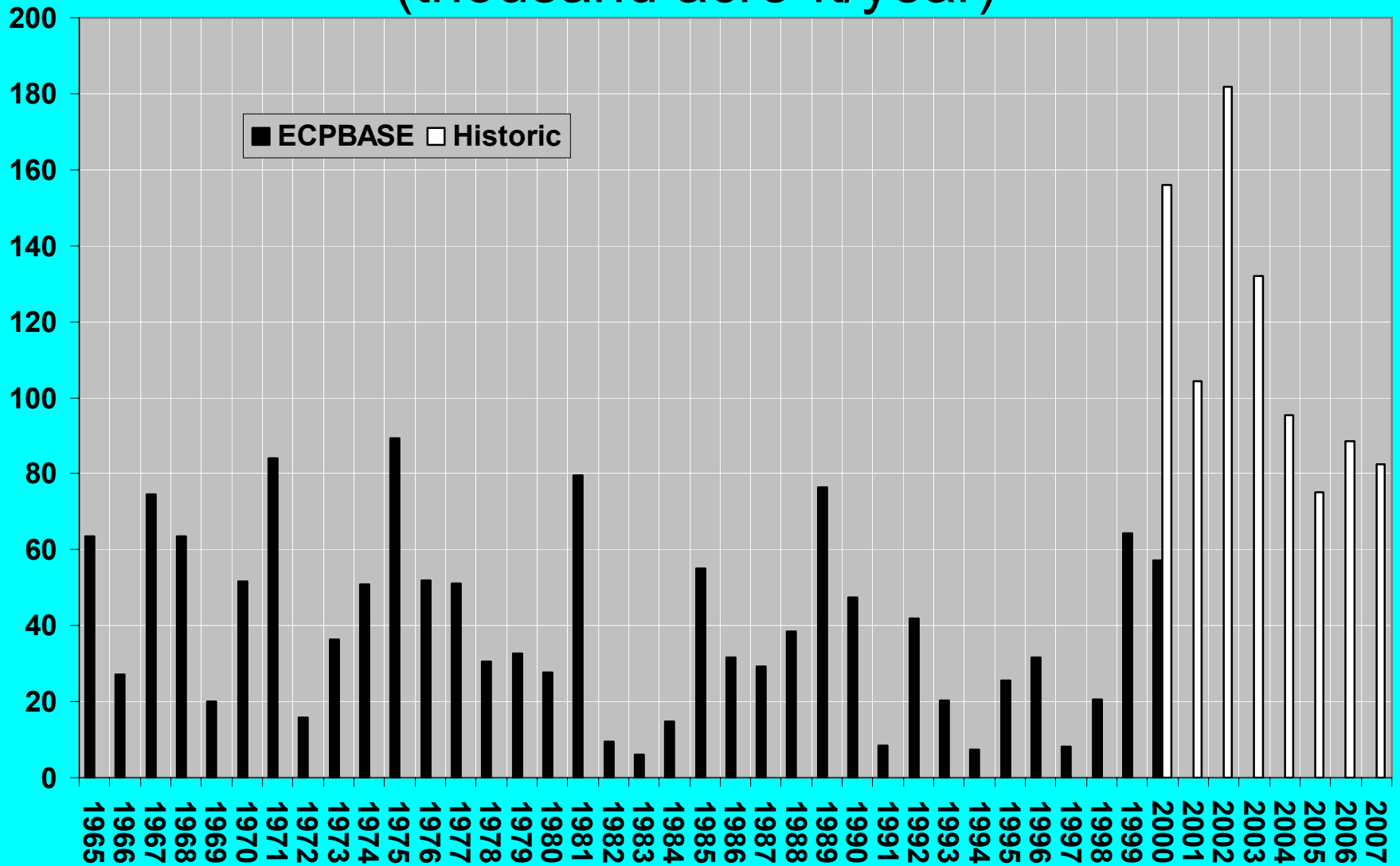
Model Projections



Historic S-10 CFS



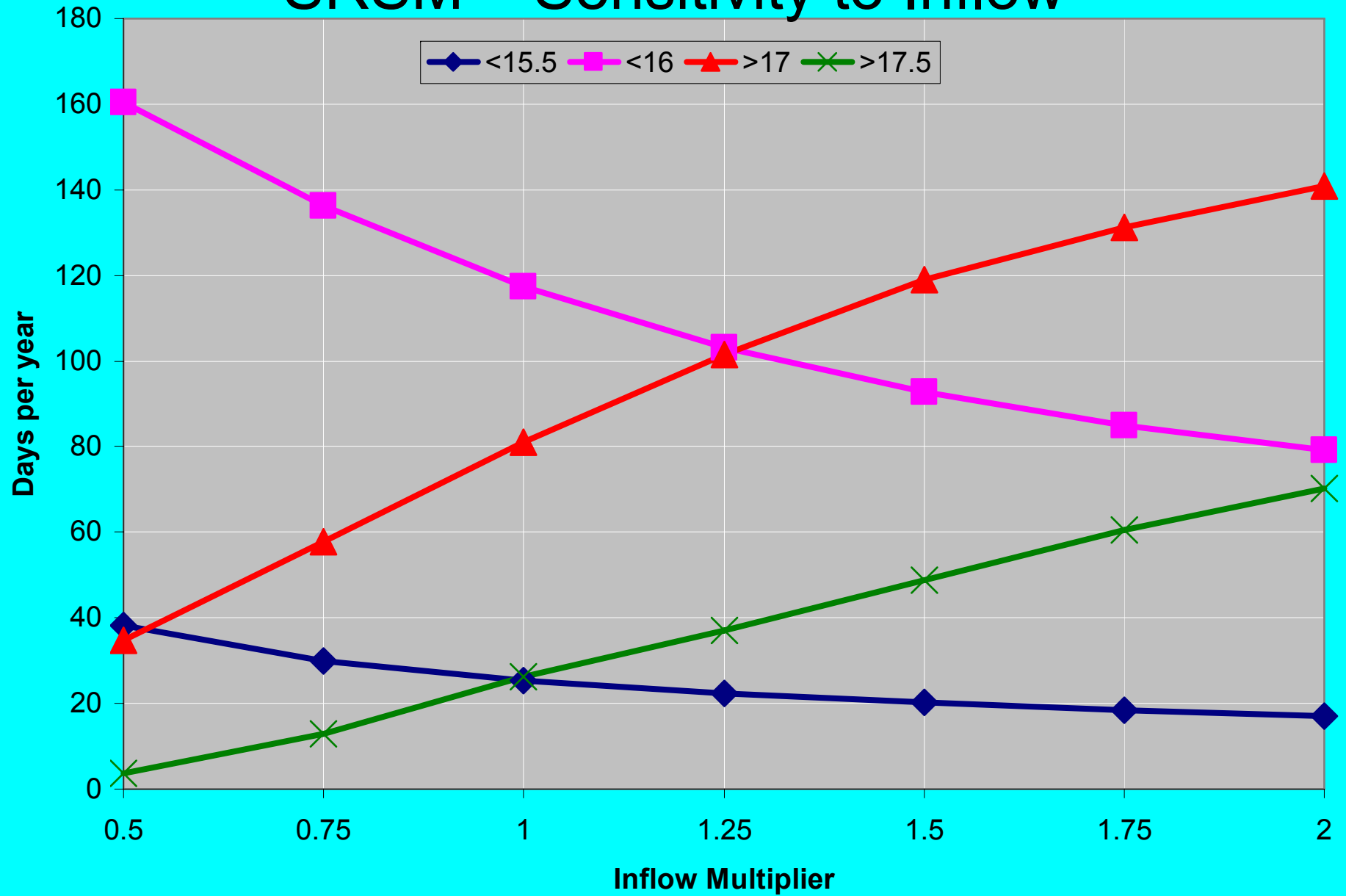
SFWMM & Historic Water Supply (thousand acre-ft/year)



Average days per year meeting condition

Source	HistRR	HistWS	Above 17 ft	Above 17.5 ft	Below 16 ft	Below 15.5 ft
SFWMM			110	44	89	15
SRSM			101	32	90	7
SRSM	X		84	27	106	13
SRSM		X	98	31	100	20
SRSM	X	X	81	26	117	25
Observed			58	10	50	0.2

SRSM – Sensitivity to Inflow



Conclusions: Findings relevant to Everglades restoration

- Marsh stage sensitive to water supply demands
- Marsh stage sensitive to regulatory releases
- Simplified modeling is efficient, & is one of multiple tools used to evaluate impacts of alternatives
- There is value in having multiple models based on different assumptions & levels of complexity
- Comparison of alternative models
 - increases credibility
 - identifies model limitations
 - identifies areas needing investigation & improvement

Questions?



USFWS Photo by S.D. Jewell