

**TOC Refuge Water Needs  
Working Group  
Technical Summary**

May 20, 2008

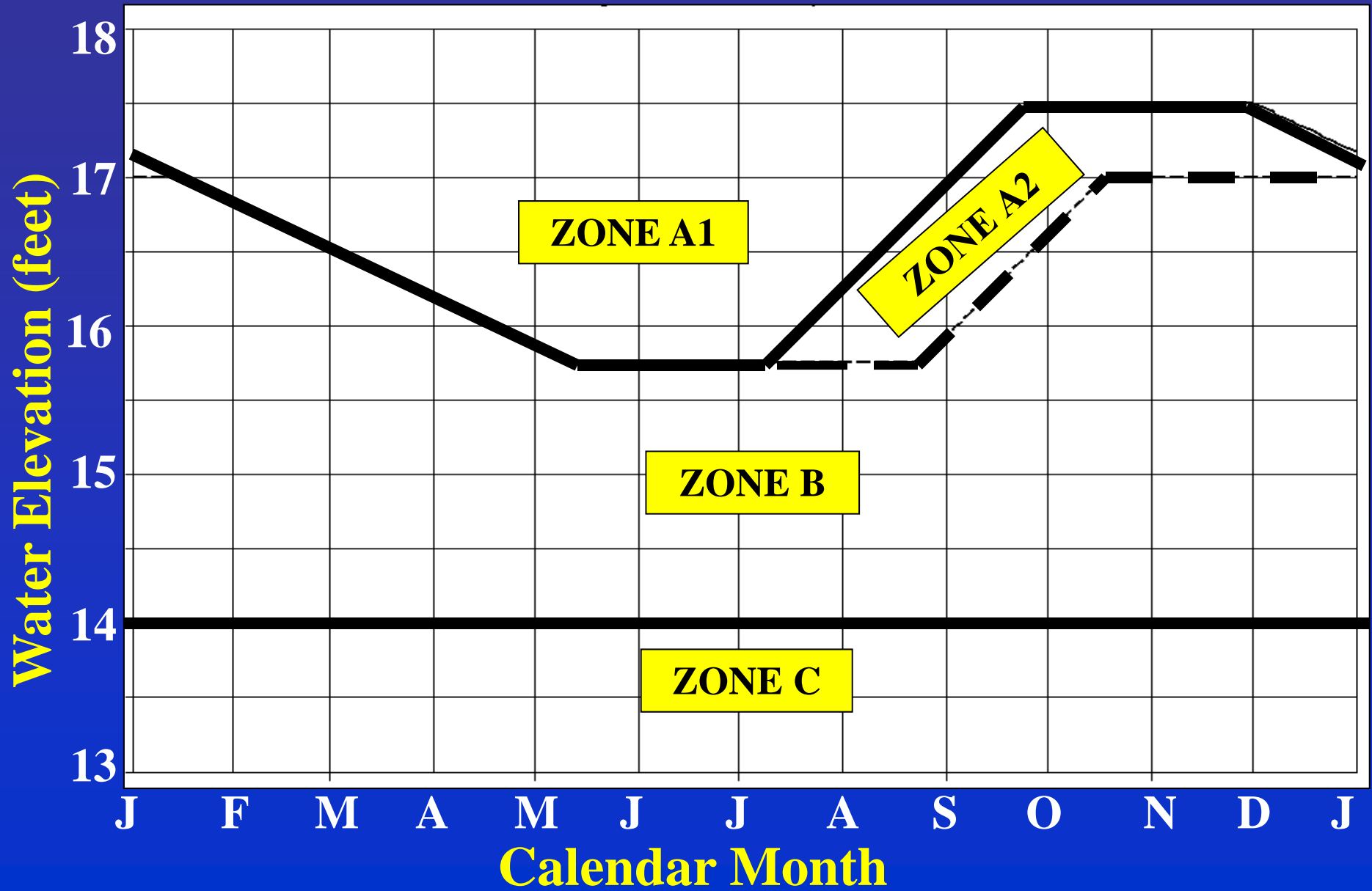
# Introduction & Background

- Initiated October 2006
- Purpose – Investigate and formulate recommendations to the TOC
- Membership – more than 30 participants
  - SFWMD
  - FDEP
  - Corps
  - DOI
  - Others
- Process – draft analyses discussed via emails, calls, meetings
- Targeted finding areas of consensus

# Acknowledgements

- Our work was based on previous monitoring, studies, and publications.
- Data analysis & review primarily by
  - Mike Waldon (USFWS)
  - Shawn Komlos (Corps)
  - Wossenu Abtew (SFWMD)
  - Tracey Piccone (SFWMD)

# Regulation Schedule



# Refuge Regulation Schedule

- Designed to provide improved habitat while meeting water use and flood control needs
- Focuses on outflow management – regulatory releases – to control stage
- New opportunities and challenges now possible

# Work Group Approach

- The “Refuge water needs” is a very broad metric that attempts to satisfy numerous conditions supporting the ecology of the Refuge.
- The “water needs of the Refuge” is not a single value but may be met through an ***operating strategy*** that adaptively considers net inflow (inflow minus outflow), timing of inflows, temporal and spatial distribution of inflows, and antecedent conditions in the Refuge.
- In analyzing Refuge water needs, the subgroup employed a suite of complementary approaches that utilized historic records or water stage modeling scenarios.

# 3 Approaches

- 1) Analysis of historical data – looked at 1995-2000, a high inflow period
  - 681 thousand ac-ft/yr average over period
  - Reduction to 608 with little effect on water budget
  - 353 is reasonable minimum with inflow management
- 2) SFWMM Scenario Statistical Analysis – examined 2x2 model runs; analyzed 72 simulated years
  - Needed inflow in range 200-500 thousand ac-ft/yr
- 3) Comparison of SFWMM with SRSM Simulation – compared models; made alternative model runs
  - Stage is insensitive to long-term average inflow above 600 thousand ac-ft/yr

# Summary

- No single method is clearly superior to other methods of estimation.
- Each approach has specific strengths and weaknesses.
- At the present time, it is best to use stage as a surrogate performance measure for the “water needs of the Refuge” when evaluating alternatives in lieu of an annual inflow volume.



# General Conclusions – 1:

- The Regulation Schedule is an extremely flexible and robust tool to manage stages within the Refuge.
- Multiple Refuge ecological performance measures were achieved with long-term average annual structural inflow volumes that ranged from 200 to 600 thousand acre-feet depending on many factors, such as antecedent conditions, structure operations, rainfall, etc.
- Desirable long-term average annual inflow volumes are therefore likely within this broad range of 200-600 thousand acre-feet per year.
- Needed inflow is highly dependent on timing of inflows and outflows relative to the Regulation Schedule, precipitation, and real-time water management practices.

## General Conclusions – 2:

- Potentially beneficial changes to water management strategies in the Refuge could require modification of the current Refuge Regulation Schedule as well as the Central and Southern Florida Project's Master Water Control Manual.

## General Conclusions – 3:

- Refuge hydrological conditions are sensitive to both the timing and operational practices of regulatory releases.
- Opportunities for optimizing these operations should be explored further.

# General Conclusions – 4:

- The desirable range of Refuge inflow volumes is also sensitive to water supply withdrawal quantity and timing.
- Projects which provide water supply alternative sources and temporal flexibility can play a significant role in reducing desirable long-term average annual inflow volume needs.

# General Conclusions – 5:

- Decisions concerning Refuge water management must consider multiple objectives; this subgroup was not tasked with addressing other objectives such as water supply or water quality.

## General Conclusions – 6:

- Upstream and downstream impacts of changes in Refuge inflow and resulting regulatory releases also were not considered by this subgroup, but should be considered prior to recommending meaningful changes to water management strategies in the Refuge.