How Modeling and Design Criteria Inform Operations Planning and Water Management Implementation

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Operating Rules

- Operating rules guide operators in handling specific situations
- Described by parameters such as stage, flow, storage, environmental conditions
- Development of operating rules must account for what information will be available to an operator at the time a decision has to made and must be physically practical to implement
- Operating decisions must be made in the context of uncertainty about the future
- Use of operator judgement, operator discretion, operational flexibility

What is a CERP Operating Manual?

- What are Differences between Water Control Manuals, Operation and Maintenance Manuals, CERP Operating Manuals
- Provides day-to-day water management for all foreseeable conditions affecting a project or system
- Contains regulation schedules, water management instructions, and operating criteria for project operation
- Includes provisions for collection, analysis, and dissemination of data
- Ensure goals and purposes of the Plan (CERP) are achieved

Regulation Schedule Examples – WCA No. 3A

1960 GDM, 1970 Min. Del. Sch.

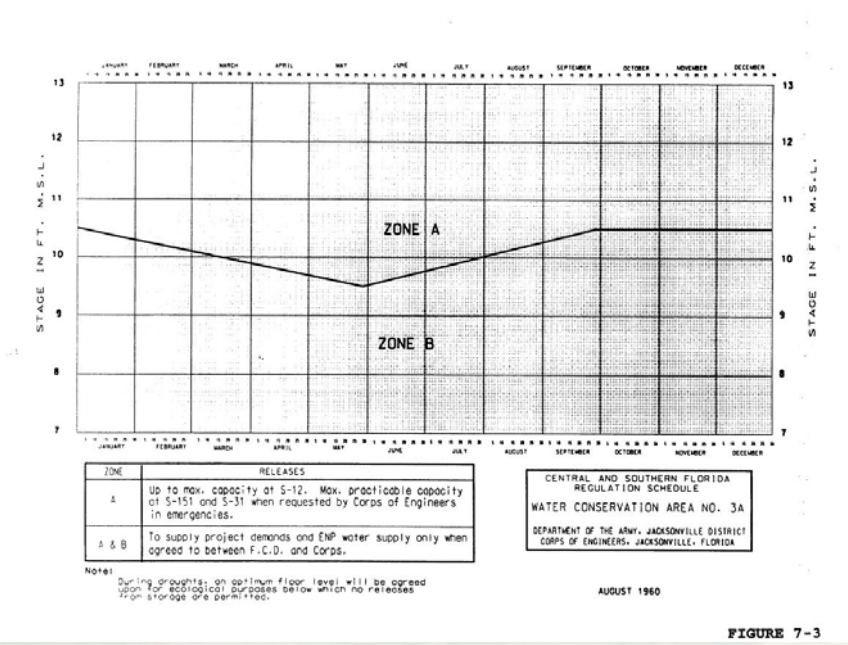

FIGURE 7-3

1985 Exp. Delivery Program

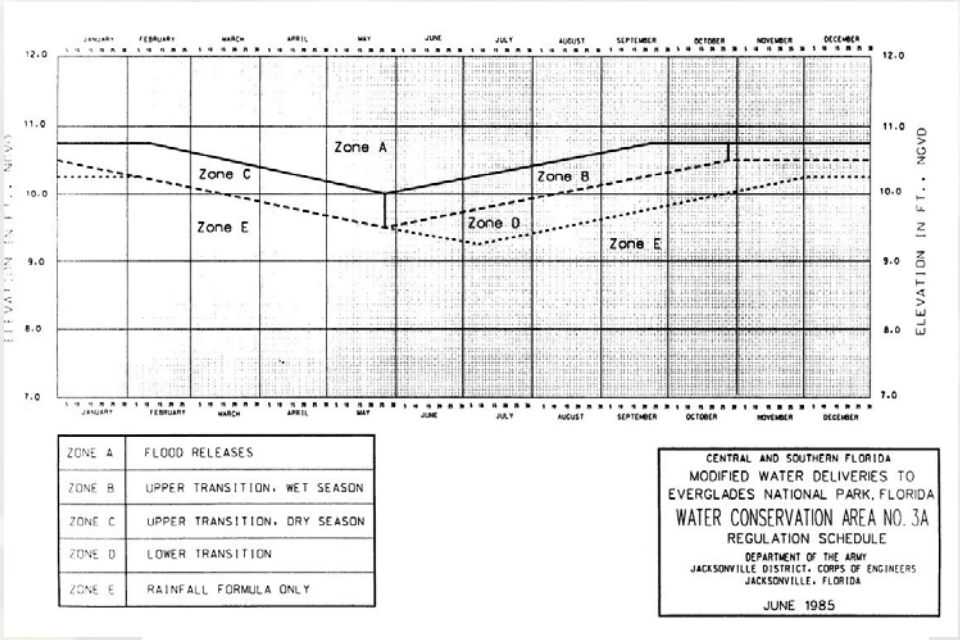

Table 7-2

Minimum Monthly Delivery Schedule At Shark River Slough

Month	Acre-Feet	Month	Acre-Feet
Jan	22,000	Jul	7,400
Feb	9,000	Aug	12,200
Mar	4,000	Sep	39,000
Apr	1,700	Oct	67,000
May	1,700	Nov	59,000
Jun	5,000	Dec	32,000

	WCA-3A OPERATIONAL GUIDELINES	
	S-12s	S-333
ZONE A	Open full.	Maximum allowable discharge.
ZONE B	S-333 Open; Discharge 45% of computed flow. S-333 Closed; Discharge at least 73% of computed flow (up to 100% if desired by ENP).	Discharge up to 55% of computed flow when permitted by this agreement.
ZONE C	S-333 Open; Discharge 45% of computed flow. S-333 Closed; Discharge 45% of computed flow plus all or part of S-333's amount if desired by ENP.	Same as Zone B.
Zone D	S-333 Open; Discharge 45% of computed flow. S-333 Closed; Discharge 45% of computed flow plus all or part of S-333's amount if desired by ENP.	Same as Zone B.
Zone E	Discharge 45% of computed flow whether S-333 is open or closed.	Same as Zone B.

CERP Operating Manuals

- Consist of System Operating Manual (SOM) and Project Operating Manuals (POM)
- USACE and SFWMD, in consultation with other Federal, State, tribal, and local governments, jointly develop and approve
- Consistent with reservation or allocation of water for natural system and savings clause, reflect operational criteria used in this identification
- Significant changes to Operating Manuals require notice and opportunity for public comment

(Guidance Memorandum No. 5; Programmatic Regulations)

CERP Project Operating Manuals

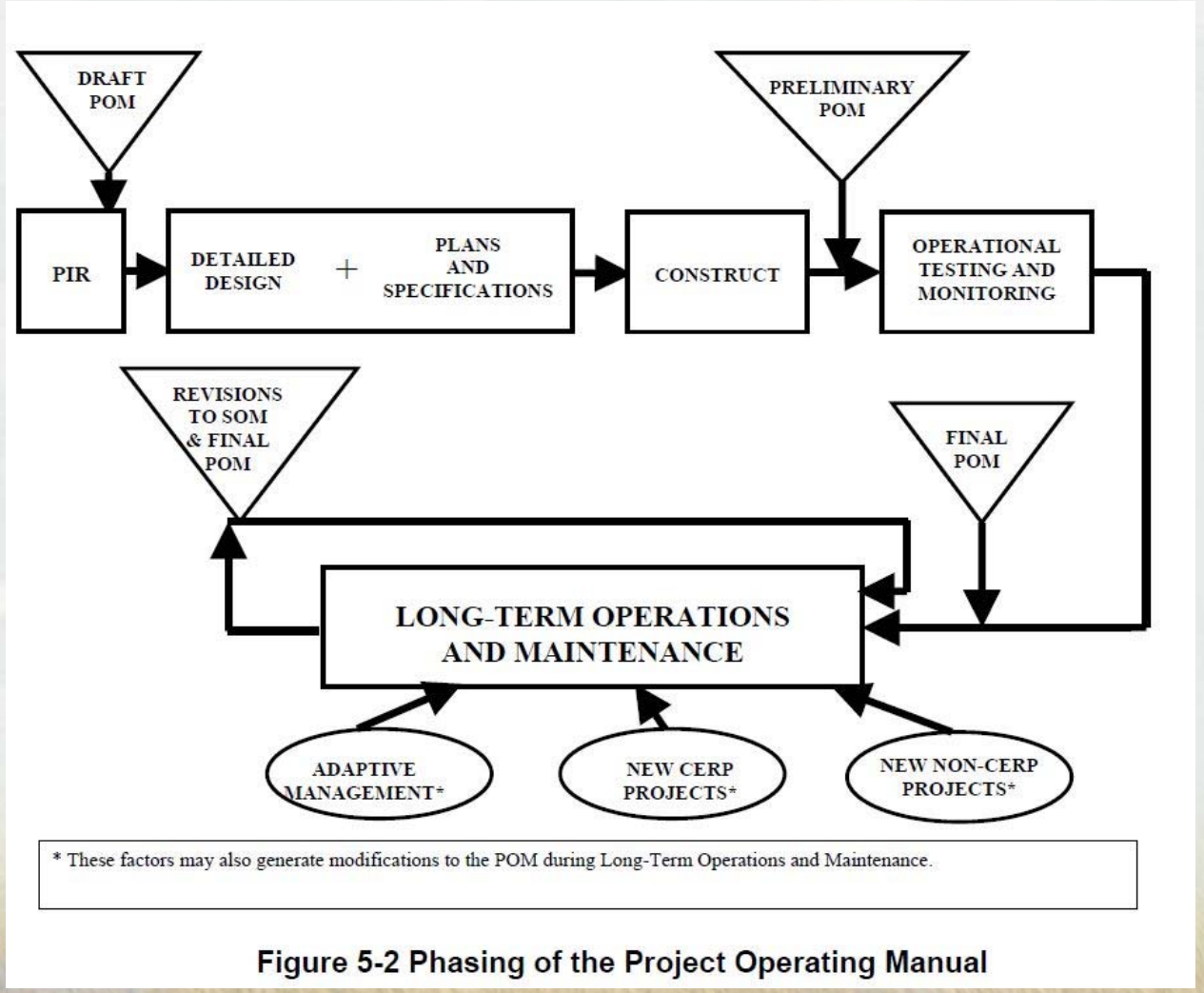

Figure 5-2 Phasing of the Project Operating Manual

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(Guidance Memorandum 5 – Operating Manuals)

Multipurpose Water Resource Projects

- Compromise is basic factor in multipurpose project design and operation
- Conflicts often arise among demands for various project purposes
- Operating rules often define how balancing is done
- Operating rules often inherently include tradeoffs

(Linsley and Franzini, 1979; Jain and Singh, 2003; EarthTech, 2005)

Corps of Engineers Multipurpose Planning and Management

- Planning is multi-objective
  - A good planning study always has several planning objectives
- Projects are multipurpose
  - Purposes may include navigation, flood damage reduction, ecosystem restoration, water supply, recreation

(Corps of Engineers Planning Community Toolbox http://planning.usace.army.mil/toolbox/library/PCC6/Print%20M1.ppt)

Multipurpose Project Operating Rules and Tradeoffs – Lake Okeechobee Lake Levels Example

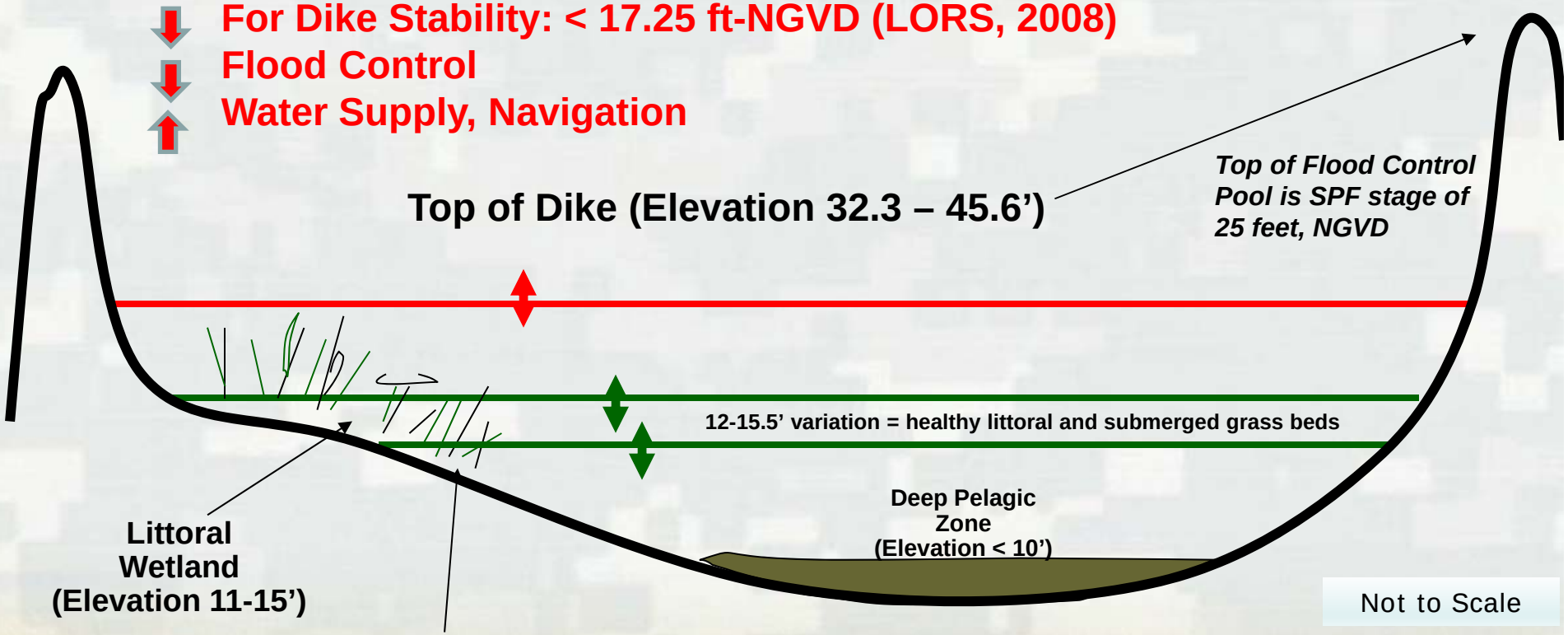
(adapted from S. Sylvester, SFWMD Water Summit 2008)

For Ecological Sustainability: 12 to 15.5 ft-NGVD

For Dike Stability: < 17.25 ft-NGVD (LORS, 2008)

Flood Control

Water Supply, Navigation



OWW Project depth based on 12.56' lake stage

Modeling and Operations

- Alternative plans developed in Planning Process
- Hydrologic simulation models used to evaluate alternatives
- Practical real-time operating rules depend upon modeling that adequately represents project features and operations
- CERP Operating Manuals should provide operating criteria consistent with assumptions used in the modeling
- Operating rules should capture the intent of the modeling

(Guidance Memorandum No. 5, EarthTech, 2005)

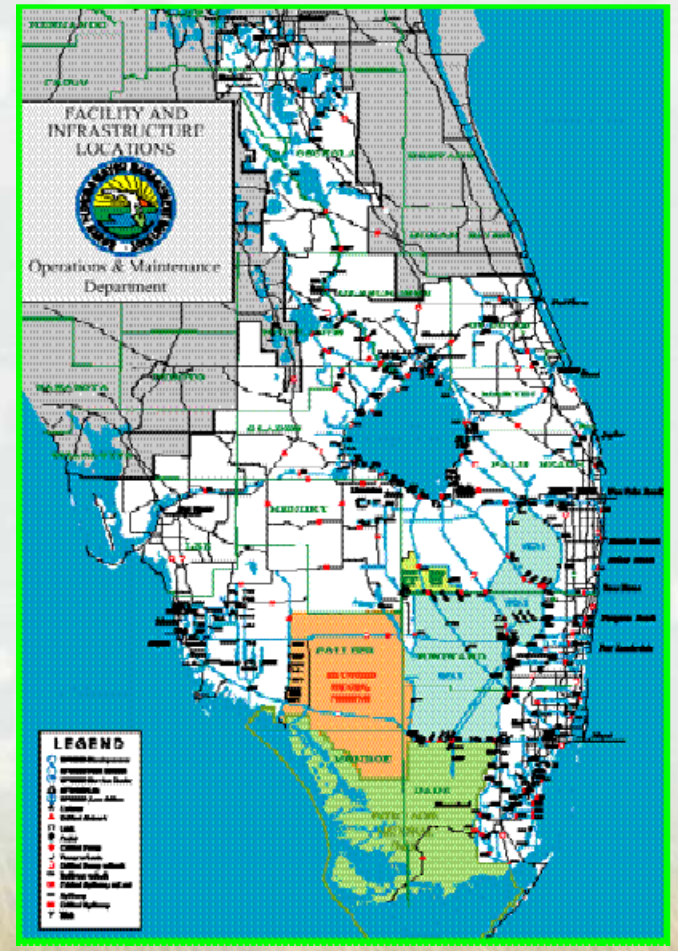
Design and Operations

- Modeling evaluates benefits over the long term
- Real-time Operational actions limited by information available in the short term
- Operators need operating rules based on short term surrogates that guide them toward achieving long term goals
- Design capacity of project features provides operational limits
- CEPP PIR Draft POM – Operating criteria based on Alt 4R2 modeling assumptions, specific operational criteria will be developed prior to changes in operation of CEPP/C&SF structures

(EarthTech, 2005; CEPP PIR, 2014)

Operational Flexibility and Adaptive Management (AM)

- Operational flexibility used in real-time operations
- Operational flexibility and Adaptive Management not synonymous
- Operational flexibility can be a tool in Adaptive Management



Operational Flexibility and Adaptive Management

- Real time operations versus testing hypothesis
- Spatial and temporal scale issues for use in Adaptive Management
- Can monitoring measure these changes?
- Feedback loop from monitoring and assessment
  - ► Example - CERP System Status Report (SSR)

Adaptive Management

- AM recommendations within scope of CERP Operating Manuals can be implemented using existing operational flexibility
- Otherwise, additional analysis, coordination, public review, NEPA documentation may be required
- CEPP POM will be developed in coordination with and consistent with the CEPP Adaptive Management Plan
- CEPP AM Plan specified RECOVER will work with Water Managers on monitoring, information, and triggers for POM to inform operational adjustments to meet goals and objectives over long term

(CEPP PIR, 2014; GM 5)

Thank You