BCB Flood Protection Level of Service - Project Scoping

Akintunde Owosina
Chief, Hydrology and Hydraulics Bureau
Operations, Engineering & Construction Division

4/21/15

Overview of Program Elements

- LOS Fundamentals
- Assessment
- Sea Level Rise
- Basin-Scale Projects:
  - LOS modeling for Basin
  - Basin Atlas

Purpose of BCB LOS Study

- Evaluate the state and performance of BCB water management system
- Identify under-performing canal segments
- Investigate effects of Sea Level Rise on the BCB LOS
- Support BCB Strategic Planning efforts by identifying long term needs of the primary canals & structures

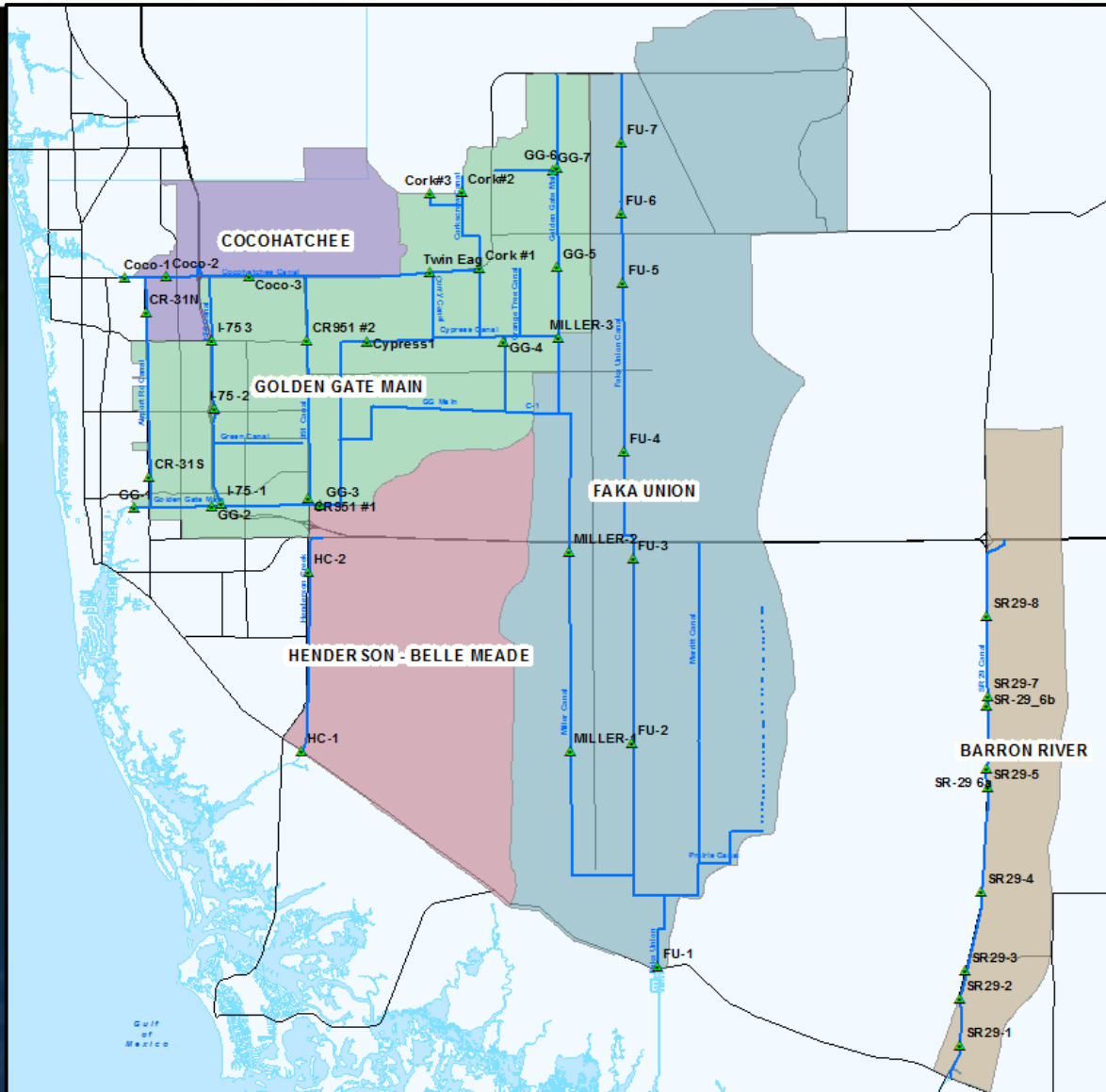
Past BCB Flood Studies

- 1990 – PBSJ, Engineering Report "Level of Services Evaluation of Works of the District"
- 2001 – BCB, "BCB Watershed Management Plan – Flood Control Element"
  - SWMM \ UNET model was used in the study
  - Simulated storms with emphasis on 10-year & 25-year events for flood control
  - Developed a regional plan to address issues affecting flooding, water supply, and environmental quality and prepared a Capital Improvement Program

Watersheds For Flood Protection Level-of-Service Study

BCB LOS effort

- Will focus on primary system in the major watersheds
- Will evaluate effects of Land Use on LOS
- Will modify and apply existing tools



Completed Scoping Activities

- Formed a BCB LOS Scoping team
- Identified technical issues and project requirements for BCB
- Identified and assessed status of available data and tools
- Reviewed LOS metrics and definitions from Pilot Project
- Developed modeling strategies appropriate for the LOS effort in BCB
- Initiated work plan development effort with schedule and cost

Identified Technical Challenges

- Data - Information needed to build and run the model/s.
  - Canal cross-section data is outdated
  - Calibration data for flood events is limited
- Model - The existing model was not developed solely for flood modeling.
  - The model needs to be resilient to flooding events (numerical instability).
  - The model needs to make reasonable predictions of peak runoff into the canal network.
  - Incorporation of tidal operations for sea-level rise analyses

Planned In-Scope Activities

- Develop Basin Atlas
- Modify and recalibrate model
- Conduct LOS assessment for Existing Conditions
  - Define current LOS
  - Identify problematic areas
- Conduct LOS assessment for Future Sea-Level Rise Conditions
  - Change in LOS caused by Sea Level Rise
  - Identify problematic structures

After-Project Activities

- Solution development and strategic plan update
- Coordination with stakeholders and regulators on LOS findings
- Incorporate findings of LOS effort into BCB operational planning.

Questions and Discussion

LOS Performance Metrics

- Performance Metrics that focus on the Primary Canal Network
  - Maximum Stage in Primary Canals
  - Maximum Discharge Capacity throughout Primary Canal Network
- Performance Metrics that focus on the Impact of Sea-Level Rise:
  - Structure Performance – effects of sea level rise
  - Peak Storm Runoff – effects of sea level rise
- Performance Metrics for Developed Lands
  - Frequency of Flooding

Project #1: Pilot

- LOS Fundamentals (white paper and modeling guidance)
- Assessment Process (issues, info collection and exchange)
  - Sea Level Rise - modeling guidance
  - Rainfall Change - literature review and assessment
- Basin-Scale Assessment
  - Basin Atlas for one Basin
  - LOS modeling for one Basin
- Lessons Learned

Basin Atlas Update

- Basin description (watersheds, canal network, structures, monitoring)
- Operational intent narrative
- Original C&SF Design Criteria
- Structures, current design criteria, structure operations
- Issue Identification (sea level narrative, LOS results, …)

INTENT:

- *Authoritative source for Operational Rules*
- *Linked to other authoritative sources*
- *Auto-maintained*

Modeling Objectives

- Determine current LOS
  - Compare to original design LOS
  - Compare to Permitted LOS
- Assess future performance of system (without changes)
  - Sea-level rise impacts
  - Future development impacts
  - Impact of constraints imposed by water supply, environmental protection or ecological protection
- Identify future work, i.e. critical structures, data gaps, additional analyses, etc.