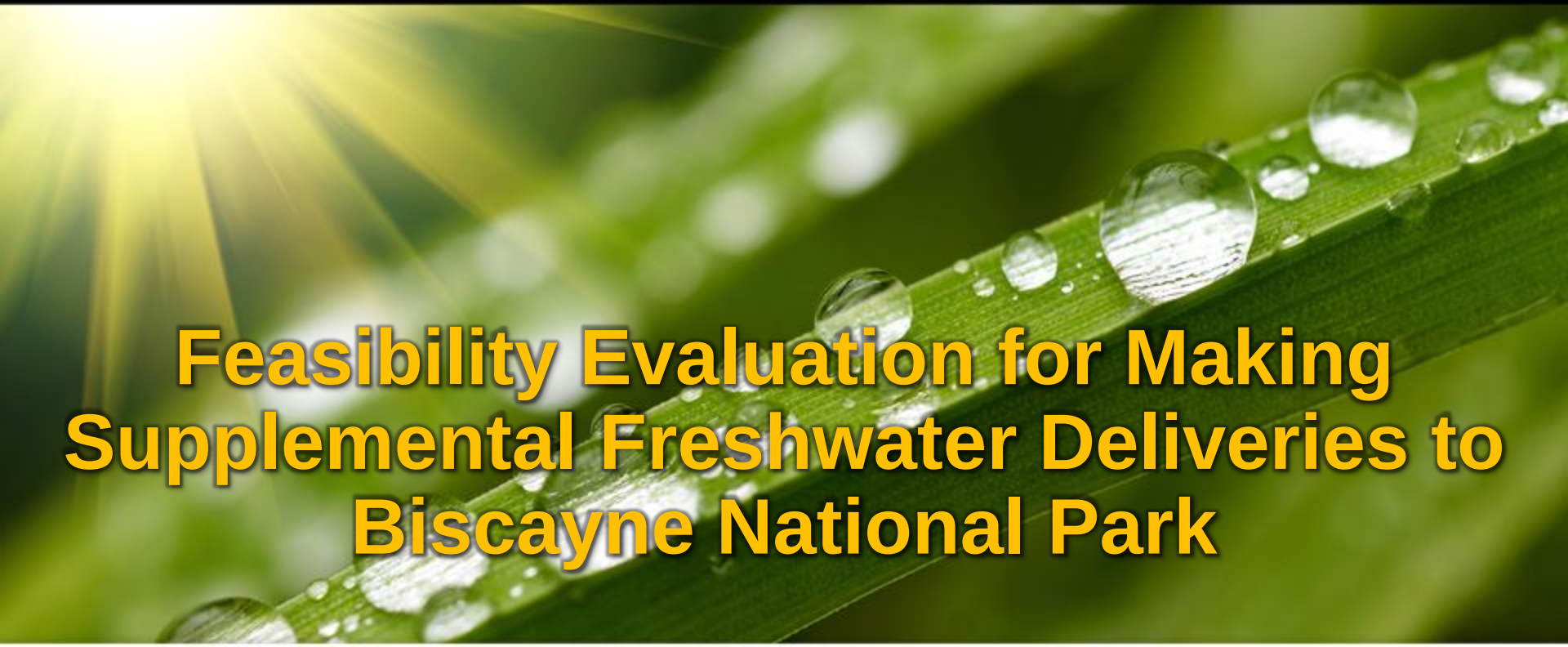


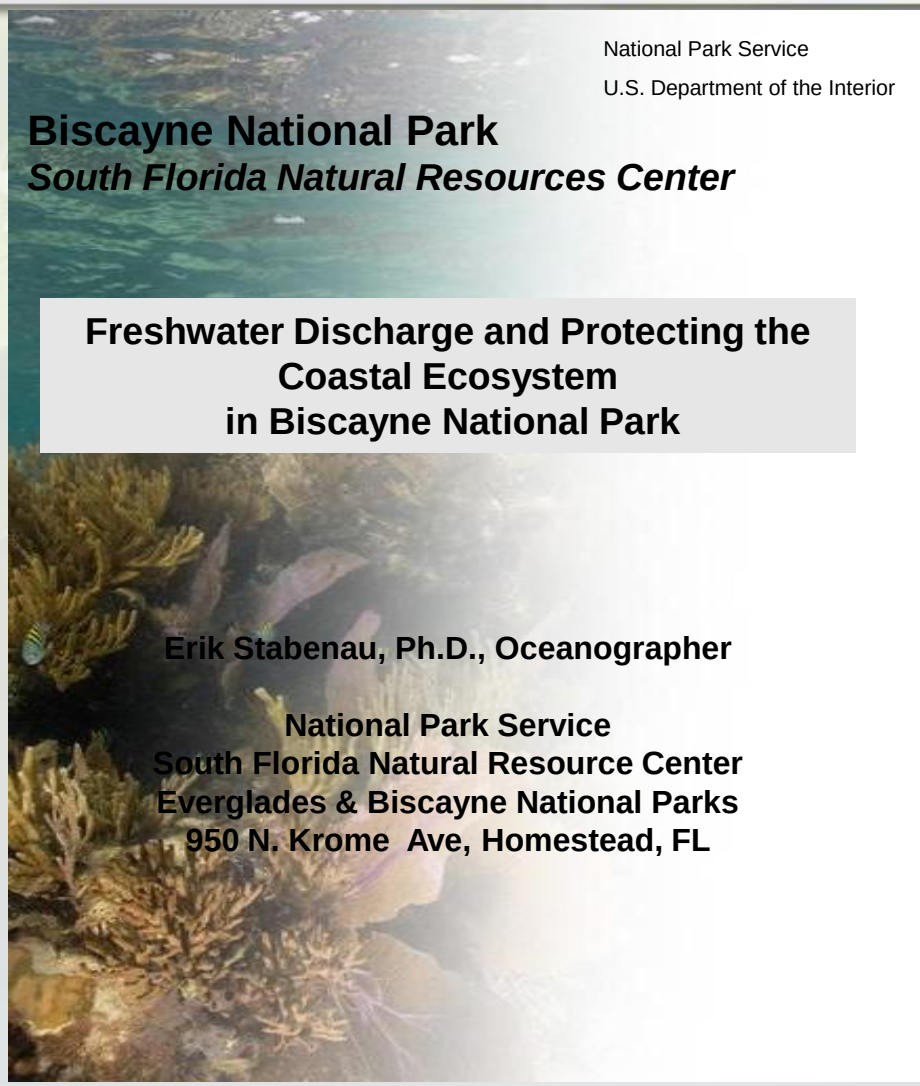
Feasibility Evaluation for Making Supplemental Freshwater Deliveries to Biscayne National Park

Governing Board Workshop
March 9, 2011

Scott Burns, Chief Scientist, Federal and State Policy Division
Everglades Restoration and Capital Projects

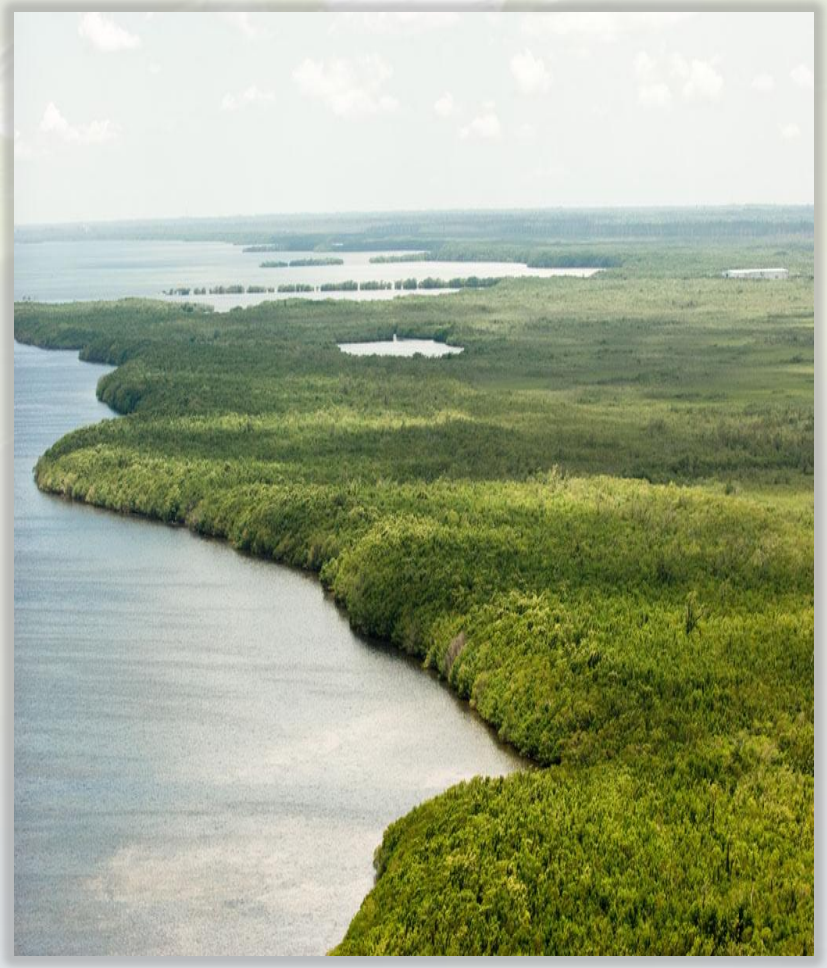
Origin of the Feasibility Evaluation

- Research conducted by National Park Service
- Findings presented to South Miami-Dade Water Issues Coordination Roundtable, November 22, 2010
- Presentation to Governing Board January 2011
  - Board requests staff to evaluate potential operations



Objective of the Feasibility Evaluation

- To identify potential operations, constraints and considerations associated with providing supplemental freshwater releases to Biscayne National Park in order to reduce the occurrence of high salinity conditions in the near-shore area



Project Parameters

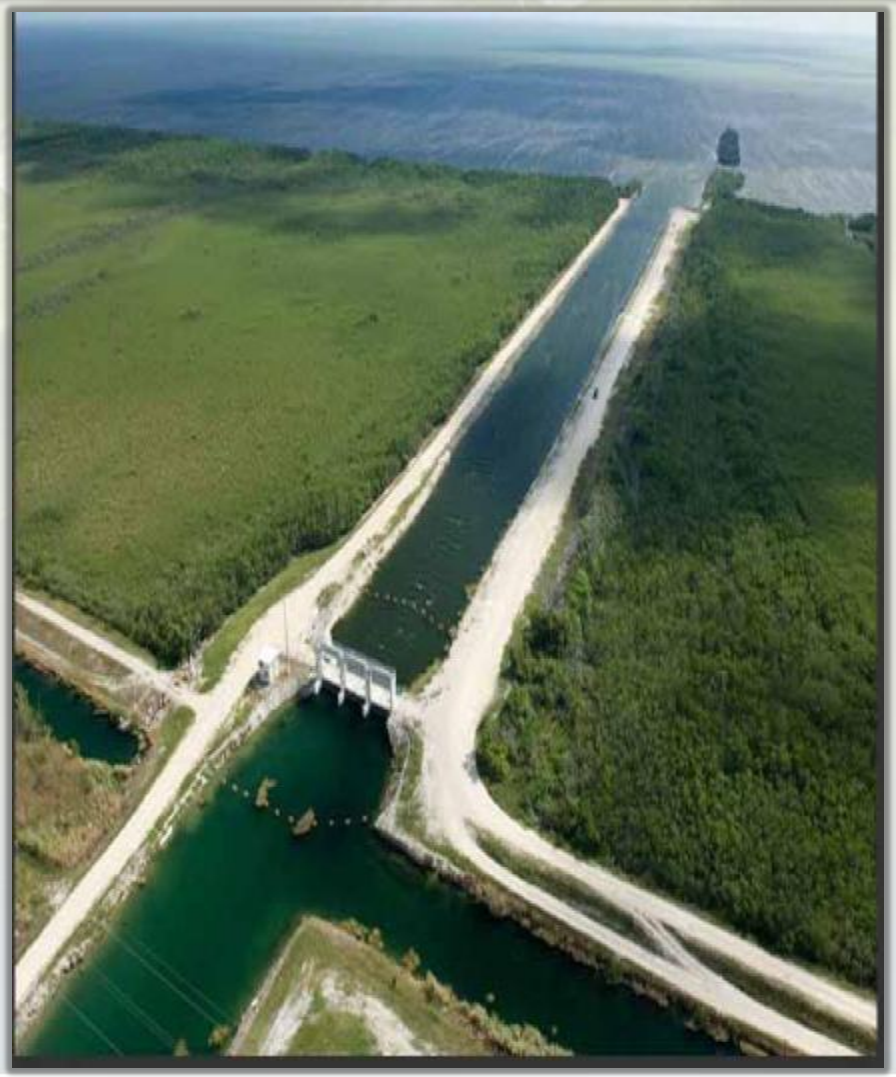
- **How much water is needed**
  - Sufficient freshwater discharges to limit near-shore salinity levels to 30 PSU or less
- **Where**
  - Outflow structures: S21A and S20F
  - Salinity monitoring stations: BISC14 and BISC40
- **When**
  - Latter part of dry season: February through May

Basis of Request for Supplemental Freshwater Flow

- Provide optimal salinity regime conducive to the variety of species that occur within the Biscayne Bay coastal zone
  - Optimal conditions: 5 to 25 psu salinity
  - “Life support” conditions: 30 psu salinity
- Avoid hypersalinity conditions that, by frequency or duration, would result in reduction in habitat and associated species diversity

How Much Water is Needed

- Approximately 76 cfs from each of the two coastal structures S21A and S20F, during the months of February through May
  - Target flows calculated three different ways
  - Verified by SFWMD scientists



How Much Water is Needed (Cont.)

- Existing dry season flows don't meet the targets
  - S20F average monthly discharge (1986 – 2010)

	Feb	Mar	Apr	May
Avg. month flow cfs	101.8	85.3	57.2	59.7
# months < 76 cfs	10	13	18	16

  - S21A average monthly discharge (1986 – 2010)

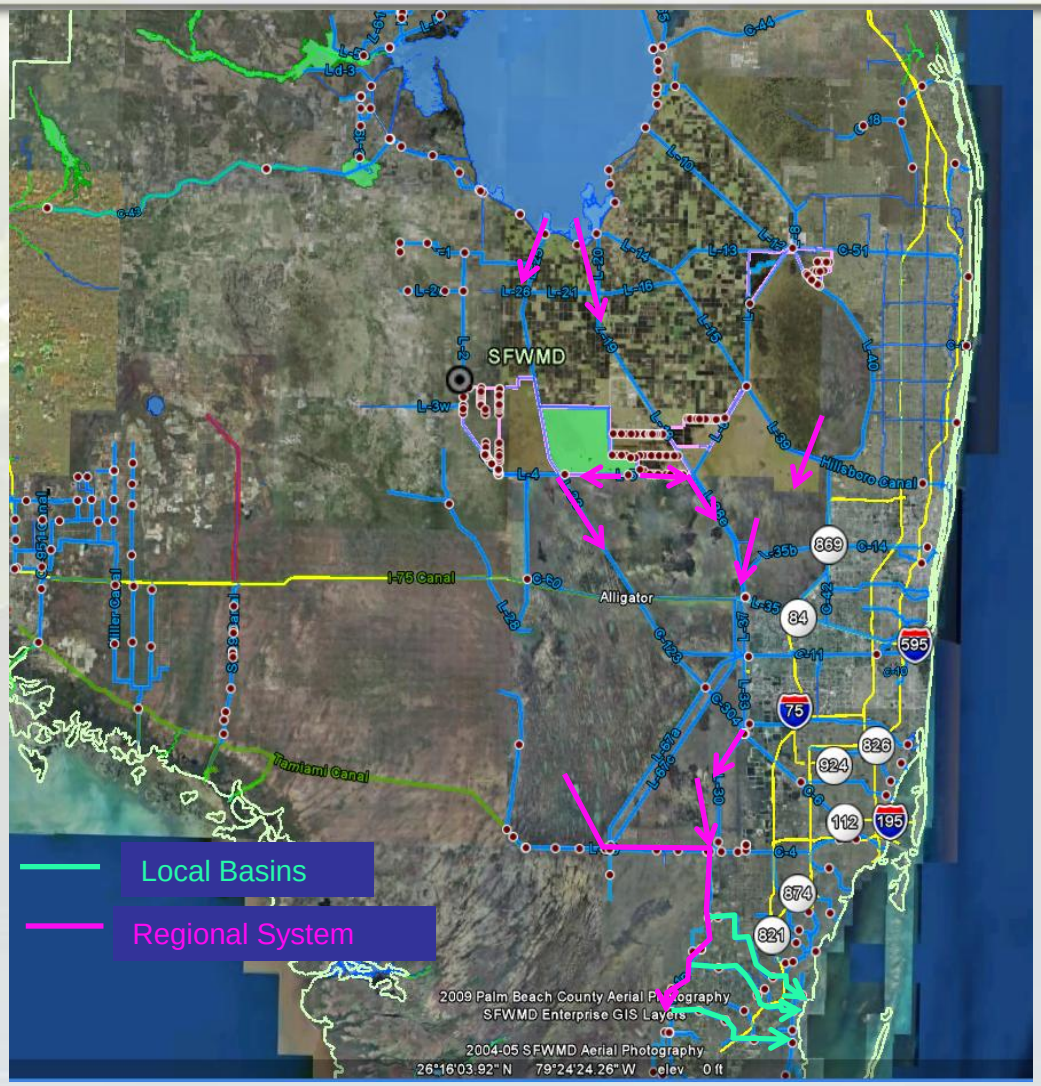
	Feb	Mar	Apr	May
Avg. month flow cfs	55.2	52.2	40.1	38.6
# months < 76 cfs	19	19	22	21

System Constraints and Considerations

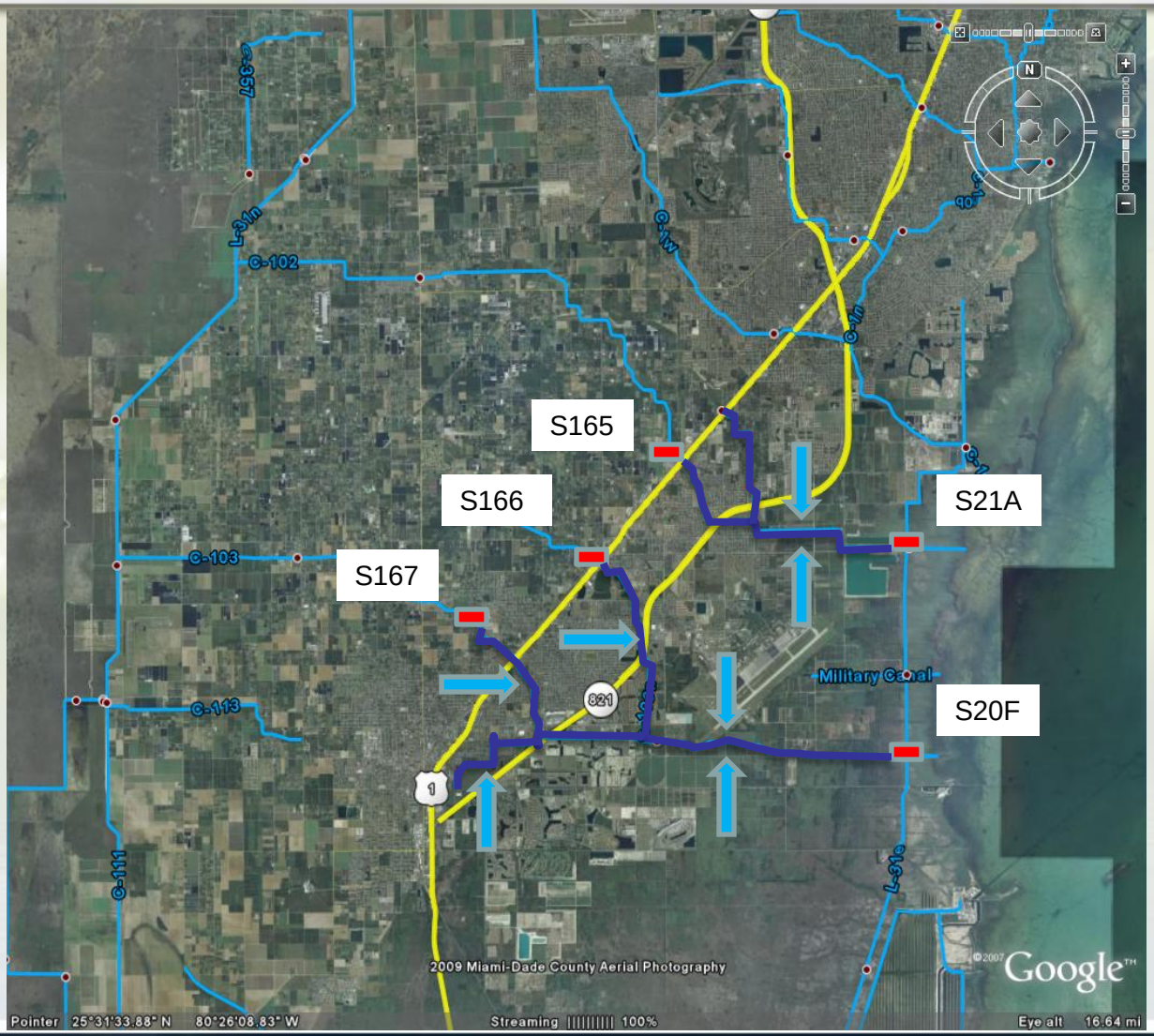
- Use existing system; no pumps or reservoirs
- Limited storage; canal prism and adjacent groundwater
- Coastal structures have limited operational ranges
  - 0.4 ft range between open and close
  - Tidal tailwater constraint
  - Pulse release approach would be needed

Sources of Supplemental Water

- Coastal basin
- Inland ‘ridge’ basin
- WCA-3
- WCA-2
- Lake Okeechobee



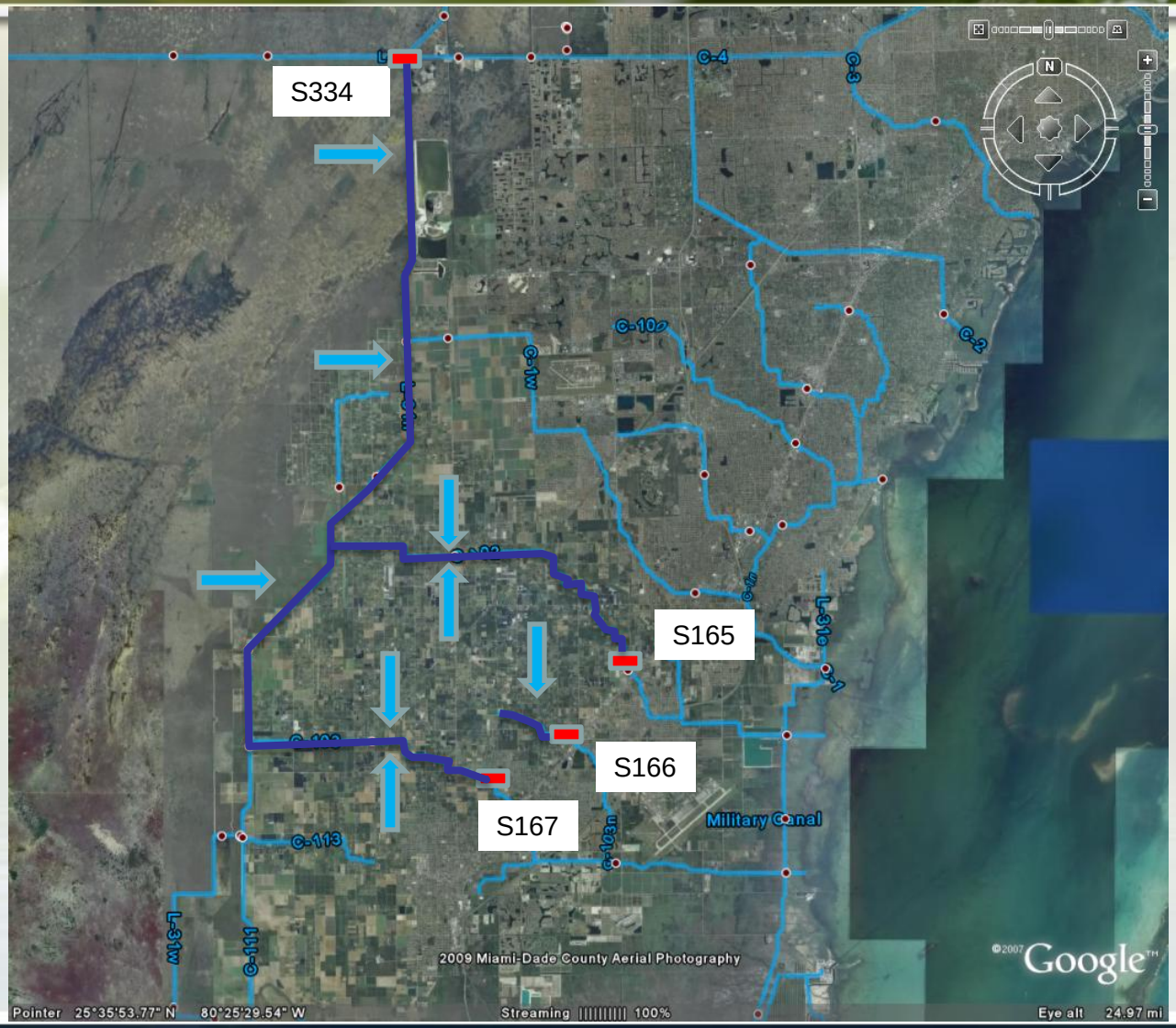
Coastal Basin



Coastal Basin Operations and Considerations

- Operations
  - S20F and S21A gates closed to gain storage; opened to release water to Bay in a pulse
  - Primary source of supply
  - Little water available to the Bay after February
- Considerations
  - Long-term operations of coastal structures in low range depletes groundwater storage near the coast and increases risk of saltwater intrusion

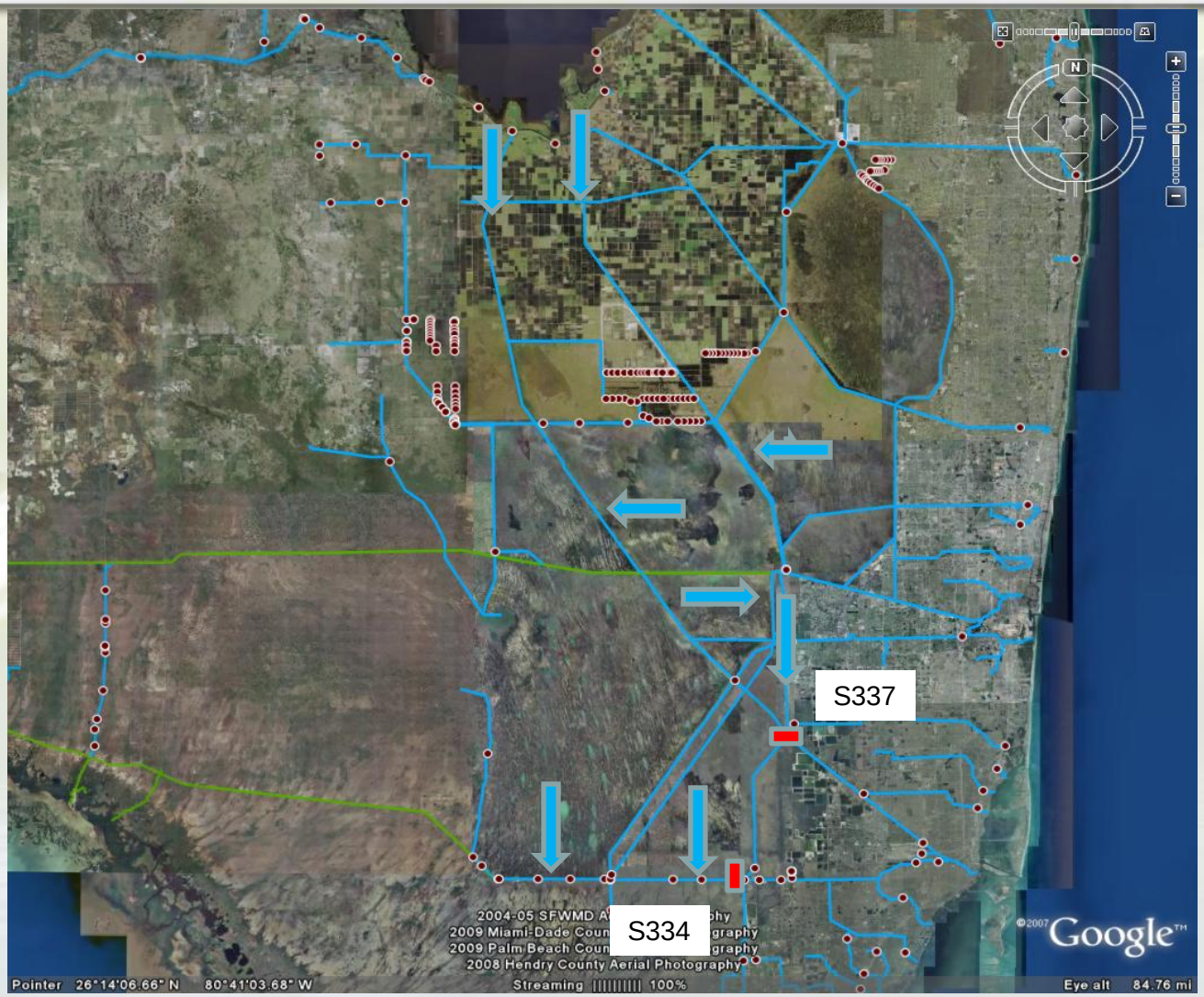
Inland Ridge Basin



Inland Ridge Basin Operations and Considerations

- Operations
  - S20F and S21A gates closed, Ridge and Divide structures S165, S166 and S167 opened to allow water from upper basin to flow to coastal structures
  - Divide structures closed, coastal gates opened with falling tides to release water to the Bay
- Considerations
  - Reducing storage in inland basin; affects existing legal users (ELUs)
  - Induces seepage from ENP; potential to reduce flows south in the L-31N
  - Increases ‘pull’ on upstream sources

Regional Water Deliveries



Regional System Operations and Considerations

- Operations
  - WCA-3 deliveries via S337 and S334
  - WCA-2 to WCA-3
  - Lake Okeechobee deliveries via STAs and WCAs to South Dade conveyance system
- Considerations
  - Large conveyance losses require larger volumes of supply
  - Water treatment requirements and operational constraints
  - Competition for water supply; environmental and ELUs
  - Low regional system availability during moderate regional droughts

Operational Decision Tree

- Series of ‘if then’ protocols used to guide operational decisions
  - Considers short term and future weather and salinity trends
  - Ground and surface water stage/storage conditions
  - Defines transitional thresholds, which drive operational logic
- Conceptual operational decision tree drafted
  - Transitional thresholds being determined in order to finalize draft

Preliminary Findings

- The availability of fresh water in the basins is very low in the latter part of the dry season.
- Very little water is available in the regional system in the latter part of the dry season.
- Significant conveyance losses occur when moving water south in the regional system in the dry season
- Shifting water from the inland basins and the regional system will potentially conflict with existing environmental and consumptive uses

Next Steps

- Complete operational decision tree
- Potential to conduct limited test releases
- Conduct evaluation of impacts associated with proposed revised operations
- Review results with stakeholders
- Receive direction from decision makers on implementation

Questions?