# LAKES BROOKLYN AND GENEVA

## DRAFT MFLS

PUBLIC WORKSHOP

09/24/2020

# Overview

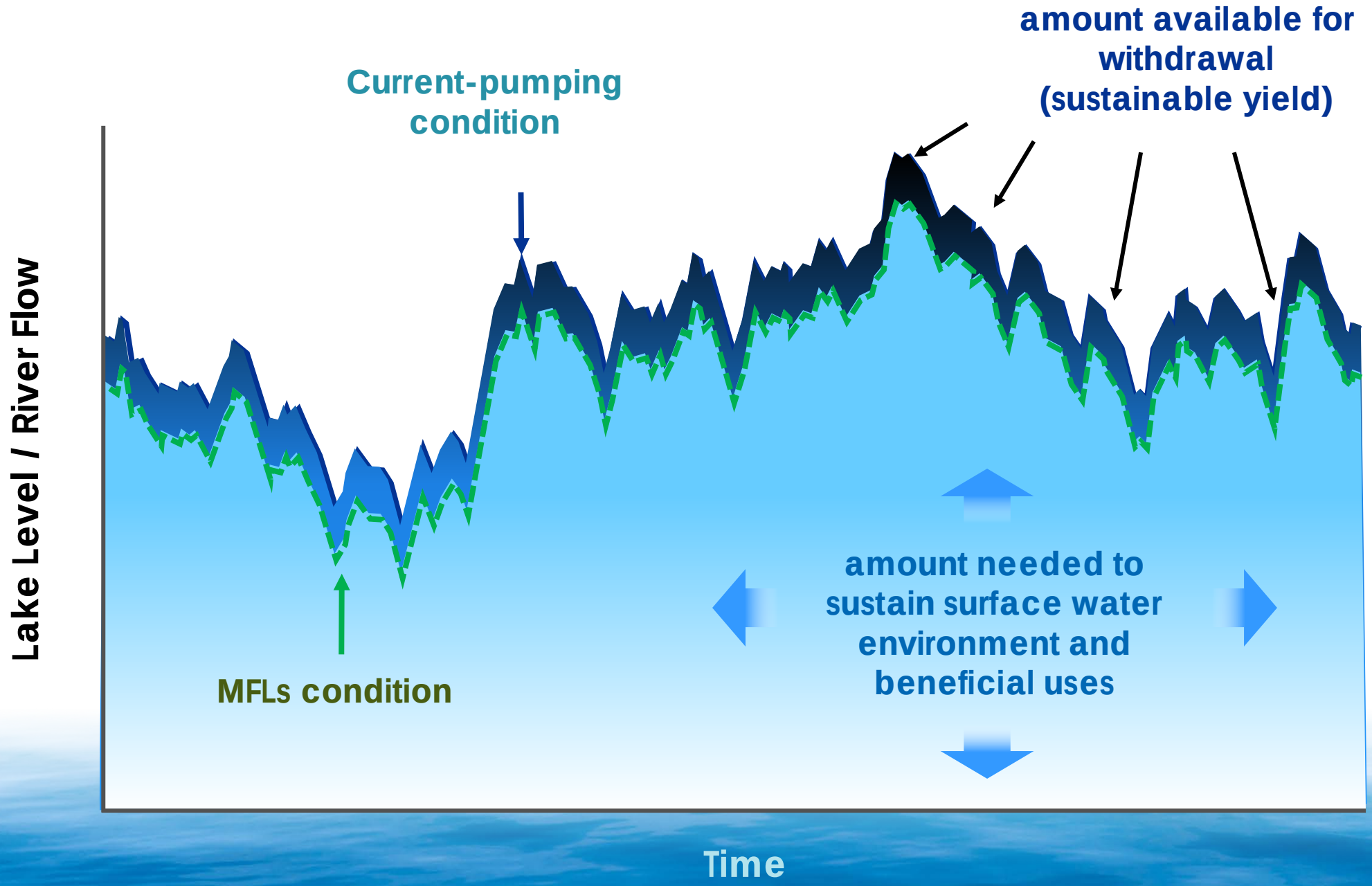
- MFLs Process / Background
- MFLs Determination
- MFLs Assessment
- Recommended Minimum Levels
- Next Steps
- Public Comments and Questions

# Statutory Directive

Water management districts must establish MFLs that set…

***"…the <u>limit</u> at which further withdrawals would be significantly harmful to the water resources or the ecology of the area."***

*Section 373.042(1), Florida Statutes (F.S.)*


amount available for withdrawal (sustainable yield)
Current-pumping condition
Lake Level / River Flow
MFLs condition
amount needed to sustain surface water environment and beneficial uses
Time

# MFL PROCESS OVERVIEW

**MFLs Determination:**

- Determine the most critical environmental features to protect and the minimum hydrologic regime required for their protection (MFLs condition)

**MFLs Assessment:**

- Determine the no-pumping hydrologic regime (no-pumping condition)
- Determine the current impacted hydrologic regime (current-pumping condition)
- Compare the MFLs and current-pumping conditions to determine if water is available (freeboard)

# LAKES BROOKLYN AND GENEVA

# MFLS DETERMINATION

# BACKGROUND

**MFLs originally adopted in 1996**

**Updated methods**

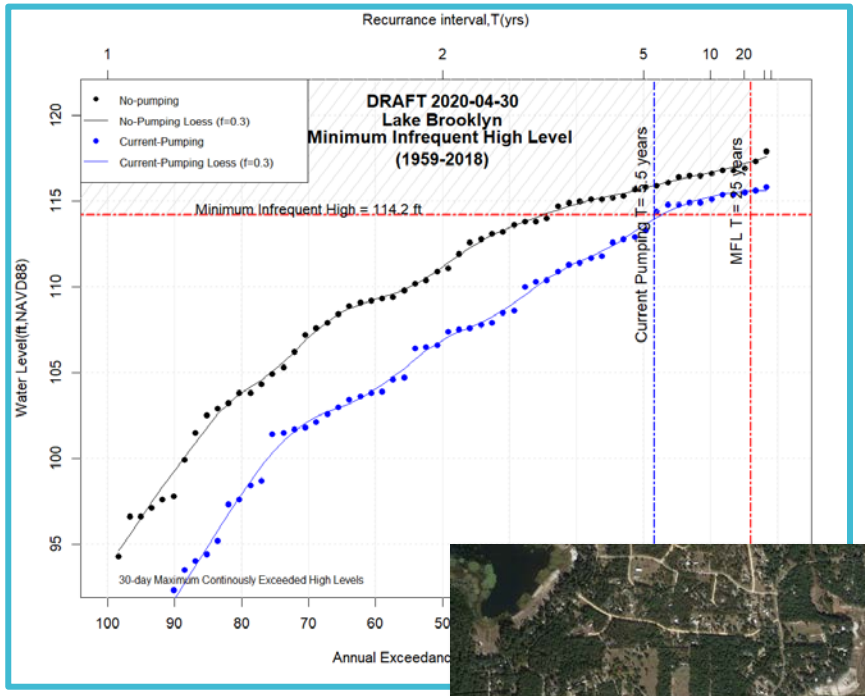
- Developed new regional and local-scale groundwater models
- Developed new, more appropriate, environmental criteria
- Incorporated more recent observed lake levels and groundwater pumping

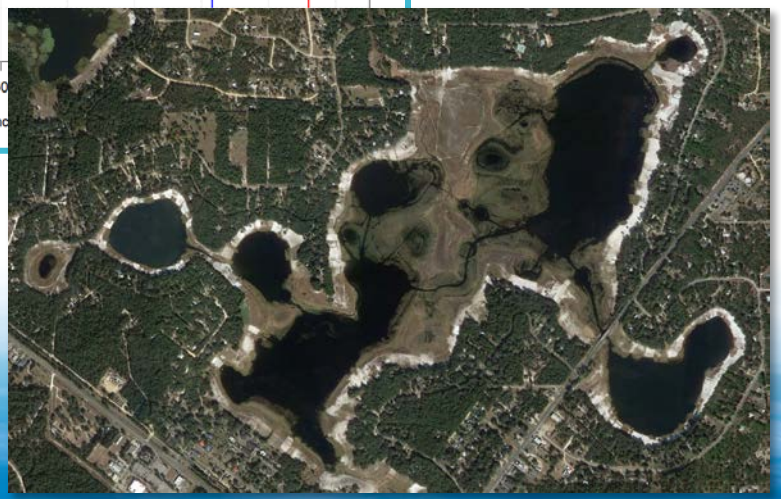
**Peer review and stakeholder review**

- Cardno, HSW, Brown and Caldwell, and Intera (model review)
- Numerous meetings with stakeholder groups

# MINIMUM INFREQUENT HIGH (MIH)

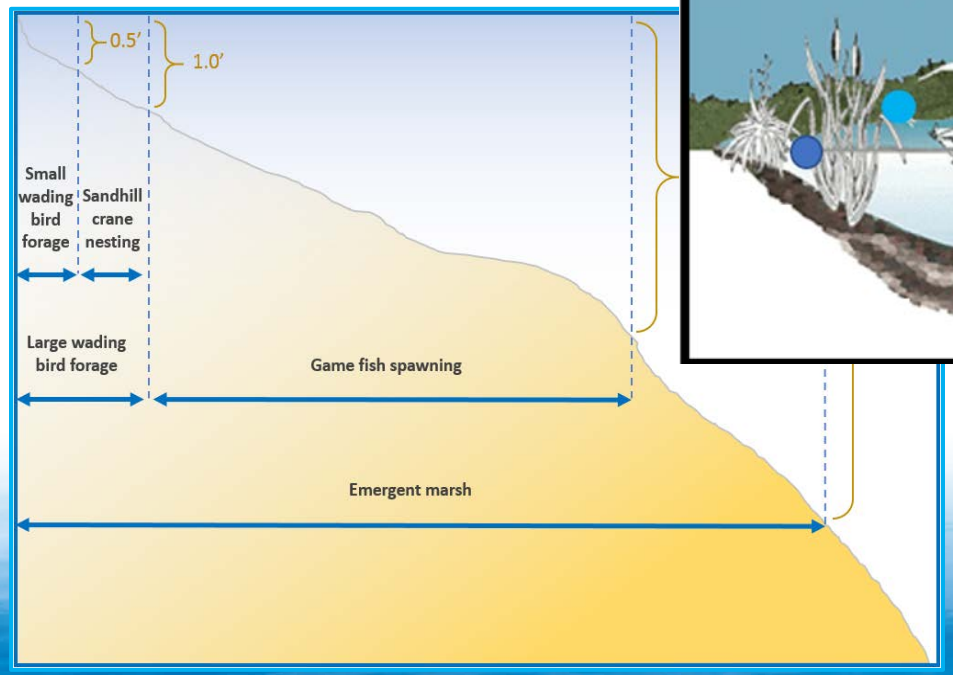
- **MIH is very insensitive to pumping**
  - **NP P50 = ~109 ft**
  - **MIH Condition P50 = < 95 ft**
    - **> 180% increase in current pumping**
    - **> 14 ft reduction in median water level**

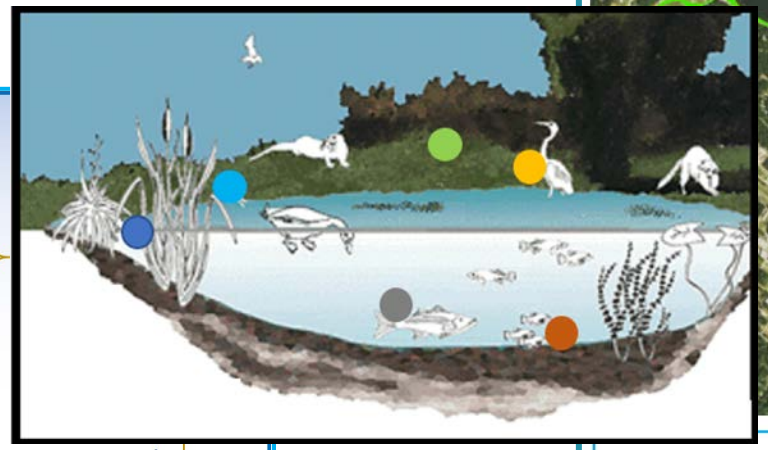


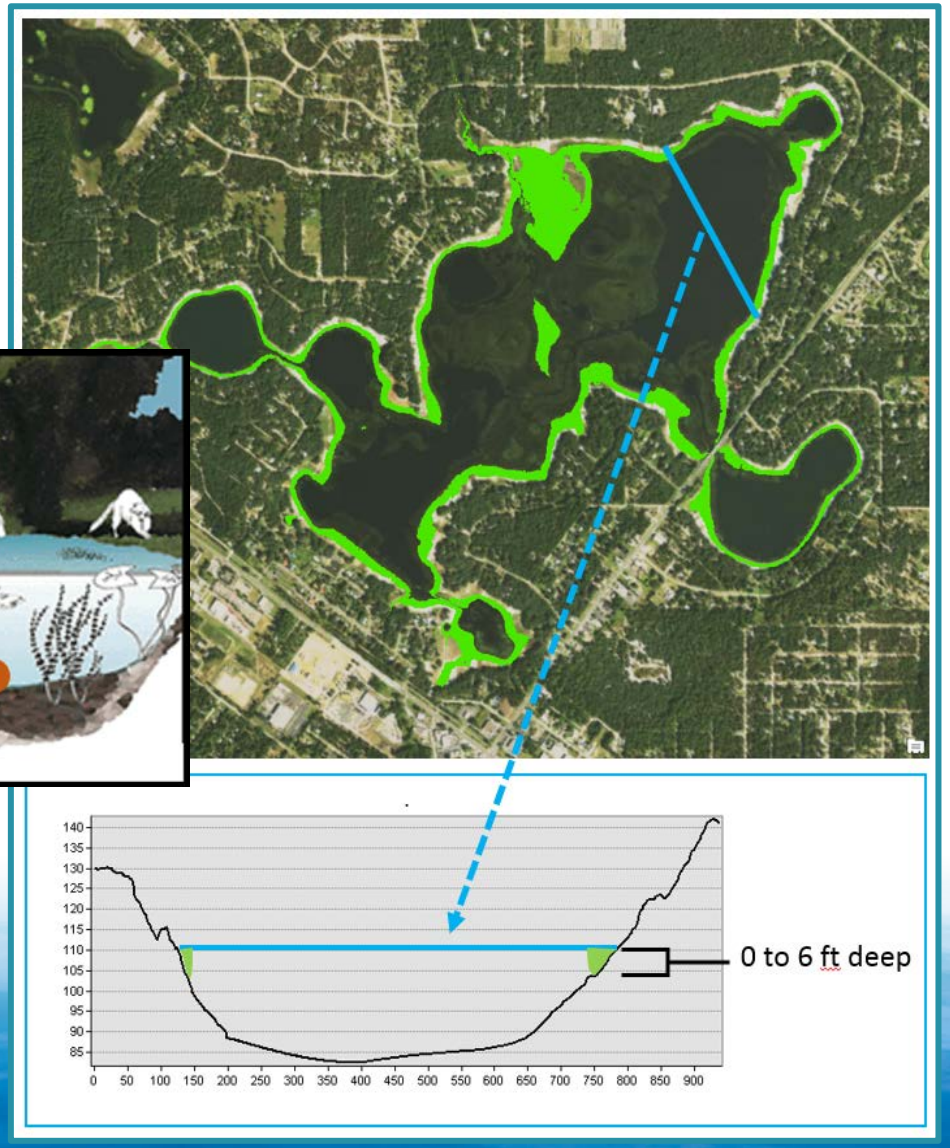



# Fish and Wildlife Habitat – Hydroperiod Tool Metrics

- Emergent marsh habitat
- Largemouth bass and forage fish habitat
- Large wading bird forage habitat
- Small wading bird forage habitat
- Sandhill crane habitat



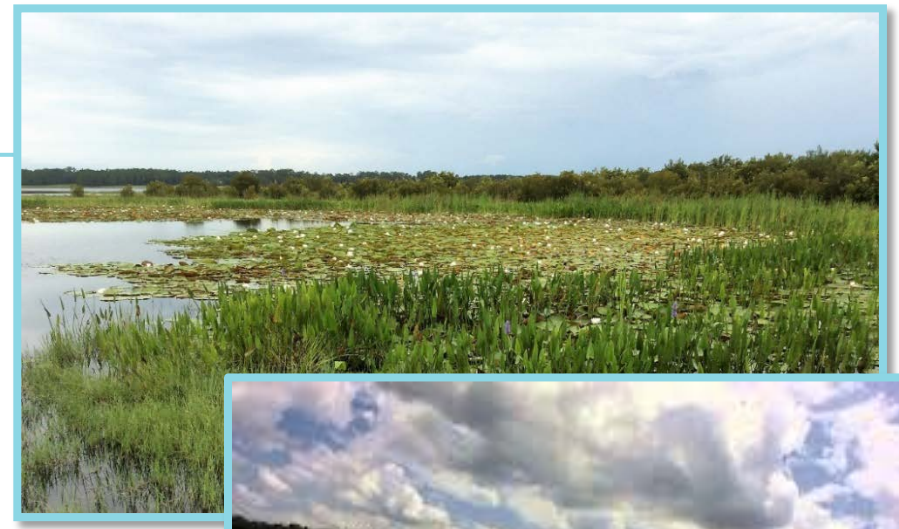


# Open Water Area – Lake Area ≥ 5 ft Deep

- **Recommended by peer reviewers**
- **Protects recreational values**
  - Safe boating, swimming and other forms of recreation
  - Open water free of submerged obstacles (most littoral spp. within 0 to 5 ft deep)
- **Protects fish habitat**
  - Open water area important for game fish
  - Refuge habitat important during dry periods
  - Supported by FWC
- **Additional benefits**
- **Most sensitive metric for both lakes**

# ENVIRONMENTAL CRITERIA

- **Minimum Infrequent High**
- **Lake Connection metric**
- **5 Fish and Wildlife metrics (HT)**
  - Emergent marsh area
  - Gamefish spawning area
  - Large wading bird forage area
  - Small wading bird forage area
  - Sandhill crane nesting area
- **Open Water metric (≥ 5 ft deep)**
- **Average depth**
- **Surface area**



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# MFLs Assessment

**Dataset**

Lake Levels

**Pumping Impact Assessment**

Determine the impact from pumping on levels using NFSEG and KHTM models

**Current-Pumping Condition Levels**

Develop no-pumping and current-condition levels using models and multiple linear regression

**Current Status of MFLs**

Estimate freeboard or deficit in the levels under current pumping condition to assess current status of MFLs

**Future Status of MFLs**

Estimate freeboard or deficit in the levels under future pumping condition using groundwater models

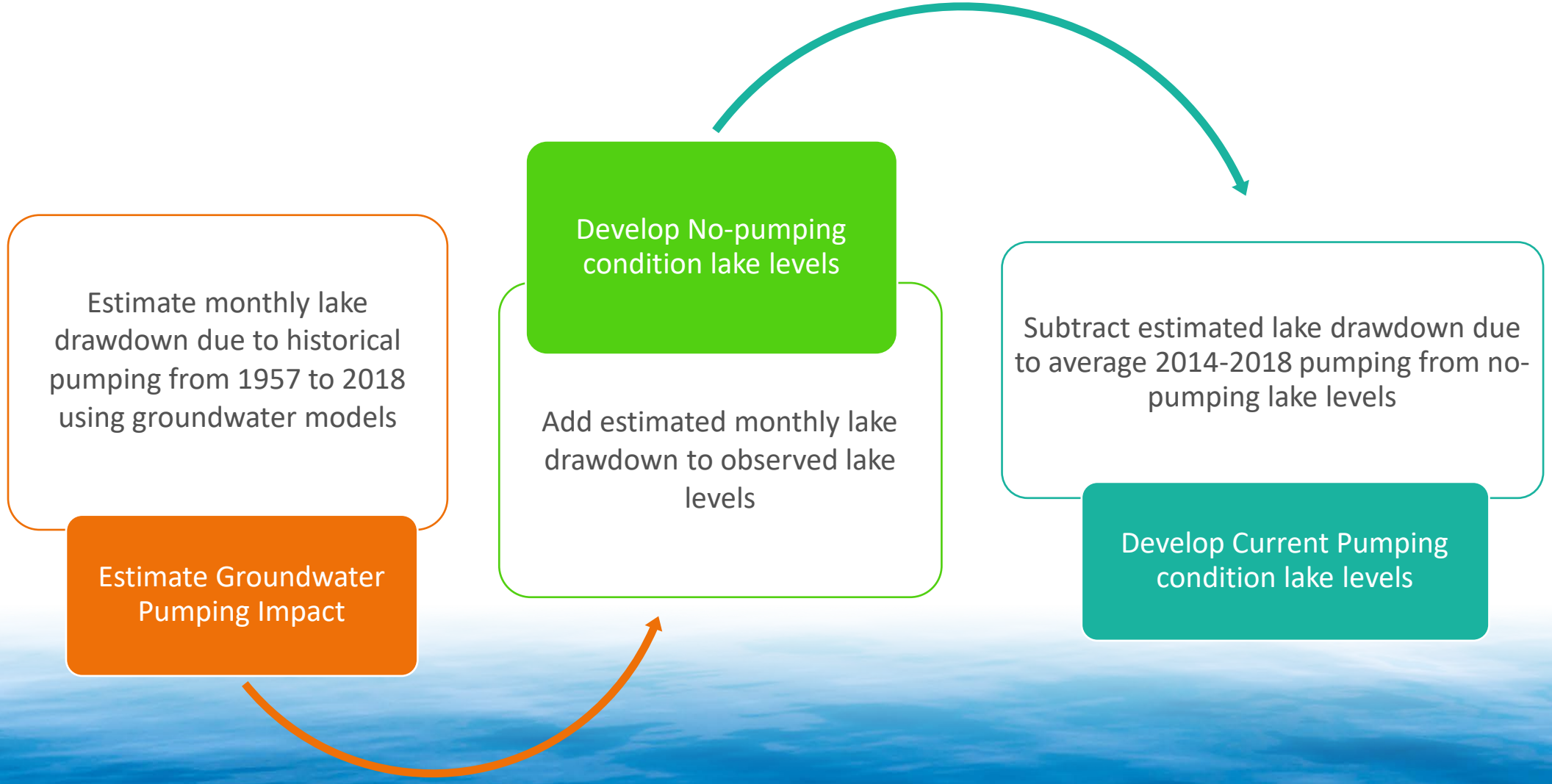
# LAKES BROOKLYN AND GENEVA

## HYDROLOGICAL ANALYSES

# NO-PUMPING AND CURRENT-PUMPING CONDITION LAKE LEVELS

- **No-pumping condition lake levels**
  - Estimated historical lake levels without pumping impact
- **Current-pumping condition lake levels**
  - Estimated historical lake levels with current pumping impact (2014-2018 average pumping)

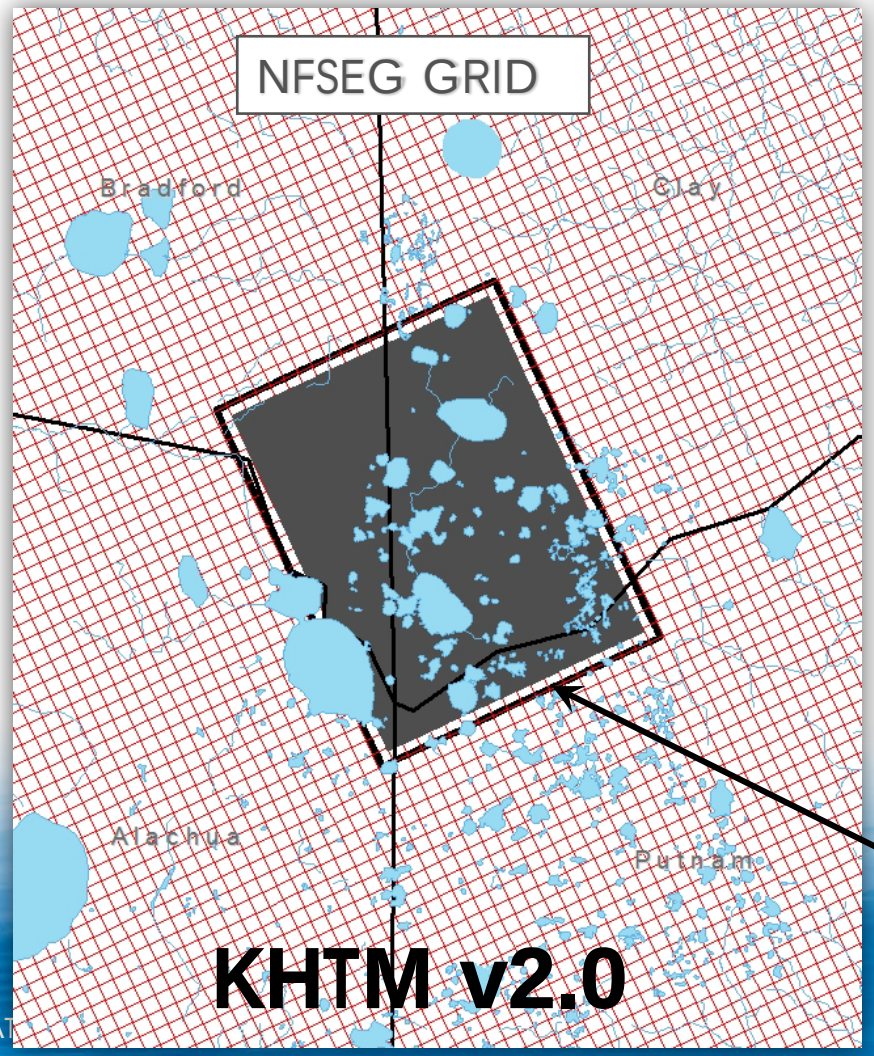
# NO- AND CURRENT-PUMPING CONDITION DATA DEVELOPMENT

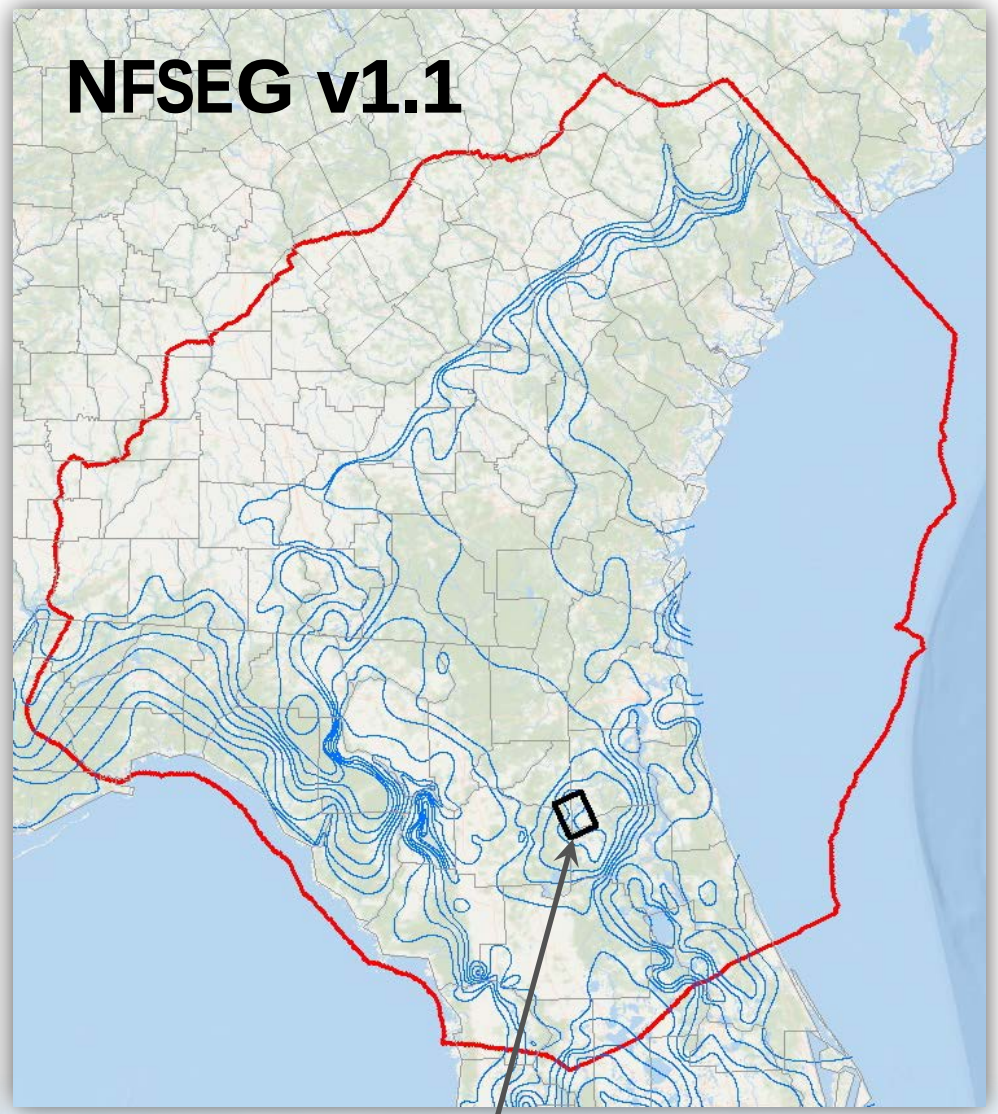


# GROUNDWATER MODELS

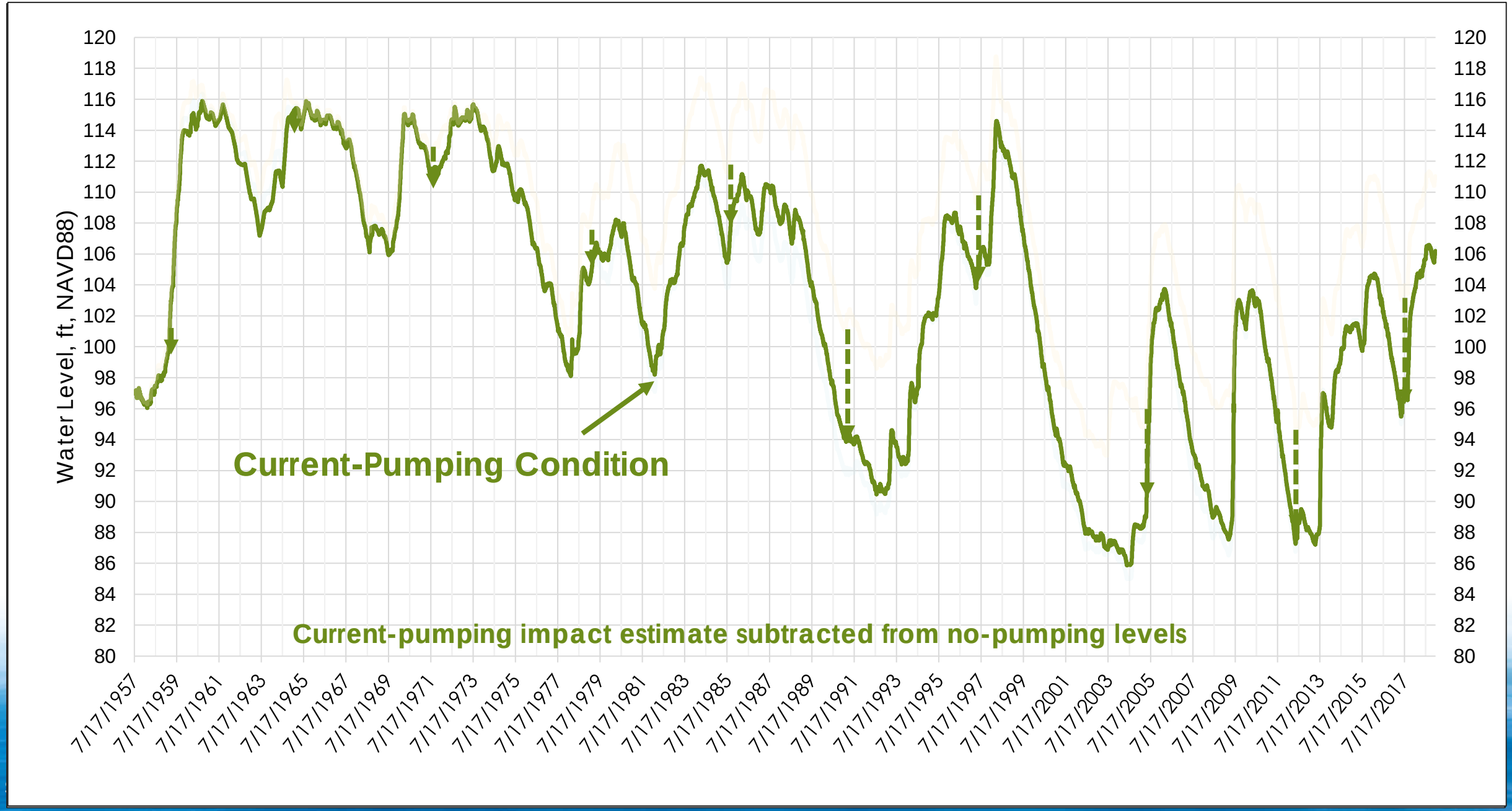
- **KHTM v2.0** - Keystone Heights Subregional Transient Model
  - Local-scale semi-integrated surface/groundwater model
  - Grid cell size: 250 ft x 250 ft
  - Monthly simulations from 1957 to 2018
  - Simulates groundwater and lake levels, Alligator creek flows

- **NFSEG v1.1** - Northeast Florida Southeast Georgia Model
  - Regional scale groundwater model
  - Grid cell size: 2500 ft x 2500 ft
  - Steady-state 2001 and 2009 simulations
  - Does not simulate lake levels or Alligator creek flows

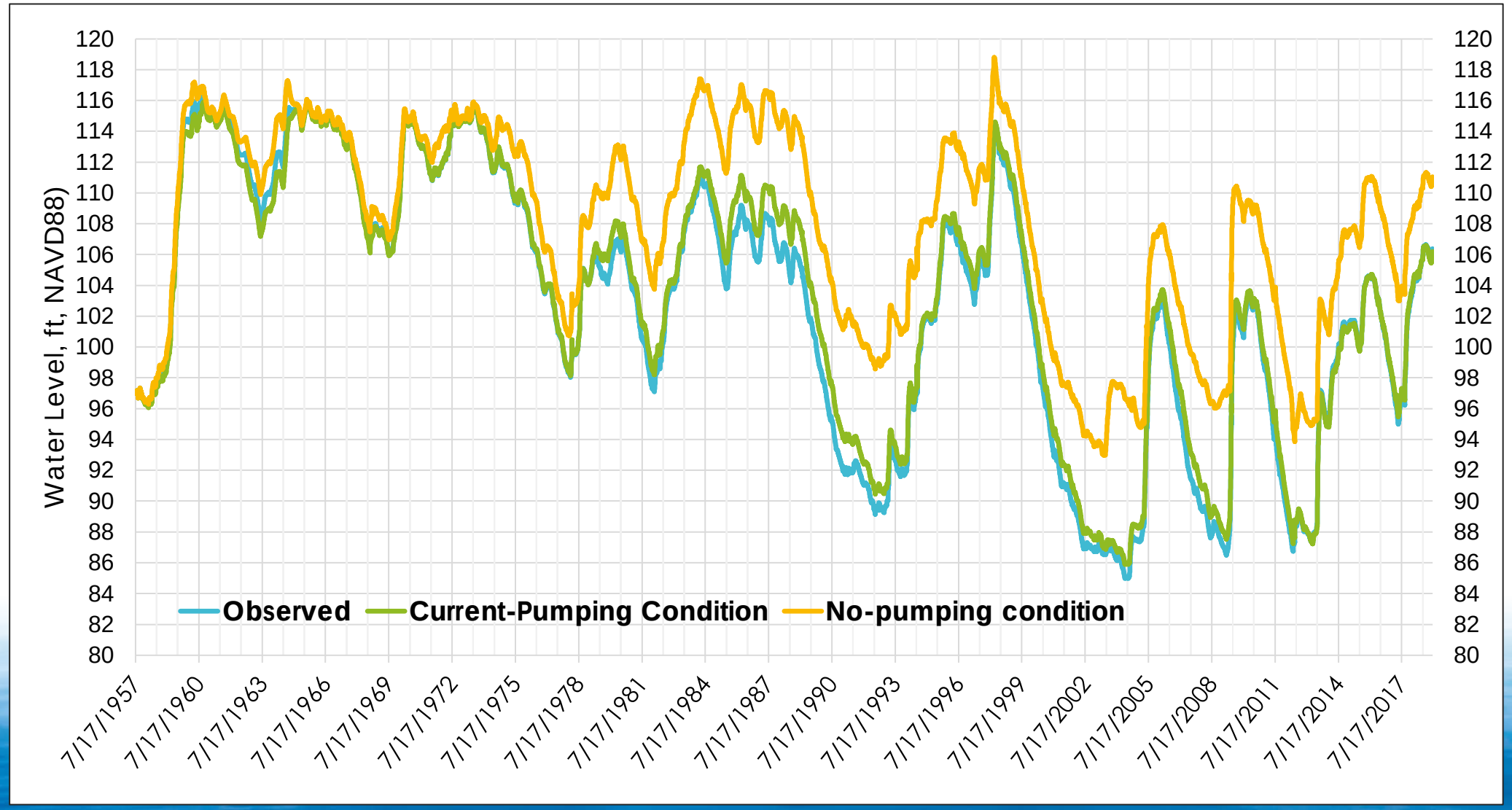

NFSEG GRID
Bradford
Clay
Alachua
Putnam
KHTM v2.0


NFSEG v1.1
KHTM Subregional Model

# NO-PUMPING AND CURRENT-PUMPING LEVELS



# LAKE BROOKLYN NO-PUMPING AND CURRENT-PUMPING LEVELS

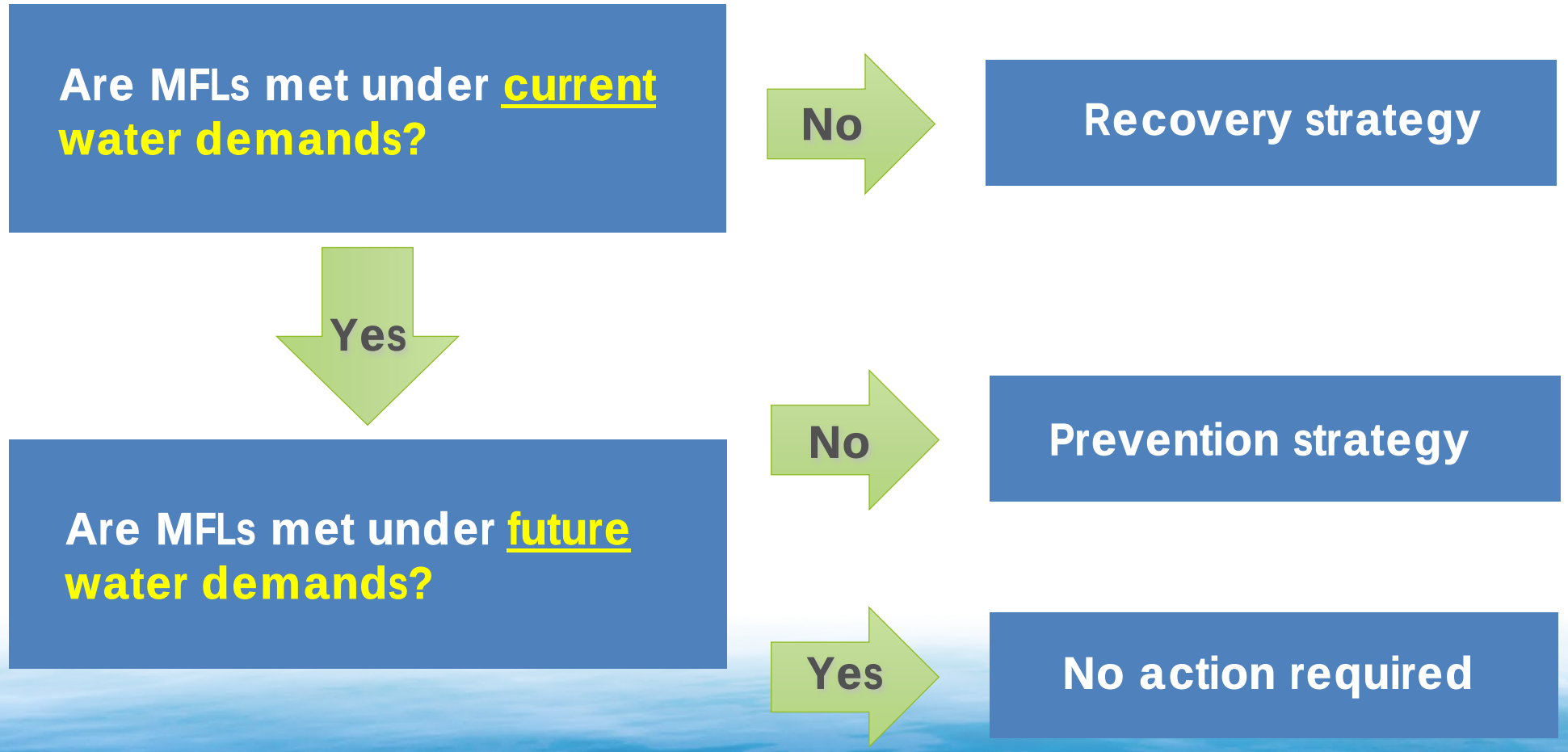


# LAKE GENEVA NO-PUMPING AND CURRENT-PUMPING LEVELS

# CURRENT AND FUTURE

## MFLS STATUS ASSESSMENT

# PREVENTION, RECOVERY OR NEITHER



# LAKES BROOKLYN AND GENEVA – DRAFT FREEBOARDS / DEFICITS

| Environmental Criterion | Lake P50 Freeboard /Deficit (ft) | |
|---|---|---|
| | Lake Brooklyn | Lake Geneva |
| Minimum Infrequent High | > 10.0 | > 3.2 |
| Emergent marsh habitat | > 5.0 | > 5.0 |
| Largemouth bass habitat | > 5.0 | > 5.0 |
| Small wading bird forage | > 5.0 | > 5.0 |
| Large wading bird forage | > 5.0 | > 5.0 |
| Sandhill crane nest habitat | > 5.0 | > 5.0 |
| Lake surface area | - 0.5 | 1.0 |
| Average lake depth | - 0.6 | 0.0 |
| Lake lobe connectivity | -1.3 | 0.2 |
| Open water area | -1.6 | -0.3 |

# CURRENT STATUS ASSESSMENT - SUMMARY

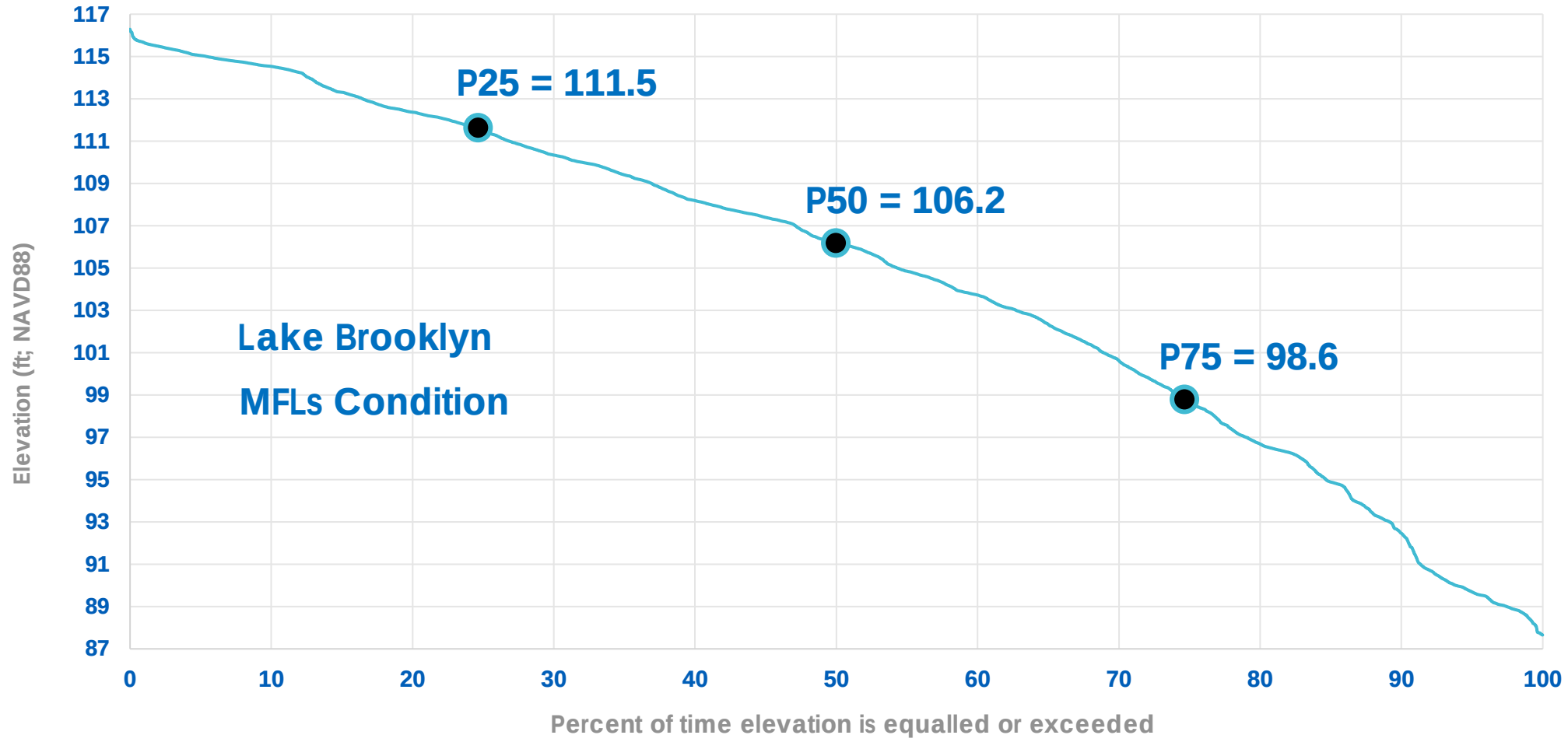
| Water Use Scenario | Lake Brooklyn freeboard/deficit (ft) | Lake Geneva freeboard/deficit (ft) |
|---|---|---|
| Current pumping (2014 – 2018 avg) | -1.6 | -0.3 |

**Lakes Brooklyn and Geneva are in RECOVERY**

# LAKES BROOKLYN AND GENEVA

# RECOMMENDED MINIMUM LEVELS

# MFLs Condition Percentiles



# DRAFT RECOMMENDED MINIMUM LEVELS

| System | Percentile | Minimum level (ft; NAVD88) |
|---|---|---|
| Lake Brooklyn | P25 | **111.5** |
| | P50 | **106.2** |
| | P75 | **98.6** |
| Lake Geneva | P25 | **101.7** |
| | P50 | **98.3** |
| | P75 | **89.3** |

# Next Steps:

- **Draft MFLs Report is on the SJRWMD website:**

  **https://www.sjrwmd.com/minimumflowsandlevels/brooklyn-geneva/**

- **Public comment period: through October 8th**
  - **Send comments / questions to asutherl@sjrwmd.com**

- **Recovery Strategy development**
- **Schedule Notice of Proposed Rule**

# QUESTIONS / COMMENTS?