2019 Lower Kissimmee Basin Water Supply Plan Update

Mark Elsner, P.E.
Water Supply Bureau Chief
Stakeholder Meeting #2
October 4, 2019
Today’s Agenda

- Opening remarks
- Water resource protection tools
- Public water supply by Okeechobee Utility Authority
- Overview of the Draft 2019 LKB Water Supply Plan Update (posted online Sept. 27, 2019)
  - Population and demand projections
  - Water source options
  - Water resource development projects
  - Conclusions and future direction
- Next steps
Water Supply Plan Requirements

- 20-year planning period
- Demand estimates & projections
- Resource analyses
- Issues identification
- Evaluation of water source options
- Water resource development
  - Responsibility of water management district
- Water supply development
  - Responsibility of water users
- Minimum Flows & Minimum Water Levels
  - Recovery & prevention strategies
After the District Governing Board approves the water supply plan update:

- All local governments must amend their Comprehensive Plan to incorporate a Water Supply Facilities Work Plan within 18 months of the plan update’s approval
  - If plan update approved in December 2019, Work Plans will be due in June 2021
- Utilities identify the projects to be developed
- Utility annual progress reports
  - District automated WaSUP database – due annually in November
Water Resource Protection Tools

Toni Edwards
Senior Scientist
Stakeholder Meeting #2
October 4, 2019
Water Resource Protection Tools

Minimum Flows and Minimum Water Levels

Water Reservations

Restricted Allocation Areas

Toni Edwards
Senior Scientist – SFWMD
October 04, 2019
- Minimum Flows and Minimum Water Levels (MFL)
- Water Reservations
- Restricted Allocation Areas (RAA)
  - Adopted by rule in the Florida Administrative Code (F.A.C.)
  - Considered in Consumptive Use Permitting (CUP) process
Minimum Flows and Minimum Water Levels (MFL)

Statutory Authority: Chapter 373, Florida Statutes (F.S.)

Defined in Rule 40E-8.021, F.A.C.

MFL

- Point at which further withdrawals will cause "significant harm" to the water resources or ecology of an area

Significant Harm

- Temporary loss of water resource functions that takes more than two years to recover, but is less severe than serious harm

*May be adopted for both surface waters and groundwaters*

Lotus pads on Lake Okeechobee
Source: Katherine Wolkoff at https://www.audubon.org
MFL Recovery and Prevention Strategies

Section 373.0421(2), F.S.

Recovery Strategy

- For waterbodies not meeting the MFL at the time of adoption
- Achieve recovery to the established MFL as soon as “practicable”

Prevention Strategy

- For waterbodies that are meeting the MFL but are not expected to meet it in 20 years
- Prevent the existing flow or level from falling below the adopted MFL

Great Egret (Ardea alba) and American Alligator (Alligator mississippiensis) in pond, Kissimmee, Florida
Source: https://naturetime.wordpress.com
MFL Recovery and Prevention Strategies

Recovery and Prevention Strategies

- Strategies must be adopted simultaneously with MFL rule adoption
- When MFL is revised, strategy must be reviewed and revised (if needed) to meet the revised MFL
- Must include a phased-in approach or timetable for the components
- May not be based solely on water shortage restrictions
With Prevention Strategies
- Biscayne Aquifer (2001)
- Lower West Coast Aquifers (2001)
- St. Lucie Estuary (2002)
- Florida Bay (2006)
- Lake Istokpoga (2006)

With Recovery Strategies
- Caloosahatchee River (2001)
- Everglades (2001)
- Lake Okeechobee (2001)

Cover > 6.6 million acres districtwide
## MFLs Covered in Other Water Supply Plans

<table>
<thead>
<tr>
<th>MFL Waterbody</th>
<th>Water Supply Plan</th>
<th>MFL Criteria</th>
<th>Recovery or Prevention Strategy</th>
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</thead>
<tbody>
<tr>
<td>Lower West Coast Aquifers</td>
<td>Lower West Coast</td>
<td>Rule 40E-8.331, F.A.C.</td>
<td>Prevention</td>
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<tr>
<td></td>
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<td></td>
<td>Subsection 40E-8.421(4), F.A.C.</td>
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<tr>
<td>Lake Okeechobee</td>
<td>Lower East Coast</td>
<td>Subsection 40E-8.221 (1), F.A.C.</td>
<td>Recovery</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Subsection 40E-8.421(2), F.A.C.</td>
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</tbody>
</table>
Lake Istokpoga MFL


Defined in Subsection 40E-8.021(11), F.A.C as...”the lands and waters contained within the lake below 40’ NGVD, the top of the U.S. Army Corps of Engineers (USACE) regulation schedule”

- Lake level of 36.5’ NGVD
- An MFL violation occurs when:
  - Surface water level falls below 36.5’, for 20 or more weeks within a calendar year, more often than once every four years

Lake Istokpoga – Osprey (Pandion haliaetus), Cypress (Taxodium distichum), and shoreline
Source: SFWMD
Lake Istokpoga Prevention Strategy

Subsection 40E-8.421(7), F.A.C. and Lower Kissimmee Basin Water Supply Plan

Lake water level controlled by operation of S-67 (replaced G-85) and S-68 structures in accordance with USACE regulation schedule

- Continue current operational plan and regulation schedule
- Re-evaluate MFL criteria when changes in lake management occur
- Implement extreme lake drawdowns, when necessary, in a manner that avoids MFL violations

sfwmd.gov
Water Reservations

Statutory Authority: Chapter 373, (F.S.)

Functions and Considerations

- Reserve water for the protection of fish and wildlife or public health and safety
- Prevent use of reserved water for consumptive uses
- Required for CERP projects per federal Water Resources Development Act of 2000 (WRDA 2000)
- May be used as MFL recovery or prevention strategies

Adopted for both surface waters and groundwaters

Osprey (Pandion haliaetus) with bass (Micropterus sp.) on Merritt’s Mill Pond
Source: http://nykography.weebly.com
Water Reservations Do Not...

- Prevent use of unreserved water or water allocated under CUPs
- Establish an operating regime
- Drought-proof the natural system
- Ensure wildlife proliferation

Lake Okeechobee under drought conditions
Source: SFWMD

American Alligator (Alligator mississipiensis)
Source: http://www.photodrom.com

S-67 water control structure (replaced G-85 structure)
Source: SFWMD
Water Reservations Adopted to Date in SFWMD

- Fakahatchee Estuary (2009)
- Picayune Strand (2009)
- North Fork of the St. Lucie River (2010)
- Nearshore Central Biscayne Bay (2013)
- Caloosahatchee River C-43 West Basin Storage Reservoir (2014)

Cover 344,574 acres districtwide
Water Reservations under Development

Kissimmee River and Chain of Lakes, Rule 40E-10, F.A.C.

For the protection of fish and wildlife

- Nationally recognized largemouth bass fishery
- Endangered Wood Stork and Snail Kite nesting colonies
- One of the largest concentrations of nesting bald eagles in the U. S.

Largemouth Bass (*Micropterus salmoides*)
Source: Engbretson Underwater Photography
https://www.underwaterfishphotos.com

Snail Kite (*Rostrhamus sociabilis*)
Source: https://de.wikipedia.org

Bald Eagle (*Haliaeetus leucocephalus*)
Source: Audubon.org
**Upper Chain of Lakes** (6 groups - Lakes Hart-Mary Jane, Lakes Myrtle-Preston-Joel, Alligator Chain of Lakes, Lake Gentry, Lake Tohopekaliga, East Lake Tohopekaliga - each containing several lakes and canals)

**Headwaters Revitalization Lakes** (Lakes Cypress, Tiger, Kissimmee and Hatchineha, and associated canals)

**Kissimmee River and Floodplain** (to S-65E structure north of Lake Okeechobee; includes Istokpoga Canal and floodplain, C-38 Canal and remnant river channels from S-65 to S-65E)

**Kissimmee River Center Wetland** (~1,200-acre wetland restoration area, part of CERP Lake Okeechobee Watershed Restoration Project)
- 172,500 acres and spans portions of LKB and UKB (CFWI) Planning Areas
- Kissimmee River downstream of S-65A is in LKB Planning Area
- Upper Chain and Headwaters Lakes - primary sources of water for the Kissimmee River
- Reservations will support KRRP (~$1 billion public investment)

Kissimmee River Restoration Project (KRRP): Looking north from the south end of the Phase I restoration area.
Source: SFWMD
Kissimmee River and Chain of Lakes Water Reservations

Water Proposed for Reservation from Allocation (In Progress)

Surface Water:

- Upper Chain of Lakes Reservation Waterbodies
  - All surface water *up to specific water reservation stages*

- Headwaters Revitalization Lakes, Kissimmee River, and Kissimmee River Center Wetland Reservation Waterbodies
  - All surface water

Groundwater:

Surficial aquifer system groundwater contributing to the reservation waterbodies that is required for the protection of fish and wildlife
Kissimmee River and Chain of Lakes Water Reservations

Project Status

- Currently in rule development (draft rule revised since Dec. 2014)
- Supporting Technical Document nearly complete (revised since March 2015)
- Public workshop by end of 2019 or early 2020 (contact Toni Edwards for workshop notifications at tedwards@sfwmd.gov)
- Rule adoption by end of 2020
Restricted Allocation Areas (RAA)

Listed in Section 3.2.1 of the Applicant’s Handbook, incorporated by reference in Rule 40E-2.091, F.A.C.

Definition and Uses

- Areas from which new or increased water allocations are restricted
- Regional in scope, for specific sources or areas of the SFWMD
- Implemented where water for projected needs is insufficient
- Protect water for natural systems and future restoration projects (CERP)
- May be designated as part of MFL recovery or prevention strategies

L-1, L-2, & L-3 Canal System (1981)

Lake Istokpoga/Indian Prairie Canal System (1981)

Lower East Coast Everglades Waterbodies (2007)

North Palm Beach County / Loxahatchee River Watershed (2007)

Pumps on Floridan Wells in Martin and St. Lucie Counties (2007)

Lake Okeechobee & Lake Okeechobee Service Area (2008)

Cover > 4.3 million acres districtwide
# RAA Criteria in the Lower Kissimmee Basin Planning Area

<table>
<thead>
<tr>
<th>RAA</th>
<th>Water Allocations Are Limited To:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lake Istokpoga / Indian Prairie Canal System</td>
<td>Existing surface water allocations (no additional allocations)</td>
</tr>
<tr>
<td></td>
<td>Existing surface water pump capacity (no increases in pump capacity)</td>
</tr>
<tr>
<td>Lake Okeechobee and Lake Okeechobee Service Area</td>
<td>Historic water use that occurred from April 1, 2001 to January 1, 2008</td>
</tr>
</tbody>
</table>
Questions?

For more information contact:

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(561)682-6387

Don Medellin at
dmedelli@sfwmd.gov or
(561)682-6340

https://www.sfwmd.gov/our-work

Purple Gallinule (*Porphyrio martinicus*)
Source: flickr.com
Public Water Supply in the LKB Planning Area

John Hayford
Utility Director, Okeechobee Utility Authority
Stakeholder Meeting #2
October 4, 2019
2019 LKB Water Supply Plan Update Meeting
Okeechobee, Florida
October 4, 2019
The Okeechobee Utility Authority

• Created by Interlocal Agreement between the:
  – City Of Okeechobee;
  – Okeechobee County;
  – Okeechobee Beach Water Association.

• The Agreement signed in 1995
The Okeechobee Utility Authority

The Interlocal Agreement creating the OUA established the OUA as a “Special District” defined by Chapter 189, F.S.

A Special District is defined as a local unit of special purpose, as opposed to a general purpose government.

Special Districts:

- Have Governing Boards with policy making powers;
- Provide essential governmental services and facilities;
- Operate in a limited geographical area.
The Okeechobee Utility Authority

Special Districts can be either:

Dependent Special Districts which means that they are:

- Under some control by a single County or Municipal government;
- May have identical governing board members;
- May appoint or remove any governing board member;
- May approve or veto annual budget.

Independent Special Districts

- Do not have any of the above mentioned characteristics;
- May include area from more than one County.

The OUA is an Independent Special District
The Okeechobee Utility Authority

- The Okeechobee Utility Authority provides utility services, both water supply and wastewater treatment.
- The OUA Service Area consists of Okeechobee County and a portion of NE Glades County.
- Glades County area includes the Buckhead Ridge area.
OUA Water Service Area

OKEECHOBEE UTILITY AUTHORITY
POTABLE WATER SERVICE AREA
Okeechobee Utility Authority
Water Treatment Facilities
Okeechobee Utility Authority
Water Treatment Facilities

• OUA Surface Water Treatment Plant
  – FDEP Permitted Capacity 5.0 MGD
  – Constructed in 2005
  – Two lake intakes
  – One intake on the Rim Canal

• OUA Ground Water Treatment Plant
  – FDEP Permitted Capacity 1.0 MGD
  – Constructed in 1993
  – Seven Shallow Wells
Okeechobee Utility Authority
Wastewater Treatment Facility

• OUA Regional Wastewater Treatment Facility
  – FDEP Permitted Capacity 4.0 MGD
  – Final Construction completed in 2010
  – Effluent Disposal by land application or deep injection well
  – Residuals (AA) disposal to landfill or fertilizer supplement
OUA WWTF Deep Injection Well
OUA WWTF Residuals Drying Facility
The Okeechobee Utility Authority

Where is the Okeechobee Utility Authority heading?

• Facility Infrastructure Expansion and Improvements

   New wastewater septic to sewer projects to meet both public health concerns and water quality improvements

   Construction of a new 3 MG ground storage tank at the surface water treatment plant (remove 1.5 MG)

Water & Wastewater Master Planning Projects

Continued facility restoration, replacement or upgrades

Consideration of Advanced Metering Infrastructure (AMI) as water meter replacement
OUA Infrastructure Projects

• SW Wastewater Service Area Project
  - New Customers
    - Residential ±738 (738 ERC’s)
      (Where ERC = Equivalent Residential Connection)
  - Estimated to remove 6.7 tons per year of nitrogen
  - Estimated to remove 1.6 tons per year of phosphorus
  - Estimated Construction Cost - $13,950,000
Southwest Wastewater Service Area
OUA Infrastructure Projects

• Pine Ridge Park Septic to Sewer Project

- New Connections
  - Residential – 80 (80 ERC’s)

- Estimated to remove 0.75 tons per year of nitrogen

- Estimated to remove 0.25 tons per year of phosphorus

- Estimated Construction Cost - $1,500,000
OUA Infrastructure Projects

- Treasure Island Septic to Sewer Project

  - New Connections
    - Residential – 2,430 (2,430 ERC’s)

  - Estimated to remove 21.9 tons per year of nitrogen

  - Estimated to remove 5.3 tons per year of phosphorus

  - Estimated Construction Cost - $24,300,000
OUA Infrastructure Projects

• Okee-Tantie Wastewater Improvements
  - New Connections
    - Residential – 39 (39 ERC’s)
    - Non-Residential 14 (20 ERC’s)
    - Master Meter - 33 (574 ERC’s)
  - Estimated to remove 5.7 tons per year of nitrogen
  - Estimated to remove 1.4 tons per year of phosphorus
  - Estimated Construction Cost - $10,500,000
All Projects

- **New Customers**
  - Residential $\pm 3,287$ (3,287 ERC’s)
  - Non-Residential 14 (20 ERC’s)
  - Master Meter - 33 (574 ERC’s)

- Estimated to remove 35 tons per year of nitrogen

- Estimated to remove 8.6 tons per year of phosphorus

- Estimated Construction Cost - $50,250,000
Water Supply Issues

OUA Intake Looking East, circa 2007
Water Supply Issues

OUA Intake Looking West, circa 2007
OUA Water Supply Issues

Well Field Impacts
Okeechobee Utility Authority

Questions & Answers
2019 Lower Kissimmee Basin Water Supply Plan Update

Natalie Kraft
Plan Manager
Stakeholder Meeting #2
October 4, 2019
Lower Kissimmee Basin Planning Area

- Portions of Okeechobee, Highlands, and Glades counties
- Seminole Tribe of Florida Brighton Reservation
- Population
  - 2017 52,496 residents
  - 2040 58,662 residents
    - 12% increase
- Major agricultural industry
- Significant environmental systems
Public Participation

- Governing Board updates
- Two stakeholder workshops
- Discussions with local government, tribal, agricultural, and utility representatives
- Draft LKB documents posted online September 27
- Written comments due back November 1
Planning Document Outline

- Executive Summary
- Chapter 1: Introduction
- Chapter 2: Demand Estimates and Projections
- Chapter 3: Demand Management – Water Conservation
- Chapter 4: Water Resource Protection
- Chapter 5: Water Source Options
- Chapter 6: Water Resource Issues and Analyses
- Chapter 7: Water Resource and Supply Development Projects
- Chapter 8: Future Direction

Appendices:
- Information for Local Governments
- Demand Projections
- MFLs
- Wastewater Treatment Facilities
- Utility Summaries
Goal of Water Supply Plans

To identify sufficient water supply sources and future projects to meet existing and future reasonable-beneficial uses during 1-in-10 year drought conditions through 2040 while sustaining water resources and related natural systems.
2019 LKB Plan Update Objectives

- Water Supply
- Natural Systems
- Conservation
- Linkage with Local Governments
- Compatibility and Linkage with Other Efforts
Population Projections

The chart shows population projections for Glades, Highlands, and Okeechobee counties from 2017 to 2040. The population is projected to increase significantly in Okeechobee County by 2040, with other counties also showing growth.

- **Glades**: 2017: 5,000, 2040: 10,000
- **Highlands**: 2017: 15,000, 2040: 15,000
- **Okeechobee**: 2017: 30,000, 2040: 45,000

The chart distinguishes between DSS Population and PWS Population.
Agricultural FSAID Acreage

FSAID: Florida Statewide Agricultural Irrigation Demand

- Hay/Pasture
- Citrus
- Sugarcane
- Sod
- Fresh Market Vegetables

2017

2040
## Agricultural Irrigation Demands – AFSIRS

<table>
<thead>
<tr>
<th>Crop Type</th>
<th>2017</th>
<th>2040</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Acres</td>
<td>Average Demand (mgd)</td>
<td>Acres</td>
</tr>
<tr>
<td>Hay/Pasture</td>
<td>43,046</td>
<td>81.90</td>
<td>37,892</td>
</tr>
<tr>
<td>Citrus</td>
<td>38,316</td>
<td>64.03</td>
<td>36,957</td>
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<tr>
<td>Sugarcane</td>
<td>17,436</td>
<td>37.82</td>
<td>21,250</td>
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<tr>
<td>Other Crops*</td>
<td>20,236</td>
<td>45.57</td>
<td>27,019</td>
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<tr>
<td><strong>Crop Subtotal</strong></td>
<td>119,034</td>
<td>229.49</td>
<td>123,118</td>
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<tr>
<td>Livestock/Aquaculture</td>
<td>--</td>
<td>7.54</td>
<td>--</td>
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<tr>
<td><strong>Total</strong></td>
<td>119,034</td>
<td>237.02</td>
<td>123,118</td>
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</table>

* Other crops includes sod, greenhouse/nursery, field crops, fruit (non-citrus), and potatoes.

mgd = million gallons per day

AFSIRS: Agricultural Field-Scale Irrigation Requirements Simulation
## Total Demand Projections

Demands under average rainfall conditions, in million gallons per day.

<table>
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<tr>
<th>Water Use Category</th>
<th>2017</th>
<th>2040</th>
<th>Change</th>
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<tbody>
<tr>
<td>Public Water Supply</td>
<td>3.04</td>
<td>3.39</td>
<td>+0.35</td>
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<tr>
<td>Domestic &amp; Small Public Supply</td>
<td>2.02</td>
<td>2.28</td>
<td>+0.26</td>
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<td>Agricultural Irrigation</td>
<td>237.02</td>
<td>248.14</td>
<td>+11.12</td>
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<td>Industrial/Commercial/Institutional</td>
<td>1.70</td>
<td>1.95</td>
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<td>Recreational/Landscape Irrigation</td>
<td>1.64</td>
<td>1.73</td>
<td>+0.09</td>
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<td>Power Generation</td>
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<td>0.00</td>
<td>0.00</td>
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<tr>
<td><strong>Total</strong></td>
<td>245.42</td>
<td>257.49</td>
<td>+12.07</td>
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Demand Management: Water Conservation

- Among the lowest-cost solutions
- Agriculture
  - FDACS Best Management Practices
  - More efficient irrigation systems
- Public water supply
  - Outdoor irrigation ordinances
  - More efficient plumbing fixtures
- Potential 2040 savings: 17 mgd
Water Resource Considerations

- Environmental water needs for the Kissimmee River Restoration Project
- Seminole Tribe of Florida Brighton Reservation water entitlement
- Effects of groundwater withdrawals on Lake Wales Ridge MFL water bodies
- Impacts of climate change on agricultural water demands
- Regulatory limitations on surface water availability
Resource Protections

- **Water Reservations**
  - Kissimmee River and Chain of Lakes (under development)

- **Minimum Flows & Minimum Water Levels (MFLs)**
  - Lake Istokpoga

- **Restricted Allocation Areas**
  - Lake Istokpoga/Indian Prairie Canal System
  - Lake Okeechobee Service Area
Water Source Options

- Aquifer Storage & Recovery*
- Reclaimed Water*
- Reservoirs*
- Surface Water
- Fresh Groundwater
- Saline Groundwater*
- Conservation*

* Alternative water source
Groundwater Sources
Resource Evaluation & Analysis

- Review of 2014 groundwater modeling results
- Review of water use permit information
- Consideration of regulatory limits on surface water withdrawals
- Analysis of groundwater levels
Groundwater Levels & Rainfall

Surficial aquifer well near Sebring Airport
Water Resource Development Projects

- Kissimmee River Restoration Project
- CERP Lake Okeechobee Watershed Restoration Project
- Dispersed Water Management Program
- NEEPP Lake Okeechobee Watershed Protection Plan
- NEEPP Taylor Creek & Nubbin Slough STAs
Future Direction

- Complete the Kissimmee River Restoration Project
- Complete the Kissimmee River and Chain of Lakes Water Reservations
- Finalize & implement components identified in the Lake Okeechobee Watershed Restoration Project’s tentatively selected plan
- As appropriate, reduce or augment water use for agricultural irrigation via stormwater and tailwater recovery and more efficient water conservation practices
- Continue coordination with local governments, other state agencies, tribal nations, utilities, and water users
Future water needs of the region can be met through the 2040 planning horizon with appropriate management and conservation.
Next Steps

- **September 27**: Posted draft plan documents
- **October 4**: Stakeholder meeting #2
- **October 10**: Presentation to Governing Board
- **November 1**: Deadline for external comments
- **December 12**: Final plan to Governing Board for consideration
Questions?

- Plan information can be found at:  
  [www.sfwmd.gov/lkbplan](http://www.sfwmd.gov/lkbplan)

- Written comments to:  
  Natalie Kraft – Plan Manager  
  nkraft@sfwmd.gov
Thank You

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