



Florida Department of Environmental Protection
Division of Environmental Assessment and Restoration

***Wekiva River, Rock Springs Run, and
Little Wekiva Canal
Basin Management Action Plan
(BMAP)***

***Moira R. Homann
March 8, 2018***





Agendas

Onsite Sewage Treatment and Disposal System (OSTDS) Advisory Committee

- Welcome and Opening Remarks – *Tiffany Busby*
- Recap Items
- New Items/Discussion – *Moirra Homann*
 - Revised OSTDS Policies
- Public Comments – *All*
- Adjourn OSTDS Committee – *Moirra Homann*

Wekiva BMAP General Discussion

- New Items/Discussion – *Moirra Homann*
 - Reduction Estimates from Projects
 - Calculation approaches
 - Starting year for project credits *Mary Szafraniec and Megan Long*
 - Review of reductions necessary
 - Gap Analysis
 - Remaining load to be addressed
 - Additional Reduction Options
 - Timeline for BMAP Development
- Public Comments/Action Items – *All/Tiffany Busby*
- Adjourn – *Moirra Homann*



OSTDS Restoration Approaches

- OSTDS Remediation
- New OSTDS
- Education
- Rulemaking and Implementation
- Funding



OSTDS Remediation

Nitrogen Enhancement/"On-Site AWT"

- Features achieving at least 65 % nitrogen reduction
- Systems approved by Florida Department of Health (FDOH)

Connection to Sewer

- OSTDS is properly abandoned and property is connected to sewer service



New OSTDS

- As required by statute:
 - New OSTDS within the PFAs on lots less than 1 acre are prohibited (by statute) unless there are exceptions described by the BMAP
 - Exceptions –
 - OSTDS with nitrogen enhancement
 - Conventional OSTDS allowed if property is scheduled for a sewer project listed in BMAP
- Begins upon BMAP adoption (~July 2018)
- Important to abate future growth of OSTDS loads



Existing OSTDS

- Extent (“envelope”) of the remediation area for nitrogen enhancement policy under discussion
- Function of:
 - Potential for reducing load through enhancement
 - Total amount of load to be reduced
 - Relative contribution of nitrogen load from OSTDS
- Reduction credit per system:
 - Recharge and attenuation applied, based on location



Reductions Gap

- Reductions Needed: 209,428 lb-N/yr
- Current Project List: 109,262 lb-N/yr
- **Gap/Additional Reductions Needed: 100,166 lb-N/yr**

$$\begin{array}{c} 2 > -3 \\ 0.999... = 1 \\ \pi \approx 3.14 \\ \sqrt{2} \\ 5(2+2) \\ 101_2 = 5_{10} \end{array} \begin{array}{c} + \\ - \\ \times \\ \div \\ 5^2 \\ (1-2)+3 \end{array}$$



Policy Envelope

$$A + B = C$$

Recharge	PFA lots less than 1 acre			PFA lots equal to or greater than 1 acre			All Lot Sizes		
	Number of OSTDS	Load Reductions Through AWT	Load Reduction Through Sewering	Number of OSTDS	Load Reductions Through AWT	Load Reduction Through Sewering	Total OSTDS in PFA	Total Reductions Through AWT	Total Reductions Through Sewering
High	23,447	110,560	161,587	3,174	14,966	21,874	26,621	125,526	183,461
Medium	5,742	15,042	21,984	1,009	2,643	3,863	6,751	17,685	25,847
Low	158	83	121	19	10	15	177	93	136
Total	29,347	125,684	183,692	4,202	17,619	25,752	33,549	143,304	209,444



Options to Address Gap

- Additional OSTDS Remediation in PFA (B) = +17,000 to 26,000 lb-N/yr
- Additional OSTDS Remediation BMAP-wide = +15,000 – 22,000 lb-N/yr
- Additional Urban Turfgrass Fertilizer (UTF) = ?
- Additional Sports Turfgrass Fertilizer (STF) = ?
- Advanced Agricultural Practices = +5,000 to 46,000 lb-N/yr
- Additional Wastewater Treatment = +54,754 (Springshed) or +54,752 (PFA Only) lb-N/yr





Implementation

- Milestones for DEP and FDOH include:
 - Develop funding programs in cooperation with local governments for homeowners and individuals to remediate subject OSTDS
 - Update FDOH rules for OSTDS permitting and additional remediation options
 - Develop and disseminate education materials to identify the need, options, and funding for enhancement

A scenic view of a lake surrounded by dense trees, with a wooden bridge visible in the background. The text "Thank you OSTDS Committee!" is overlaid in large white letters.

Thank you OSTDS Committee!



Wekiva BMAP

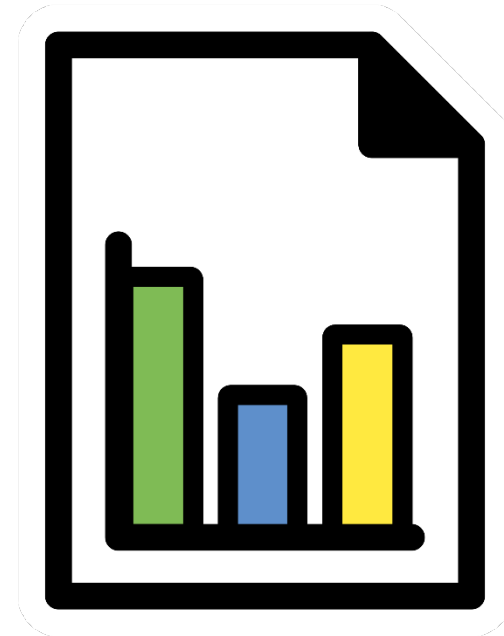
General Discussion

--All Nitrogen Sources--



Draft Approaches to Achieve Reductions and Restoration

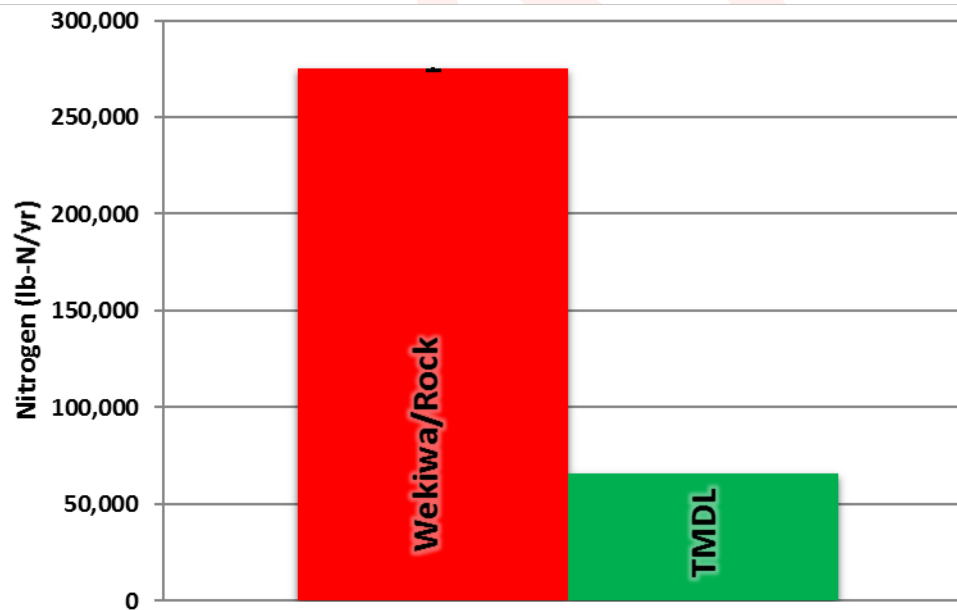
- Reductions
- Gap Analysis





Current Load Compared to the TMDL

Total Required Reduction to Meet the TMDL (lbs-N/yr)		
Description	Nitrogen Loads	Source
Total Load at Spring Vent	275,065	Upper 95% confidence interval - Nitrate and flow data from 2003-2017
TMDL	65,637	Upper 95% confidence interval - flow data from 2002-2017 and 0.286 mg/L
Total Required Reduction	209,428	





Reduction Milestones

- To achieve TMDL, BMAP implementation will be a 20-year process
- Wekiva Springs BMAP will define nitrogen reduction milestones:
 - 30 % reduction within 5 years – 62,828 lb-N/yr
 - 50 % reduction within 10 years – 104,714 lb-N/yr
 - 20 % reduction within 15 years – 41,886 lb-N/yr
 - Total reduction – 209,428 lb-N/yr





Florida Department of Environmental Protection

Water Quality Restoration Program

Wekiwa Springs and Rock Springs Basin Management Action Plan (BMAP) Technical Meeting 3/8/2018

**Moir Homann
DEP Basin Coordinator**

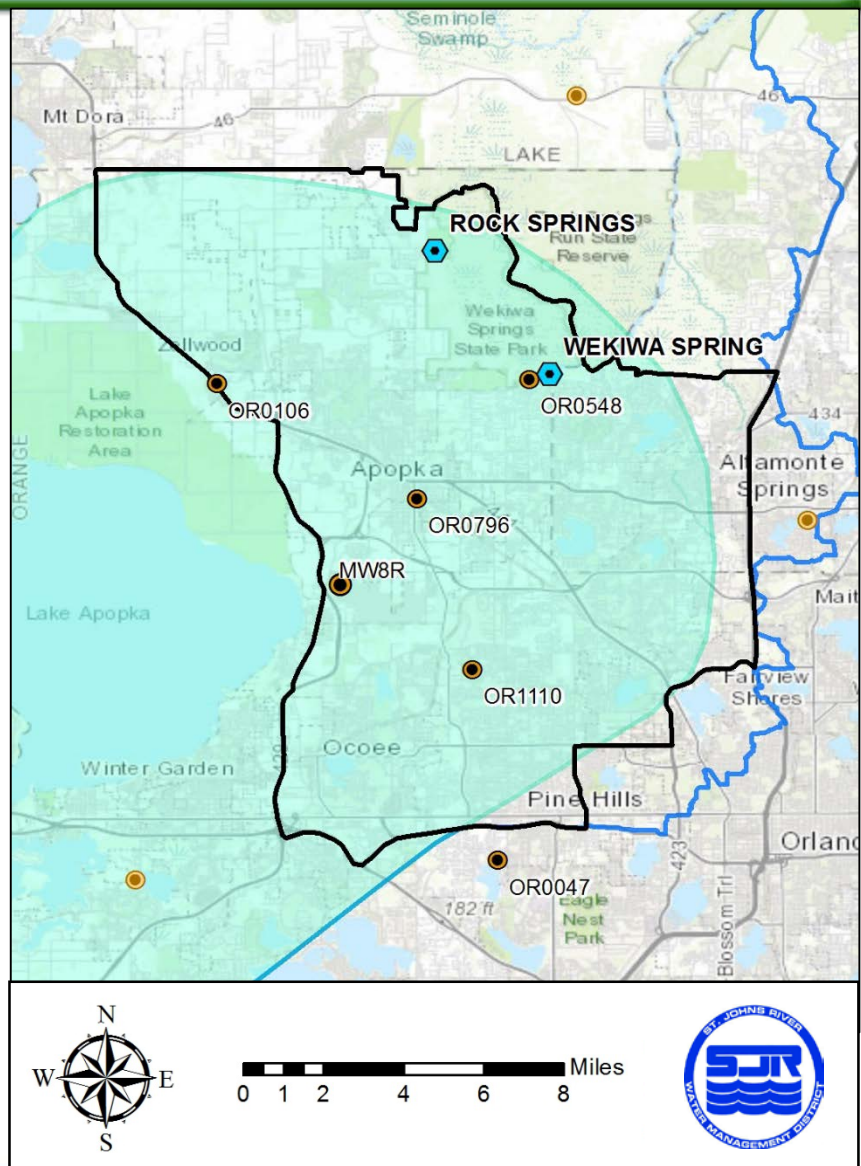
**Mary Szafraniec,
Wood (Amec Foster
Wheeler), Contractor**





Data Collection and Processing

- Data Collection
 - Spring Vent Discharge (cfs)- SJRWMD
 - Surface water - Nitrate-Nitrite (NO_x) – SJRWMD
 - Groundwater - NO_x - SJRWMD and USGS monitoring wells in surrounding areas
- Data Processed Using QA/QC Methods
 - Fatal qualifier codes, statistical checks





Data Construct and Load Calculation

- Data Analysis

- Breakpoint assessment to determine period of record for projects
- Upper 95% confidence interval values for a population mean for discharge and concentration
- Calculated loads discharging from spring vents

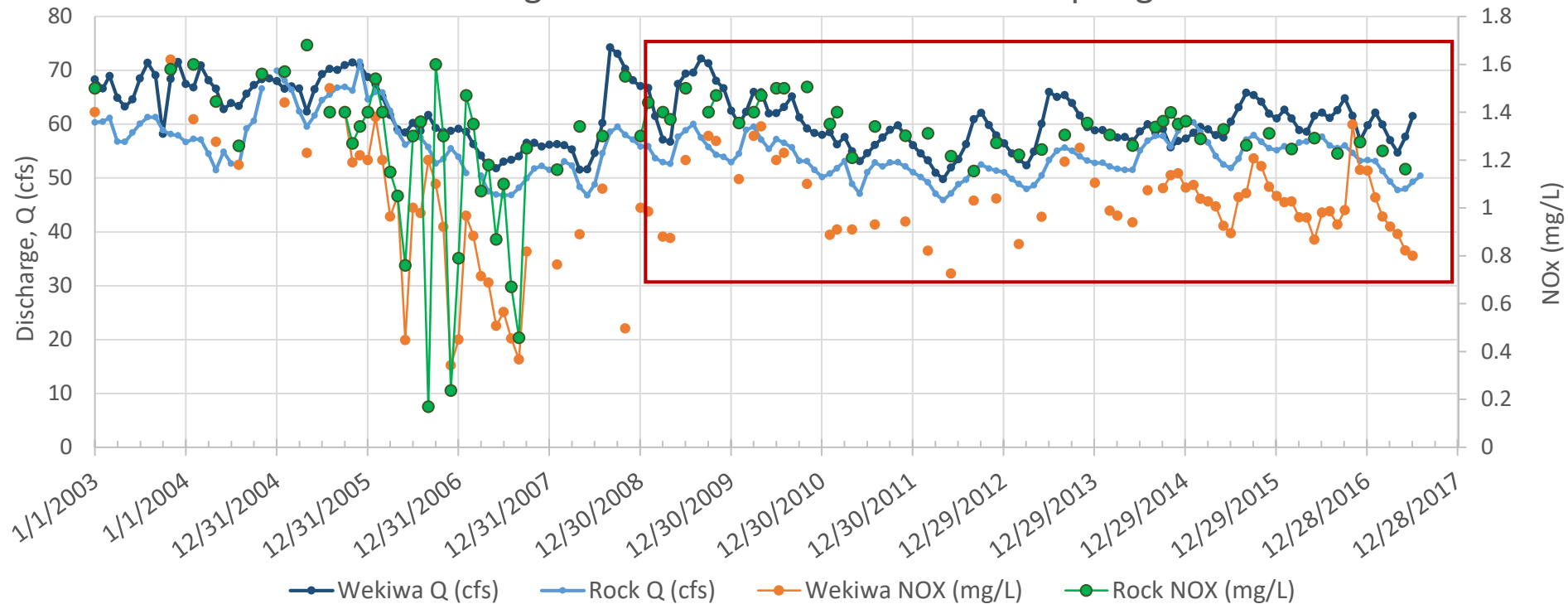
- Comparison of NO_x at Springs vs. Groundwater Wells

- Evaluate NO_x at spring vent in comparison to nearby groundwater monitoring wells
- Use results to infer future NO_x concentrations in spring vents based on nearby wells in contributing springshed
 - Could suggest higher NO_x at springs in the future if well NO_x is historically higher
 - Dependent on lag/travel time of groundwater flow from well location to springs



Breakpoint Assessment

Discharge and NOx at Wekiwa and Rock Springs



- Breakpoint where data is steady and near current values
 - High discharge period from 2003-2005.
 - Low discharge (drought) period from 2006-2008.
 - Nitrates and flows reach steady, current values from 2009-2017 (representative POR)



Spring Vent Load and TMDL Calculations

<i>Nitrate-Nitrite Loading at Spring Vents</i>				
Waterbody	NO₂+NO₃ (mg-N/L)	Discharge (cfs)	Individual Load (lb-N/yr)	Total Load (lb-N/yr)
Wekiwa Springs	1.07	61.2	128,562	275,065
Rock Springs	1.34	55.5	146,502	

Used upper 95% confidence interval values of data from 2009-2017

<i>Nitrate-Nitrite TMDL Using Calculated Flows</i>				
Waterbody	*NO₂+NO₃ (mg-N/L)	Discharge (cfs)	Individual Loading (lb-N/yr)	Total Load (lb-N/yr)
Wekiwa Springs	0.286	61.2	34,413	65,637
Rock Springs	0.286	55.5	31,224	

POR is 2003-2017

Used same flows from spring vent loading analysis to calculate TMDL loads

**Used concentrations from TMDL for Wekiwa Springs and Rock Springs*



Groundwater Concentration Comparison

Water Body	<i>Nitrate Concentration (mg-N/L)</i>	
	Spring Vent	Groundwater Wells
Wekiwa Springs	1.08	1.46
Rock Springs	1.37	

Used upper 95% confidence interval values for springs (2009-2017) and groundwater (2002-2017)

Observations from Groundwater

- Wells nearest springs had lower concentrations (0.05-1 mg/L)
- Well near Lake Apopka had highest concentration (3 mg/L)
 - POT surface maps suggest a northeast GW flow path toward springs
- Not enough nitrate data to draw conclusions about possible future concentrations in springs



Contact Information

For additional information please contact:

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wood.

(Wood still operating as Amec Foster Wheeler)



BMAP Gap Analysis

Gap Analysis		
Nitrogen Source	Credits Based on Projects Submitted (lb-N/yr)	Description
OSTDS	1,019	Credits verified for stakeholder OSTDS projects (enhancement or sewer)
UTF (Urban Turfgrass)	4,650	DEP approved credits (up to 6%) for public education activities as well as credits identified for stakeholder stormwater projects
AD (Atmospheric Deposition)	0	No projects/reductions
FF (Farm Fertilizer)	16,513	15% BMP credit on FF load to groundwater, assuming 100% owner-implemented BMPs on all fertilized lands
STF (Sports Turfgrass)	7,408	6% BMP credit for sports fields and 10% BMP credit for golf courses on STF load to groundwater, assuming 100% BMP implementation on golf courses and sports fields
Livestock	832	10% BMP credit on load to groundwater, assuming 100% owner-implemented BMPs at all livestock facilities
Nurseries	5,364	15% BMP credit on load to groundwater, assuming 100% owner-implemented BMPs at all nursery facilities
WWTF (Wastewater Treatment Facility)	73,476	Achieved current Wekiva Protection Act Policy and verified WWTF projects
Total Credits	109,262	
Required Reduction	209,428	
Load Remaining	100,166	GAP

How to address the remaining 100,166 lbs/yr?



How do we
address the
Gap?





Possible Approaches for Achieve Remaining Reduction

- OSTDS
- Wastewater Treatment Effluent Standards
- Urban and Sports Turfgrass
- Agriculture



OSTDS

Estimated Reduction Credits for Additional OSTDS Enhancement OR Sewering

$$D + E = F$$

Recharge	Outside the PFA (In the springshed) lots less than 1 acre			Outside the PFA (In the springshed) lots greater			Outside the PFA (In the springshed) All Lot Sizes		
	Number of OSTDS	Load Reductions Through AWT	Load Reduction Through Sewering	Number of OSTDS	Load Reductions Through AWT	Load Reduction Through Sewering	Total OSTDS Outside PFA	Total Reductions Through AWT	Total Reductions Through Sewering
High	880	4,149	6,065	425	2,004	2,929	1,305	6,153	8,994
Medium	2,172	5,690	8,316	973	2,549	3,725	3,145	8,239	12,041
Low	671	352	514	563	295	431	1,234	647	945
Total	3,723	10,191	14,894	1,961	4,848	7,085	5,684	15,039	21,980



Wastewater Treatment Facilities (WWTFs)

Current WWTF Policy from 2015 Wekiva BMAP		
Area	Nitrogen Concentration Limits for Rapid Infiltration Basins (RIBs) (mg/L)	Nitrogen Concentration Limits for Reuse and Package Plants (mg/L)
Primary Protection Zone	3	10
Secondary Protection Zone	6	10
Tertiary Protection Zone	Meet existing regulations	Meet existing regulations

Policy change would result in a reduction of approximately:

- Option 1 (PFA-wide policy) = +54,752 lb-N/yr or
- Option 2 (Springshed-wide policy) = +54,754 lb-N/yr

Table 4. DEP WWTF Policy in BMAP		
Disposal Volume (gpd)	Nitrogen Concentration Limits for RIBs and Absorption Fields (mg/L)	Nitrogen Concentration Limits for All Other Land Disposal Methods (mg/L)
Greater Than 100,000	3	3
20,000 to 100,000	3	6
Less Than 20,000	6	6



Urban Turfgrass

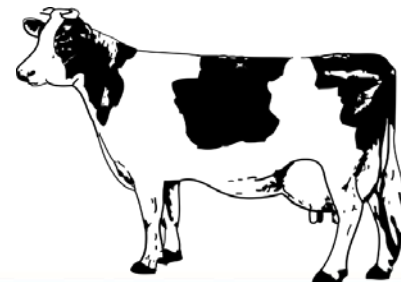
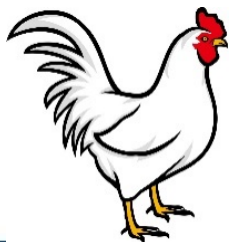
- *Urban/Sports Turfgrass Fertilizer (UTF)* –
 - Calculated the estimated reductions to groundwater for source control measures:
 - Florida Yards & Neighborhoods Program
 - Local ordinance (fertilizer, local pet waste ordinance, irrigation ordinance; local Florida-friendly (low irrigation and fertilizer) landscape ordinance)
 - Entities have the option to collect and provide monitoring data to quantify reduction credits for additional measures
 - e.g., Seminole County
 - Fertilizer Educational Outreach
 - Interconnected Online Calculators
 - Quantifying Long Term Impact





Agriculture

- *Farm Fertilizer (FF), Livestock Waste (LW), and Nurseries*
 - Calculated the reductions to groundwater from 100% owner-implemented best management practices (BMPs)
 - Calculated the reductions to groundwater from existing additional cost-share BMPs and special projects
 - Additional credits could be achieved through better documentation of reductions achieved through BMP implementation or implementation of advanced cost-share BMPs, such as precision irrigation, soil moisture probes, cover crops, and conservation easements





Ag Options to Reduce Remaining Load

Estimated Reduction Credits for Advanced Agricultural Practices

Action	Estimated Reduction Credit (lb-N/yr) High Recharge	Estimated Reduction Credit (lb-N/yr) Medium Recharge	Estimated Reduction Credit (lb-N/yr) Low Recharge
Precision Fertilizer	20,445	11,358	2,272
Precision Irrigation	696	387	77
Soil Moisture Probes	23,212	12,896	2,579
Cover Crops	22,141	12,301	2,460
Controlled Release Fertilizer (CRF)	5,790	3,217	643
Total Potential Reduction	72,284	40,159	8,031





Water Quality Monitoring

- Water quality monitoring –
 - Surface water & groundwater monitoring network
- Update water quality stations in the BMAP monitoring network and biological monitoring information
 - Frequency
 - Parameters
- Follow-up needed with all monitoring entities by March 30, 2018



Wrap Up

- Action Items
- Next steps
 - Draft revised BMAP document
 - Draft BMAP document out for public review
 - Public meeting on the draft BMAP document
(tentative late April/early May)
- Other comments/announcements



Thank you!