



Florida Department of Environmental Protection
Division of Environmental Assessment and Restoration

***Upper Wakulla River and
Wakulla Springs
Draft Basin Management
Action Plan (BMAP)***

August 31, 2015





Agenda

- Welcome and Introductions
- Brief Review
 - TMDL
 - BMAP Approach
 - Trends – Water Quality and Biology
- Overview of Revisions since the Previous Draft BMAP
- Florida Department of Health (FDOH) Update: Nitrogen Reduction Strategies Study
- BMAP Schedule
- Questions and Wrap Up



Upper Wakulla River Total Maximum Daily Load (TMDL)

WBID	Parameter	TMDL Target (mg/L)	TMDL % Reduction
Upper Wakulla River (WBID 1006)	Nitrate, as monthly average	0.35	56.2%

- Stream Condition Index (SCI) scores indicated poor biological conditions
 - Impaired based on failing scores between February 2000 and May 2007
 - Biological community is affected by excessive algal mats linked to elevated nitrate concentrations
- Nitrate concentrations in the springshed are elevated as a result of anthropogenic sources
 - Impaired for nitrates



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- Wakulla BMAP Basin Geopolitical**
- Map prepared July 31, 2013 by the Watershed Recorder Program, Division of Environmental Assessment and Restoration. This map is not for legal decision making purposes. For more information or copies, contact Stephen Ciolek at 850-244-8113 or Stephen.Ciolek@dep.state.fl.us. ©2013, revised by Stephen Ciolek.
- Legend:**
- ★ Wakulla Spring
 - ★ Spring Creek
 - Cody Scarp Line
 - Wakulla BMAP Boundary
 - Wakulla Priority Focus Area (PFA1) & (PFA2)
 - WBID 1006
 - Springs Protection Zones
 - Tallahassee
 - County Boundaries



BMAP Approach

- Phased BMAP
 - Total reductions addressed in five-year increments
 - Implementation of management strategies
 - Simultaneously monitor and conduct studies



First BMAP Iteration

- Management strategies will focus on the PFAs
- More work is needed with on-site treatment and disposal systems (OSTDS) sources, and will be further addressed with the OSTDS Initiative



Future Iterations

Discussions with stakeholders to identify additional management strategies, as needed

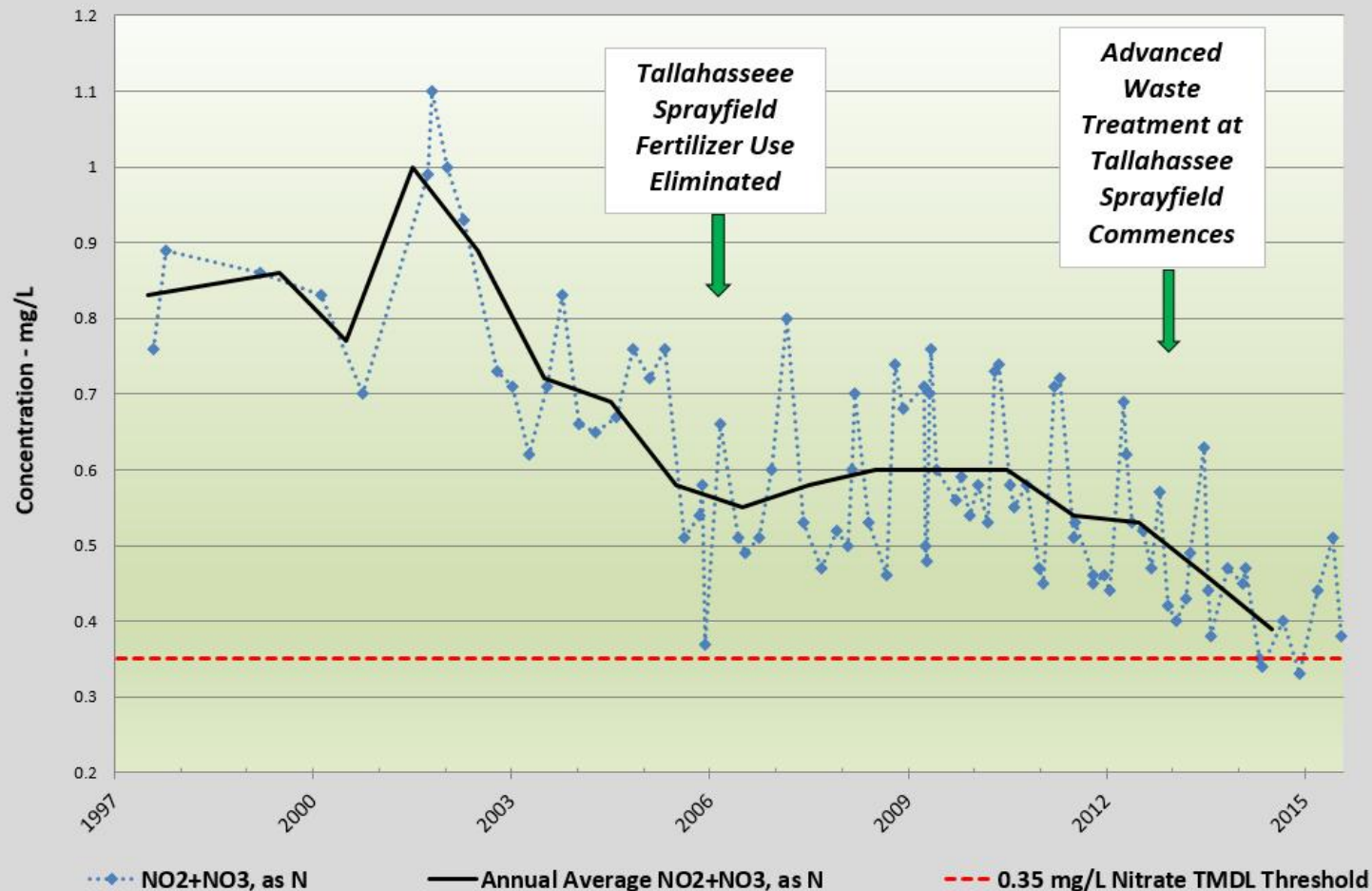


Water Quality and Biological Community Trends



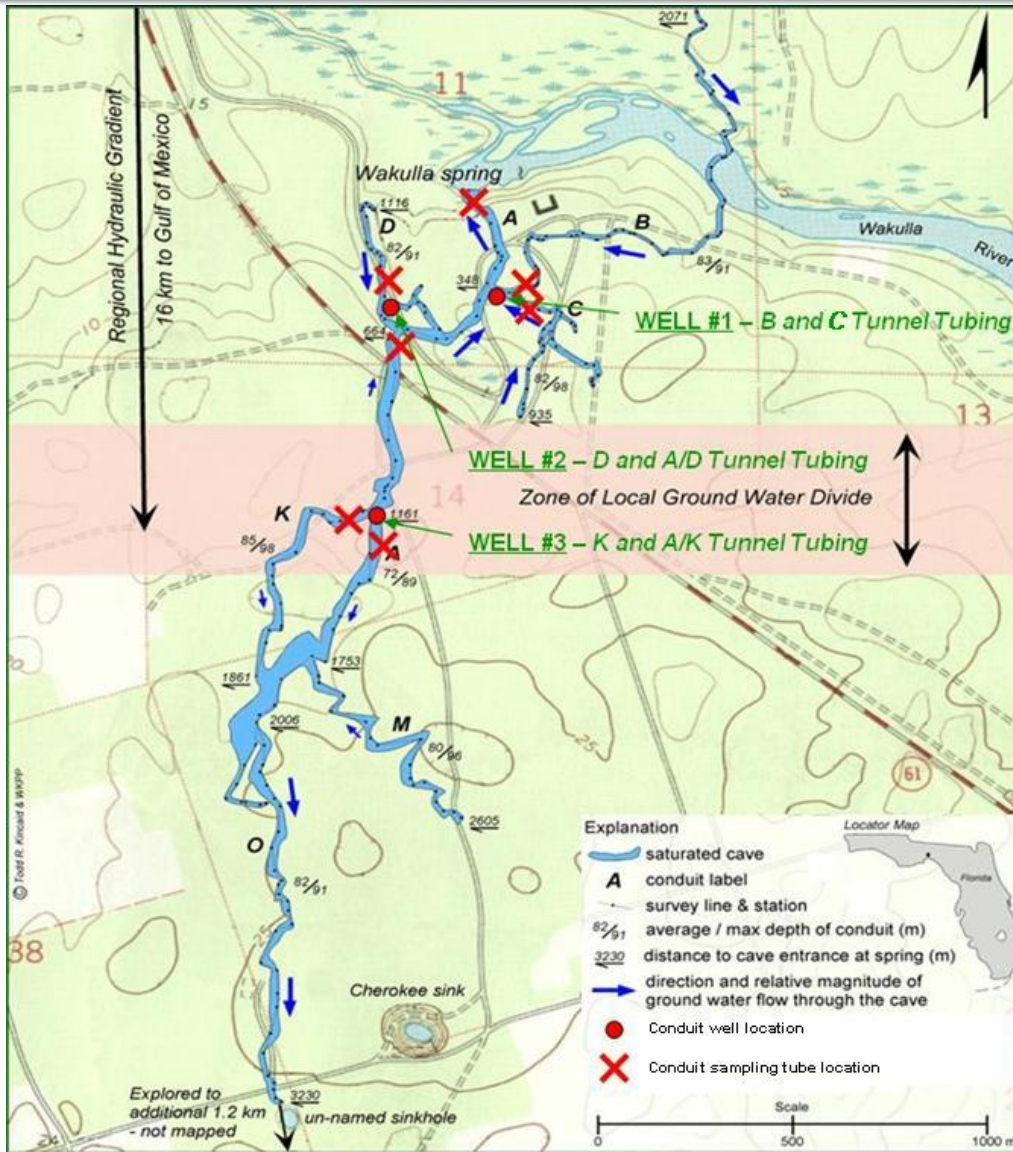
Wakulla Main Spring Nitrate-Nitrite Trend 1997-2015

Wakulla Main Spring Nitrate Concentrations





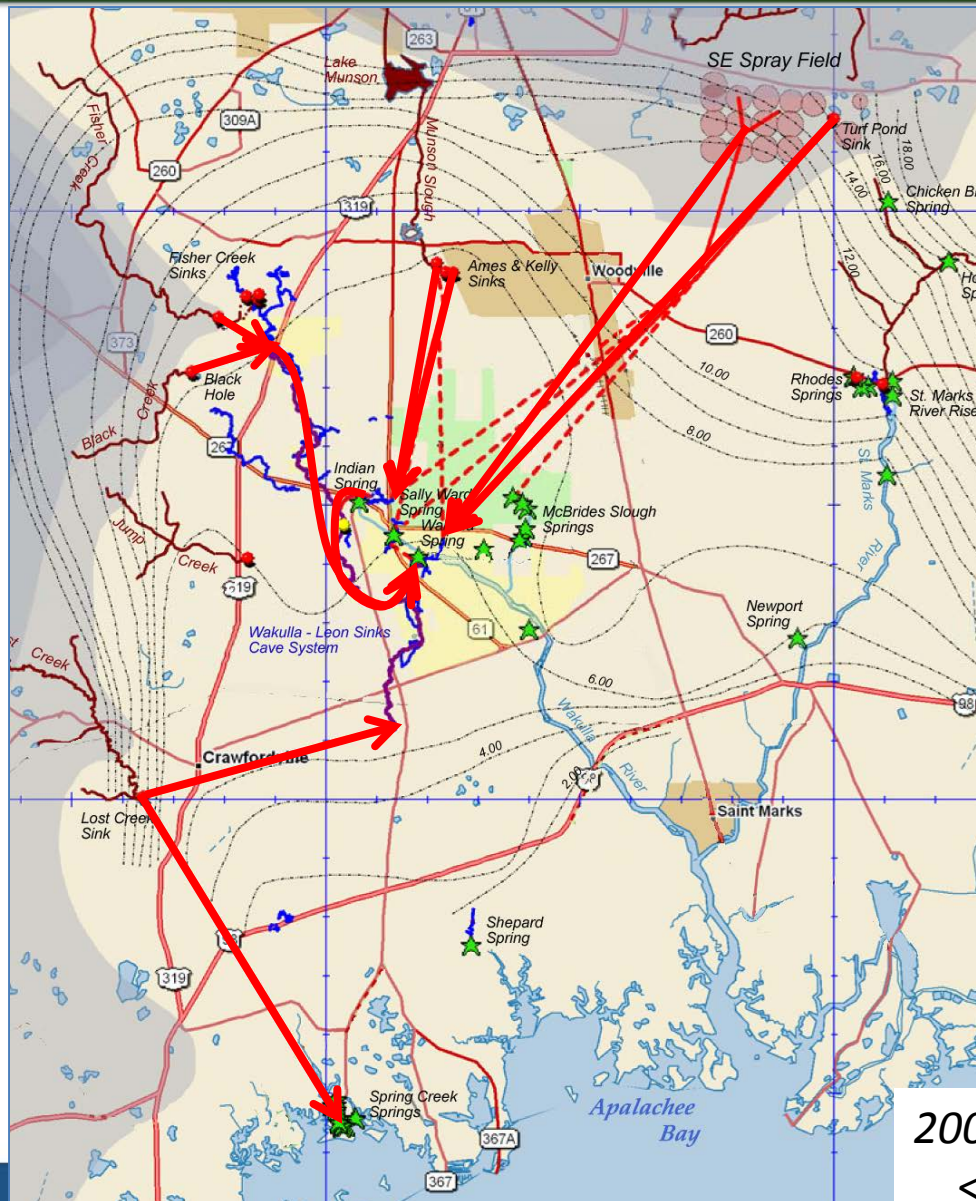
Wakulla Cave Access Well Locations



Well #3: K- and A/K-Tunnel access



Wakulla Ground Water Tracing History



2002: Fisher Creek – Emerald Sink
2,680 m / 56 hours (820 m/day)

2003: Black Creek – Emerald Sink
2,576 m / 76 hours (810 m/day)

2004: Emerald Sink – Wakulla Spring
16,550 m / 7.1 day (2,337 m/day)

2005: Kelly Sink – Indian Spring
8,400 m / 13.5 days (622 m/day)

2005: Ames Sink – Indian Spring
8,400 m / 17.2 days (506 m/day)

2005: Indian Spring – Wakulla Spring
8,790 m / 5.9 days (1,490 m/day)

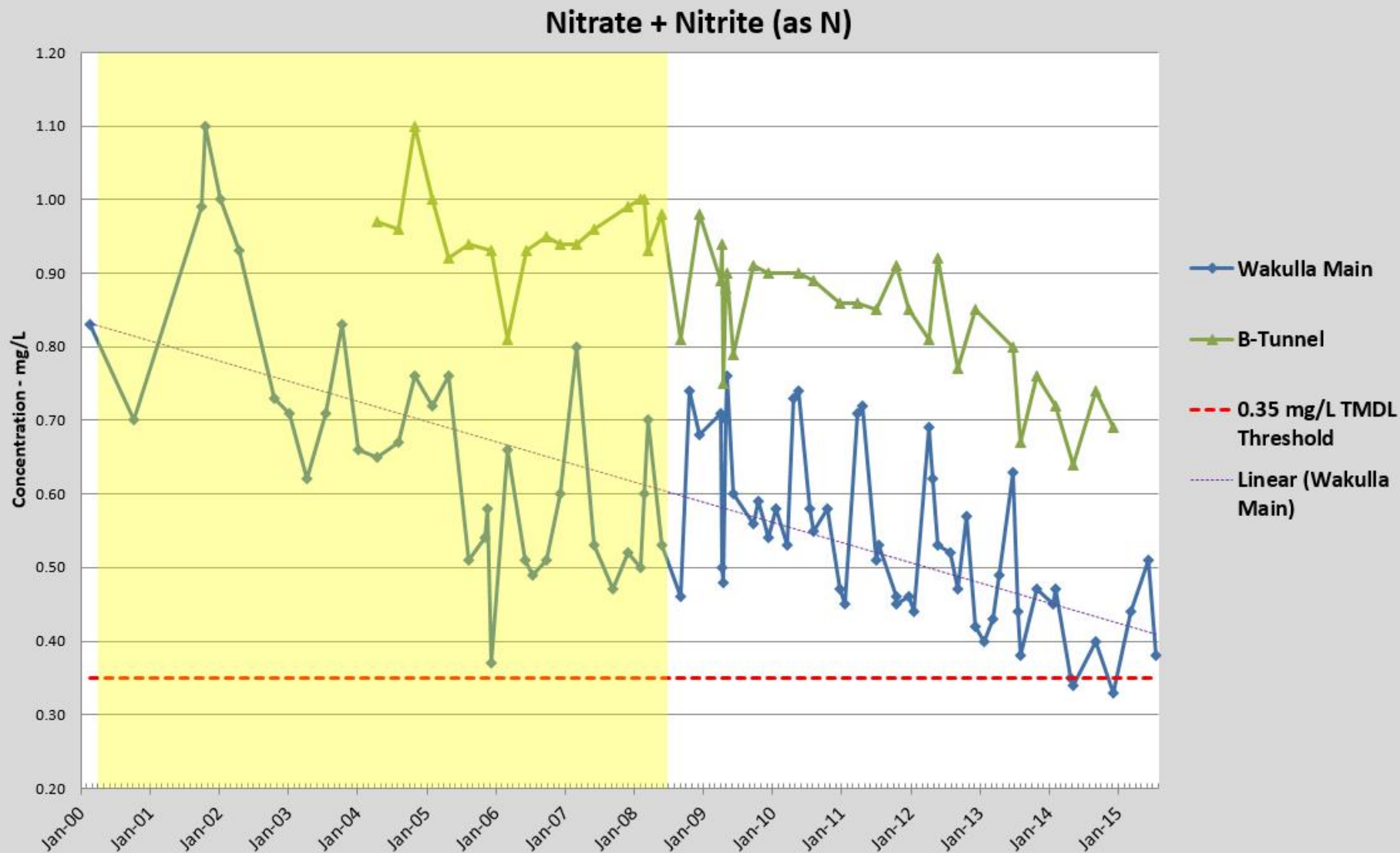
2006: Wells – Wakulla Spring
16,800 m / 66.5 days (252 m/day)
16,800 m / 56 days (300 m/day)

2006: Turf Pond – Wakulla Spring
17,500 m / 56 days (312 m/day)

2008: Lost Creek – Spring Creek & Wakulla Spring
< 7 days / > 2 weeks

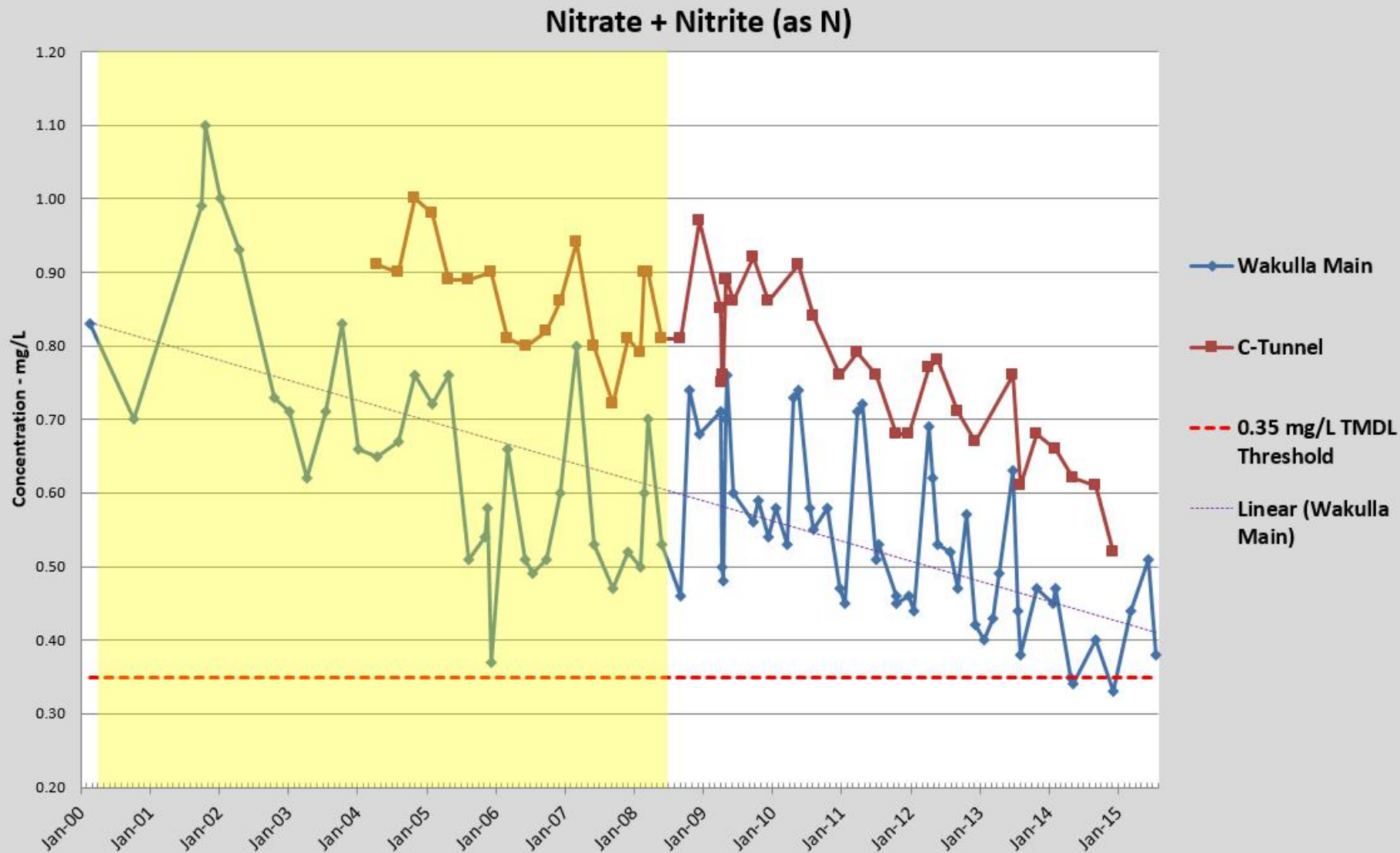


Wakulla B-Tunnel Nitrate-Nitrite Trend



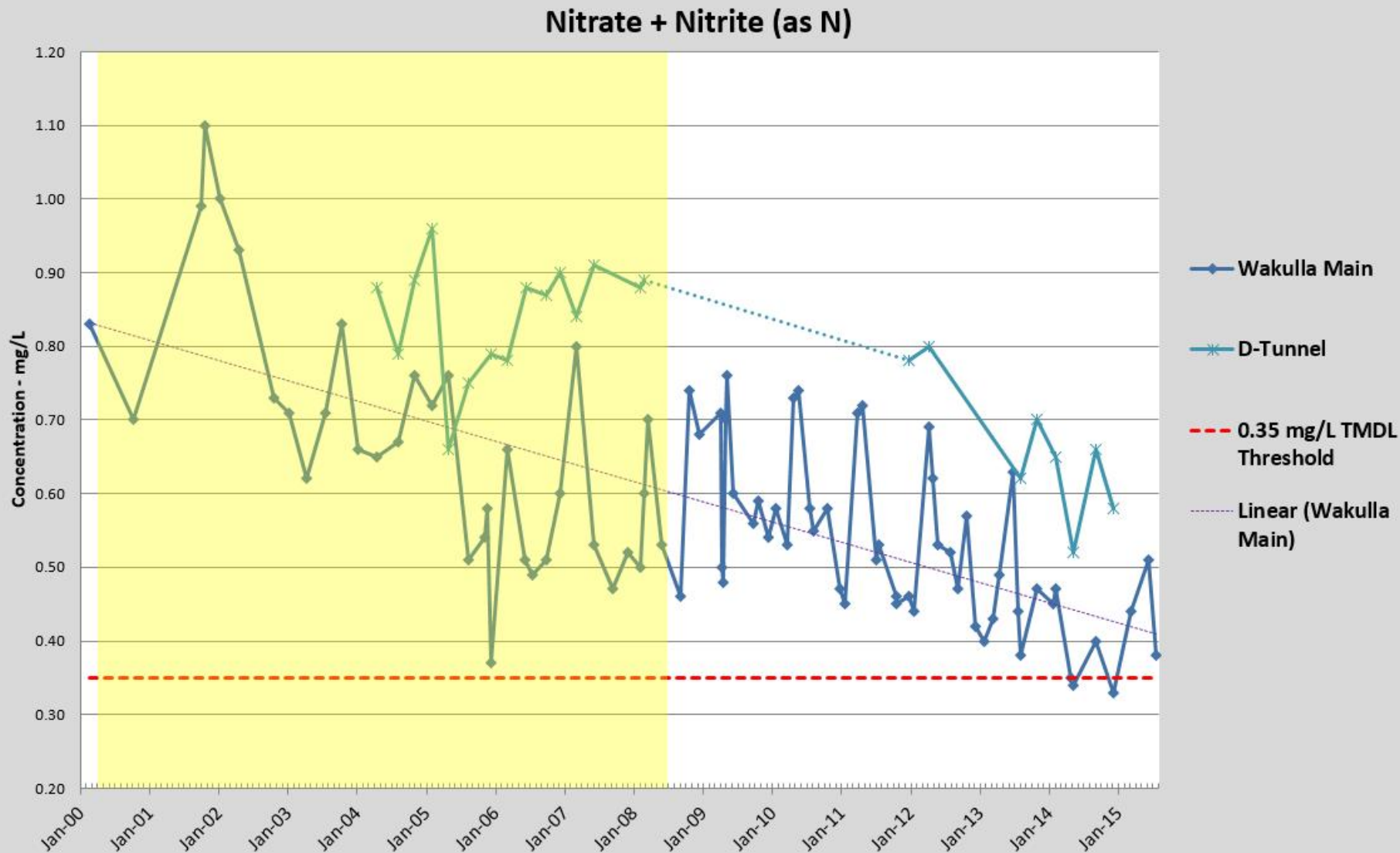


Wakulla C-Tunnel Nitrate-Nitrite Trend



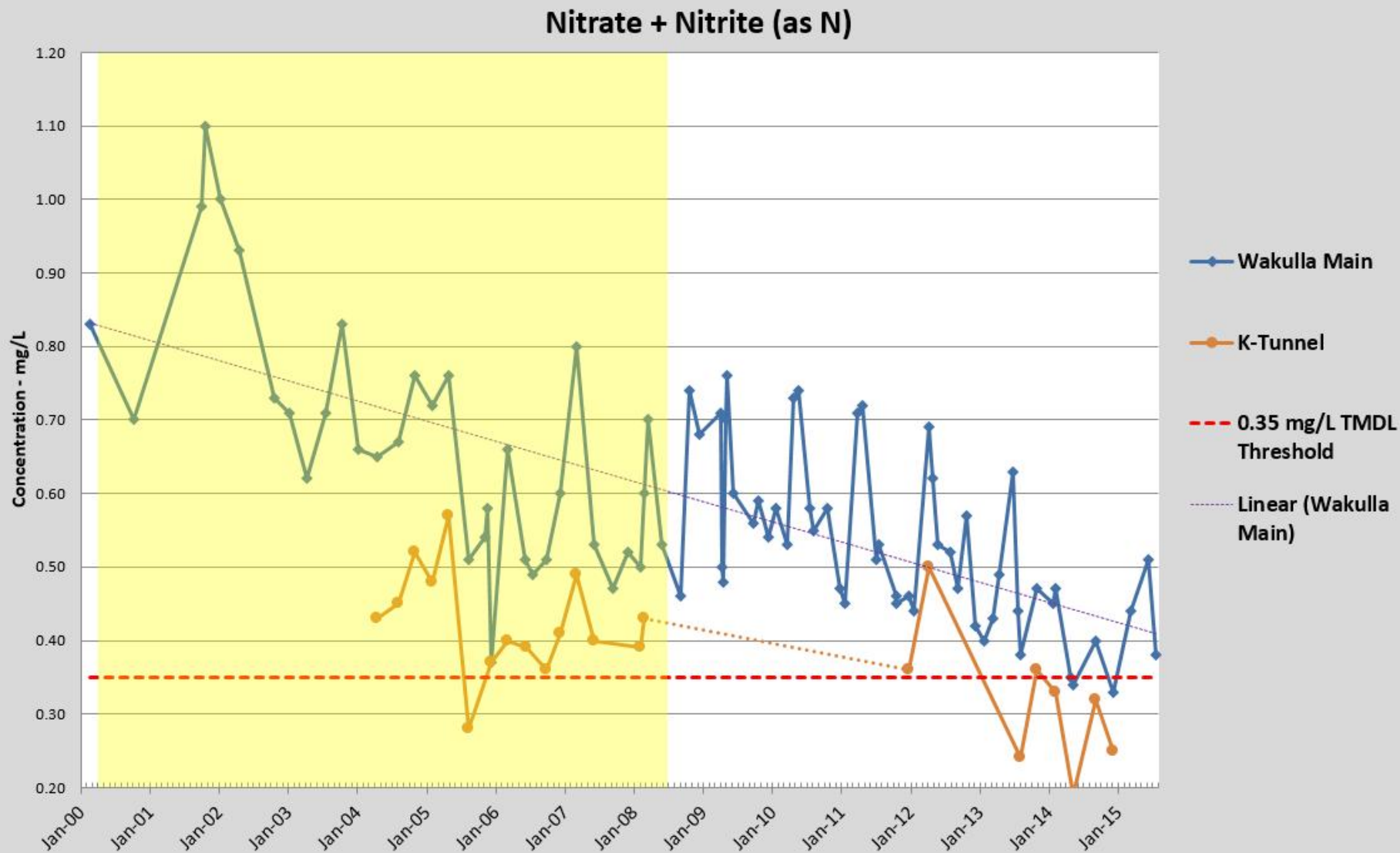


Wakulla D-Tunnel Nitrate-Nitrite Trend



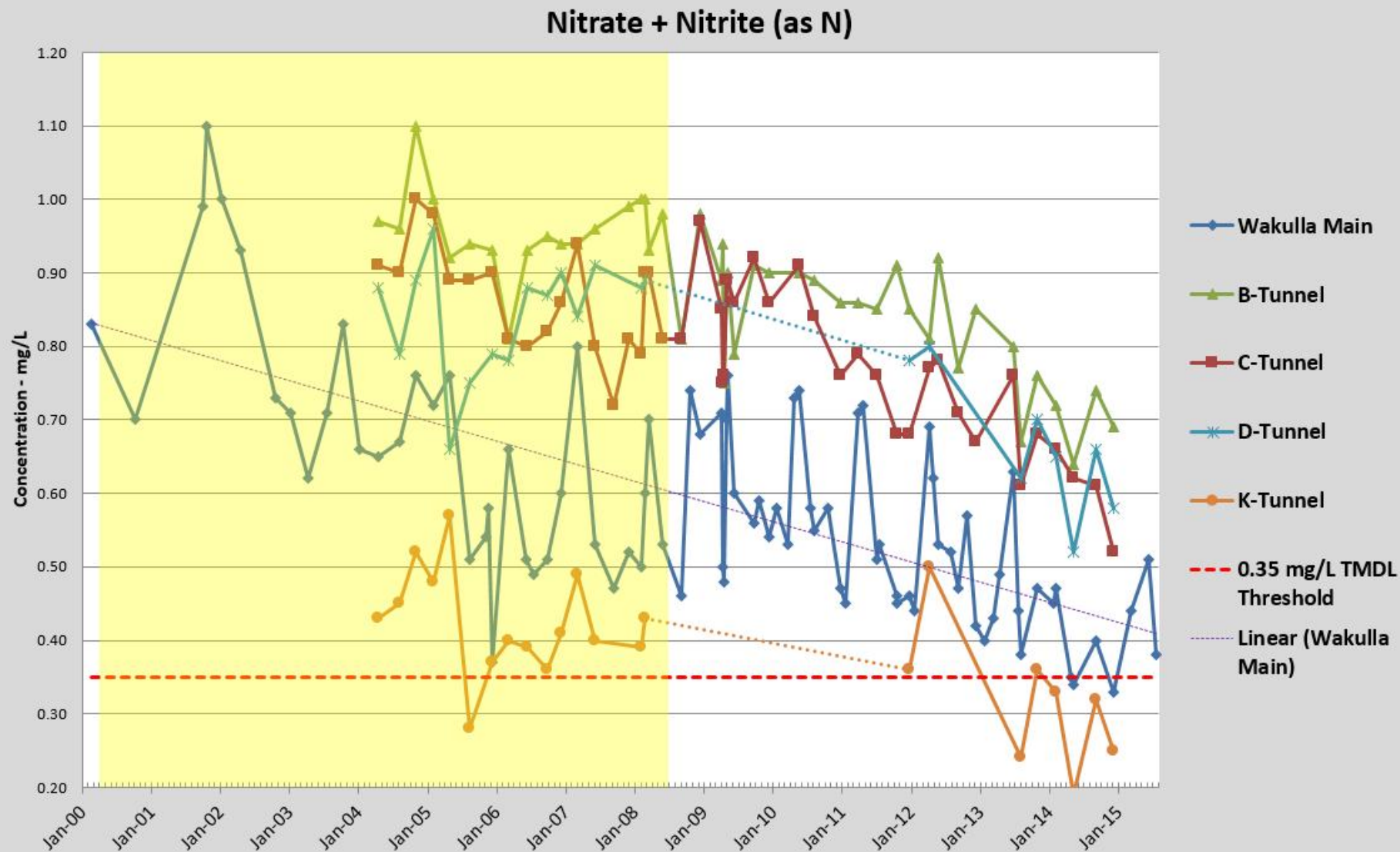


Wakulla K-Tunnel Nitrate-Nitrite Trend





Wakulla Tunnels Nitrate-Nitrite Trend

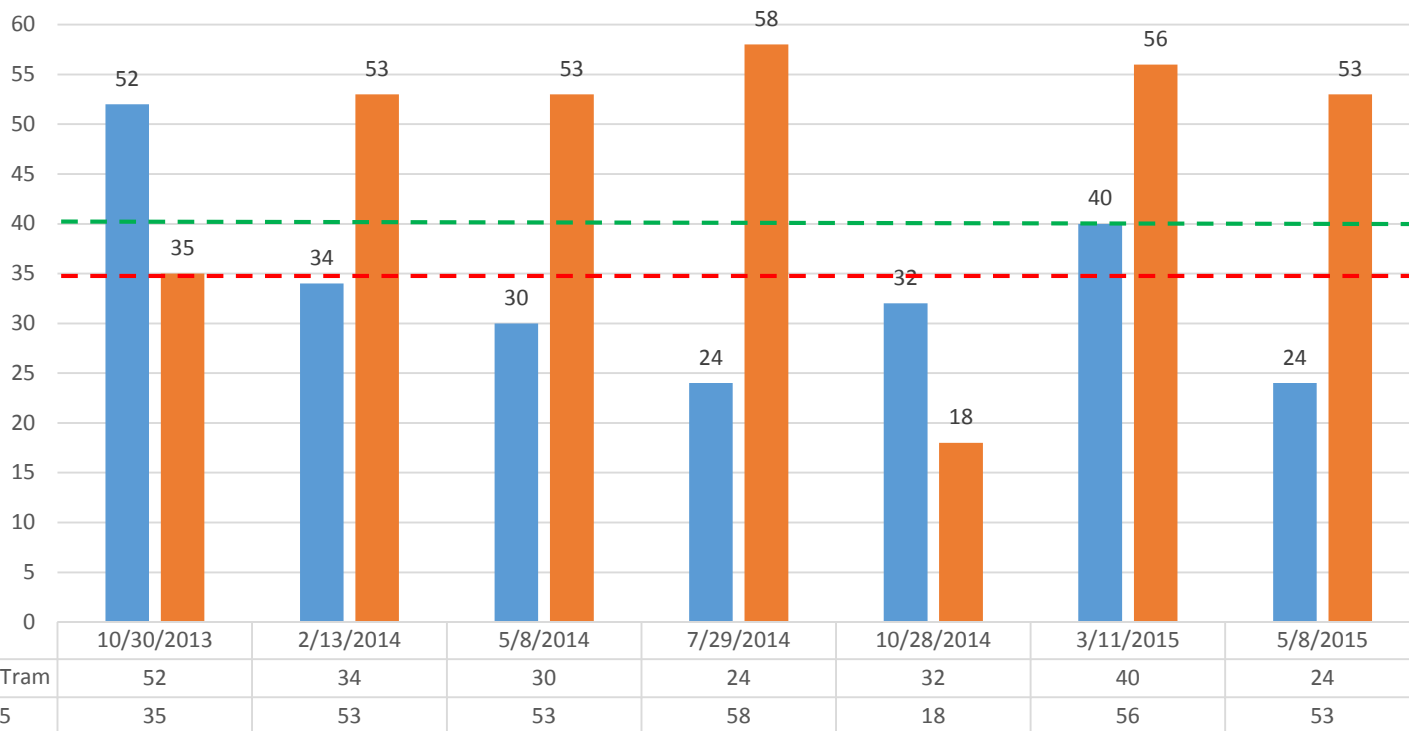




Biological Community Trends

SCI Results

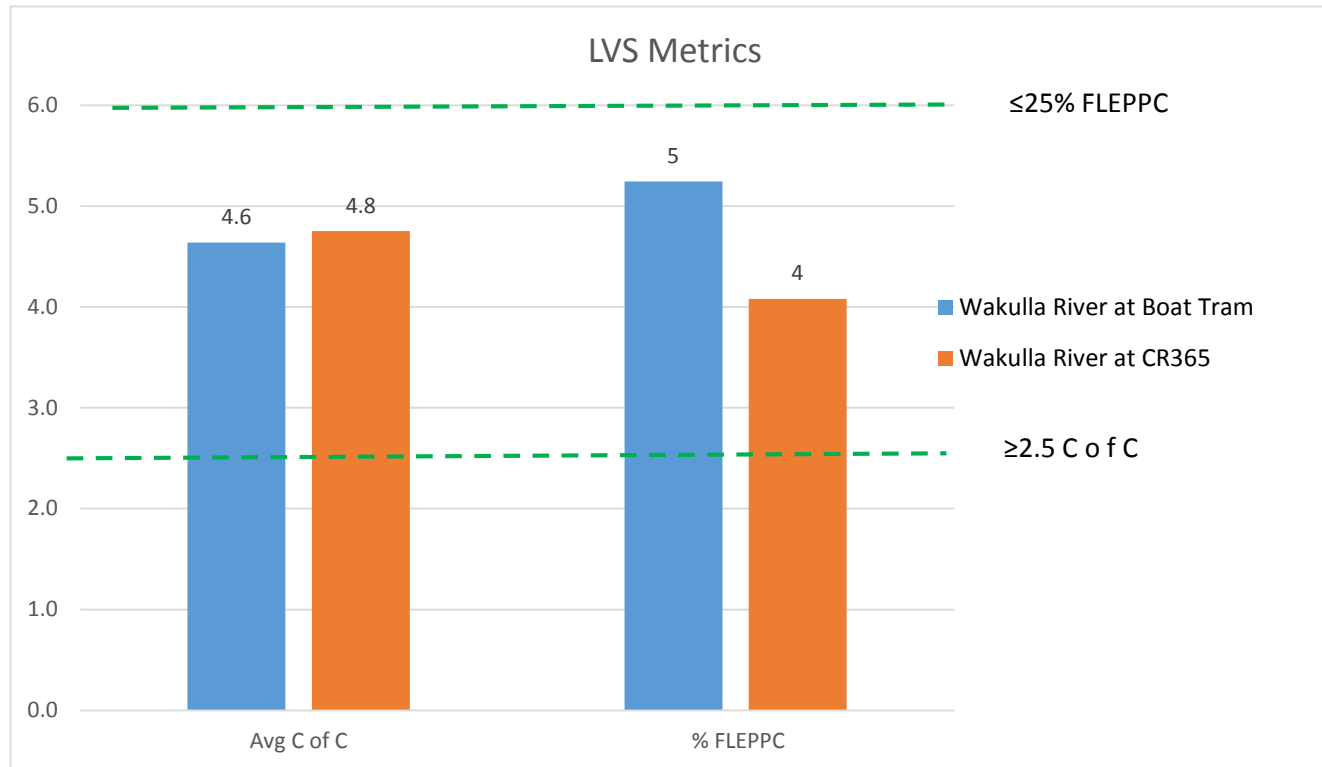
SCI_2012 Scores



■ Wakulla River at Boat Tram ■ Wakulla River at CR365



Biological Community Trends LVS Results

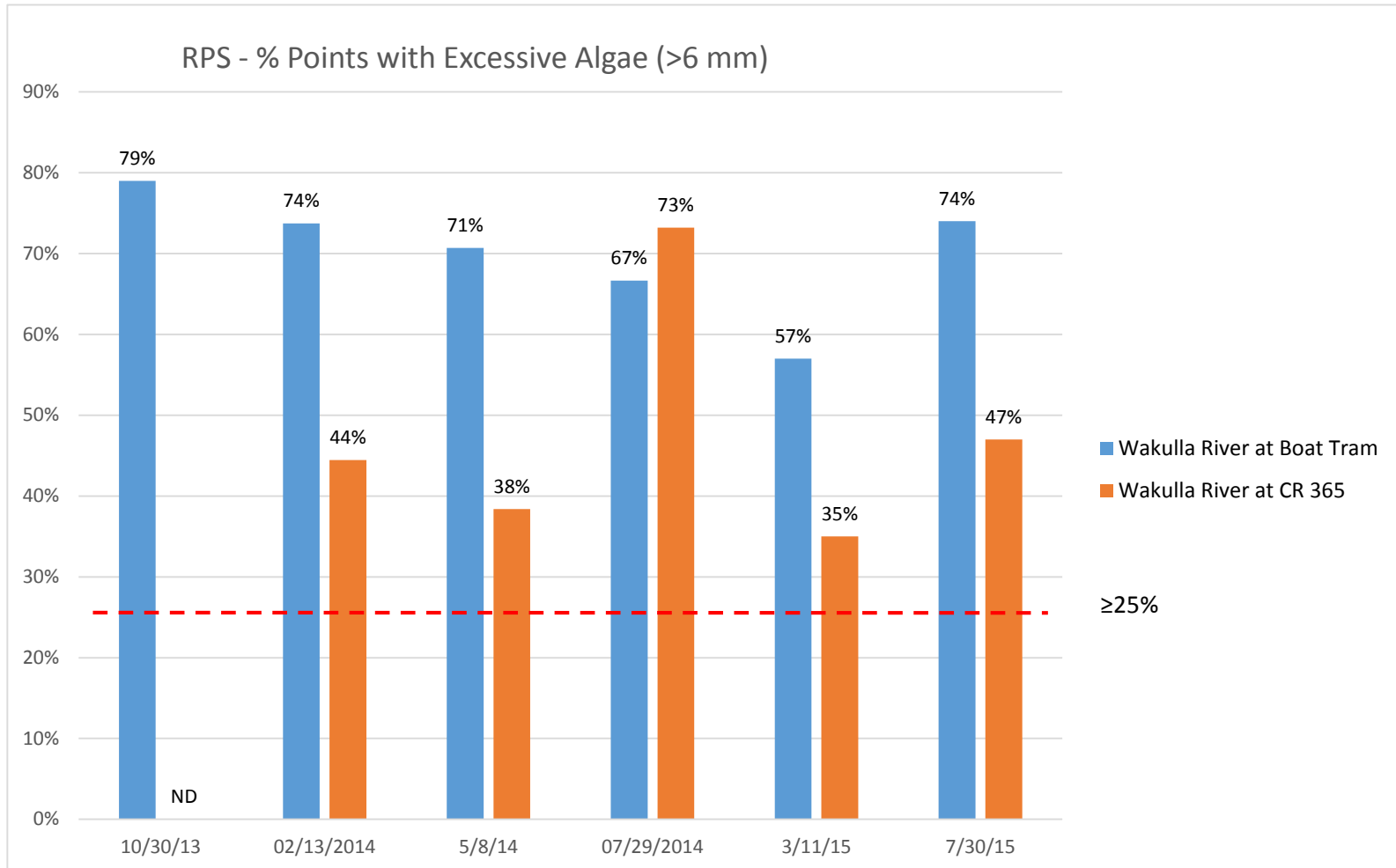


Date Sampled	Wakulla River at Boat Tram		Wakulla River at CR365	
	Avg C of C	% FLEPPC	Avg C of C	% FLEPPC
10/30/2013	4.5	9	4.4	7
2/13/2014	4.6	6	5.1	0
5/8/2014	4.8	3	4.5	6
7/29/2014	4.0	13	4.9	6
3/11/2015	4.8	0	4.7	0
7/30/2015	5.2	0	4.9	6



Biological Community Trends

RPS Results





Major Document Revisions Since Previous Draft



OSTDS (Wastewater) Initiative

- Goal
 - Develop and implement management strategies necessary to reduce nutrient loading from OSTDS
 - Effective and financially feasible strategies
 - Realistic timeframe
- Advisory Committee
 - Florida Department of Environmental Protection (DEP) organized, will include
 - FDOH, utilities, government, businesses, homeowners, community and environmental groups, etc.
 - Enhance communication and coordination among interested entities
 - Implement initiative



OSTDS Initiative (cont'd.)

Objectives

- Identify, collect and evaluate scientific information
- Develop education plan
- Identify and develop an OSTDS Plan

Plan

- Prioritize areas where greatest risk exists
- Determine areas of opportunity (cost/benefit ratio)



OSTDS Plan Development

- After BMAP adoption
 - Within three months:
 - Initial technical meeting to present methodology and geographic data
 - Within three years:
 - OSTDS Plan will be developed identifying specific projects to achieve nutrient reductions
 - OSTDS Plan will be consistent with BMAP obligations required in municipal separate storm sewer system (MS4) permits
- The timing of the implementation of plan components may be subject to change
- The OSTDS Plan will be reviewed and updated annually

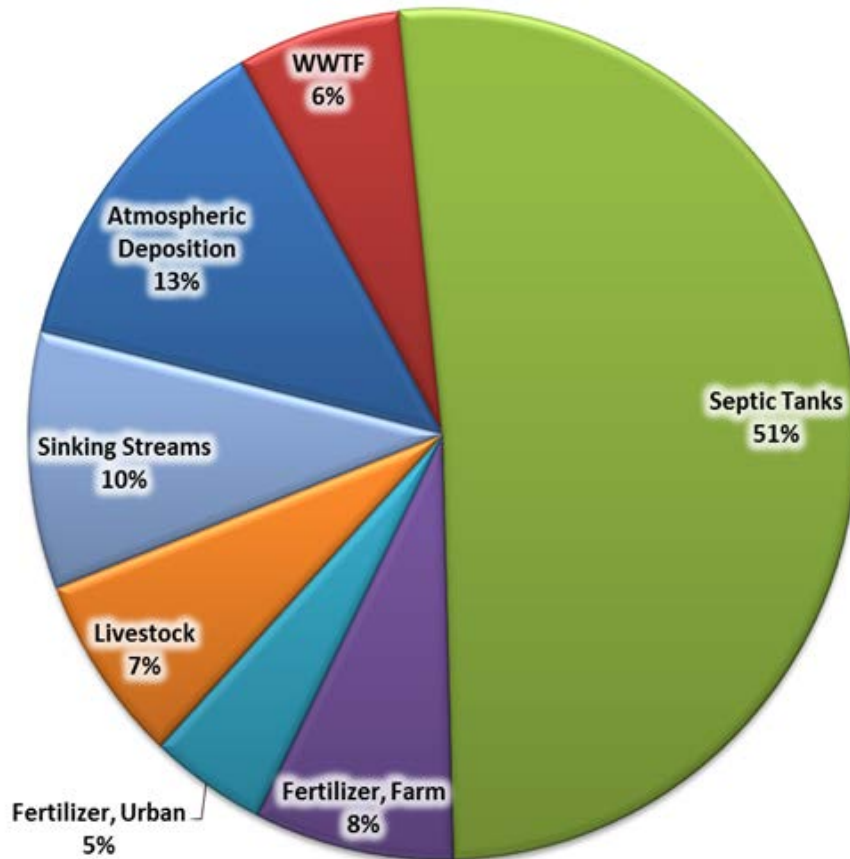


Nitrogen Source Inventory and Loading Tool (NSILT)

- Planning tool that provides the best available assessment of where nitrogen is currently being applied in the BMAP area
- Estimates nitrate loads from several sources:
 - Atmospheric deposition
 - Sinking streams
 - Agricultural and nonagricultural fertilizer
 - Livestock waste
 - Septic systems
 - Wastewater application
- Developed to accomplish the following:
 - Identify and quantify the most significant contributing nitrogen sources to ground water in springsheds
 - Assist stakeholders and the department in identifying locations where future projects will have the greatest impact in reducing nitrogen loads



NSILT: Summary of Loading to Ground Water



- Figure shows relative contribution of major sources of nitrogen to ground water
- An estimated 342,048 kg/yr of N enters the ground water in the BMAP basin



BMAP Review Process

Action	Involved Parties	Date
Revised Draft BMAP for stakeholder and public review	Department	August 24, 2015
Public workshop on the BMAP	Department and Public	August 31, 2015
Public comment period ends	Department	September 14, 2015

Action	Date
Brief Department management on BMAP	Late-September 2015
Brief Department Deputy Secretary on BMAP	Mid-October 2015
Brief Department Secretary on BMAP and obtain Secretarial approval/Notify interested parties	Mid-October 2015
BMAP becomes final and effective 21 days after Secretarial approval	Mid-November 2015

An aerial photograph of a winding river or stream flowing through a dense, lush green forest. The water is a deep blue color. On the right bank, there is a small, light-colored sandy area with a dock and a boat. The text "Thank you!" is overlaid in the center of the image in a large, white, sans-serif font.

Thank you!