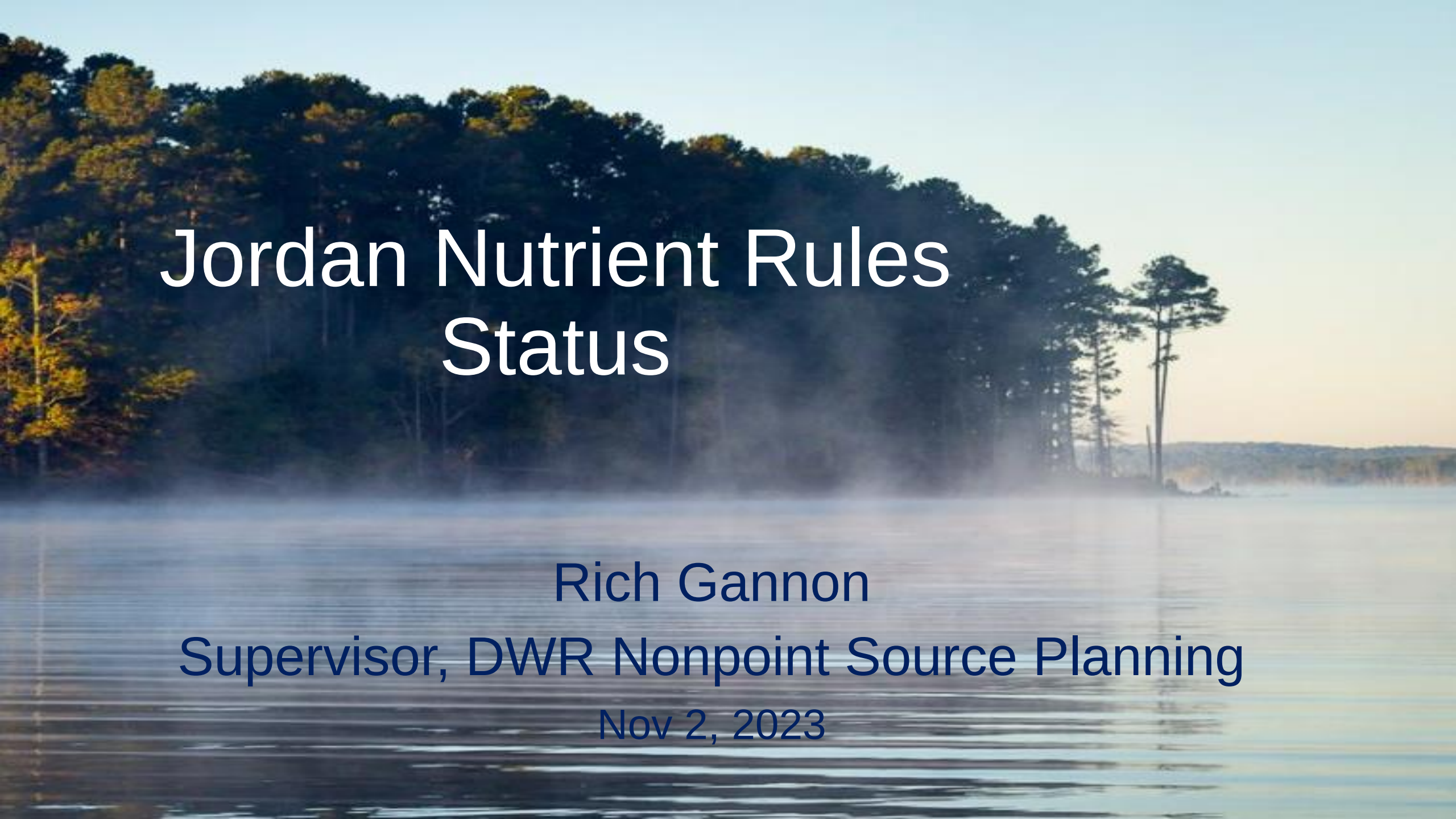


Jordan Nutrient Rules Status

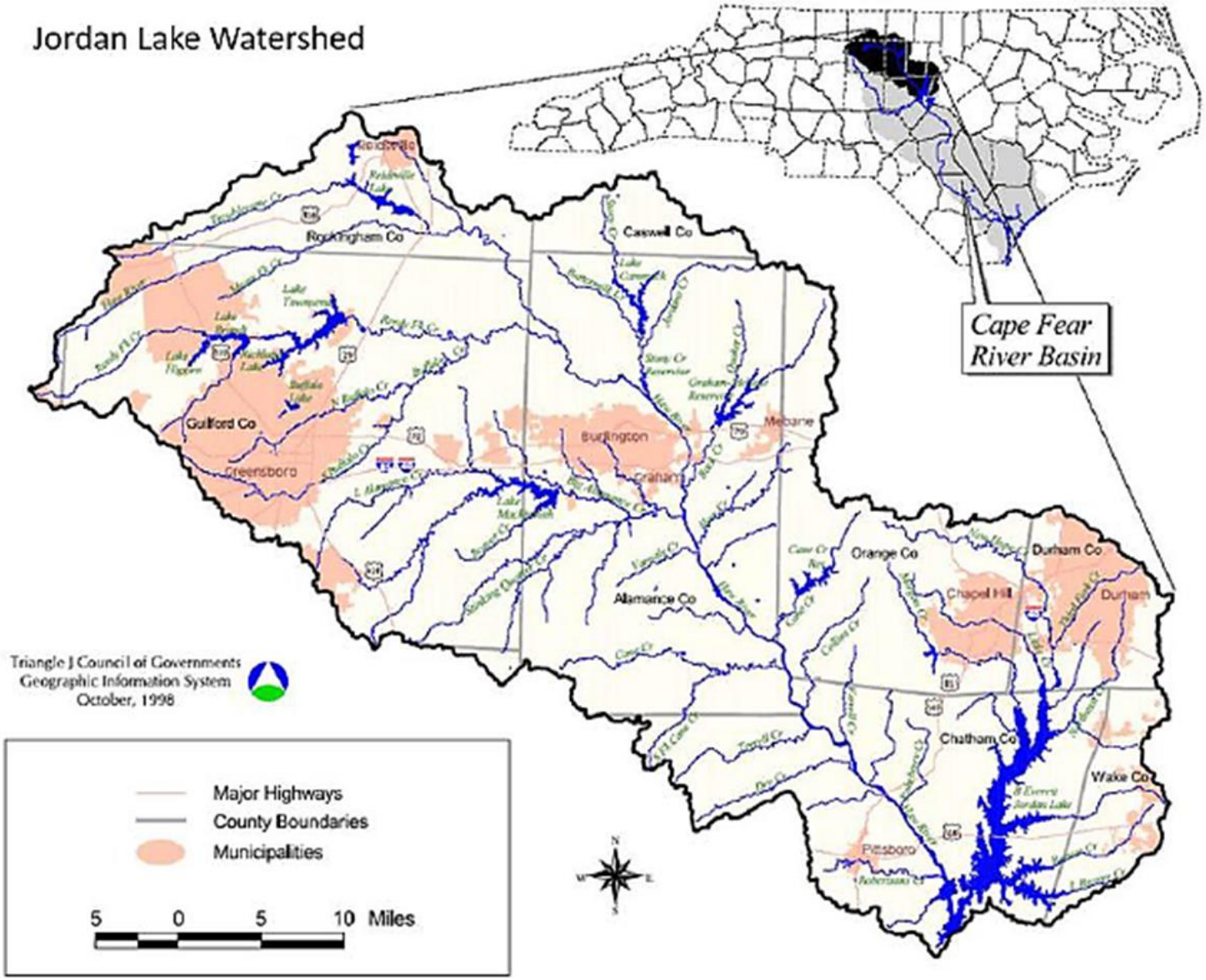
Rich Gannon

Supervisor, DWR Nonpoint Source Planning

Nov 2, 2023

Talk Outline

1. Review nutrient strategy history
2. Status of Rules Implementation
3. Collaboratory report highlights
4. Engagement-rulemaking schedule


Jordan Lake Watershed
Cape Fear River Basin
Rockingham Co
Caswell Co
Guilford Co
Alamance Co
Orange Co
Durham Co
Chatham Co
Wake Co
Greensboro
Burlington
Graham
Mebane
Chapel Hill
Durham
Pittsboro
Triangle J Council of Governments
Geographic Information System
October, 1998
Major Highways
County Boundaries
Municipalities
5 0 5 10 Miles

Jordan Timeline to Date

1983 – present	Lake consistently over-enriched
2002, 2005	Lake arms officially impaired for chl-*a*
1999-2003	Dischargers develop lake model
2003-2006	Collaborative stakeholder processes –> rule concepts
2008; 2009	EMC adopts rules; Legislature modifies, enacts
2009 – present	**Rules implemented**
2011 – 2018	Session laws modify, delay or study rules & alternatives
2017-2019	UNC Collaboratory studies
2021-2023	Supplemental lake model refinements, UNC-C

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Session Laws Modifying Jordan Rules

- SL 2009-216– replaced Existing Dev. Rule
- SL 2009-484 – modified New Dev., buffer rules
- SL 2011-394 – delay WW TN compliance date
- SL 2012-187 – modify WS-IV standards
- SL 2012-200 – delay New Dev. Implementation
- SL 2013-360, 2013-395 – Solarbees, 3-yr delay
- SL 2015-241 - +3-yr delay, extend Solarbees

- SL 2016-94:
  - End Solarbee in situ demo, repeal 2015 3-yr delay
  - New In Situ study – algaecide, phos-lock; report March 2018
  - **Mandates UNC Collaboratory 3-yr study of Jordan strategy – to report Dec 2018**
  - Begin readopting Jordan rules Mar 2019 based on UNC study
  - **Interim bar on Jordan stormwater rules implementation**
  - Several policy studies, reports
- SL 2018-5
  - **Extends UNC Collaboratory study to Dec 2019**
  - **Adds Lake and watershed modeling requirement, funds; gives 1 year**

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Jordan Rules Overview

- Establish lake nutrient loading goals (% reduction, lb/yr)
  - for each of 3 arms, vs. baseline period 1997-2001
  - Based on modeled input reduction needs to meet Chl-*a*
- Rule for each major nutrient source type throughout watershed
- Rules design: N, P performance targets – provide flexibility
- Trading options increase flexibility
- Rule-specific implementation / compliance timeframes

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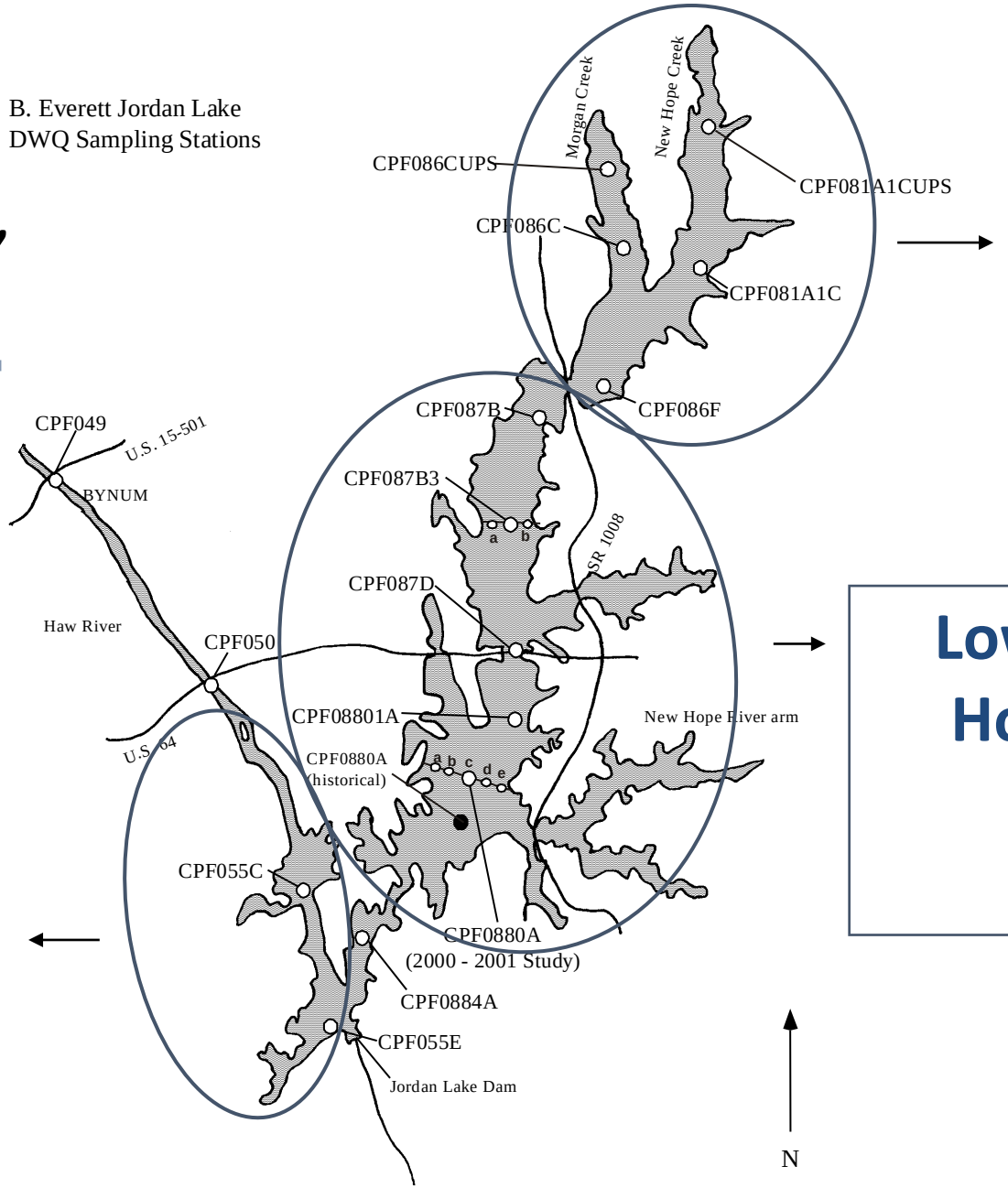
Jordan Lake - Two Separate Impairments, Three Sets of Goals

N and P % Reduction Goals

(relative to 1997-2001 baseline period)

B. Everett Jordan Lake
DWQ Sampling Stations



Upper New Hope Arm
35% N
5% P

Lower New Hope Arm
0% N
0% P

Haw Arm
8% N
5% P

Current Jordan Rules

Basic Requirements
Implementing Parties
Rule Status

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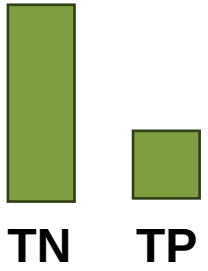
Wastewater (in effect)

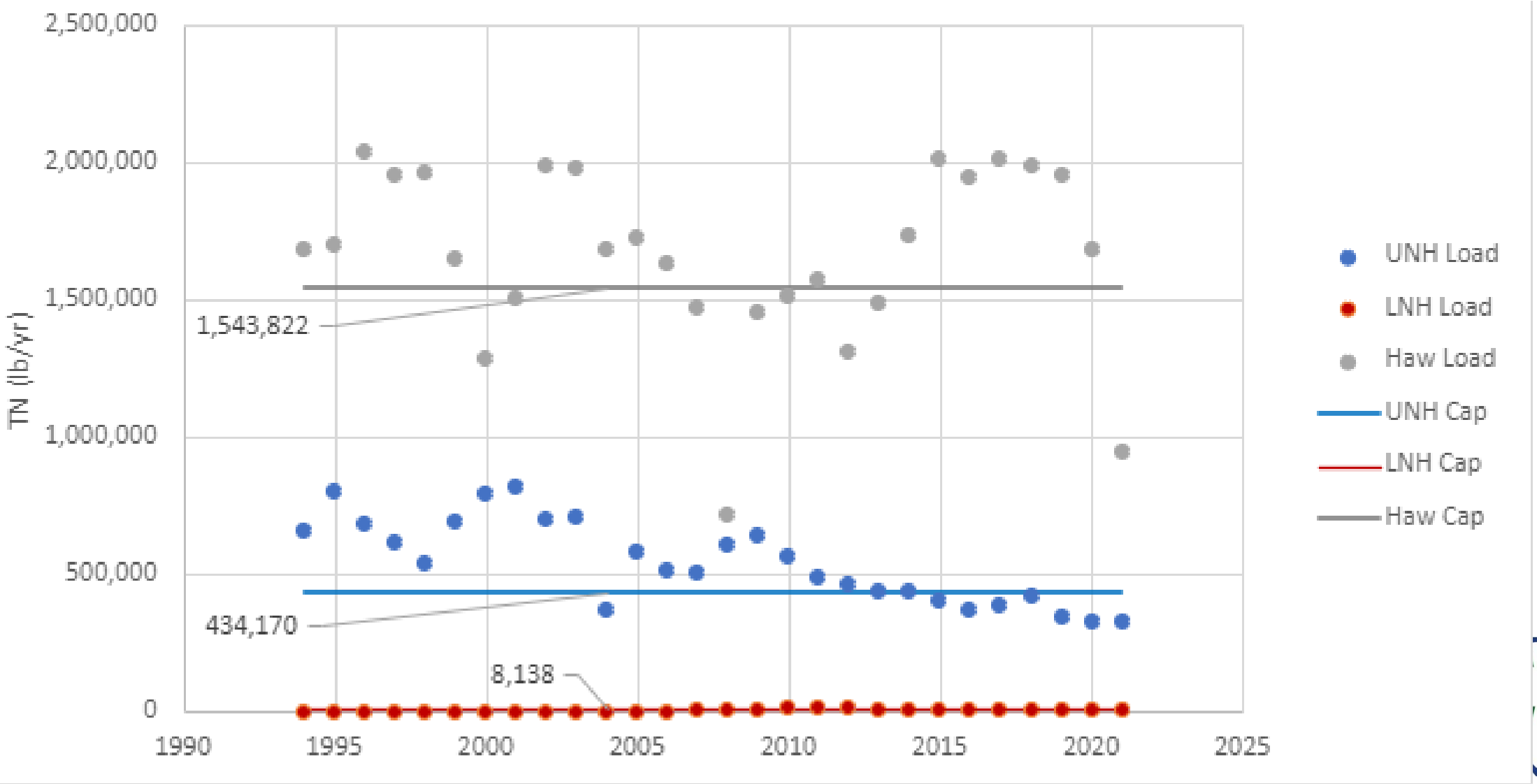
- Individual NPDES dischargers > 0.1 MGD – mostly POTWs, some industries
  - Haw ~10 (37); UNH 4 (9); LNH 1
- Existing facilities - Annual mass load N and P allocations (lb/yr)
- New facilities – obtain allocation + 3.0 mg/L N, .18 mg/L P at permitted flow



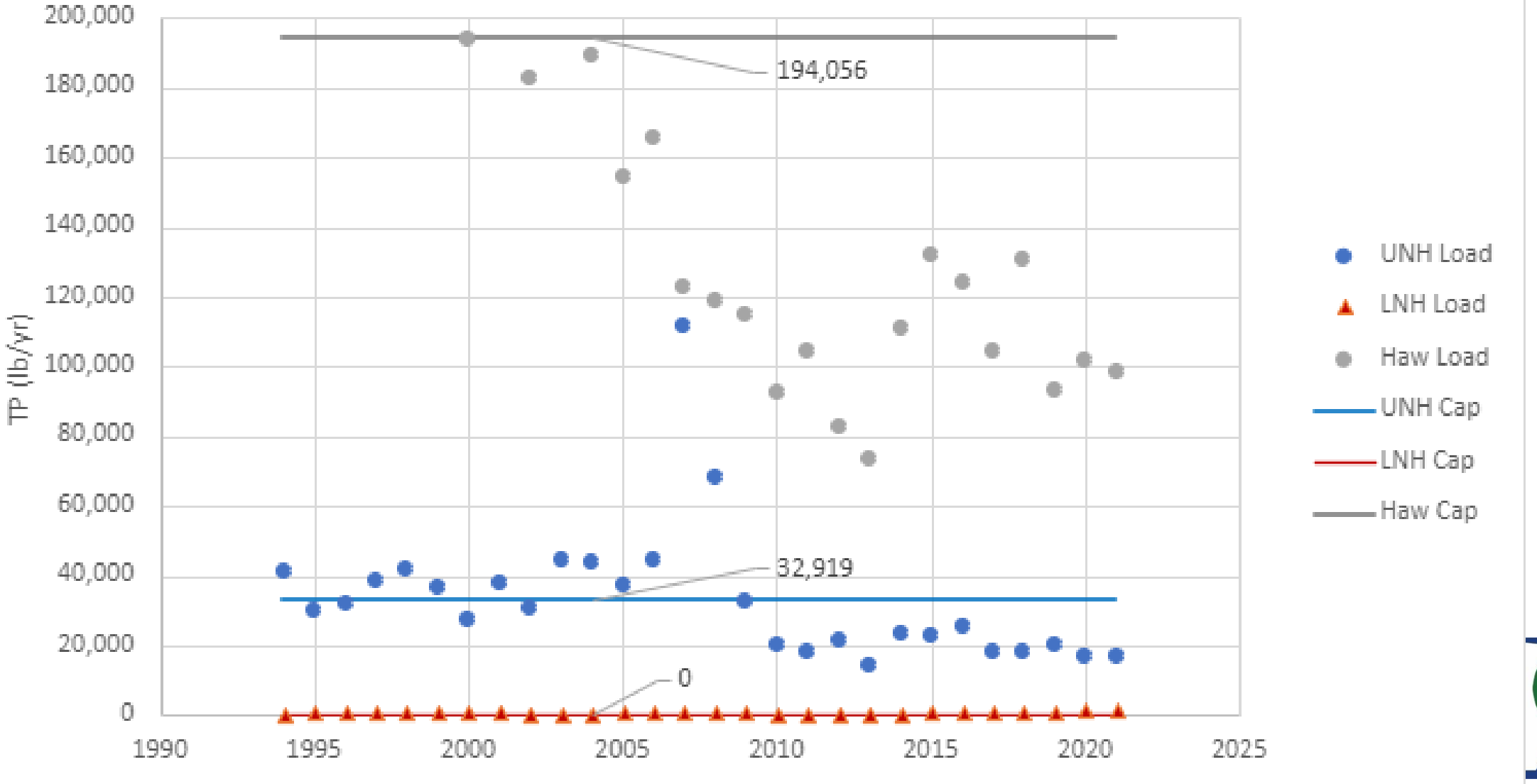
- Option - Group compliance association w/group permit
- DWR – Municipal NPDES Permitting Unit

- TP – compliance deadline – calendar 2010
- TN – compliance deadline - changed from 2016 to 2019

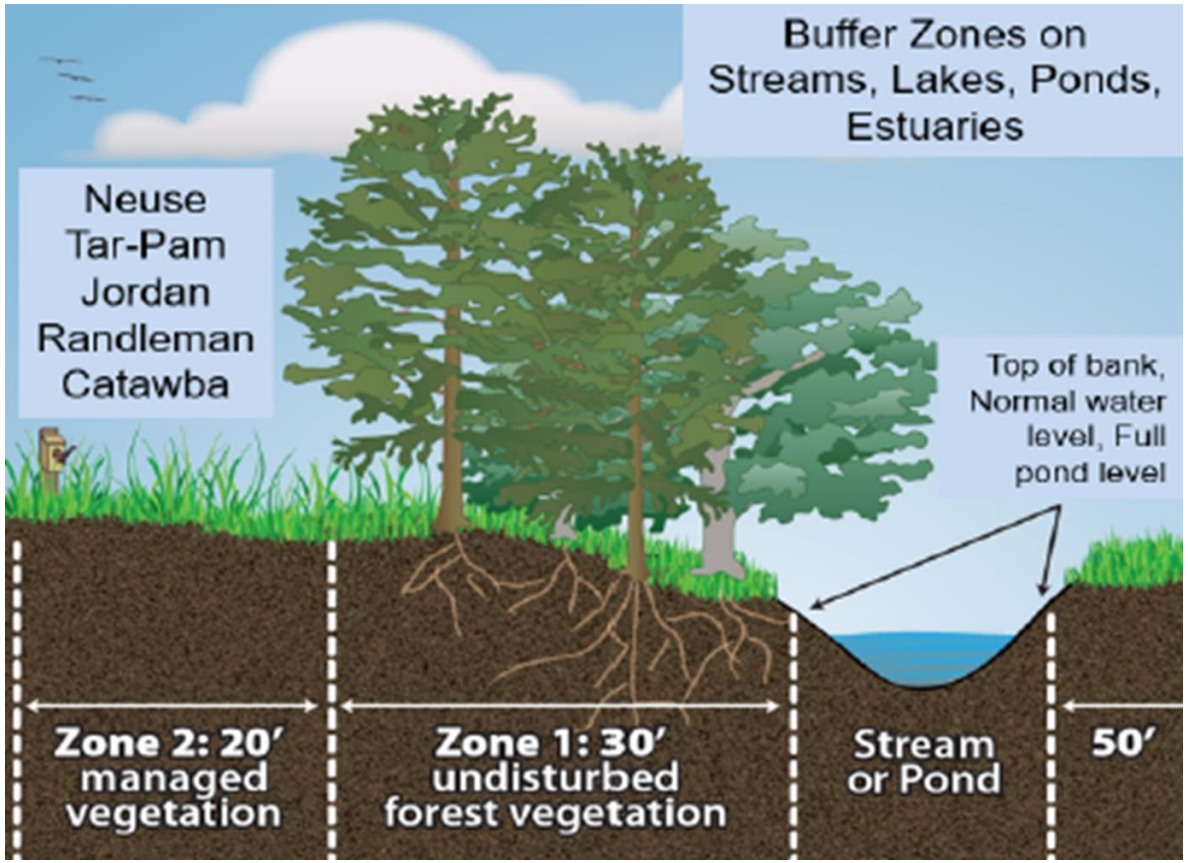
Jordan Wastewater TN Loads, 1994-2021
Subwatershed Totals, End-of-Pipe

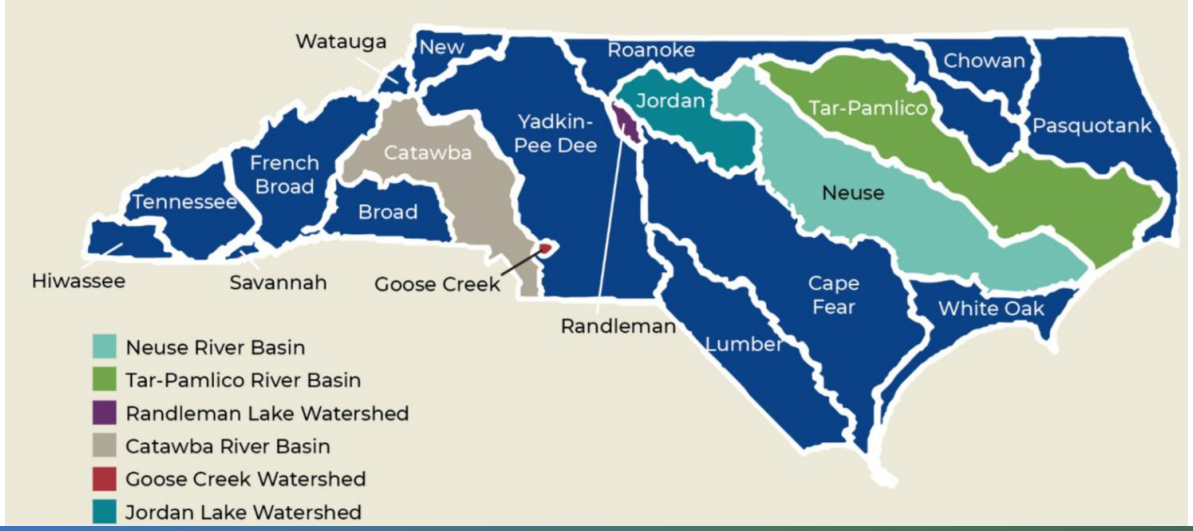


Jordan Wastewater TP Loads, 1994-2021
Subwatershed Totals, End-of-Pipe



Riparian Buffer Protection (in effect)





- Protects existing vegetated riparian zones across all land uses
- **50 ft protected**
  - Zone 1 – 30 ft
  - Zone 2 – 20 ft
- **Change in existing use of buffer invokes restrictions**
- **“Table of uses”** detailed list of activities allowed/prohibited.

Riparian Buffer Protection (in effect)

- Jordan local governments implement and enforce programs (most cases)
  - DWR – certain activities + where no preexisting local program
- DWR 401 & Buffer Permitting Branch
  - ‘audits’ for noncompliance, technical assistance

- Buffer Protection provisions changed but in effect in 2009, local gov plans began implementing in 2011.

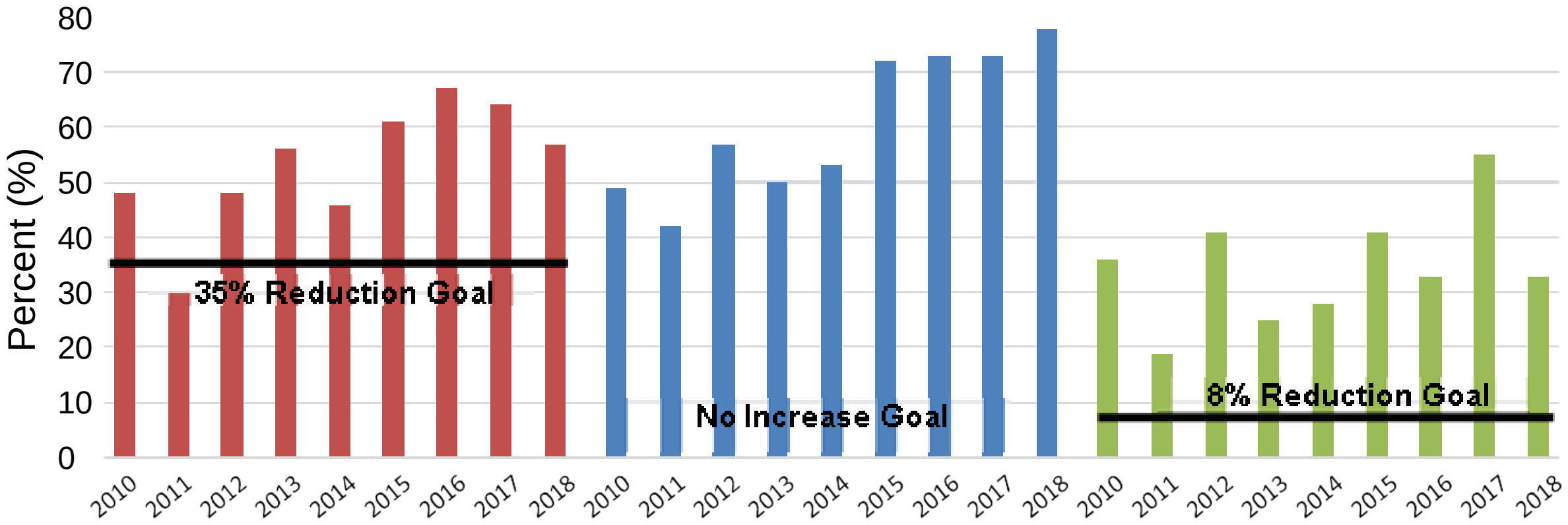
Agriculture (in effect)

- **Collective N and P reduction goals** for cropland and grazed pastureland agriculture
- Annual progress accounting by DSWC via Nitrogen Loss Estimation Worksheet (NLEW)
- Tracks annual changes in N loss based on major crop acres, N rates, cost shared BMPs

- Watershed Oversight Committee (WOC) – oversees implementation and accounting process

- In effect in 2009, collective reduction deadlines delayed to 2018
  - **Achieved reduction goals in 2014 and all years thereafter**

Collective Cropland N Loss Reduction % by Jordan Subwatershed, 2010 – 2018, NLEW



Upper New Hope Lower New Hope Haw

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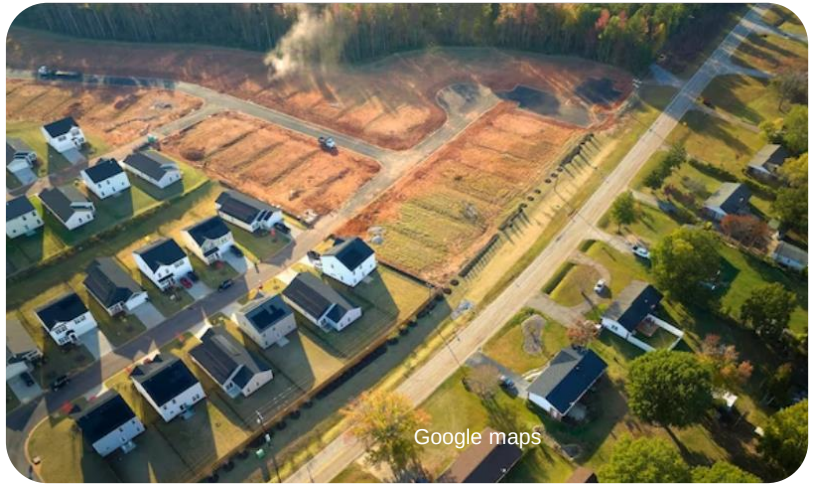
New Development Stormwater (on hold)

- Project requirement - meet subwatershed N, P loading rate targets (lb/ac/yr)
  - One SCM required, 85% TSS, 1” storm
  - Offset purchase allowed for balance
- Peak rate match, 1 yr 24 hr storm

- All local governments implement programs
- Programs approved by EMC

- **Implementation mandate delayed starting 2012**
- 2012-2015, 11 of 33 communities implemented voluntarily
- 2015, 2016 SL’s barred further implementation
- Separately, Phase I, II NPDES Stormwater communities implement MS4 post-construction requirements

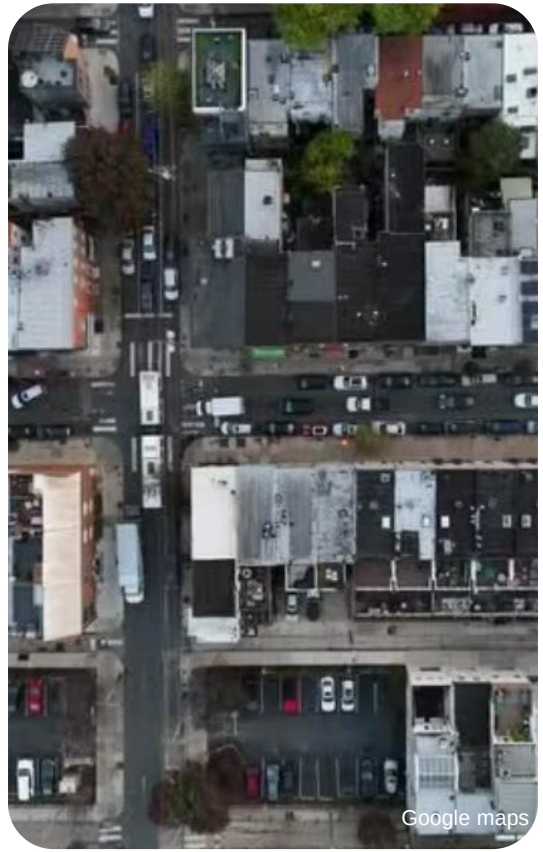


Existing Development Stormwater (on hold)

- Local governments to reduce loading from existing developed areas
  - Stage 1: programmatic actions – most addressed in MS4 permits
  - Stage 2: develop, implement programs for 8% N, 5% P
    - Triggered by lake monitoring – ongoing impairment
    - Use 2014 watershed model results; involved specifics

- All local governments create and implement plans
- DWR NPS reviews plans, EMC approves

- Local load reduction requirements **barred pending rules readoption**
  - **Stage 1 in effect, Stage 2 on hold – no implementation required**



State/Fed Entities Stormwater (partly in effect)

- Applies to New Development (ND) and Existing Development (ED) under the control of the NC Department of Transportation (DOT) and other state/fed entities (Non-DOT)
- Non-DOT: same loading rate targets, offset options as private developers
- DOT: Road projects comply with buffer rule.
  - Non-road projects: option of loading rate targets or strategy goal %'s vs pre-development

- DEMLR permits new development.

STORMWATER BEST MANAGEMENT PRACTICES TOOLBOX

BMP Toolbox for Post-Construction Program

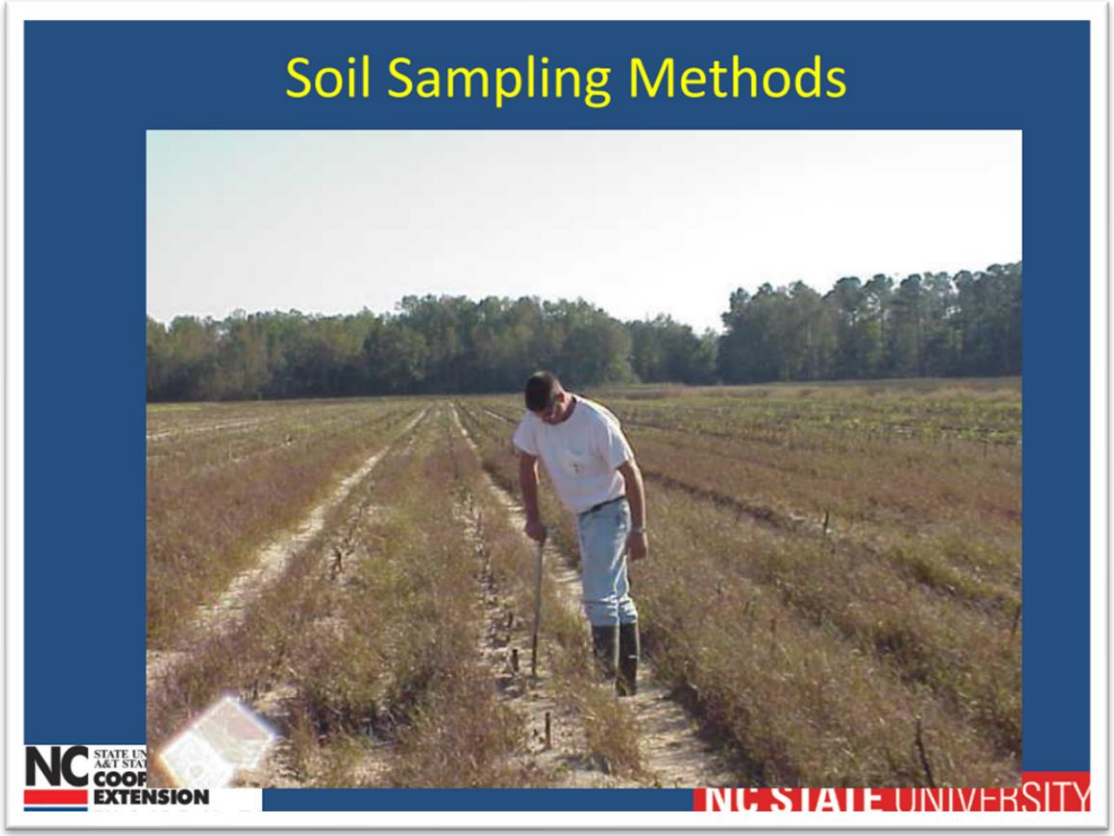
- State/Fed ND in effect since 2012.
- State/Fed ED on hold since 2016.

Fertilizer Management (in effect)

- Fertilizer applicators to commercial or institutional lands shall:
  - A) complete nutrient management training OR
  - B) apply fertilizer according to an approved nutrient management plan

- Training provided by NC Cooperative Extension
  - Originally live sessions
  - Now PowerPoint modules on DWR website
- DWR NPS provides note of certification

- Compliance by existing applicators required by August 2012, and subsequent applicators as needed



Trading/Nutrient Offset (in effect)

- Criteria and process for transfer of load reduction credit between parties as allowed by source-specific rules
- Annual mass load units, account for delivery differences to lake
  - Within subwatershed
  - DWR approved practices, potentially others
  - Sources - private banks or Division Mitigation Services (DMS)
- To date virtually all projects = riparian restoration in rural areas

Two rules govern:

15A NCAC 02B .0703 – Nutrient Offset Credit Trading

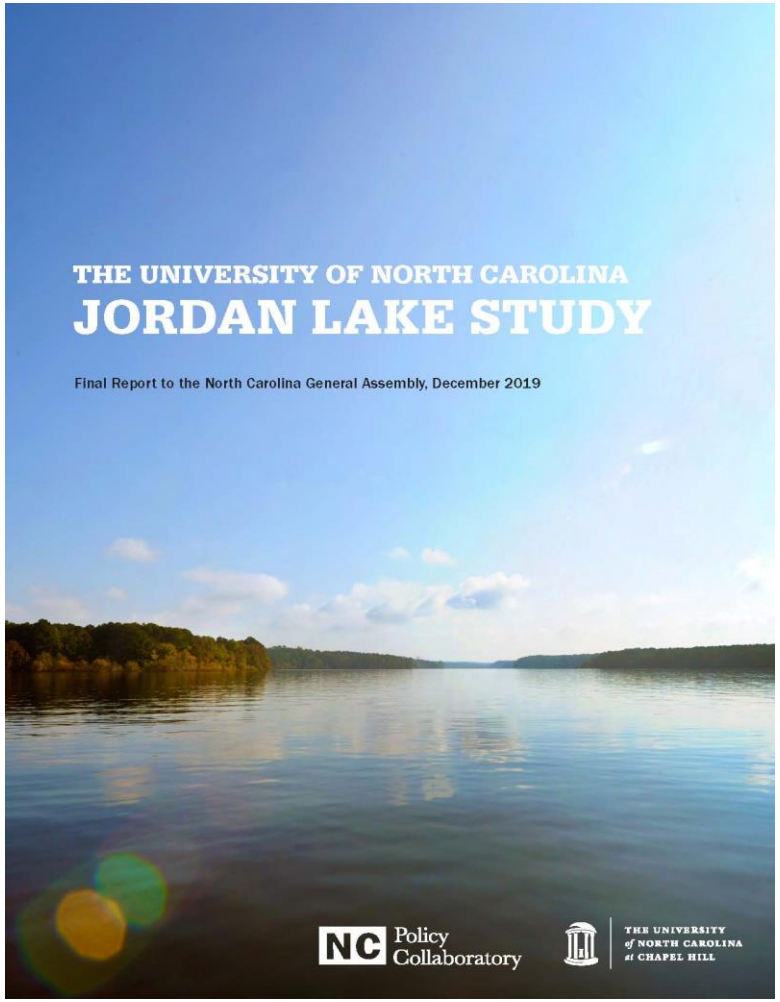
15A NCAC 02B .0273 – Jordan Options for Offsetting Nutrient Loads

- Several DEQ branches involved in implementation and enforcement

- Jordan .0273 in effect. 2B .0703 in effect, amended 2020

Collaboratory Report - Recommendations

- Reduce **point source** loads
- Prioritize **older urban infrastructure retrofits**
- Minimize or offset **new development** loading
- Mitigate **agricultural** loading, especially **wet years**
- Coordinate **forest preservation**
- Maintain/repair **septic systems**
- Ecosystem:
  - Restore streams, reconnect floodplains
  - **Fence cattle** out of streams
  - **Increase riparian buffers**, **infiltration**



Engagement, Rules Readoption Schedule

Lake Model Finalization

Late 2023	Release completed lake model for external review and comment.
Winter 2023 – Fall 2024	External review and comment, model finalization

Informal Stakeholder Process

All Stakeholders Meetings

Nov 2, 2023:	Kickoff - Joint JLOW/DWR Autumn meeting
Feb 2024:	Detailed review of current knowledge, implications

Technical Focus Groups

Late Feb - April 2024	Round 1 (2 meetings each for 3 Rules, 9 weeks)
June - August 2024	Round 2 (2 meetings each for 3 Rules, 9 weeks)

Draft Rule Vetting

Sept-Oct 2024	First and second draft rules released for feedback

Formal Rulemaking

Nov 2024	Draft rules to EMC Water Quality Committee, request to proceed with rulemaking
Nov 2024 - Sum 2025	Fiscal analysis, OSBM approval
Fall 2025	Request EMC approval to proceed with comment and hearings
Fall 2025 – Sum 2026	Public hearings/comment, Hearing Officers deliberate, EMC adopts rules

'New' Lake and Watershed Studies

- **Today's panel presents highlights from the latest lake and watershed modeling studies**

- Collaboratory - Jordan Lake Study Final Report - December 2019
- Jordan Lake Reservoir Model – supplemental UNC refinements - August 2023
- DWR - Jordan Watershed Trend Analysis - March 2022

Jim Bowen,
UNC Charlotte

2023 Reservoir Model - Stations in Jordan Lake

Under Internal Review

Dan Obenour Lab,
UNC Chapel Hill,
Collaboratory

2019 Watershed Model

Additional research:
UNC Collab, Report

Andy Painter, DWR
Modeling and Assessment

2022 Trend Analysis - Stations in Jordan Watershed – Storymaps

More Information

Contacts

Ellie Rauh, ellie.rauh@deq.nc.gov – Jordan Coordinator

Rich Gannon, rich.gannon@deq.nc.gov – NPS Supervisor

Jordan Lake Nutrient Strategy Website

https://www.deq.nc.gov/about/divisions/water-resources/water-planning/nonpoint-source-planning/jordan-lake-nutrient-strategy

Reserve Slides

Statutory Charges – Federal and State

- Federal Clean Water Act – framework: designate uses of surface waters, **set water quality standards, regulate discharges of pollutants into waters of the US**
  - DEQ delegated authority by EPA, obligated to protect water resources
  - States to address impairments of water quality standards
  - Recent decades - increased emphasis on addressing nutrient impairments

- NC Statutes follow federal – 143B-282 EMC Powers and Duties
  - EMC charged with restoring impaired waters, regulating point and nonpoint sources
  - 143-15.8B – EMC set goals for nutrient-impaired waters, develop plans

- 15A NCAC 02B .0211 - Freshwater Class C Standards
  - **Sets chlorophyll-a, pH, turbidity standards**

Collaboratory Studies – Hydrology, Loading

- Watershed Study:
  - **Older,** pre-1980, **urban development contributes > 2x loading** of post-1980 development

- Reservoir Model – NCSU (Year 3)
  - Lake reduction needs range: **25-75% N; 30-75% P**
  - **Sediment** causing recovery delays
  - **High flow events** deliver significant proportion of nutrient load, and contribute to lake sediment resuspension

Collaboratory Studies - Practices

- Best Management Practices Literature Review
  - Evaluated lowest-cost strategies per pound nutrients removed. **Riparian buffers are considered cost effective**.

- Agricultural Study
  - **Greatest loading from grazed pasture; 40% ag stream miles unbuffered**
  - **In wet years, agricultural loading increases** more than loading from other land covers
  - Little change in total agricultural acres; **most development occurs on forest land**

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Jordan is so Popular – What Problems?

1960's, 1970's - Nutrient problems predicted

1981-82 – Reservoir constructed

1983 – "Nutrient Sensitive", 2 mg/l TP discharge limits

1983 – present: Consistently rated overenriched

" Frequent harmful algal blooms in Summer

1996, 2003: Taste & odor complaints, Cary

1997 - Clean Water Responsibility Act – tighter N, P limits

2000 – UNH Dischargers 0.5 mg/l Summer TP

2002 - Upper New Hope Arm Impaired (303d)

" - EMC approves reservoir model

2003-2004 - Jordan Stakeholder Project

2005: Oct – Entire reservoir impaired

Mar 2006 – Fish kill, Upper New Hope

2006 – Algal blooms, user impacts