

UNRBA Path Forward Committee Meeting

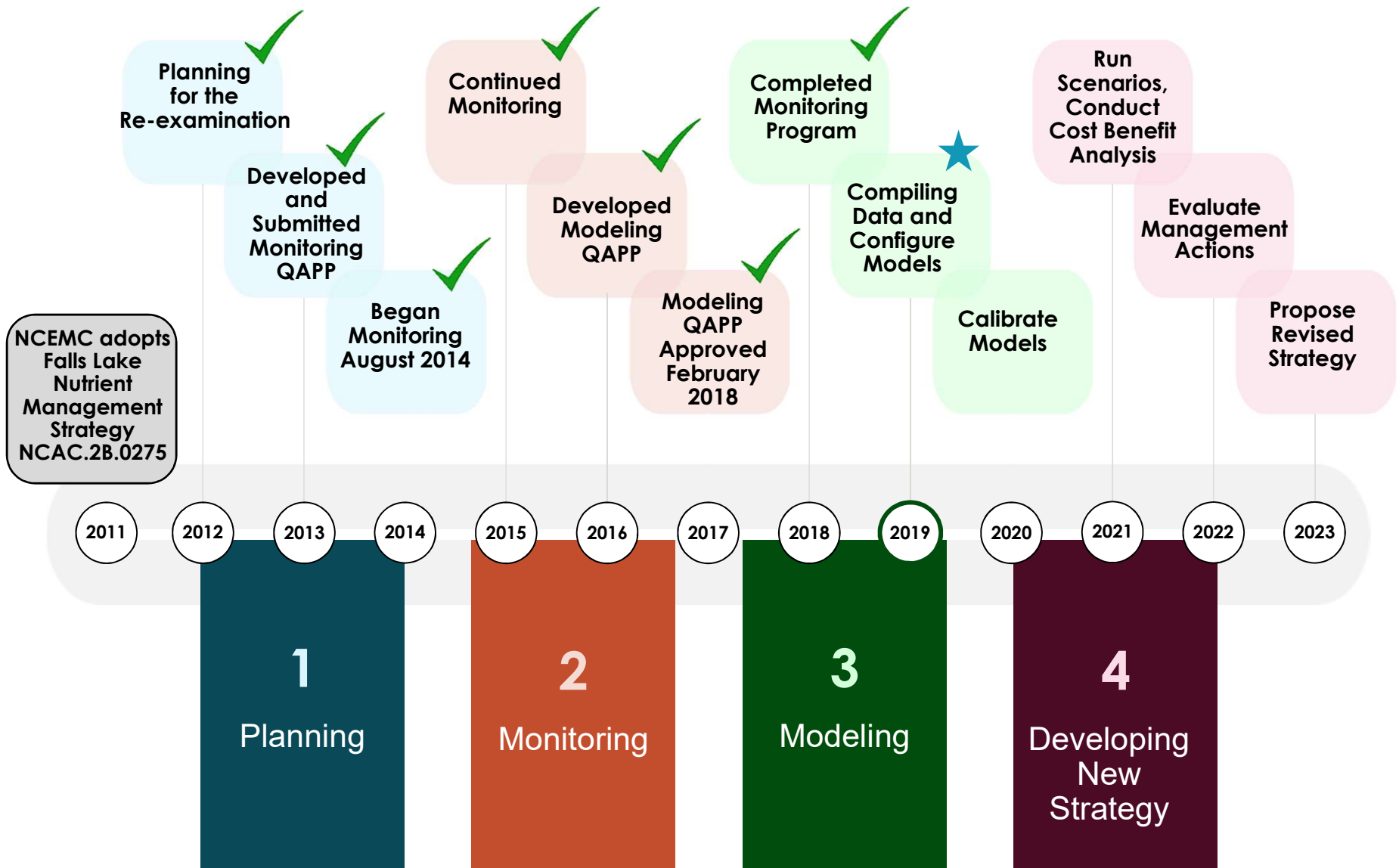
Monitoring and MRS Projects - Status Updates



January 23, 2019



Multi-year Re-examination Timeline



Status Update for Monitoring Program

Routine Monitoring Status

Date	Sample Collection	Sample Analysis	Data Review	Posted to Database
Aug – Dec 2014	✓	✓	✓	✓
Jan – Dec 2015	✓	✓	✓	✓
Jan – Dec 2016	✓	✓	✓	✓
Jan – Dec 2017	✓	✓	✓	✓
January 2018	✓	✓	✓	✓
February 2018	✓	✓	✓	✓
March 2018	✓	✓	✓	✓
April 2018	✓	✓	✓	✓
May 2018	✓	✓	✓	✓
June 2018	✓	✓	✓	✓
July 2018	✓	✓	✓	✓
August 2018	✓	✓	✓	✓
September 2018	✓	✓	✓	✓
October 2018	✓	✓	✓	✓

The UNRBA has collected Routine Monitoring samples for 51 months.

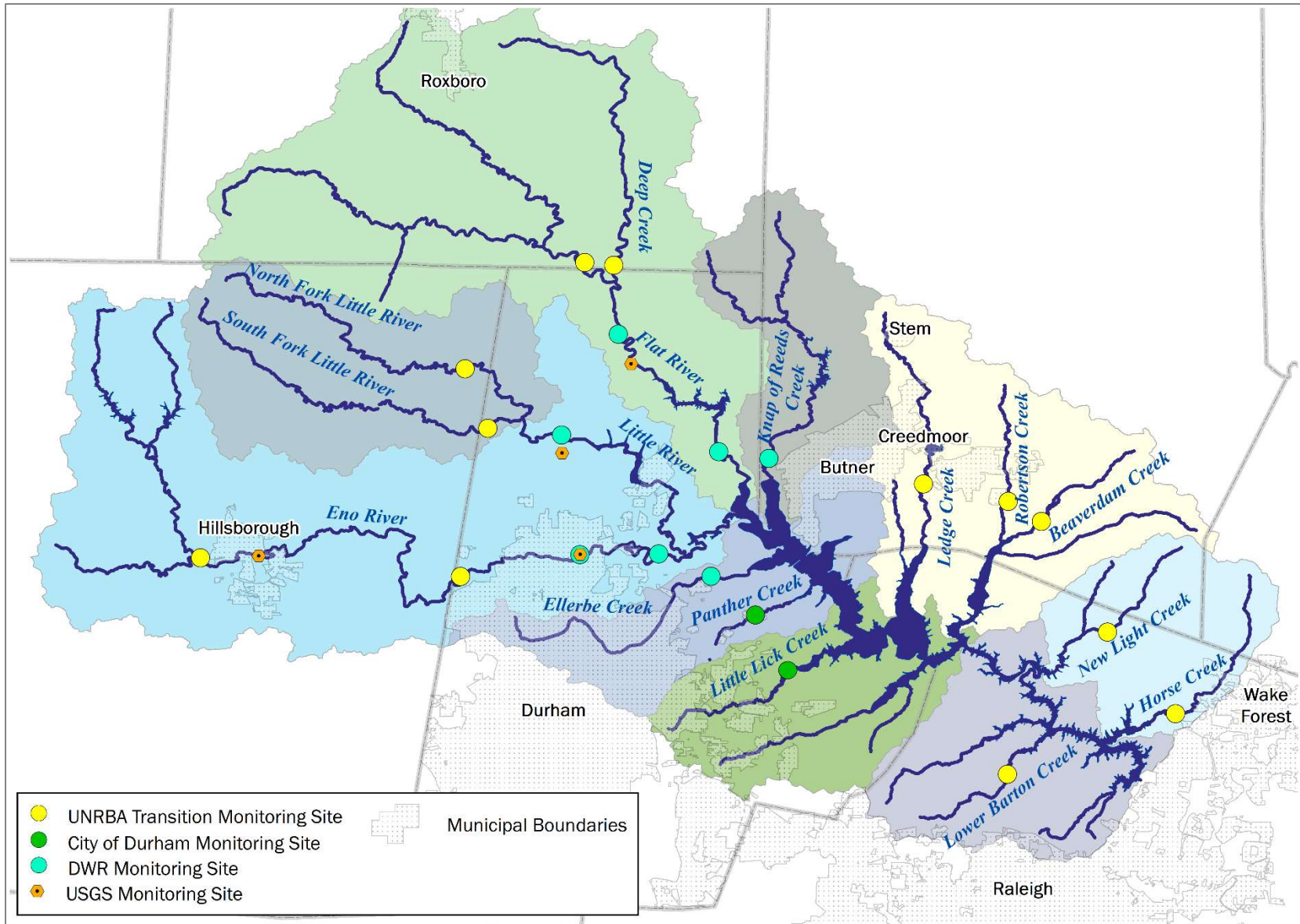
Routine Monitoring sample collection for the Modeling Program is **COMPLETE**.

Routine Monitoring - Completeness

- The UNRBA's monitoring efforts have generated a database with more than **28,000** water quality data points for tributaries to Falls Lake
- Almost **95%** of the targeted analyses were completed
 - Most of the “missing” data was the result of dry stream conditions or severe weather conditions that precluded sample collection
- The data quality of the UNRBA monitoring results is very high

Transitional Monitoring Now Under Way

- Reduced monitoring program
 - Fewer stations (12 stations versus 38)
 - Fewer parameters focused on nitrogen and phosphorus
- Allows for more resources to be directed toward analyses and modeling
- Relies on data collected by other organizations
- Maintains ongoing data collection for potential future uses



- UNRBA Transition Monitoring Site
- City of Durham Monitoring Site
- DWR Monitoring Site
- USGS Monitoring Site
- Municipal Boundaries



Transition Monitoring Locations
 Upper Neuse River Basin Association
 North Carolina



Falls Lake Sediment Evaluations

Falls Lake Sediment Study

Prepared for
Upper Nouse River Basin Association
by
Marc Aiperin, Ph.D.
Department of Marine Sciences
University of North Carolina at Chapel Hill

November 30, 2018

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Project ID: 18-0362

Falls Lake Nutrient Exchange & Sediment Oxygen Demand (SOD) Study Final Project Report

Project Location: Upper Nouse River Basin,
Raleigh, NC (Durham and Wake Counties)

Project Date:
June 4-9, 2018

Report Approval Date:
September 7, 2018

Report Revision Date:
October 29, 2018

Project Leader: Morris Flemer
Ecology Section
Field Services Branch
Science & Ecosystem Support Division
USEPA – Region 4
980 College Station Road
Athens, Georgia 30605-2720

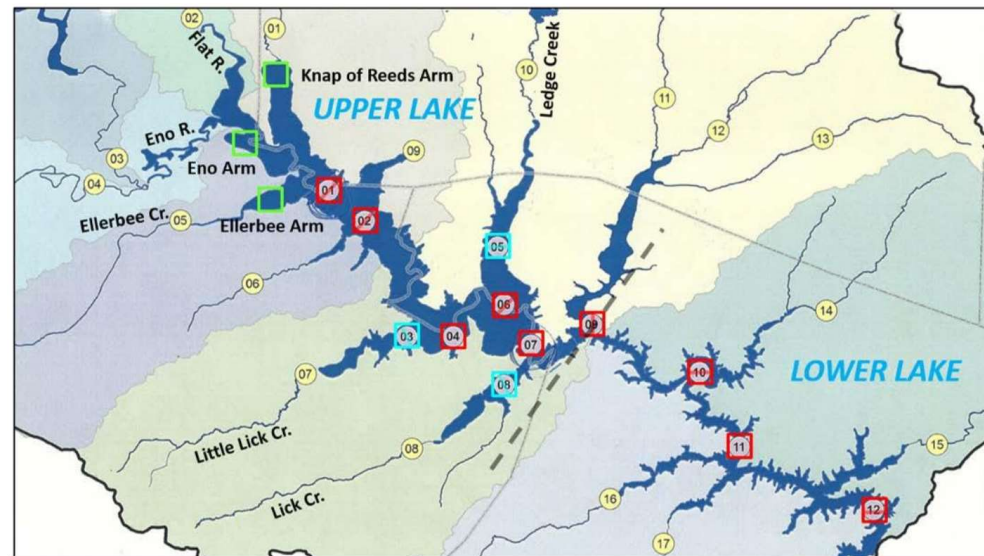
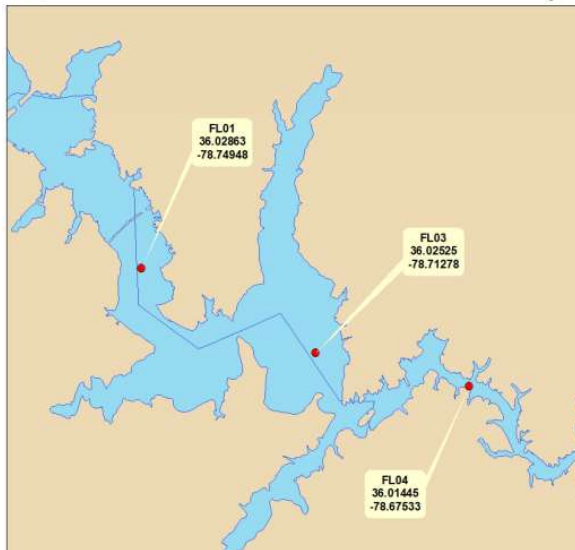
The activities depicted in this report are accredited under the US EPA Region 4 Science and Ecosystem Support Division ISO/IEC 17025 accreditation issued by the ANSI-ASQ National Accreditation Board. Refer to certificate and scope of accreditation AT-1644.



Science & Ecosystem Support Division

Overview of Sediment Studies

- Studies were conducted three years apart
- Different methods
 - Alperin analyzed sediment cores at 12 locations (right)
 - EPA used benthic flux chambers at 3 locations (left)
- Results were similar across studies
 - Ammonia had the highest flux rates compared to other parameters
 - Nitrate, phosphate, and total phosphorus were low



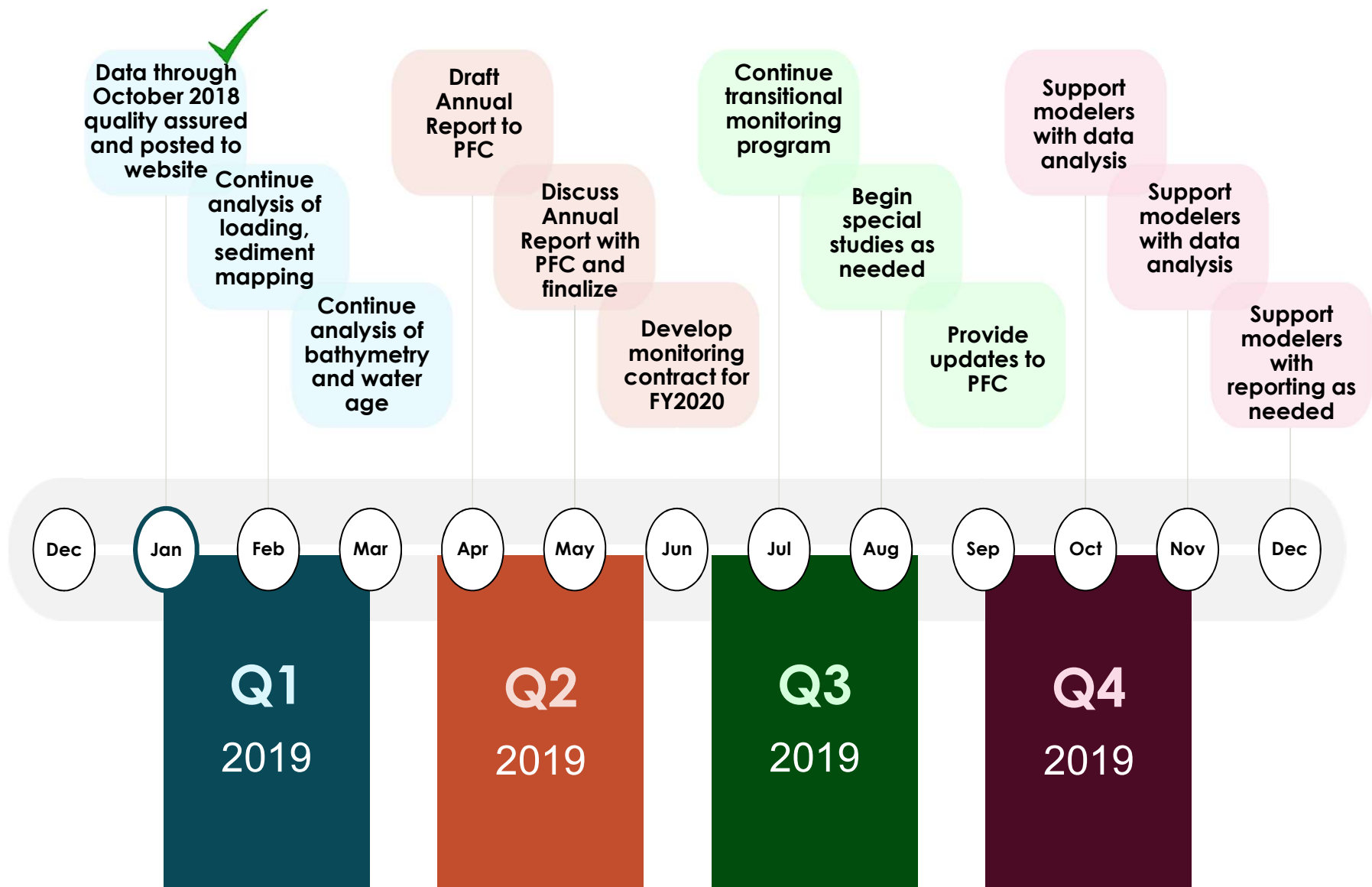
Key Findings from Alperin Study

- More sediment accumulates in old channels
 - Higher ammonia concentrations in bottom water
- Internal stores of ammonia will take more than 20 years to deplete
- Nitrate and phosphate concentrations in bottom water were fairly consistent across the sites; both were low
 - Ammonia flux was 300 times higher than the potential phosphate flux
 - The presence of oxygen at sediment/water interface prevents phosphate release during most times
 - Nitrate fluxes were 2% of total nitrogen fluxes
- Old floodplain (“shelf”) was sometimes too bare to sample
- Carbon content comes from algae and vascular plants, with not one dominating

Final Monitoring Report for Modeling Purposes

- Report preparation under way
- Data acquisition from other entities is ongoing
- Final report not only conveys data to Modeling Team, but will stand on its own with results and interpretation
- New types of analyses are being explored
 - Loading analyses
 - Sediment studies and inlake nutrient releases (with mapping correlations)
 - Bathymetry measurements
 - Water age
- Coordinating with Executive Director and Subject Matter Experts on report content, and with Modeling Team
- Report delivery is contingent on data acquisition
 - Targeting early spring of 2019

2019 Monitoring Program Activities





Monitoring Program

Questions and
PFC Discussion

Status Update for MRS Project

Current Activities

- Continuing to compile data
- Develop model input files
- Configuring the watershed model
- Setting up the hydrodynamic lake model
- Recent meeting with the UNC Collaboratory
- Upcoming meeting with the MRSW (next slide)

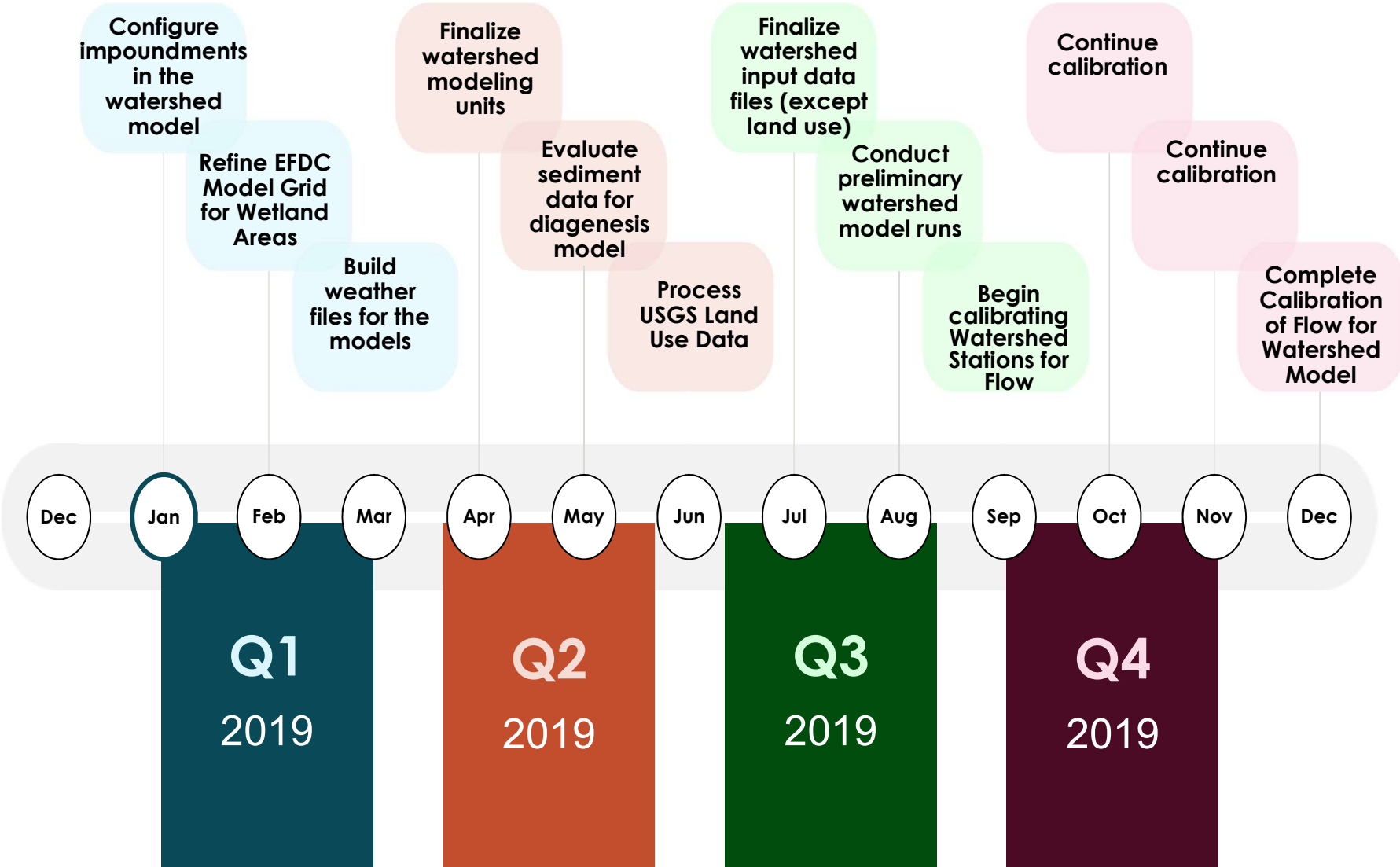
Topics to Discuss with the MRSW

- Modeling decisions to address key stakeholder questions
 - Appropriate catchment delineations and municipal boundaries
 - Land use changes, existing development, new development
 - Model output resolution (spatial and temporal)
- Locations to request radar precipitation data
- Chesapeake Bay framework for nutrient management
- MOA with DEQ
- Data release schedules and work planning (next slide)

Data Availability

- NCDOT municipal boundaries for 2018 will be released in late March 2019
- USGS land use data for 2006, 2011, and 2016
 - Original release date: December 2018
 - Postponed to February 2019 in early December
 - Anticipate further delays
- NOAA weather data through 2018 (? Release)
- Updated data sets from local governments
 - WWTPs
 - Impoundments
 - Water withdrawals

2019 MRS Work Planning





Modeling and Regulatory Support



Questions and
PFC Discussion