

Modeling and Regulatory Support Workgroup Meeting Remote Access, June 1, 2021



Remote Access Options

Equipment Type	Access Information	Notes
Computers with microphones and speakers	Join Microsoft Teams Meeting Please mute your microphone unless you want to provide input.	Press control and click on this link to bring up Microsoft Teams through the internet. You can view the screen share and communicate through your computer's speakers and microphone
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Remote Access Guidelines

- This meeting will open 30 minutes prior to the official meeting start time to allow users to **test equipment** and ensure communication methods are working
- If you dial in through your phone, mute your microphone and turn down your speakers to **avoid feedback**
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Agenda

- Opening Comments, Agenda Review/Revisions
- MRSW Workgroup Reports
- Review of Contracts for FY2022
- Modeling and Regulatory Support Status
- Plan for Statistical Model Development and Regulatory Options for the Chlorophyll-a Water Quality Standard

MRSW Workgroup Reports

Status of Two Scenario Workgroups

- The MRSW and PFC have formed two workgroups to provide input to the modeling team on scenarios
- The Model Scenario Output Workgroup
 - Discussing reporting formats for comparing scenario descriptions and model output
 - The 6th meeting for this workgroup was held April 12th
 - Decision to transition to an online reporting tool
- The Scenario Screening Workgroup
 - Developing a selection process for choosing scenarios and a preliminary list of scenarios to evaluate
 - The 5th meeting for workgroup was held May 24th
 - Two subgroups are working on scenario forms for scenarios preliminarily assigned a high priority
 - Discussion of three scenarios today

Model Scenario Output Form – Part A

Scenario (short) name/ Scenario ID number: 01_All Forest Scenario

Scenario description: Would the lake meet water quality standards if all of the land were forested or wetlands, all wastewater and nutrient application were ceased, etc.?

Convert all land uses that are not forest or wetlands to mixed use forest; remove point sources and nutrient application (except atmospheric deposition?); bypass upstream impoundments. Run the scenario for the 2015-2018 time period. Evaluate the change in nutrient load loading by year. Evaluate changes to lake water quality (nutrients and chlorophyll) by year.

Scenario type: Infeasible maximum limit; regulatory consideration

Count(ies) affected: All counties

Municipality(ies) affected: All municipalities

Sectors affected: Removes all sectors

Water Quality Models used: Watershed model (WARMF), Simple Lake Model (WARMF)

Consultants involved: Systech Water Resources

Simulation considerations: Tbc by modeling team.

Preliminary cost to run scenario: Medium

PFC approved for evaluation: TBD

PFC recommended scenario priority: High

“All Forest” Scenario for PFC Consideration

- The MRSW voted to recommend an “all forest” scenario for evaluation with the watershed model and assign a High priority
- This is not an actionable scenario.
 - Places a limit on what is possible in Falls Lake with most human impacts removed.
 - Evaluates what happens over time when the watershed has most human impacts removed.
 - Infeasible maximum scenario that describes the “best” condition that could possibly be achieved in the lake if human sources are removed
- Purposes
 - Limits the number of nutrient reduction scenarios that need to be evaluated for reduction curves
 - Provides basis to consider regulatory options such as site specific criteria

Model Scenario Output Form – Part A

Scenario (short) name/ Scenario ID number: 07_Reducing sediment nutrient soil pore water concentrations in watershed

Scenario description: Test effects of reducing the initial pore water concentrations used to calibrate the watershed water quality model. Revised initial starting points may be determined by running the watershed model for several repeating years to determine equilibrium under current or reduced nutrient application/deposition rates.

Scenario type: Nutrient management; regulatory consideration

Count(ies) affected: All counties

Municipality(ies) affected: All municipalities

Sectors affected: Developers, local govts, DOT/State, agriculture, forestry

Water Quality Models used: Watershed model (WARMF), Simple Lake Model (WARMF)

Consultants involved: Systech Water Resources

Simulation considerations: Each catchment has different initial pore water concentrations; equilibrium conditions may differ more in some catchments than others relative to the calibrated model and the current (or reduced) nutrient loading rates from fertilizer application and atmospheric deposition

Preliminary cost to run scenario: Medium to high (requires many iterative runs or revision of initial soil conditions at the catchment level)

PFC approved for evaluation: TBD

PFC recommended scenario priority: Medium

“Watershed Soils” Scenario for PFC Consideration

- The Scenario Screening Workgroup voted to recommend this scenario as Medium priority
- This is not an actionable scenario.
 - Provides information on how long it would take for the watershed soils to reach equilibrium in response to reduced inputs of nutrients in the watershed (fertilizer, atmospheric deposition, etc.)
 - May be better as a scenario in conjunction with another nutrient management scenario rather than a stand alone scenario
- Purposes
 - Provides basis to consider regulatory options such as site specific criteria or long-term variances

Model Scenario Output Form – Part A

Scenario (short) name/ Scenario ID number: 08_Lake Sediment Scenario

Scenario description: Test effects of decreasing sediment nutrient concentrations in the lake sediments over time and how that affects nutrient loading from the sediments and water quality in the lake.

Scenario type: Regulatory consideration - Understand potential need for variance in terms of complying with (revised) water quality standards

Count(ies) affected: All counties

Municipality(ies) affected: All municipalities

Sectors affected: All sectors (nutrient inputs into the lake via water and via sediments both affect sediment nutrient concentrations)

Water Quality Models used: Sediment diagenesis models within WARMF, EFDC later, and accounting in the Statistical/Bayesian model

Consultants involved: Systech Water Resources, Dynamic Solutions, KDV Decision Analysis, BC

Simulation considerations: Sediment diagenesis models need to run for decades to reach steady state, so a limited number of scenarios can be evaluated

Preliminary cost to run scenario: High (requires decadal model runs)

PFC approved for evaluation: TBD

PFC recommended scenario priority: High – later (need to identify which nutrient management scenario(s) to evaluate)

“Lake Sediments” Scenario for PFC Consideration

- The Scenario Screening Workgroup voted to recommend this scenario as High-later priority
- This is not an actionable scenario.
 - Provides information on how long it would take for the lake sediments to reach equilibrium in response to reduced inputs of nutrients to the lake
 - We need to identify one or two nutrient management scenarios to conduct in conjunction with this scenario
- Purposes
 - Provides basis to consider regulatory options such as site specific criteria or long-term variances

Review of Contracts for FY2022

Contracts for FY2022

- Contract renewals:
 - Brown and Caldwell Modeling, Regulatory Support and Communications Support
 - Sauber Water Quality Consulting
 - Phthisic Consulting
 - MFG Consulting LLC (web support)
 - Executive Director Services
- New contract:
 - Support for site-specific criteria development (Dr. Marty Lebo)

Modeling and Regulatory Support Status

Reporting

- Interim draft report for the hydrologic model development and calibration for the Watershed Analysis Risk Management Framework (WARMF) watershed model
 - Addressing Executive Director's comments on draft hydrologic sections
 - Adding text to describe water quality model development
 - Including the model calibration output formats requested by the MRSW
- Developing draft report for the EFDC model

EFDC Hydrodynamic Lake Modeling

- Modeling team is refining hydrodynamic calibration to apportion flow balances based on tributary area and use a statistical smoothing technique
- Setting up the water quality components of the EFDC lake model (inputs, calibration data, etc.)

WARMF Watershed Modeling

- Model is being calibrated for stream flow and water quality across the watershed
- As described in the QAPP, calibration and performance criteria focus on the upper five tributaries that deliver more than 70 percent of the flow to the lake
- Performance criteria will be provided for both concentrations and loads
- Checks for “reasonableness” were conducted for the other tributaries using the UNRBA monitoring data despite lack of gaged stream flows
- Overall, the model performs well when streams are flowing and delivering load to the lake; simulated concentrations are not accurate during very low flows

Plan for Statistical Model Development and Regulatory Options for the Chlorophyll-a Water Quality Standard

Planning for Development of a Petition for Site Specific Criteria

- A primary task for the legal team is to begin consideration of a petition for site specific criteria for Falls Lake
- The UNRBA Statistical Model of Falls Lake will be used to support this effort
- Evaluation of other State's site-specific standards for chlorophyll-a and nutrient-related standards is ongoing.
- The legal team and the statistical modeling team are coordinating on this effort
- The Technical Advisors Workgroup was formed at the January 2021 PFC meeting and initial meeting held in May
- We have identified a Subject Matter Expert for assistance to the UNRBA in the site-specific effort, Dr. Marty Lebo who was part of the High Rock Lake SAC. We have developed an agreement for support of the UNRBA effort.

Closing Comments Additional Discussion