

Mystic River Watershed Steering Committee
Meeting Focus: Mystic River Eutrophication Study

October 11, 2018

Massachusetts Department of Environmental Protection, Wilmington, MA

Meeting Summary

Meeting in Brief

The Mystic River Steering Committee's October meeting focused on the Mystic River Eutrophication Study. Participants heard about the preliminary results of the eutrophication study, relevant requirements for the new MS4 permit, and innovation to improve stormwater management. Participants also had an opportunity to share relevant updates and announcements. Presentation slides from the meeting are available at <https://mysticriver.org/epa-steering-committee> and <https://www.epa.gov/mysticriver/mystic-river-watershed-initiative#MeetingsEvents>. A list of meeting participants can be found at the end of this document.¹ For more information about the Steering Committee and current efforts to restore the Mystic River watershed, please visit www.epa.gov/mysticriver.

Next Meeting

The next steering committee meeting will take place on Thursday January 10, 10am-12pm.

Action Items

- EPA – Invite EPA Region 1 Administrator Alexandra Dunn to the January 10, 2019 Steering Committee meeting.
- All – Email Mel Cote if you want to help plan the 2019 Science Symposium.

Eutrophication (Phosphorus) Study Preliminary Results

The slides from these presentations contain more detail on the study and its results. They are available at <https://mysticriver.org/epa-steering-committee>.

Study context and design

Patrick Herron (Mystic River Watershed Alliance (MyRWA) and Steering Committee co-chair) introduced the Mystic River Phosphorus Study by reviewing the study's impetus, goals, collaborations, and sampling design. The study was designed to address evidence of impairment in the river, including invasive plants, the 2017 cyanobacteria bloom, and multiple 303(d)-listed water bodies in the watershed. MyRWA hopes to use study results to reduce public health impacts of phosphorus, improve the aesthetics of the river, and improve ecosystem and river herring health. Many partners collaborated on the study including EPA Region 1, Massachusetts Department of Environmental Protection (MassDEP), U.S. Geological Survey (USGS), and the Massachusetts Water Resources Authority (MWRA).

Phosphorus and chlorophyll grab samples were collected at 12 locations biweekly in 2016 and 2017. Over 2,200 samples were collected during more than 750 sampling trips. In addition, automatic samplers were deployed on the Aberjona River, Mystic River, and Alewife Brook to collect data on flow and weekly nutrient loads.

¹ This summary was prepared by the Consensus Building Institute.

Study phases and preliminary findings

Mark Vorhees (EPA) reviewed the preliminary results of the eutrophication study. He emphasized that the goal of the study was to estimate what nutrient load reductions would be needed to meet nutrient-related Massachusetts Surface Water Quality Standards², and to transfer this information into watershed management strategies and tools. Stormwater management needs were also considered in the study. There are two phases of the project and one ancillary task:

- **Phase 1:** Convene Technical Steering Committee, assess/analyze available data, select nutrient targets, select appropriate model(s), and conduct watershed phosphorus loading analysis. (Draft Report completed June 2017)
- **Phase 2:** BATHTUB modeling of Mystic River and Upper and Lower Mystic Lakes, finalize watershed loading estimates and needed reductions, and conduct public outreach. (Final Report completed in early January 2019)
- **Ancillary Task:** Lake Loading Response Model for five impaired lakes. Led by EPA and MA DEP.

The study was also designed to facilitate implementation of stormwater load reductions. The project collaborators are now focusing on how to interpret the results of the study and translate them into solutions.

The Phase 1 Draft Report summarizes conclusions on the following topics:

- **Conceptual:** Modeling should be focused on three critical water body segments: Upper Lobe of Upper Mystic Lake, Upper Mystic Lake, and the Lower Basin.
- **Data gaps:** Use land-loading model to fill in total phosphorus loading gaps.
- **Water quality target in three critical segments:** Seasonal average chlorophyll-a less than 10 micrograms per liter and 90th percentile chlorophyll-a less than 20 micrograms per liter.
- **Model approach:** Stormwater Management Model (SWMM) Hydrologic Response Unit (HRU) modeling within EPA Region 1's stormwater management optimization tool (Opti-Tool) for land-loading model and BATHTUB for water quality response modeling in three main sections.

Remaining tasks for the Geographic Information System watershed analysis and phosphorus loading analysis include developing a watershed delineation to support the land-loading model for total phosphorus; characterizing land-use, impervious cover, and hydric soil characteristics; and using the Opti-Tool/SWMM to develop estimated total phosphorus loads for periods of interest.

The scope of work for Phase 2 and deadlines are as follows:

- Finalize watershed phosphorus loading estimates. (Completed)
- Develop and calibrate BATHTUB models for the Mystic River watershed. (Completed)
- Conduct watershed phosphorus load reduction analysis. Preliminary results indicate 40-60% stormwater phosphorus reductions – at different magnitudes in different areas of

² <https://www.mass.gov/regulations/314-CMR-4-the-massachusetts-surface-water-quality-standards>.

the watershed – are likely needed to attain nutrient-related Massachusetts Surface Water Quality Standards. (Ongoing to early Nov. 2018)

- Develop broad-based nutrient stormwater management strategies for Mystic River watershed study area using Opti-Tool. (Ongoing to mid-Nov. 2018)
- Independent technical reviews. (Nov. to Dec. 2018)
- Final report. (Early Jan. 2019)

Discussion

Meeting participants shared their thoughts and asked questions about the phosphorus study. Responses from the presenters are in italics.

- Have you been able to broadly determine the sources of phosphorus in the watershed? *We think so. We assume that reducing the land-based phosphorus load will reduce load in the river.*
- Could you clarify what a “no regrets” approach to stormwater and green infrastructure management opportunities associated with normal municipal business operations” entails? *This approach operates with the idea that stormwater controls can be implemented as normal municipal work is performed (e.g., redevelopment, road repair). It reduces costs and total construction time and produces a number of co-benefits.*
- What are examples of low-hanging fruit for nutrient reductions that communities can implement now? *Communities should aim to keep nutrient loads low and to spend money effectively. Small, effective controls can be incorporated as business occurs. Communities can consider passing ordinances that will distribute the burden to achieve reductions. Operations and maintenance strategies for reducing nutrient loads (e.g., catch basin cleaning, well-timed street sweeping) at the municipal level are a great first step.*

Relevant Requirements from the 2016 MS4 Permit: Addressing nutrient impairments in stormwater management

Suzanne Warner (EPA) presented an overview of how the 2016 Municipal Separate Storm Sewer System (MS4) stormwater permit requirements will apply to the Mystic Watershed. In the permit, EPA relies upon Mass DEP’s most recent 303(d) list of impaired waters to identify water quality problems in receiving waters and require stormwater management solutions for those waters. Appendix H, Part II, of the permit requirements address impairments due to phosphorus loading. In areas where a total maximum daily load (TMDL) has not yet been established, the goal is to start with low-hanging fruit such as annual public education on nutrient sources in stormwater, updated ordinances requiring phosphorus removal optimization, and good housekeeping practices for grass cuttings, leaf litter, and street sweeping. Permit requirements also require municipal permittees to draft a phosphorus source identification report that addresses impervious area, land use, and monitoring and to plan for structural retrofits on municipal properties.

A meeting participant asked if recently-completed projects could be used to satisfy parts of the MS4 permit so that grants are used efficiently. Suzanne responded that recent project may be appropriate to submit but the municipality would need to consider if any changes would be needed to the phosphorus source identification report.

Innovation to Improve Stormwater Management

The slides from these presentations contain more detail. They are available at

https://mysticriver.org/s/houle_mystic_10-2018_final.pdf and <https://mysticriver.org/s/Mystic-Eutrophication-Analysis-Briefing.pdf>.

Mystic River municipal technical assistance overview and update

Suzanne Warner (EPA) presented an update on the stormwater management community support project launched this fall. EPA distributed a request for letters of interest in the late summer and early fall to work with communities in the Mystic River watershed on stormwater management. They received seven applications and selected two communities – Arlington and Winchester – to work with the collaborative technical team to pilot collaborative water resource management and implement on-the-ground improvements.

The project team for this effort includes the towns of Arlington and Winchester, University of New Hampshire Stormwater Center, Eastern Research Group, the Consensus Building Institute, EPA, MassDEP, and MyRWA. The project team will address the following topics in their discussions over the next 8 months: stormwater management challenges, new research and technologies, lower-cost and smaller-scale stormwater best management practices and finding stormwater management opportunities in routine projects. The goal of this effort is to foster mutual learning and problem solving, learn about the latest research and innovations, and create a local, cost-effective stormwater management strategy to address nutrient load sources in the two selected communities.

A meeting participant reminded the group that there are synergies between this project and other efforts. Arlington and Winchester are both municipal vulnerability preparedness communities, which means that they are undertaking a planning process for hazard mitigation and climate change preparedness. These planning processes make them eligible for planning funding. Environmental Bond Grants can also help municipalities plan for the future.

Challenges and practical solutions to managing municipal stormwater systems

Jamie Houle (University of New Hampshire Stormwater Center (UNH SC) presented lessons learned from stormwater management in New Hampshire. Working with the City of Dover, NH; UNH SC; NH Department of Environmental Services; and EPA Region 1, Jamie has studied the implementation of a range of stormwater management projects.

Jamie illustrated the following lessons learned with example projects he has worked on:

- Keep the project's overall goal in mind. Planners should not be committed to their designs. A project can be successful if it manages to give the client what they want while achieving stormwater management goals.
- Project design must take operations and maintenance into account. It is critical to educate the owner about their new system and ensure it will be properly maintained as part of routine work. Planners should design projects for easy maintenance activities that are familiar to maintenance staff. Public Works Departments are key partners for driving innovation in stormwater management because they are responsible for these projects.

- Be cost-effective. If two plants achieve the same goals but one plant is easier and cheaper to maintain, consider selecting that plant.
- Planners should make a start and not become distracted by modeling and calculations. Best practices and innovation will come from lessons learned on the ground. Spend time learning about the maintenance culture of the municipality instead.
- We may not need to over-design our systems for extreme precipitation events. Models may be too conservative.
- Models should better account for horizontal flow out of the system. Many system models only model vertical flow and omit horizontal flow. The vast majority of the flow leaves the system through the sidewalls of an installation and this volume should be accounted for.

Meeting participants shared their thoughts and asked questions about stormwater lessons learned. Responses from the presenters are in italics.

- Consultants often push to overbuild a system to earn more money. How can communities ensure consultants are not taking advantage of them? *Communities should use the “no regrets” approach: take every opportunity to improve and look for simple fixes. Towns need to take ownership of their projects and be clear with consultants what they are looking for.*
- How can municipalities innovate while still satisfying regulator requirements? *This is a challenge. State requirements often keep projects from moving forward because they may be written for different scenarios than the one under consideration. It is important to quantify the benefits of new projects. Retrofits and new development may need to be handled differently in the permitting process.*
- Where can communities concerned about stormwater find good models of zoning and ordinance language? *The UNH Stormwater Center website has links to good models. One place to look is the Southeast Watershed Alliance³ in New Hampshire. Data that quantifies loading and the benefits of control can help communities weigh the pros and cons of different types of zoning and ordinances.*

Announcements, Updates, and Funding Opportunities

- MyRWA will hold its annual meeting on October 24 at Tufts University. At the event, MyRWA will recognize the support of a number of organizations including MassDEP.
- The City of Medford will hold a Harvester Energy Festival at its wind turbine on Saturday October 13 from 12-3pm.
- EPA sends out Urban Waters Program announcements regularly. EPA is happy to include other groups' updates in these announcements.
- The biennial Science Symposium will be held in Spring 2019. Participants should let Mel Cote know if they would like to participate in planning the symposium. In advance of the symposium, the Mystic Watershed Steering Committee will activate its Water Quality Planning Committee.

³ <https://southeastwatershedalliance.org/wp/southeast-watershed-alliance-home/southeast-watershed-alliance-important-links/>.

- There is ongoing work on fish consumption advisories. MA Department of Public Health released a new Lower Mystic Fish Advisory in late August. MyRWA will distribute information on this advisory to the public soon.
- EPA Region 1 Administrator Alexandra Dunn may be moving to EPA Headquarters for a new position if she is confirmed. The Mystic Watershed Steering Committee will still invite her to its January meeting.
- After many years of active participation on the Mystic River Watershed Steering Committee, Ivey St. John will be stepping off the Steering Committee. The co-chairs expressed their deep appreciation for her long commitment to this initiative.

Meeting Participants

Name	Affiliation
Karen Buck	Friends of the Malden River
Dave Butler	MassDEP
Bryan Carignan	Winchester
Wayne Chouinard	Arlington
Bill Copithare	Arlington
Mel Cote	USEPA
Sean Dixon	USEPA
David Elmer	Weston & Sampson
Ona Ferguson	Consensus Building Institute
Rebecca Gilbert	Consensus Building Institute
Lynne Hamjian	USEPA
Patrick Herron	MyRWA
Jamie Houle	UNH SC
Andy Hrycyna	MyRWA
Alicia Hunt	Medford
Rachel Kelly	Everett
Clay Larsen	Groundwork
Lisa Mark	MWRA
Nihar Mohanty	MassDEP
Catherine Pedemonti	MyRWA
Tom Philbin	Everett
Tony Rodolakis	Wood E&I Solutions
Alex Rozyck	Reading
Greg St. Louis	Everett DPW/Eng.
Emily Sullivan	Arlington
Kathy Vandiver	Friends of the Malden River, MIT CEHS
Mark Voorhees	USEPA
Elaine Vreeland	Winchester Conservation Commission
Suzanne Warner	USEPA
Catherine Daly Woodbury	Cambridge DPW
David Wu	MWRA

For questions regarding this meeting summary, please contact Caitlyn Whittle at EPA (whittle.caitlyn@epa.gov) or Ona Ferguson at the Consensus Building Institute (ona@cbi.org).