

March 13, 2019

Source Water Protection Strategy Update

Data Gathering and Analysis Workgroup Meeting #2 - Summary

1pm-3pm

The meeting began with brief introductions by the nine participants which included NHDES staff, stakeholders, and partners.

Introduction

Tyler Davidson began with an outline of the agenda for the meeting. Questions and comments related to the meeting minutes and preliminary findings document from Data Gathering and Analysis Work Group Meeting 1 were solicited. No questions/comments regarding the minutes and preliminary findings were generated. Tyler then provided an overview of how the meeting will unfold. The purpose, outcome, and output of the Data Gathering and Analysis Work Group meeting were reviewed.

Preliminary Finding #1 – No Vulnerability Analysis

Tyler then presented Preliminary Finding #1: that there is currently no comprehensive analysis of the vulnerability of surface sources in New Hampshire to cyanobacteria. Tyler stated that knowledge of where cyanobacteria are a problem would allow DES to prioritize resources effectively and can be used to provide justification to water systems in support of implementing a monitoring program. Tyler presented three potential options for a vulnerability analysis along a continuum of low to high resource and labor intensity, including a “back-of-the-napkin” approach looking for systems that have had a history of blooms, systems that are not conducting any monitoring, and systems identified as having inadequate treatment for cyanobacterial cell removal. Additionally, a cyanobacteria community composition approach was discussed, in which vulnerability could be identified based on the toxicity profile of the cyanobacteria community in the waterbody. Finally, an example of a statistical model approach based on surrounding land use and water body physiographic characteristics that could be used was presented. A discussion of monitoring procedures ensued. Karen Craver inquired as to whether there were any other criteria for assessing vulnerability. Tyler stated that we could look at the number of susceptible populations served. Karen stated that census data can be used to determine the population served by a system, as well as any sensitive populations. Nancy Leland stated that any land use data used for a vulnerability analysis should be easy to

incorporate into a model and that a primary goal should be to analyze the potential for N and P loading. Pierce Rigrod replied that NHDES uses the United States Environmental Protection Agency (EPA) Region 5 modeling approach for in-lake nutrient modeling. Pierce stated that we could move forward with this approach, but would need an endorsement from this group on the model so that we could start working with the NHDES watershed bureau. Amanda McQuaid noted that some lakes have demonstrated cyanobacteria problems, but do not have problems with excess P. For example, Lake Winnepesaukee is very oligotrophic but still has cyanobacteria issues. Amanda posited that looking at cyanobacterial communities in waterbodies instead of nutrient concentrations would be a valuable approach. Nancy Leland agreed and further stated that trophic states of waterbodies are not necessarily matching up well with bloom issues. Nancy posited that more information can be gained by studying cyanobacterial communities. Amanda further stated that cyanobacteria communities can behave differently from lake to lake and that understanding cyanobacteria community composition can give an idea as to toxicity. **Sara Steiner noted that the NHDES Jody Connor Limnology Center has phytoplankton community data for many of the lakes in NH (NHDES Source Protection to follow-up).** Nancy stated that the way cyanobacteria populations are responding to different inputs provides valuable information and that fluorometry can provide this information in a cost-effective manner for water systems. Pierce summed up the conversation by stating that there seems to be no “one-size-fits-all” approach to assessing vulnerability, and that responses need to be tailored to each system. Pierce stated that outreach/assistance activities should be prioritized at sources without watershed plans.

**Preliminary Finding #2 – Lack of Cyanobacteria Monitoring and
Preliminary Finding #3 – Cyanobacteria Data Collection Methods**

Tyler transitioned to Preliminary Finding #2, that it is unlikely that many surface water systems in NH are conducting monitoring of their source water for indicators of cyanobacteria. Tyler rationale that a lack of monitoring of surface sources represents a potential gap of surface water sources in the state that are potentially vulnerable to cyanobacteria blooms, with little to no regular surveillance. Tyler again presented a series of options existing along a continuum of low to high resource and labor intensity. These options included encouraging and supporting participation in the EPA Cyanobacteria Monitoring Collaborative (CMC), coordinating a state-supported monitoring program (similar to Vermont), and implementing a state-mandated monitoring program (similar to Ohio). Amanda McQuaid stated that a state-supported monitoring program would certainly be useful, but that there are currently not enough resources at the state-level to implement. Pierce mentioned that microcystin is on the Candidate Contaminant List (CCL), and that it would be good to identify systems that are having

issues with this toxin as it could become regulated in the future. At this point, the discussion naturally transitioned to a Nancy stated that it would be beneficial to identify water systems with sources that support populations of *Microcystis* and determine if they are potentially toxic. Amanda mentioned that NHDES and EPA both have protocols that can be followed for sampling and analysis. Amanda stated further that the Enzyme-Linked Immunosorbent Assay (ELISA) is a well-accepted method for this analyte, and that NHDES has the capability to run this test. Amanda suggested that, to establish a waterbody specific baseline of what could happen, systems should be following the EPA CMC monitoring protocol. Furthermore, Amanda stated that fluorometry data needs to be analyzed on a site-specific basis. Pierce questioned whether there is a monitoring plan with a robust approach to determine when blooms are becoming problematic? Nancy mentioned that her ongoing study on Cape Cod could be a model, and that similar projects have been completed with Manchester Water Works and Pennichuck Water Works. Nancy stated that a Quality Assurance Project Plan (QAPP) already exists for most of this work (through the EPA CMC QAPP), though there are some missing pieces and these should be filled in soon through Nancy's publications. Pierce wondered whether we should continue to fund fluorometers if we are unsure of the data they are generating. Amanda answered that it comes down to the system having knowledge of their system prior to interpreting results. Amanda maintained that the EPA CMC is useful for water systems. Pierce wondered whether we can find ways to support existing monitoring programs as pilots. Nancy mentioned that current monitoring programs such as the United States Geological Survey (USGS) VirtualBeach and the EPA CyAN Network are currently being tested on Cape Cod. Pierce wondered whether a good approach to encourage monitoring on surface sources would be to map out our available resources and partner with a third-party to encourage water system participation. Marco Philippon posited that systems are typically already maxed out with regard to resources, they are really only going to focus on their required tasks. Leveraging a third-party to collect data would certainly be useful in these cases. Nancy also mentioned that Jim Haney at UNH is meeting with groups at Lake Winnepesaukee to find ways to implement programs similar to what is being done on Cape Cod. Nancy stated further that she will be conducting a project with Manchester Water Works to determine when to hit the "panic button" in terms of initiating a response to a potential bloom. She will also be working with them to evaluate the effectiveness of test strips for screening finished water for toxins. Amanda wondered how well equipped water systems are for cyanobacteria sampling. Pierce stated that a goal of the NHDES Source Protection Program is to get more water systems monitoring. Pierce further wondered whether any system would implement a monitoring program on their own without significant assistance. Karen Craver described challenges in getting data from water suppliers for some of her work. Marco then described the challenges faced by water systems with regard to staffing and the limited resources available to engage in monitoring for most water systems. Pierce wondered whether connecting water systems with outside resources in an effort to increase

the likelihood of them implementing a monitoring plan is a worthwhile endeavor. Marco thought that this would be a worthwhile effort, as the lack of monitoring programs statewide is largely thought to be a bandwidth issue – systems don't have the time/resources to dedicate to a monitoring program, but they may be open to partnerships.

Preliminary Finding #4 – Public Water Supply Training

Tyler then pivoted the discussion to Preliminary Finding #4, few water systems have staff trained in cyanobacteria awareness/management. Tyler presented potential actions for NHDES related to public water supply training. An idea generated by Jim Haney regarding a potential “cyanobacteria certificate” was discussed. It is thought that this certificate program would be offered through the University of New Hampshire (UNH) Professional Development and Training (PD&T), and would be structured similar to the stormwater management certificate offered by that program. Potential content for this certificate would include a regulatory overview of cyanobacteria, a review of monitoring procedures, and cyanobacteria management (in-lake and in-plant), among other topics. As a water supplier and the target audience for this potential training, Marco was asked what he thought about this idea. Marco stated that it was a great idea, and that many water suppliers would support such a program. Pierce posed a question to the group about the preferred method of training on this issue for water suppliers, particularly whether centralized conferences/trainings would be preferable, or if smaller trainings would be preferred. Nancy described her experiences providing training for her volunteers on Cape Cod and noted that she often hosted small, specialized training sessions where the trainees can select what gets covered in the training. She mentioned that she also had success setting up “train-the-trainer” programs with those volunteers. Amanda noted that training is important as she would be cautious about having systems jump into fluorometry without having a full understanding of the issue. Pierce then wondered about the benefit of having systems collecting fluorometry data and if there is a consensus regarding the thresholds for predicting the formation of a bloom or initiating further sampling. Nancy stated that, at this point, the benefit of fluorometry data is the ability to ascertain spatial/temporal patterns in the cyanobacteria community, and interpreting population dynamics.

Preliminary Finding #5 – Potentially Inadequate Treatment

Tyler then transitioned the discussion to Preliminary Finding #5, that eight (8) water systems are identified as potentially vulnerable to cyanobacteria blooms without effective treatment to remove intact cyanobacteria cells. Tyler presented options to address this finding, including working with this group of systems to assess their vulnerability, assess cyanobacteria

community composition, and optimize treatment (if deemed necessary). Grant funds could be advertised to these systems to help with this. The ensuing discussion generally focused on the resources needed to make any changes to a water system treatment train. The general consensus among the group was that this would be a lower priority item and should only be undertaken if there is a demonstrated risk of cyanotoxin exposure as a result of a cyanobacteria bloom impacting the treatment plant.

Preliminary Finding #6 – Nutrients

Tyler then presented Preliminary Finding #6, that the NHDES Source Protection Program does not have a comprehensive nutrient dataset compiled for surface sources in NH. Tyler mentioned that nutrient loading to surface water bodies has been consistently identified as a factor contributing to the formation of cyanobacteria blooms, though they may not be the sole determinant. Amanda mentioned that the nutrient issue as it relates to cyanobacteria is complex. Some lakes may be oligotrophic yet are still experiencing blooms. Other water bodies may be promoting cyanobacteria blooms through internal loading of phosphorus. She further mentioned that an outreach campaign to residents surrounding affected water bodies could be useful. The outreach campaigns could focus on homeowner stormwater management, or shoreline development Best Management Practices (BMPs) in an effort to reduce nutrient pollution at the lot level. Pierce mentioned that these types of programs could be supported through grant funding available from the NHDES Source Protection Program.

Conclusion

Tyler then wrapped up the meeting by discussing the next steps for the Data Gathering and Analysis Work Group and solicited any additional comments. No comments were generated by the group, and the meeting was adjourned.