



## **WSCAC Meeting**

Location: MWRA Facilities  
Southborough, MA  
February 13, 2018 – 10:00 A.M.

### **MEMBERS IN BOLD IN ATTENDANCE:**

**Whitney Beals, WSCAC Chair**  
**Gerald Eves, PV Trout Unlimited**  
**Martha Morgan, Nashua River Watershed**  
**Kurt Tramosch, Wayland Wells**  
Terry Connolly, Town of Ware  
**Jean McCluskey, Mission-Focused Alliance**  
**William Copithorne, Town of Arlington**

Martin Pillsbury, MAPC  
Andrea Donlon, CRWC  
**Michael Baram, WSCAC**  
**Paul Lauenstein, NepRWA**  
**Bill Fadden, OARS**  
**Janet Rothrock, League of Women Voters**

### **NON-MEMBERS IN ATTENDANCE:**

Lexi Dewey, WSCAC staff  
Bill Kiley, BWSC  
Valerie Pasquarella, UMASS Amherst/NECSC

Steve Estes-Smargiassi, MWRA  
Herm Eck, DCR-DWSP

### **WSCAC BUSINESS AND UPDATES**

Michael Baram called the meeting to order. Members and guests introduced themselves for purposes of the recording. Approving the December Meeting Summary was the first order of business. Bill Fadden noted the correction he made to the summary regarding the energy output of an MWRA wind turbine. Lexi Dewey confirmed that the change had been made. The Meeting Summary was unanimously approved.

Voting on a prospective WSCAC member—Roger Wrubel—was the next order of business. Michael provided an overview of Roger's background, which includes running the Mass Audubon Wildlife Sanctuary in Belmont. Roger is a renowned environmentalist. Previously, he was a professor at Tufts University. Michael asked if members wished to engage in any discussion before moving to a vote. Lexi noted that the Executive Committee had approved Roger's membership, so this vote would be a full committee vote. Following a motion to approve Roger's membership, members voted unanimously in the affirmative.

Michael then recounted the substance of the January Executive Committee Meeting. At that meeting, the Executive Committee discussed WSCAC's priorities. Michael explained that prior to the meeting, Paul Lauenstein had outlined a great deal of WSCAC priorities in a memo that was sent to the full committee. At the meeting, the Executive Committee added to Paul's list. Michael and Lexi plan to work together to incorporate all of the ideas and distribute a comprehensive list to the full committee

for comment. Michael asked that members provide feedback regarding how important each enumerated priority is to them and offer comment on any key WSCAC issues.

Michael then discussed materials that had been distributed to WSCAC members, including the Water Use Trends Report and information on drought. Finally, Michael asked that members readily submit ideas for meeting topics.

Lexi then introduced and explained the draft WSCAC Organizational Chart and Narrative. At the January Executive Committee meeting, members asked that Lexi and Heidi create a chart to explain WSCAC's network—where we receive our information from and who we regularly work with. The chart will be a useful tool for new members and members of the general public who are unfamiliar with WSCAC's work. Lexi explained that she would appreciate any feedback members had to offer. Specifically, Lexi asked that members indicate whether the chart is clear. The chart is meant to be informative and readily understandable. Lexi stated she looks forward to hearing members' feedback.

Michael then invited comment on any member concerns or comments. Hearing none, Michael welcomed Valerie Pasquarella—a postdoc at the Northeast Climate Science Center—to the floor.

### **Mapping and Monitoring Forest Pests Using Satellite Remote Sensing** *By Valerie Pasquarella*

Valerie introduced herself and thanked WSCAC for inviting her to the meeting. Valerie explained that she would be discussing the gypsy moth outbreak that the region has experienced over the course of several years. The presentation, she explained, would include a brief history of gypsy moths in New England, a summary of the Northeast Climate Science Center's current work on gypsy moths, and their plans for the future.

In 1868 or 1869, Leopold Trouvelot introduced the gypsy moth to Massachusetts. Trouvelot was a French scientist who intended to crossbreed the gypsy moth with silk worms in order to make new type of silk. Unfortunately, the caterpillars escaped from his house in Medford and have been wreaking havoc ever since. Early on, there were some fairly serious eradication efforts, including chemical spraying and flame throwing. Nonetheless, the gypsy moth continued to spread.

Gypsy moths go through cyclic outbreak periods, Valerie explained. Prior to 1981, the affected region experienced regular outbreaks every ten or so years. However, in 1989, a fungal pathogen began to dampen the oscillations. Scientists continued to observe some periodic defoliation in Southern New England, but nothing like what was seen prior to 1989.

Over the past several years, the northeast has experienced substantial drought. May and June have been particularly dry months, especially in 2014, 2015, and 2016. Coincidentally, the critical months for the fungal pathogen are May and June—the fungus likes it to be wet and this time period is also when the caterpillars begin to hatch. Therefore, as a result of the dry conditions, a massive defoliation event occurred in 2016. Valerie was able to visit the Quabbin Reservoir and observe the defoliation on the ground. However, she is more interested in large scale monitoring. Traditionally, aerial sketch maps have been used to monitor gypsy moth defoliation. Aerial sketch maps provide an expert-validated perspective, but it is very hard to sketch damage from a plane flying at various speeds. Although the maps provide a decent means of general quantification of the damage, Valerie wanted to see if satellite imaging could improve existing sketch-mapping techniques. Valerie explained that

there is actually a fairly long history of using satellite data to look at gypsy moth. Some of the earliest papers date back to the 1970s and coincide with the launch of some of the first earth-observing satellites. Gypsy moth monitoring was actually one of the first problems Landsat—the longest running enterprise for acquisition of satellite imagery on Earth—tackled.

However, in the past decade, there has been a change in Landsat sensing. Although there was a lot of work done on how to use the imaging for monitoring, only a handful of images were actually being used. In 2008, there was a change in the way in which Landsat data was distributed. All of the historic images—every image that has been collected from 1970 to the present—were made available after the distribution policy changed in 2008. Prior to this time, it could cost upwards of \$6,000 to buy a single image. Although the images covered a large area, it was a substantial investment. So, you wanted to pick only a few images (as few as you could get away with) and actually have money left to do the research. Because of this policy shift, people are using more Landsat images than ever before.

Now that Valerie has access to all of the images, she can take all of the best, most useable data (meaning clear and not cloudy) in order to make time series. Valerie displayed a time series of every clear observation. She explained that they use a metric of greenness—which means the overall health of the vegetation. Valerie then explained that they take the greenness time series and fit a model to a period when Massachusetts had very little gypsy moth damage, such as 2005 to 2015. This gives scientists an idea of what the forest should look like, based on its history, at any point in the year. Valerie takes the prediction for the stable period and extrapolates it forward.

Basically, Valerie takes the observed data, asks where it would be on the model (where is it supposed to be?), takes an account of the difference, and then divides by the error of the model. This process reveals how far away the observed data point is from normal. Valerie explained that there is a lot of noise in the data—not every point is perfectly on the line; therefore, the division by error is a process that corrects for the fact that the model is not perfect. The whole idea is that every time Valerie gets another point to add to the times series, she predicts an image from that curve at that same time, finds the potential changes, and gets what she calls “near real time products.” After about a week of the data coming in, Valerie was able to generate a look at the landscape.

Valerie stated that the satellite picks up deviations from normal. Such deviations could be attributable to factors other than gypsy moth—such as other forest health issues or development. Valerie explained that it is important to validate this work with comparisons to field surveys and aerial sketch data.

Valerie then surveyed the 2016 Defoliation Map that she generated from the Landsat data. Valerie explained that she is seeing a lot of severe damage in Rhode Island. In a lot of places, however, she noted some recovery. The trees are capable of re-leafing out if the conditions are right. Valerie compared the map to the 2016 aerial sketch map and illustrated how aerial sketch data is subjective and does not provide the same level of detail. Valerie then displayed the 2017 Defoliation Map. She is seeing significant defoliation in Eastern Connecticut, Massachusetts, and Rhode Island. She noted that there was an increase of rainfall in 2017—we had a very wet spring, unlike previous years. The fungus, which had been dormant, came back in force. But, it did not come back until the end of the gypsy moth life cycle. It was good that the fungus came back, because if it had not come back late in the game, the defoliation would have been much more severe.

Valerie explained that outbreaks are likely linked to extreme weather events. So, going forward, it will be important to understand how new extreme events will impact pests and biocontrols. Scientists

expect that defoliation is going to continue this coming summer. The location and severity, however, will depend very much on the size of the gypsy moth population, as well as the weather next spring. At most sites, there is about a ninety-nine percent mortality rate for the caterpillars. That is great—but ninety-nine percent mortality is not one hundred percent. One female, for instance, lays 200 eggs. It is hard at even ninety-nine percent mortality to knock back the population in just one year. Valerie expects it is going to take multiple years, even at sites with high mortality. We really need a wet spring to keep the fungus happy.

Valerie concluded by stating that she is looking forward to continuing with this work in 2018. She hopes to have better news to report at this time next year. Valerie thanked the Northeast Climate Science Center for funding her work, collaborators at Boston University, Harvard Forest, UMass Forest Service, and USGS. Valerie then opened the floor to questions.

Michael asked what Valerie really means by real-time capability. If he asked her to produce something at this very moment that would give him a basis for intervening in some way to help with the gypsy moths, how long would it take her to accumulate all of that data? Valerie said that they can it “near real-time” because it is not exactly real-time. The images have to come off of the satellite, then they go to the USGS facility in South Dakota for processing and posting. When Valerie is working in the monitoring phase, it is between a week to two weeks.

Lexi asked Herm how this sort of imaging and data helps him in the context of Quabbin forestry. Herm replied that when you are dealing with a big land mass, such as Quabbin—60,000 acres of forest and 25,000 acres of open reservoir—it takes a great deal of time to assess defoliation with a boots-on-the-ground approach. With the satellite approach, he can zero in on the problematic areas very quickly. That has been extremely helpful.

Kurt Tramosch asked Herm what sort of mitigation or response the information leads to. Herm replied that the gypsy moth outbreaks are likely to lead to some mortality—just how much mortality, he does not know. This information will be used to help direct searches for mortality this spring. If it is significant enough, he may want to initiate some salvage operations. Herm explained that there is a substantial oak forest at Quabbin—tens of millions of dollars of forest product that could potentially just die.

Michael asked if Herm is able to distinguish if the mortality comes from insect infestation or drought. Herm said he is unsure if he could do that and Valerie noted that both components are very intertwined. It all results in stress to the trees, which leads to mortality. Valerie said Michaels question hits on the attribution phase of this examination—all the satellite data does is tell us that something is different. The attribution phrase requires boots-on-the-ground experts to look at the defoliation and determine the causation of the damage.

Bill Fadden asked about the manner in which the gypsy moths died this year as compared to last—he had observed that the way they died appeared to be different, and inquired if it was a different fungus that killed them off. Valerie explained that there are two major controls of the population. There is the fungus, and there is the virus. The virus comes into play in high population densities. It is a natural mechanism within the gypsy moth population. When they get to a high enough density, the virus in them leads to their death, and the caterpillars walk on top of their dead carcasses and eat parts of the leaves that are contaminated, so it spreads through the population. When the caterpillar dies of the fungus, it dies in a different position than when it dies from the virus. One of them is head-down, and

one is in the shape of a “v.” Although the position is not definitive, it is a helpful indicator of what is happening with the population.

Valerie then addressed a question pertaining to Landsat technology development. A launch for Landsat 9 is in the planning phase—expected in 2020. The number one priority is greater temporal frequency and the second priority is finer spatial resolution. The seminal satellites are a ten or twenty pixel—the hope for the new technology is a fifteen pixel so it nests nicely with the existing thirty.

Paul asked a question relating to biology: is it accurate to say that when Valerie is talking about defoliation, she is talking about converting the canopy into gypsy moth poop? Valerie said yes. Paul continued to state that all of that biomass is dropping down onto the ground—could those nutrients cause algae blooms in the Quabbin Reservoir? Steve said that the answer is not necessarily known. The forests at Quabbin have solid leaf underpinnings so he has not seen a lot of direct movement from water to ground to streams—it is mostly ground, ground water, then to streams. So there is some mitigation. Herm said that most sites at Quabbin are relatively nutrient poor to begin with. There is enough going on in the understory to suck that nutrient back up.

Michael asked what measures are available at MWRA to deal with gypsy moths in the watersheds. Steve said the approach is more reactive than proactive. Herm said that some states actively spray, but there is no one doing large-scale aerial spraying in Massachusetts. Herm is keeping a close eye on concentrated mortality in order to make decisions about salvaging. Whitney Beals commented that in the 1970s, there was aerial spraying being done to control gypsy moths; the effort was fruitless and knocking the peak of the population off, so it prevented the virus and fungus from building up to the point where it could naturally control the population. So ultimately, the spraying was prolonging the events and causing more damage to the forests.

Members and guests thanked Valerie for her informative presentation. Valerie’s full presentation is available for viewing on the [WSCAC website](#).

## **Lead and Copper Rule/Federalism Review Overview**

*By Steve Estes-Smargiassi*

Since 2004, the Authority has been paying close attention to the Lead and Copper Rule (LCR)—a very complicated rule the EPA put in place in 1991. The EPA has been trying to determine how they can improve the rule and as part of the water industry, the Authority has been questioning how they can help EPA improve the LCR without making anything else worse. Unintended consequences are a key concern in promulgating regulations that pertain to drinking water.

With the change in administration, and uncertainty about issues post-Flint, the EPA re-opened the federalism review. There are two primary components to the federalism review. First, in order to do a major change through a rule that has economic impacts, EPA must reach out to their state and local partners. Because all of the rules involved are not solely EPA rules, they impact state agencies; therefore, the state and local partners must be involved. The second piece of the federalism review is unfunded mandates. Steve explained that in the course of his brief presentation, he would address what the Authority and others are doing in light of these two interconnected components.

EPA opened its federalism review in January. EPA invited a number of associations—about ten to fifteen different organizations which represent their partners. Water folks were also invited—initially

it was not clear that water associations would be engaged in the process. The duration of the review is sixty days. Lots of organizations will submit comments. Because the MWRA Advisory Board represents chief elected officials, it is an ideal organization to comment on the review. The Authority itself will be submitting comments as well. The key in the comment process is determining how the Authority's information can influence the EPA's thinking: where is the data gap? Where are the open questions and can the Authority provide information—not rhetoric—which the EPA can then put to use in its revisions.

Michael asked if the rule would be under the Safe Drinking Water Act? Steve replied yes.

Steve then discussed the particulars of the open questions involved in the federalism review. Should the revised rule require utilities to do an inventory of lead service lines? What is the standard of care? Is simply looking at paper records sufficient to constitute an inventory? Does it mean I have to do field work before I can produce an inventory? Does it mean that I actually have to do excavations? Clearly, there are a lot of questions surrounding the inventory issue. There is also a great deal of money associated with this issue. Moreover, there are a number of policy issues relating to how such information is disclosed. For instance, is information relating to lead service lines on private property public or private information? Folks come down on both sides of this debate. Timing is also a concern: do you create an inventory first, and then begin removing lead service lines? Or do you conduct the activities simultaneously? There are various ways in which these questions could go.

Michael said that in order for WSCAC to truly appreciate the breadth of Steve's discussion, the committee needs to understand where MWRA's responsibility ends. Is it upon delivery of water, or does it continue up to the tap in the home? Steve said this is an excellent question that highlights the differences between EPA rules and actual practices. The MWRA has taken an approach to many of the issues faced by water suppliers nationally that involves partnering with local communities. Legally, the Authority's responsibility is to provide water that meets the Safe Drinking Water Act as the water is transmitted to its customers. Not every wholesale water supplier takes that stance. The Authority's legal responsibility ends at its meter. The Authority does not own lead service lines and cannot necessarily get at that homeowner interaction. Nonetheless, the MWRA Board of Directors has recognized two things. First, the Authority must undertake the most aggressive treatment possible in order to make sure the water is less corrosive. Second, the Board decided to put one hundred million dollars on the table to allow communities to get at this problem with zero interest loans. The Authority, therefore, is facilitating action at the local level.

Janet Rothrock asked if the scale of the problem is known—and how reliably is the scale of the problem known? The short answer is that the scale of the problem is not known. Nationally, conversations are taking place—whereas some places have a decent inventory and grasp on the issue, others do not. Some places have thorough records, but they are all on paper. New York City does not have any record at all. Their legal position is that they do not own the service lines whatsoever. There is a similar situation in Denver, Colorado.

Michael Baram asked if there is statewide testing data pertaining to infants and lead levels. Steve replied yes and explained that lead levels are down dramatically. Massachusetts has a particularly strong testing program, so the data is quite good. Just about every child between the age of nine months and six years is tested at least once—frequently, more than once. From the 1970s onward, there has been about a ninety percent reduction in lead blood levels. However, our goal is zero. So going from a higher number to a lower number is good, but not good enough. Moreover, as you get to

lower numbers, further reducing lead levels is more difficult. The remaining sources are more difficult to get at. Water is one of the few remaining things we might be able to have a little bit of leverage on.

Steve continued to explain that a national lead service line replacement program is 55,000 local lead service line replacement programs—and they are all going to be different. Here at the MWRA, we have made zero interest loans available for full lead service line replacement. At this point, the MWRA has four programs that are fairly far along in the process. Each program is unique; communities have different incentives, different timelines, and different approaches to accomplishing the common goal of removal. Steve reasoned that if there is this much variety in the MWRA service area, the range in variation across the nation would be significant. Therefore, flexibility for local circumstances is important.

Steve continued to explain that the Authority is in the process of formulating recommendations that will assist the EPA as it moves forward in the revision process. Steve stated that if the EPA were to require phosphate, the Authority would likely have wastewater issues. Additionally, open reservoirs would likely turn green. There are multiple layers of complication.

Kurt asked about the issue of private homeownership. There are requirements—either for disclosure or mitigation—for formaldehyde, asbestos, radon, lead paint, and lead in soil. Kurt asked if there was a similar requirement for lead service lines in homes? Steve replied that there is currently not a uniform disclosure law pertaining to lead service lines. The Environmental Defense Fund did a nationwide survey to determine which states have disclosure laws and which do not. Most states do not. Massachusetts received an “F” for its lack of a law.

Kurt then asked if it was possible that a lead service line would not show up as part of a water test inside the home. Steve replied yes. He continued to state that the Authority is doing a good job in most cases with corrosion control. It is a problem—something Steve terms “false assurance.” You can have a lead service line in your home, and in certain circumstances, your children could be getting lead from that lead service line. But if you take a grab sample, and it is a stagnant grab sample, and it comes back low, is that a false assurance that you do not have a risk? Steve believes that it is.

Kurt asked if there is any receptivity to having the federal government involved in homeowner lead service line replacement? Steve stated that when the National Drinking Water Advisory Council issued their recommendations, there were recommendations to EPA—including recommendations pertaining to how EPA should work with other federal agencies—and recommendations for what Congress and states can do legislatively. Disclosure laws would require legislative action. It cannot be done from a regulatory standpoint. In most cases, EPA does not have the authority to mandate disclosure of a lead service line at sale. Here in Massachusetts, there has been some legislation drafted on this issue, but no action.

Steve then discussed the topic of a lead service line inventory. He believes that an accessible, public inventory is a best management practice for a water utility. The EPA is pushing an inventory as part of its LCR revisions.

Steve also discussed two types of targeted outreach. The first type of targeting is doing more work with folks who have lead service lines. Annual notices, for example, could be issued to homeowners with lead service lines—the notices would serve as a reminder to the homeowner to replace their line. New customer leaders could also include information pertaining to lead service line replacement. The

second type of targeting would address sensitive populations: pregnant women, younger children, and daycares.

Janet Rothrock stated that a lot of people spend more time at their work setting than they do at home. If the sensitive population is children, then their “work setting” would be their schools. Janet asked if workplaces are tested? Steve replied that there is no requirement for the testing of workplaces and there is no requirement to test schools under the LCR. There is a best practice for water departments to be helpful to school departments, but that is not a regulatory mandate at this time. The MWRA voluntarily designed a free program for school testing. Steve reiterated that this is a best practice at the community level—it is distinct from a federal mandate under the LCR. In general, Steve reasoned, workplaces will have a lower risk than homes because the water does not sit stagnant in the same way it does in homes. Moreover, workplaces do not typically have lead service lines. Nonetheless, if you are a landlord, it might be a best practice to test. If you are a pregnant woman, it might be a best practice to think about where you consume water, what surfaces you touch, and so on.

Steve then moved on to discuss sampling. He said there are a number of questions around this topic, such as, should systems change the way in which they collect samples. Steve explained that samples should be fit for a purpose, so the Authority must consider what it can do with the data obtained from any particular type of sampling. Another question to consider is whether the Authority should sample more samples. More samples are always better, but harder to get. Trying to get homeowners to sample—especially when the sampling technique is difficult—is hard to do.

Michael Baram stated that he believes the EPA—given the ubiquitous nature of the issue—will handle lead like stormwater. EPA will delegate to states and the states will sub-delegate to local communities to come up with a reasonable plan. Steve reasoned that that is a possibility—Michael reasoned there is no way EPA can manage such a program without delegation. [DEP has delegated SDWA responsibilities to the state in almost every state. The second question about whether local entities have planning flexibility or rigid mandates is the critical one.] Steve cautioned that EPA has a great deal of options on the table; some of which are far advanced. Administrator Scott Pruitt has proclaimed a “war on lead” so Steve thinks that there is the possibility for a variety of approaches moving forward.

Paul asked what WSCAC can do to help—should WSCAC get involved? Steve replied that he does not have an answer. The federalism review consists of state and local partners. WSCAC does not necessarily fit into that framework. The deadline is March 8th, which means the committee would have to figure out their approach before that time. Members, Steve reasoned, could individually ask their local water departments about lead service lines and lead service line inventories.

Janet stated that she thinks the best way to go about approaching this issue is through real estate transactions. Janet reasoned that if there was a financial impact on the homeowner, a lot of what Steve discussed in terms of testing, could be accomplished upon the sale of a home. Steve replied that an inventory gives people an incentive to deal with the lead service line before they put their house on the market because it makes their home more marketable.

Michael stated that he thinks WSCAC should be active and participate in the federalism review process. Michael asked if Steve has a statement about the criteria in which the EPA is interested. On the EPA website, Steve stated, there is a PowerPoint presentation that walks through all of the questions. Steve advised picking a few questions such as flexibility, dealing with lead service line disclosure at the state level, and pushing for a Title V approach of “remove on sale.”



Kurt asked if private wells are an issue. Steve stated that it could be. If he had a private well, he would have it tested for lead, and he would have it tested in a number of ways in order to get a good assessment for all of the water.

Janet asked if there is any way that the EPA could require towns, when they dig up a road, to change all of the lead service lines thereunder. Steve said he imagines the revisions will push utilities to remove lead service lines when they can. EPA's guidance manuals already include such a recommendation and it is being pushed aggressively.

WSCAC and meeting attendees thanked Steve for his informative presentation.

Michael adjourned the meeting.

**WSCAC's next meeting will be held on Tuesday, March 13, 2018 at the MWRA Facilities in Southborough. Please visit the WSCAC [website](#) for more information.**