

## **OUTFALL MONITORING SCIENCE ADVISORY PANEL MEETING**

**Wednesday, April 24, 2019**

**10:00 AM to 3:00 PM**

**EPA, 15th floor, Courtroom 6, 5 Post Office Square, Boston**

*Meeting notes drafted by Cathy Vakalopoulos and Matt Liebman*

### **Welcome**

Lynne Hamjian (EPA, Deputy Director, Office of Ecosystem Protection) welcomed everyone and thanked OMSAP for their important scientific input that they have provided through the years.

### **OMSAP's Role in Advising Agencies on MWRA's Ambient Monitoring, Judy Pederson**

Judy Pederson (OMSAP Interim Chair, MIT Sea Grant) described OMSAP's role in advising EPA, MassDEP, and MWRA, reviewed the agenda, explained the expectations for the day, and introduced new members Ginny Edgcomb (WHOI) and Jeff Rosen (Corona Consulting).

### **Overview of Recent Ambient Monitoring Results, 2017 and 2018, Betsy Reilley and Ken Keay (MWRA)**

Betsy Reilley and Ken Keay (MWRA) presented recent monitoring results (slides are available upon request). Bruce Berman (Save the Harbor/Save the Bay) asked if they have seen any change in seasonality regarding algal blooms. Betsy replied yes, *Phaeocystis* is growing later in the season. That's why we've have had summer season Contingency Plan exceedances. The summer threshold was set using pre-outfall baseline data and is very low. Now we can tell by the water temperatures when *Phaeocystis* will bloom. Jeff asked if there have been changes to the benthic community, and whether there are species that stir things up. Betsy replied that we have seen changes and also an increase in diversity. Ken added that we don't see the types of species that stir things up. The mechanisms that mix sediments are sediment transport and storms. Julie Simpson (MIT Sea Grant) asked where the caged mussels are placed near the outfall. Ken replied in the outfall's zone of initial dilution.

Phil Colarusso (EPA) asked how the concentrations of contaminants in mussels near the outfall compare to mussels at the reference station. Ken said that we always test the mussels when they are collected at a "clean" location and the mussels caged in Boston Inner Harbor, at Deer Island Light, at the outfall, and at the outfall "B" Buoy always have higher concentrations of contaminants. Betsy added that MWRA is not the only discharger in the area. We are looking forward to working with others on ambient monitoring. We will be working with Anna Robuck (URI) on her PFAS study in Massachusetts Bay and will be providing her effluent samples for analysis. To date, we have spent \$73 million on ambient monitoring. There was additional discussion on details of the AMP.

### **Evolution of MWRA's Ambient Monitoring Plan (AMP)**

Ken Keay described how the AMP was developed in the 1990's in collaboration with OMSAP's predecessor, regulators, and NGOs. It was designed around 33 monitoring questions. There is also a Contingency Plan (CP) which contains 76 parameters with thresholds that are triggered when

measurements indicate that something is “different” than the baseline period. When a threshold is triggered, MWRA is required to evaluate the exceedance. In addition, MWRA has conducted “special studies” looking at outfall dilution and plume tracking; primary productivity; sediment metabolism and benthic nutrient fluxes; and in collaboration with USGS, modeling, moored observations, sediment mapping and sediment transport. Both the AMP and CP are attached to MWRA’s discharge permit and there is a process to revise both. The AMP was revised in 2003-2004 and 2009-2010. In terms of water column monitoring, there was initially an oversampling. There was more spatial autocorrelation than temporal autocorrelation. Revisions resulted in fewer stations near the outfall. In 2010, revisions were more about farfield sampling, and the result was less frequent, but more synoptic sampling. Judy asked about Anne Giblin’s (MBL) work on benthic nutrient fluxes. Ken replied that Anne has said that as far as she is concerned, the questions asked regarding benthic nutrient fluxes have been answered. Jeff stated that everything depends on what we consider “meaningful differences” and how those are defined. At the November 2018 conference, we discussed how the monitoring plan answered many of the original questions. Ken told the group that MWRA will be asking OMSAP what level of detail is needed to justify changes to the AMP, e.g. would OMSAP like to evaluate recent data or the whole dataset?

### **Synopsis of November 2018 Outfall Monitoring Workshop**

Judy Pederson summarized the recent OMSAP workshop “2300 Days at Sea: Monitoring the Impacts of the Outfall on Massachusetts Bay”. The AMP has four overarching questions. Many of the specific monitoring questions have been answered. The workshop reviewed the current AMP and looked at ways the AMP could evolve by looking at emerging contaminants and studying how climate change is/will impact(ing) Mass Bay and the outfall discharge. For example, how do we distinguish climate change effects from discharge effects. Do we need to look at new species ranges in our evaluations? We also learned how multiple wastewater treatment plants can collaborate with their ambient monitoring (East Bay Dischargers Authority in San Francisco). For more information, the Executive Summary is located at: [https://seagrant.mit.edu/press\\_releases.php?nwsID=689](https://seagrant.mit.edu/press_releases.php?nwsID=689). Ginny agreed that we need more information on emerging contaminants in the effluent and that though our focus is MWRA, it would be good to have information from other point sources. Rich Delaney (Provincetown Center for Coastal Studies) appreciates the difficulty in discerning whether changes in the marine environment are due to climate change. He added that the Intergovernmental Panel on Climate Change (IPCC) will be publishing a new report on oceans this summer. He also said that MWRA’s discharge permit requires the protection of endangered species.

Bruce Berman presented the Public Interest Advisory Committee’s consensus opinion about ambient monitoring that the group supports more flexibility, more collaboration, and more responsiveness. As the ocean gets warmer, deeper, and stormier, the effects of the outfall will change. He added that the AMP is a critical and cost-effective tool for monitoring the effects of the outfall. He encouraged a regional monitoring plan to address the issues of concern in a collaborative, comprehensive, and cost-effective fashion. Jackie Motyka (Northeastern Regional Association of Coastal Ocean Observing Systems, NERACOOS) pointed out that there is a collaborative framework in place in the northeast called the Integrated Sentinel Network (for more information go to: <http://www.neracoos.org/sentinelmonitoring>).

### **Revision Process for MWRA's Ambient Monitoring Plan**

Judy Pederson would like to begin planning for the review and revision of the AMP. When the AMP was first developed, we considered National Research Council's "Managing Troubled Waters, the Role of Marine Environmental Monitoring" which emphasized an adaptive management approach where monitoring is adjusted over time as questions are answered and new ones arise. OMSAP members discussed aspects of the monitoring. Juanita Urban-Rich (U Mass Boston) said that we don't know which emerging contaminants are present in the effluent or what levels are of concern. The first step is to monitor the effluent. Steve Rhode (MWRA) said that emerging contaminants are likely everywhere and we don't know if this is a bad thing. You can't just look at the effluent to answer questions about emerging contaminants. Jeff said that we should find out if the outfall is responsible for higher concentrations in Mass Bay. We could frame a pilot study that will attempt to discern between the outfall and background concentrations in Mass Bay. This should be structured with other dischargers.

Judy asked how we would address climate change. Julie replied that it will be very important to have flexibility, for example developing special studies. There are so many unknowns brought by climate change. Bruce asked about long term changes in temperature. Betsy replied that MWRA has measured about a half a degree per decade increase in temperature. Jeff said that we have not seen major effects on the ecosystem in 25 years of monitoring. We should put our heads together on whether climate change effects will change that. Bruce thinks that higher ocean temperatures will change seasonality and the intensity of nuisance blooms, both of which could be monitored.

OMSAP agreed to have their next meeting in October. **Update: the next meeting has been scheduled for October 3, 2019 at the Stellwagen Bank National Marine Sanctuary (175 Edward Foster Rd. Scituate MA).** **Matt Liebman (EPA) asked if there was OMSAP consensus on forming *ad hoc* groups. OMSAP agreed.** Bruce thought that MWRA should propose changes to the AMP before October. Betsy said that MWRA can propose changes however it will take longer to develop monitoring for emerging contaminants. There are still some very big questions about this topic especially regarding microplastics. Judy thinks OMSAP could form a focus group on emerging contaminants to help move things forward. Betsy said it is still not clear how much information MWRA will have to provide to OMSAP during this review process. Previous reviews were very labor intensive. **Jeff said as a way of streamlining, it would be useful for MWRA to list the action, why it was recommended, and supply supporting documentation. After this first cut, we could move on to more complicated issues.** Judy said that the purpose of convening focus groups is to bring in some experts which shouldn't add a lot of additional work for MWRA. **Judy added that OMSAP's homework will be to review the original 33 questions and see which are still valid. Also, we should plan to respond to MWRA's proposed list of revisions before the October meeting.** Matt and Judy discussed OMSAP's Inter-Agency Advisory Committee (IAAC) which has not convened in a long time. Judy is not concerned because the agency representatives attend OMSAP meetings regularly.

### **Emerging Contaminant Study in Mass Bay**

Anna Robuck (Ph.D candidate, University of Rhode Island Graduate School of Oceanography) described her research project that will examine 24 per- and poly-fluoroalkyl substances (PFAS), 16 active pharmaceutical ingredients (APIs), and sucralose (excellent wastewater tracer), and total oxidizable precursors in Massachusetts Bay. MWRA will be providing effluent samples to her. She also has secured four days of ship time and will be sampling (surface and bottom) August to December 2019 to capture stratified and unstratified conditions. This is the first time these parameters will be measured in Massachusetts Bay. Preliminary measurements in Stellwagen Bank National Marine Sanctuary showed PFAS concentrations 2-3 times higher than expected. She hopes to better constrain the different sources of PFAS. Her previous work includes investigating PFAS concentrations in juvenile Great Shearwaters in Mass Bay. Similar concentrations were found in birds in Narragansett Bay.

## **Attendance**

### **EPA**

Lynne Hamjian, EPA Region 1

Matt Liebman, EPA Region 1

Phil Colarusso, EPA Region 1

### **OMSAP**

Judith Pederson, MIT Sea Grant

Julie Simpson, MIT Sea Grant

Bob Beardsley, WHOI

Jeff Rosen, Corona Environmental

Juanita Urban-Rich, UMass Boston

Ginny Edgcomb, WHOI, by telephone

### **IAAC**

Cathy Vakalopoulos, MA DEP

Steve Wolf, Army Corps of Engineers

Jeff Kennedy, MA DMF

Prassede Vella, MA CZM/Mass Bays NEP

### **PIAC**

Bruce Berman, Save the Harbor/Save the Bay

Andrea Patton, Save the Harbor/ Save the Bay

Tani Marinovich, Save the Harbor/Save the Bay

Kelly Coughlin, Save the Harbor/Save the Bay

Heather McElroy, Cape Cod Commission

Andrae Downs, Wastewater Advisory Committee

Lenna Ostrodka, MWRA Advisory Board

Joe Favaloro, MWRA Advisory Board

Vi Patek, Nahant SWIM

Rich Delaney, Center for Coastal Studies

Joann Muramoto, Association to Preserve Cape Cod/Mass Bays CC

Pam Dibona, Mass Bays NEP

#### MWRA

Betsy Reilley, MWRA

Ken Keay, MWRA

Doug Hersh, MWRA

Denise Ellis-Hibbett, MWRA

David Yu, MWRA

Sally Carroll, MWRA

Fang Yu, MWRA

Dave Taylor, MWRA

Lucner Charlestra, MWRA

Dan Codiga, MWRA

Carolyn Fiore, MWRA

Jianjun Wang, MWRA

Steve Rhode, MWRA

Scott Libby, Battelle

#### Others

Jackie Motyka, NERACOOS

Peter Fifield, Boston Harbor Ecosystem Network

Bill Kiley, Boston Water and Sewer Commission