Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection
One Winter Street Boston, MA 02108 • 617-292-5500

Charles D. Baker
Governor

Karyn E. Polito
Lieutenant Governor

Kathleen A. Theoharides
Secretary

Martin Suuberg
Commissioner

Meeting Summary
Stormwater Advisory Committee - Meeting #3
September 22, 2020, 10:00 AM – 1:00 PM
Online via Zoom

ATTENDANCE

ADVISORY COMMITTEE MEMBERS

Name	Affiliation
Jeffrey Brem	Home Builders and Remodelers Association of MA (HBRA-MA)
Sandra Brock	MA Association of Conservation Commissioners (MACC)
Ronald Burns	Boston Society of Civil Engineers Section
Rich Claytor	Member At Large
Ian Cooke	MA Rivers Alliance (MRA)
Cindy Delpapa	MA Department of Fish and Game
Patty Gambarini	Pioneer Valley Planning Commission (PVPC)
Ariela Lovett	MA Municipal Association (MMA)
Robert Lowell	MA Department of Conservation and Recreation (MassDCR)
Steve Miller	Massachusetts Department of Transportation (MassDOT) – Highway Division *(Acting as alternate for Henry Barbaro, MassDOT – Highway)*
Stacy Minihane	Association of MA Wetland Scientists (AMWS)
Stephanie Moura	Massachusetts Department of Environmental Protection (MassDEP)
Chip Nylen	National Association of Industrial and Office Properties (NAIOP)
Vandana Rao	MA Executive Office of Energy and Environmental Affairs (EEA)
Lisa Rhodes	MassDEP
Heidi Ricci	MA Audubon Society (MA Audubon)
Robert Roseen	Member At Large
Newton Tedder	U.S. Environmental Protection Agency (U.S. EPA)
John Woodsmall	Central MA Regional Stormwater Coalition (CMRSWC)

MASSDEP, PROJECT TEAM, AND PRESENTERS

Name	Affiliation
Kathleen Baskin	MassDEP
Lealdon Langley	MassDEP
Thomas Maguire	MassDEP
Stephanie Moura	MassDEP
Jill Provencal	MassDEP

Lisa Rhodes	MassDEP
Laura Schifman	MassDEP
Judy Schmitz	MassDEP
Alice Smith	MassDEP
Indrani Ghosh	Weston & Sampson
Mia Mansfield	EEA
Vandana Rao	EEA
Kathy Watkins	City of Cambridge; Resilient Mystic Collaborative (RMC)
Kate Barrett	Regina Villa Associates (RVA)
Kyle Olsen	RVA
Amanda Poggenburg	RVA

PUBLIC

Name	Affiliation
Henry Barbaro	MassDOT
Rodney Bender	
Gorden Bergeron	Lowell Regional Wastewater
Lauren Caputo	VHB
Jean Christy	Tighe & Bond, Inc.
John Corey	City of Woburn
Eilish Corey	Town of Auburn
Mark Costa	VHB
Gregory Coyle	Lowell Regional Wastewater
John Digiacomo	Town of Natick
Caroline Hampton	VHB
Kevin Hardiman	Town of Tewksbury
Jennifer Hughes	Merrimack Valley Planning Commission
Joe Kietner	City of Westfield DPW
Jennifer Letourneau	City of Cambridge
Tara Lewis	Cape Cod Commission
Nancy Lin	MassDEP
John Livsey	Town of Lexington
Margot Mansfield	MA Executive Office of Energy & Environmental Affairs
Dorothy McGlincy	MACC
Theresa McGovern	VHB
John P.E.	Boston Water and Sewer Commission
Angela Panaccione	Town of Palmer
Timothy Pasakarnis	Cape Cod Commission
Hung Pham	MassDOT
Kerry Reed	CMRSWC
Jeffrey Rider	
Dominic Rinaldi	BSC Group
Maria Rose	Newton Public Works
George Saraceno	Town of Wellesley, DPW
Frank Singleton	Weymouth Conservation Commission
Kenneth Staffier	VHB
Mike Stuer	Lowell Water

Dan Van Schalkwyk	Town of Ayer
Amy Walker	Charles River Watershed Association
Julie Wood	Charles River Watershed Association
Catherine Woodbury	Cambridge DPW
Julie Wormser	Mystic River Watershed Association

This document summarizes the discussion at the September 22, 2020 MassDEP Stormwater Advisory Committee meeting[1]. All references to slides relate to the presentation posted on the website.

WELCOME AND INTRODUCTIONS

Kathleen Baskin, MassDEP, welcomed the Advisory Committee members and provided an overview of Technical Paper 40 (TP40) and MassDEP considerations for precipitation updates to ensure projects are designed to withstand future climate conditions.

Vandana Rao, MA Executive Office of Energy and Environmental Affairs (EEA), provided an overview of climate change considerations around regulatory frameworks and welcomed input and feedback from Advisory Committee members.

Stephanie Moura, MassDEP, reviewed the meeting agenda and objectives and noted the importance of getting Advisory Committee input and feedback on the issues presented. She then introduced the MassDEP team and presenters.

Kate Barrett, Regina Villa Associates (RVA), outlined the meeting process via Zoom. She asked that all panelists remain muted during the presentation and to hold all questions and comments until after the presentation, unless they had a clarifying question, which they could ask in the "chat" function. At the conclusion of each presentation, Advisory Committee members could virtually raise their hand to submit a question or comment, waiting for Ms. Barrett to recognize them before unmuting themselves and speaking. After sharing their question or comment, they should mute themselves again. All public participants would be muted during the presentations but could send written questions at any time through the "Q&A" feature. Attendees could also virtually raise their hand to verbally submit a question or comment. During the public Q&A portion, the presenters would respond to written questions submitted through the "Q&A" feature before unmuting those who virtually raised their hands in the order which they were raised. Ms. Barrett encouraged attendees to submit any further questions or comments through the form on the Advisory Committee webpage if there was not enough time to respond to all questions during the meeting.

MASSDEP: UPDATING WETLANDS REGULATIONS WITH CURRENT PRECIPITATION DATA

Lisa Rhodes, MassDEP, presented an overview of Executive Order 569, the State Hazard Mitigation and Climate Adaptation Plan (SHMCAP), the use of design storms in wetlands regulations, and the rationale behind the proposed update to precipitation data. Ms. Rhodes noted that the October meeting would provide more information about proposed changes to wetlands regulations and the Massachusetts Stormwater Handbook.

Thomas Maguire, MassDEP, reviewed the precipitation estimates MassDEP considered for the update: 1961 TP40, 2008 data from the Northeast Regional Climate Center at Cornell (Cornell) and 2015/2019 National Oceanic and Atmospheric Administration Atlas 14 (NOAA 14) for current conditions, and Downscaled General Circulation Model (GCM) data for future conditions. Mr. Maguire provided an overview of NOAA 14, which was identified by MassDEP as the most robust precipitation data set, NOAA 14 PLUS, and the metrics studied to determine the effects changes in precipitation on wetlands. He reviewed the reasons MassDEP is recommending NOAA 14 PLUS (NOAA PLUS) for the precipitation update and specific recommendations for specific water resources. See slides 3-25.

[1] Please note that DEP is not recording the Advisory Committee meetings.

FACILITATED Q&A WITH ADVISORY COMMITTEE

- **Stacy Minihane**: Asked if an evaluation of existing stormwater structures was conducted.
  MassDEP response: That has not been done, but if someone used TP40 for a 100-year stormwater basin, it would only be able to accommodate a 40-year storm based on Cornell and NOAA 14.
- **Robert Roseen**: Asked if the team could elaborate on the use of physical boundaries to define vernal pools.
  MassDEP response: Currently, the Fish and Wildlife Service does not conduct mapping and most practitioners in the field are using physical boundaries, such as breaks in slopes, instead of design storms.
- **Rich Claytor**: Asked about the use of static data compared to an analysis of 20 years of data.
  MassDEP response: The methods used in TP40, NOAA 14, and Cornell rely on stationarity. The slide that shows annual maximum daily precipitation showed four statistically significant upward trends, but the data is stationary so even if 20 years of data was used, it might not show much difference.
- **Steve Miller**: Recommended MassDEP have their conclusions peer reviewed.
  MassDEP response: The Resilient MA Action Team (RMAT) has peer reviewed the information and the MassDEP team is reviewing those comments. Additional peer review is something MassDEP will consider.
- **Patty Gambarini**: Asked if there will be interim guidance on using NOAA 14 before updates are finalized.
  MassDEP response: The use of interim guidance is something MassDEP will have to discuss internally.
- **Stacy Minihane**: Asked how this would change Isolated Land Subject to Flooding (ILSF) calculations.
  MassDEP response: Using NOAA 14 or NOAA 14 PLUS for ILSF calculations would result in a larger area. The ground would be saturated, so there would be no change in the current practice of assuming that there is no infiltration in these areas.
- **Ian Cooke**: Asked why MassDEP selected NOAA 14 PLUS at 10% lower than the NOAA 14 Upper Confidence Interval Mean.
  MassDEP response: The main idea is to use existing current precipitation data, but the team also wanted to accommodate upper range of currently observed storms. The team started looking into this by using the Upper Confidence and seeing how much they could reduce that rate so it would be reasonable to different users. The team tested different factors and found a factor of 0.9 (10% reduction of the Upper Confidence) was higher than NOAA14 data for all storms.
- **Jeffrey Brem**: Asked if there was a factor of safety, as was mentioned at the meeting in February.
  MassDEP response: There is not a factor of safety per se, but there would be additional capacity in the larger stormwater basins designed with the proposed update to precipitation data that would require using 0.9 times the 90% upper confidence interval. The proposed precipitation update includes what the team referred to as a factor of safety at the February meeting.
- **Ronald Burns**: Asked how MassDEP is handling future trends, how adjustments would be made in the future, and if the team planned for obsolescence.
  MassDEP response: The team is proposing regulations that would go out for review and public comment to replace regulations in the immediate or near-term, and to account for increasing trends.

Ms. Rhodes introduced Mia Mansfield, EEA, to discuss RMAT strategies to address climate change and future conditions.

EEA: RESILIENT MA ACTION TEAM (RMAT) CLIMATE RESILIENCE FOR PUBLIC ASSETS

To open this portion of the presentation, Ms. Rao said that the approach outlined by the MassDEP team would increase precipitation data to reflect the higher end of currently observed storms and look toward the future. She said the effort through the Resilient MA Action Team (the interagency implementation team for the State Hazard Mitigation and Climate Adaptation Plan) is looking to incorporate *future* climate projections into their approach by using the best science currently available, while Downscaled GCM projections for Massachusetts are being updated over the next several years.

Ms. Mansfield provided an overview of the RMAT and the "Climate Resilience Design Standards and Guidelines" effort for state agencies. She explained the project's proposed methodologies to account for future projections of increased precipitation, including data sources and the Tier classification approach. Ms. Mansfield then reviewed next steps for launching the web-based Climate Resilience Design Standards and Guidelines tool. See slides 27-40.

FACILITATED Q&A WITH ADVISORY COMMITTEE

- **Heidi Ricci**: Asked if the web tool would be available for voluntary use.
  EEA response: The tool will be available online as a resource for voluntary use.

Ms. Rhodes introduced Kathy Watkins, City of Cambridge, to discuss the Resilient Mystic Collaborative (RMC) and the work they have done to understand and prepare for climate change as well as the Downscale Model created for the City of Cambridge.

CITY OF CAMBRIDGE CASE STUDY/RESILIENT MYSTIC COLLABORATIVE

Ms. Watkins provided an overview of the RMC. She then reviewed the Downscale Model for Cambridge 2030 and 2070 Projections, including what they are doing with that information, RMC's recommendations for updating precipitation data, as well as how they are using that data for flood protection guidance and stormwater management in dense environments. See slides 42-68.

FACILITATED Q&A WITH ADVISORY COMMITTEE

- **Heidi Ricci**: Asked if RMC will incorporate the National Green Building Standard (NGBS) in their guidelines.
  City of Cambridge/RMC response: The City is working on an Urban Forest Master Plan that will look into ordnances to protect trees on private property and requirements for protecting the existing tree canopy. They are also looking at projects that benefit cooling and requirements that include a cool factor, which is a modified green factor.

FACILITATED ADVISORY COMMITTEE DISCUSSION WITH MASSDEP, EEA, AND CITY OF CAMBRIDGE

Ms. Rao said EEA is encouraged by the work Cambridge is doing and how it is presenting alternatives. She said NOAA PLUS would be the base requirement that could be built on and EEA wants to make sure all projects are at least at that level.

Ms. Rhodes said NOAA PLUS is available to use now and can be implemented easily.

Ms. Baskin noted that peer review has been a strong theme and is important to the process. She said that MassDEP has benefitted from a parallel process to EEA and RMAT evaluations and part of that process included a rigorous analysis of NOAA PLUS by RMAT. MassDEP is recommending NOAA PLUS as a baseline for climate projections as it is representative of conditions on the ground today.

Ms. Barrett invited the Advisory Committee to provide further comments and questions on any of the presentations.

- **Chip Nylen**: Asked if NOAA PLUS would update stormwater design parameters periodically to update precipitation trends.
  MassDEP response: NOAA 14 is static and it represents an extensive time period between TP40 and NOAA14 (50+ years). If NOAA updates the atlas, the stormwater can be updated, but the current proposal of NOAA plus takes increasing precipitation trends into account by utilizing the higher end of currently observed storms and should be acceptable for the short-term.
  Sandra Brock: Asked if there will be changes in requirements for conveyances in the trends the team is seeing with the proposed update.

MassDEP response: New pipes would need to be larger, but this would only apply to new and redevelopment projects. Often, pipes in the street are designed for small storms so there may be water pooling in the street, so new development or redevelopment will need conveyances that are large enough to support larger storms. There are no requirements proposed to increase the pipe size of street conveyances that are not part of the new development or redevelopment project design. The goal of the proposed standards, however, is to increase retention of increasing precipitation on site through increased attenuation of peak runoff and through recharge, thus minimizing impacts to off-site conveyances.
EEA response: The decision for making updates to existing or past infrastructure is not something that can be addressed in the regulations but lies at the city level. In some cases, they may not be able to resize pipes but can look at where the water is going to accommodate changes there. For the RMAT process, they are recommending the use of projected future design storms for designing stormwater infrastructure.

- **John Woodsmall, III**: Asked if MassDEP is considering issuing interim advisory on using NOAA PLUS or Cornell and, if so, requested that they share it sooner rather than later so the changes can be incorporated in one setting with regulation changes and provide certainty to developers so there are not differences from town to town. He noted that municipalities will have to update stormwater bylaws by July 2021.
  MassDEP response: MassDEP will consider issuing interim guidance. The team is looking to release a draft of the regulatory updates and Stormwater Handbook in early 2021. Incorporating the MS4 standards in wetlands regulations could create a uniformity among cities and towns. The MassDEP team will provide more information on that at the October meeting.
- **Jeffrey Brem**: Asked the project team to further analyze the impact of precipitation updates on conveyance systems. He noted that increased pipe size would affect inlets, sewer, electric lines, etc. on the street. He also suggested MassDEP look into designing a new catch basin system that takes into consideration the full system and not just the size of the pipe.
  MassDEP response: The Stormwater Handbook will be released for public comment before changes are finalized. The goal of the updated regulations is to try to encourage developers to retain more runoff onsite and increase recharge.
- **Robert Lowell**: Suggested using 2200 and not 2100 for the planning horizon.
  City of Cambridge/RMC response: Pushing projections out to later years is critical when looking at climate change, but downscale projections are not available beyond 2100.
- **Heidi Ricci**: Encouraged the team to consider stormwater treatment impacts, such as catch basins becoming mosquito habitats, issues with floatables, and taking away groundwater recharge opportunities. She said communities need to continue to incentivize to embrace LID more fully. She also said that communities need to develop designs with native landscaping that does not use potable water.
  MassDEP response: Part of the solution to these issues is more LID and recharge and MassDEP plans to be in step with EEA to require LID unless it is not feasible.
  EEA response: Having recharge occur closer to the site is very important and a lack of recharge and increased imperviousness in the ground has worsened the drought. It is important to be able to put water back into the ground as much as possible through LID and other techniques.
  City of Cambridge/RMC response: The City of Cambridge has been using a number of infiltrating catch basins for the ability to get groundwater back into the ground.
- **Ian Cooke**: Said the redevelopment standard to the maximum extent practicable (MEP) is not adequately addressing peak runoff rate, as developers are interpreting it as not making conditions worse than existing conditions.
  MassDEP response: There needs to be an evaluation on whether conditions can be improved by reducing the existing runoff rate. The team could look at changing the wording of the standard toward specific regulatory standards.

City of Cambridge/RMC response: Cambridge has a requirement that post development runoff rate from a 25-year storm event cannot exceed the pre-development two-year storm event. Want to ensure that developments improve conditions and not simply maintain existing conditions.

- **Robert Roseen**: Suggested using critical quality attributes (CQA) to ensure the stormwater network is appropriately constructed, such as using a third-party engineer to sign off that the development has been built as permitted and functions as intended. He commented that failure often occurs because the drainage system was not built properly. He also noted that operations and maintenance (O&M) is important as well, and developers should better consider low maintenance BMPs.
- **Rich Claytor**: Asked the team to address conveyance system design.
  MassDEP response: Dynamic analyses from the developers would be helpful in identifying reverse flow in the conveyance system, even if MassDEP does not change the guidance on conveyance systems at this time. MassDEP will need to consider this issue further.
  Chip Nylen: Asked the team to consider having a transition time to allow more time for developers to take these changes into account during the design phase.
- **Jeffrey Brem**: Asked about the basis for the NOAA 14 upper and lower confidences.
  MassDEP response: Each of the 650 stations did a Monte Carlo simulation and had 1,000 datasets that were ranked from high to low. The 5th and 95th percentiles became the lower and upper confidences, respectively.
- **Ronald Burns**: Said it would be helpful to have a guidance document that provides clarity on the data update. He also noted that any cost associated with the regulations becomes a burden of the community after the design phase and said projects should design for the future.
- **Robert Roseen**: Requested the team provide straightforward regulations with specific numbers for developers to meet. He also suggested introducing an incentive to reward higher levels of environmental protections. He offered to share the whitepaper he authored on the topic. The projects would all have to meet basic standards of review, but for projects that go above and beyond, there could be an expedited permitting process.
  MassDEP response: It is a good idea but would need more review to determine feasibility.
  City of Cambridge/RMC response: It is a creative idea and good incentive, but there would need to be more thought into what an expedited permitting process would look like.
- **Ian Cooke**: Suggested looking at the short- and long-term costs of updating the Stormwater Handbook to deal with issues up front and plan accordingly so the Stormwater Standards are not obsolete soon after the updates.
  MassDEP response: The team will present scenarios that examine the effects more closely on actual projects at the October meeting.
- **Steve Miller**: Said he supports the regulation update and noted that the team should be mindful about the process. He expressed concerns about the need to better understand the effects of NOAA Plus on land development due to potential over-design of stormwater systems and potential increase in the extent of Bordering Land Subject to Flooding (BLSF). He encouraged the team to have others, outside of RMAT, provide peer review.
  MassDEP response: Welcomed Mr. Miller to share his work with the Advisory Committee and team.

GENERAL Q&A WITH THE PUBLIC

Ms. Barrett invited questions from the public.

- **Maria Rose**: Asked what other cities and towns in RMC are using for precipitation data.
  City of Cambridge/RMC response: Some other communities are using Cornell data in their Conservation Commission permitting, but we do not know what design storms they are using for the design of their municipal systems.
- **Julie Wormser**: Asked the team to explain how NOAA PLUS was developed and how they determined a factor of 0.9.
  MassDEP response: MassDEP would use NOAA PLUS for current precipitation and reduced the NOAA 14 Upper Confidence by 10% because they did not want to require over design. The team iteratively went through reduction factors and found the only one to produce a higher precipitation than the initial value was 0.9. The period of record

for NOAA 14 is per station, some stations have records as early as 1818 and the latest as late as 2014. There are 51 stations available in Massachusetts with a period greater than 100 years, with an average period of record of 59 years.

- **Julie Wormser**: Asked where the percentage increases for the Tier 2 RMAT Climate Standards analysis came from based on the national climate methodology.
  EEA response: The Tier 2 percentages were based on the National Climate Assessment Report. RMAT is doing an additional analysis for eight stations across Massachusetts and looking at downscaled future climate projections for multiple planning horizons and return periods.
- **Julie Wormser**: Said updating the precipitation data and providing stronger regulations for developers is very important and encouraged the MassDEP team to use the full NOAA 14 Upper Confidence, as it is more protective, would be able to provide more than 2030 projections, and would be more cost efficient.
  MassDEP response: Noted some communities with socioeconomic concerns have expressed interest in more protective regulations.

Ms. Barrett stated that the meeting summary and presentation would be posted on the website and the team would email the group when they are available.

Ms. Baskin thanked everyone for their thoughtful comments and consideration.

Ms. Moura stated that the next Advisory Committee meeting is October 15 via Zoom.