



Massachusetts Water Resources Authority

Presentation to

NEWEA CSO Conference 2021

MWRA's CSO Public Notification Program

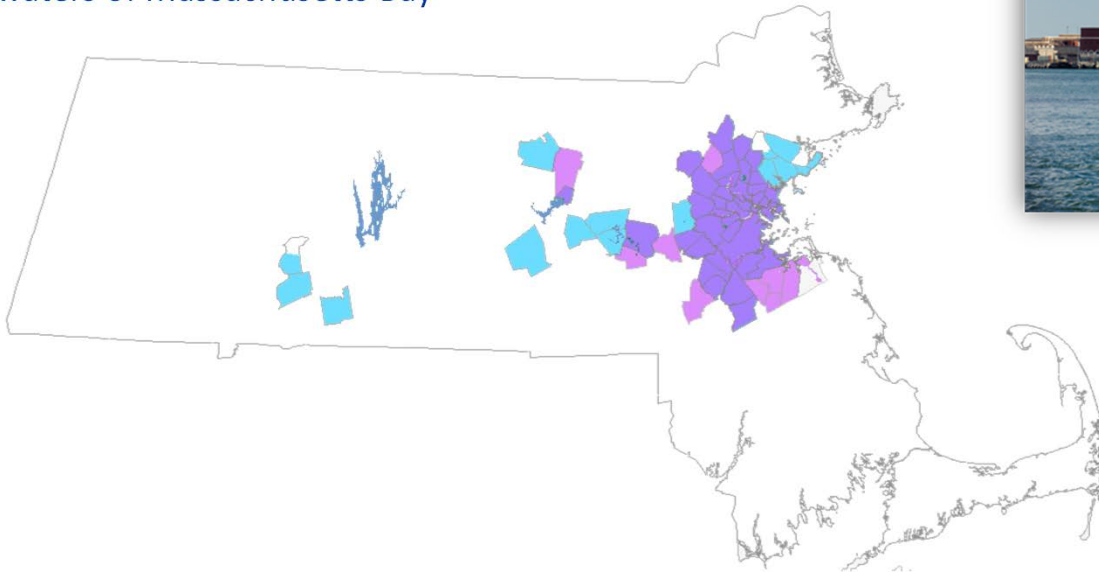
David Wu

MWRA Environmental Quality Department
September 30, 2021



Massachusetts Water Resources Authority

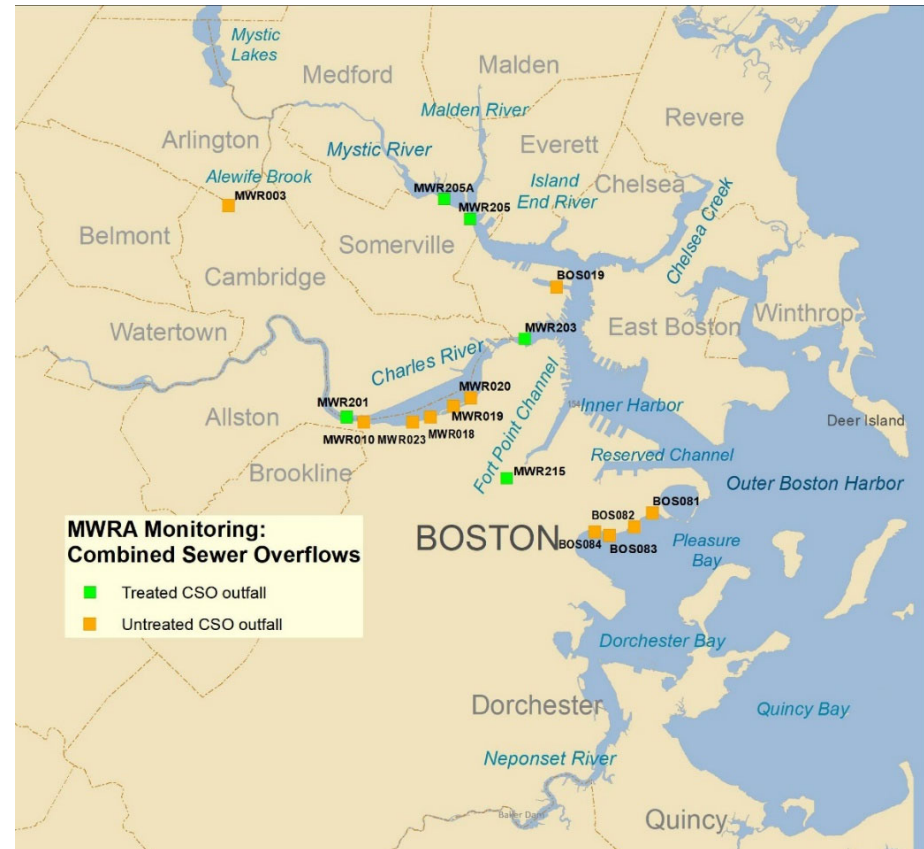
- MWRA provides wholesale water and wastewater services to over 3 million customers in 61 communities
- MWRA collects and treats an average of 360 million gallons of wastewater per day at the Deer Island Treatment Plant, with a peak capacity of 1.3 billion gallons
- Treated wastewater is discharged 9.5 miles out into the deeper waters of Massachusetts Bay





MWRA CSOs

- Nearly all flow is treated at Deer Island Treatment Plant
- CSO discharges have been reduced by 87% since 1992
- About 93% of remaining CSO flow receives treatment:
 - screening
 - disinfection
 - dechlorination
- Hydraulic model results indicate the majority of the CSO flow is stormwater rather than sanitary sewage





Variances and notification requirements

- Water quality variances for the Charles River and Alewife Brook/Mystic River
- The variances, granted by the state Department of Environmental Protection, allow MWRA to temporarily exceed water quality standards and discharge CSO while working to improve conditions
- Variances require public notification of CSO discharges

Alewife Brook/Upper Mystic River Basin

MWRA, and the Cities of Cambridge and Somerville shall, by December 31, 2020, develop and implement a CSO Subscriber-Based Notification System to provide CSO Alert Notifications to any interested parties, which shall include the following components:

- a. A CSO Alert Notification shall be issued no later than 4 hours after becoming aware of a CSO event from one or more of the permittee's CSO outfalls, but in no event later than 12 hours after onset of the CSO discharge, which shall be issued to: MassDEP, EPA, local boards of health in Cambridge, Somerville, Arlington, and Medford, the Mystic River Watershed Association, and any person subscribed to receive such Alert Notifications.

<https://www.mass.gov/guides/sanitary-sewer-systems-combined-sewer-overflows#-2019-charles-river-basin-and-alewife/upper-mystic-river-final-combined-sewer-overflow-variances->



Massachusetts CSO notification law

- “An Act Promoting Awareness of Sewage Pollution in Public Waters”
 - Signed January 21, 2021
 - 2 hour notification via email or text message
 - Notifications also on a website and “...by other means.”
- MassDEP is in the process of developing regulations
 - Stakeholder meetings held in Spring 2021
 - Draft expected in Fall/Winter 2021
 - Must be finalized by July 2022



Information flow

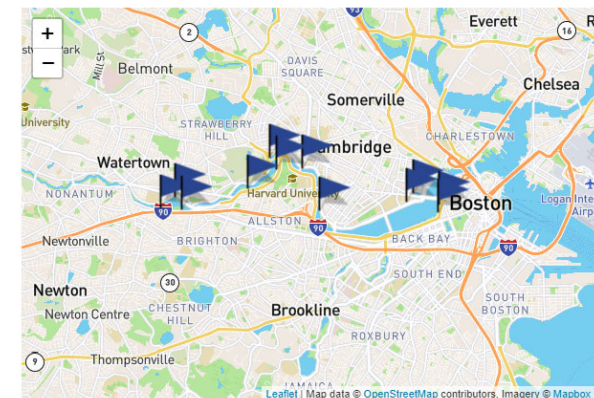
- MWRA's Operations Control Center is staffed 24/7/365
- In larger storms, the Emergency Operations Center is staffed
 - Staff monitor meter data from CSO treatment facilities and untreated CSOs
 - When an activation is confirmed, they will notify the NPDES on-call manager who is available 24/7/365
 - Confirmed CSO activations will be posted on mwra.com and via our subscriber-based system, Everbridge
 - Turnaround time has typically been under an hour



Importance of confirming CSO discharge

- MWRA has decided to have Operations Engineering staff confirm all activations before they are notified to the public
- They are trained to examine the meter data and confirm the discharge before the NPDES on-call manager is notified
- Therefore, notifications are NOT automated
- Charles River Watershed Association is using CSO notifications to “red flag” the Charles, advising people not to recreate – so it’s important to get this correct

See <https://www.crwa.org/flagging-program.html>



(Last updated: 2021-09-13 06:00:00 AM)



CSO treatment facilities

- MWRA notifies for discharges from four CSO treatment facilities
- These facilities are staffed during storms and are fully instrumented
- This is the easiest scenario!
- Luckily, most CSO discharges are from these treatment facilities

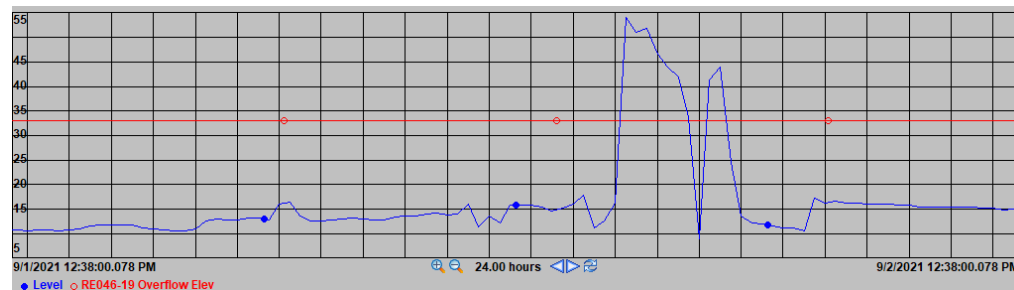




Untreated CSOs



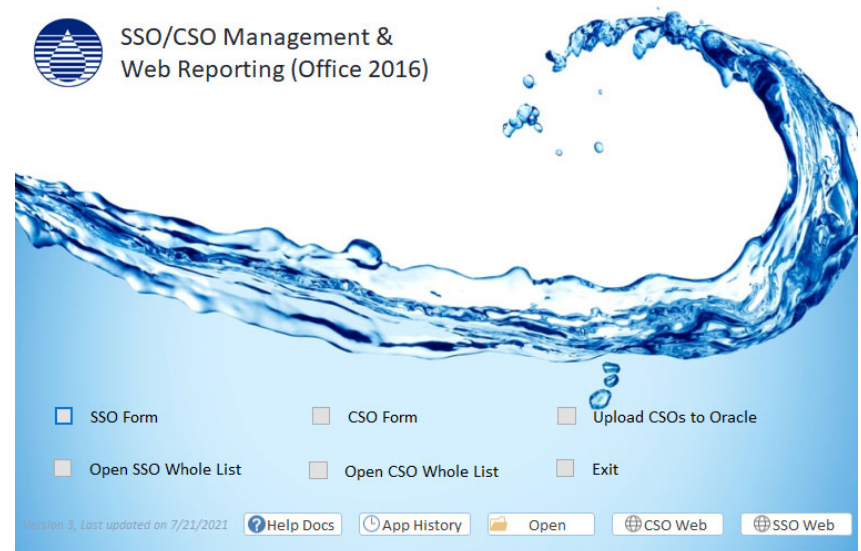
- Untreated CSOs are much trickier
 - They discharge much less frequently – only in the largest storms
 - Regulators are all configured differently
 - As part of the pre-storm checklist, all meters are checked
- Instrumentation was installed in 2018 as part of the MWRA's CSO Post-Construction Monitoring and Performance Assessment





Access application

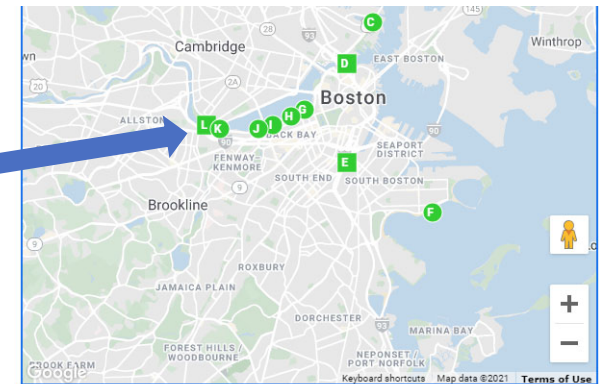
- Microsoft Access application developed in-house to record CSO activations
 - Application generates
 - Files to update the CSO notification web page
 - Text to be pasted into the Everbridge notifications
 - Application also stores outfall, start and stop times, volumes, and any notes about the activation





Access output – files

- To update the web site, staff need to only upload two text files and an Excel file
 - One text file controls the map data
 - The second is the table below the map with recent activations
 - The Excel file is an archive of all activations since 2020
- The applications generates all of those files automatically – all staff have to do is upload to the MWRA web server



discharge table below provides additional details. Discharge duration and volume are estimated. Data for CSOs is preliminary and subject to change.

MapID	CSO Number	Outfall Location	Potentially Affected Area	Start Time	Stop Time	Duration	Volume (million gallons)	Event Rainfall (inches)
D	MWR203	Upper Inner Harbor, upstream of N. Washington St. bridge	Boston Inner Harbor	9/10/2021 01:40 AM	9/10/2021 03:55 AM	2 hr 15 min	TBD Treated	TBD
	SOM007A/	Baxter Park/Assembly		9/10/2021	9/10/2021		TBD	



The Original Process

- This is a huge improvement over the original process
 - We had to manually cut and paste JavaScript from the Access application to Dreamweaver
 - Required some comfort with dealing with code
 - Not the easiest thing to do at 3am
 - Prone to errors!

```
9 <!--The following script tag downloads a font from the Adobe Edge Web Fonts server for use within the web page-->
10 <script>var __adobewebfontsappname__="dreamweaver"</script>
11 <script src="http://use.edgefonts.net/source-sans-pro:n2:default.js" type="text/javascript"></script>
12 <!-- HTML5 shim and Respond.js for IE8 support of HTML5 elements and media queries -->
13 <!-- WARNING: Respond.js doesn't work if you view the page via file:// -->
14 <!--[if lt IE 9]>
15     <script src="https://oss.maxcdn.com/html5shiv/3.7.2/html5shiv.min.js"></script>
16     <script src="https://oss.maxcdn.com/respond/1.4.2/respond.min.js"></script>
17 <![endif]-->
18 </head>
19 <body>
20 <!-- Main Container -->
21 <div class="container">
```



Public notifications – timeline of changes

- April 2016 – CSO public notifications started
 - Notifications were not required – no timeframe
 - Done just via website
- August 2019 – New CSO variances issued which included required subscriber-based CSO notifications by December 2020
 - Postings within “...4 hours after becoming aware...”
 - Volume of CSO discharged must be posted on a public website within 5 business days
- Summer 2020 – New system up and running before the deadline
 - New Access application in place; notifications on mwra.com and pushed to Everbridge subscribers; protocols developed for untreated CSOs and volume reporting



Everbridge

- Everbridge is the public notification software used by MWRA
 - Previously used for alerts/updates regarding construction, traffic, emergencies, etc.
 - No need to reinvent the wheel – so Everbridge chosen for CSO notifications
- Subscriber based – so recipients must sign themselves up
 - Can receive notifications via text and/or email



Signing up for Everbridge

<https://www.mwra.com/updates/everbridge/join.html>

ge/join.html

Sign Up to Receive Notifications from Massachusetts Water Resources Authority

Sign Up to Get MWRA Notifications, Alerts and Project Updates

Get important information from MWRA as soon as it becomes available. The MWRA notifications system sends alerts about the topics you select to your email inbox, text messages, or both. Sign up and set up your notifications preferences to get started.

Sign Up for MWRA Notifications

Available topics include:

- Project or Service Updates
- Meeting Materials and Minutes
- Water and Wastewater Quality Reports
- Job Postings
- CSO Discharge Notifications

All personal information will be kept confidential.

Sign Up

Create Your Account

All fields are required unless indicated as 'optional'.

First Name

Username

Password

Security Question

Subscriptions

Alert Subscriptions

- ☐ Emergency Notifications
- ☐ Service Updates
- ☐ Job Postings
- ☐ Reports
- ☐ Meeting Notices
- ☐ Project Updates
- ☒ CSO Overflow Notifications

☒ CSO Overflow Notifications

[Skip this](#) **Save & Continue**



CSO Notifications

Sunday, July 18, 2021



MWRA Treated CSO Activation
Treated CSO in Lower Mystic River.
MWR205 discharged on 7/18 at
05:15 AM. See link for details.
<http://tinyurl.com/mwra-cso>

From: **MWRA Subscription Services** <noreply@everbridge.net>
Date: Sun, Jul 18, 2021 at 5:33 AM
Subject: MWRA Treated CSO Activation



Massachusetts Water Resources Authority Notification

Treated CSO in Lower Mystic River. MWR205 discharged on 7/18 at 05:15 AM. See link for details.
<http://tinyurl.com/mwra-cso>

DO NOT REPLY TO THIS MESSAGE - To create an account or manage your subscription click [here](#).

https://www.mwra.com/harbor/html/cso_reporting.htm

Sewer System

Harbor and Bay

School Program

About MWRA

Doing Business with MWRA

Contact MWRA

MWRA CSO Reporting

A combined sewer overflow (CSO) occurs when a large storm overwhelms the sewage system causing rainwater to mix with wastewater and discharge to a nearby water body. This relief measure prevents sewage backups into homes and businesses. MWRA owns combined sewer outfalls that discharge to the Charles and Mystic Rivers, Alewife Brook, and Boston Harbor. When a CSO occurs at an MWRA-owned outfall, there is a notification displayed on the map below.

The cities of **Boston**, **Cambridge**, **Chelsea** and **Somerville** manage their own combined sewer outfalls, including CSO reporting. These communities must be contacted directly for information regarding their CSO discharges. To see where all CSO outfalls are located, [download this map of MWRA and community CSO sites](#).

Public health officials recommend avoiding contact with water bodies during rainstorms and for 48 hours afterwards, as there may be increased health risks due to bacteria or other pollutants associated with urban stormwater runoff and CSO discharges.

[Subscribe to MWRA CSO discharge notifications](#)

Select CSOs to display:

☒ MWRA CSO Discharge ☐ Community CSO Sites

Discharges from MWRA CSOs and Storage Facilities

Treated discharge (last 2 days)	Untreated discharge (last 2 days)	No Recent Treated discharge	No Recent Untreated discharge

Mouse over each map symbol below for the CSO number and other information.
Data for CSOs are preliminary; MWRA publishes final data in the CSO Annual Report.

To refresh the web page for the latest CSO event information, press **Ctrl + F5** in Windows or **Shift + ⌘ + R** in Mac. For mobile devices, clear the browser cache first and then refresh.

Map

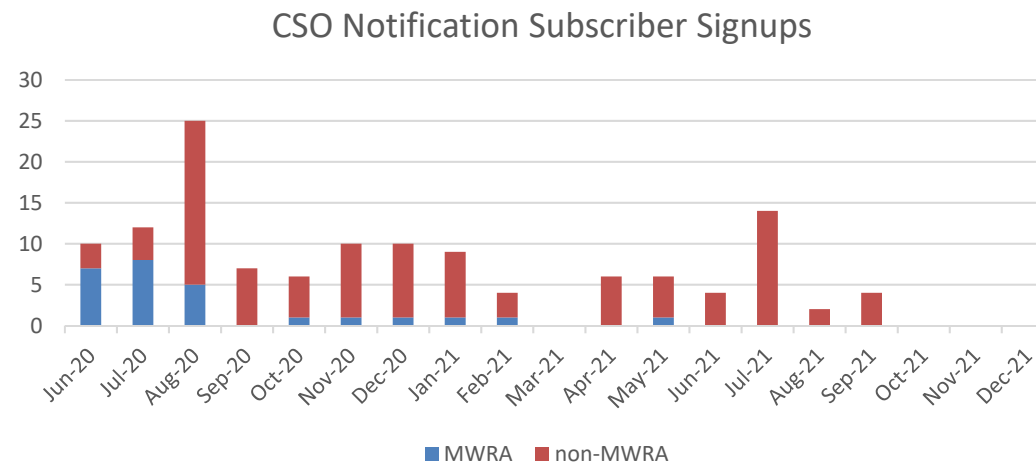
Satellite

CSO Base Map



How many subscribers?

- As of 9/13/2021, 128 subscribers
- Growth has been slow, but did pick up after a wet July





Post-Storm

- Operations Engineering calculates volume discharged
 - CSO variances require within 5 business days, currently
 - For treatment facilities, flow meter data is easily available
 - For untreated CSOs, numerous methods depending on the configuration of the regulator and data available
 - Calculation methods have been standardized into Standard Operating Procedures
- Once volumes are calculated, the Access application and website are updated – again, within 5 business days



Conclusions

- So far, so good - MWRA has been meeting all requirements
- Automated versus non-automated notifications is a big decision – MWRA has staff and resources to verify all CSO discharges, which may not be true for other agencies
- The notification process should be as streamlined as possible – no one wants to be doing extraneous things at 3am!
- Our Access application has been extremely useful
 - Automatically generates code for the website
 - Provides Outlook reminders to post volumes discharged
 - Acts as a “copy of record” for CSO activations if we need that data for other purposes



Acknowledgements

- Environmental Quality NPDES and Data Management staff
 - But especially Fang Yu, the developer of the Access application
- Lisa Bina, Kristen Hall, and Nate Little (Operations Engineering)
- Operations staff who are too numerous to count





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