



Combined Sewer System Overflow Communication Plan for Massachusetts

Supplemental Materials

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MassDEP

Commonwealth of Massachusetts
Department of Environmental Protection

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Appendixes

Appendix A: Chapter 322 of Acts 2020

Section 1: Table: Chapter 322 of Acts 2020 Coded

Table color key based on general themes

Importance of Act and Affects	Act Alert and Signage Requirements	Departments Issuing Advisories	Data Monitoring	Alert Methods
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Code	Meaning (underlined terms = sub codes)	Frequency
Emergency law	Importance of the Chapter 322 of Acts 2020	1
Health hazard reason	Health hazards as the reason of implementation <ul style="list-style-type: none"> Should be announced by local health departments Should not be a threat because of the waiver in order for the waiver to be issued.	2
Public advisory	It is necessary to issue a public advisory. Issued from permittees and from MassDEP.	7
Combined advisory message	Message listing all outfalls overflowing. [in the Act, more than 1 into the same waterbody per permittee]	1
discharge	Communicate information in case of/regarding discharge events.	37
[time] during	Communicate every 8 hours during outfall	1

[time] within	<ul style="list-style-type: none"> ● Issue alerts within established time frame ● MassDEP should post information on their website within 24 hours of receiving data 	1
[time] after	<ul style="list-style-type: none"> ● 2 hours after outfall stops, issue advisory ● 2 hr after discovered issue, issue advisory and further updates ● If time extended for communicating discharge, delay by no more than 24 hrs after start of discharge 	4
Outfall location	<ul style="list-style-type: none"> ● Alert must describe this ● Signage must identify outfall, be at outfall location ● MassDEP website information on occurring discharge must include this 	4
time	<ul style="list-style-type: none"> ● Alert must describe this 	1
date	<ul style="list-style-type: none"> ● Alert must describe this 	1
duration	<ul style="list-style-type: none"> ● Alert must describe this 	1
volume	<ul style="list-style-type: none"> ● Alert must describe this ● MassDEP report must have total discharge volumes 	2
waterways	<ul style="list-style-type: none"> ● Alert must describe this 	1

land	<ul style="list-style-type: none"> Alert must describe this 	1
Identify permittee	<ul style="list-style-type: none"> Alert must describe this 	1
Identify health hazards	<ul style="list-style-type: none"> Alert must describe this Signage must do this 	2
untreated	<ul style="list-style-type: none"> Alert must describe this regarding waste in the water 	1
Other required by DEP	<p>Consider other information required by MassDEP regarding:</p> <ul style="list-style-type: none"> Advisories Media of issuing Information displayed on signage 	3
Affected by discharge	Water or land affected by discharge	1
Average discharge...3_cal_years	Data of average discharge in past 3 calendar years	1
Dep of public health	<ul style="list-style-type: none"> Issue advisories to Dep collaborate with department of public health to issue warnings 	2
Local health dep	<ul style="list-style-type: none"> Issue advisories to Must issue health notifications of their own 	3
Impacted municipality	<ul style="list-style-type: none"> Issue advisories to Should place and maintain signs 	2
MassDEP	<ul style="list-style-type: none"> Issue advisories to Must regulate alerts from local health facilities 	8

	<ul style="list-style-type: none"> ● Must make further regulations ● Must regulate signage size ● Must coordinate with dep of conservation and recreation, municipalities and landowners to place and maintain signage on public and private property ● Display information on website about discharge events ● Must provide access to public advisories and updates ● On may 15th each year issue a report of all discharge events <ul style="list-style-type: none"> ○ On website 	
Local news	<ul style="list-style-type: none"> ● Issue advisories to 2 largest 	1
Permittee must	<ul style="list-style-type: none"> ● issue advisories ● Issue updates ● Include information in alerts.. ● Use the following media.. ● Create a public website ● Establish metering/modeling/ot her method of finding discharge <ul style="list-style-type: none"> ○ To use another method, apply to commissioner ● In case of inability to collect reliable data on time, improve data collection method 	11

	<ul style="list-style-type: none"> ● Install signage at outfall locations and public access points 	
email	<ul style="list-style-type: none"> ● Issue advisories by email 	1
text	<ul style="list-style-type: none"> ● Issue advisories by text 	1
website	<ul style="list-style-type: none"> ● From permittees to subscribe to notifications ● From MassDEP to display information: <ul style="list-style-type: none"> ○ Current outfall discharge ○ Include annual report 	4
subscription	<ul style="list-style-type: none"> ● Issue to those subscribed ● Signage should include this process 	3
Telephone	<ul style="list-style-type: none"> ● Issue advisories by <u>voice message/</u> ● <u>reverse 911</u> ● BOH must use reverse 911 if available 	2
Social media	<ul style="list-style-type: none"> ● Issue advisories by social media 	1
Existing notif system	<ul style="list-style-type: none"> ● Utilized by BOH in relation to local boards of health 	1
metering	<ul style="list-style-type: none"> ● Permittee should establish metering 	1
modeling	<ul style="list-style-type: none"> ● Permittee should establish modeling 	1
Reliable information	<ul style="list-style-type: none"> ● Collect though metering or modeling or other methods 	3

	<p>approved by commissioner</p> <ul style="list-style-type: none"> ● If not possible to collect in a given time contact commissioner 	
Commissioner	<ul style="list-style-type: none"> ● Connect to by the permittee to authorize outfall data collection ● If no reliable information or alert possible, extend time period to complete these tasks ● Issue waiver if issuing it complies by requirements ● Waiver submitted in writing <ul style="list-style-type: none"> ○ Explain conditions 	2
waiver	<ul style="list-style-type: none"> ● Issued by commissioner if: <ul style="list-style-type: none"> ○ Outfall decommissioned ○ No significant discharge in last 5 yrs ○ No threat to public health 	4
signage	<ul style="list-style-type: none"> ● Place near outfall ● Place at public entrance points <ul style="list-style-type: none"> ○ Boat ramps ○ Piers ○ Swimming areas 	4
Public access points	<ul style="list-style-type: none"> ● Must have signage ● <u>Boat ramps</u> ● <u>Piers</u> ● <u>Swimming areas</u> 	3

Weather causes	<ul style="list-style-type: none"> Signs must identify causes of discharge (weather) 	1
Yearly report	<ul style="list-style-type: none"> Issued by MassDEP 	1
frequency	<ul style="list-style-type: none"> Frequency of effluent going into the waters (report) 	1
pretreatment	<ul style="list-style-type: none"> Wastewater treatment (in report) 	1

This table depicts the codes of the themes present in Chapter 322 of Acts 2020, the meaning of the codes and in what context themes are presented in the act, and the frequency of occurrence.

Appendix A
Section 2: Pie Charts for the Chapter 322 of Acts 2020 codes

Importance of Act and Effects

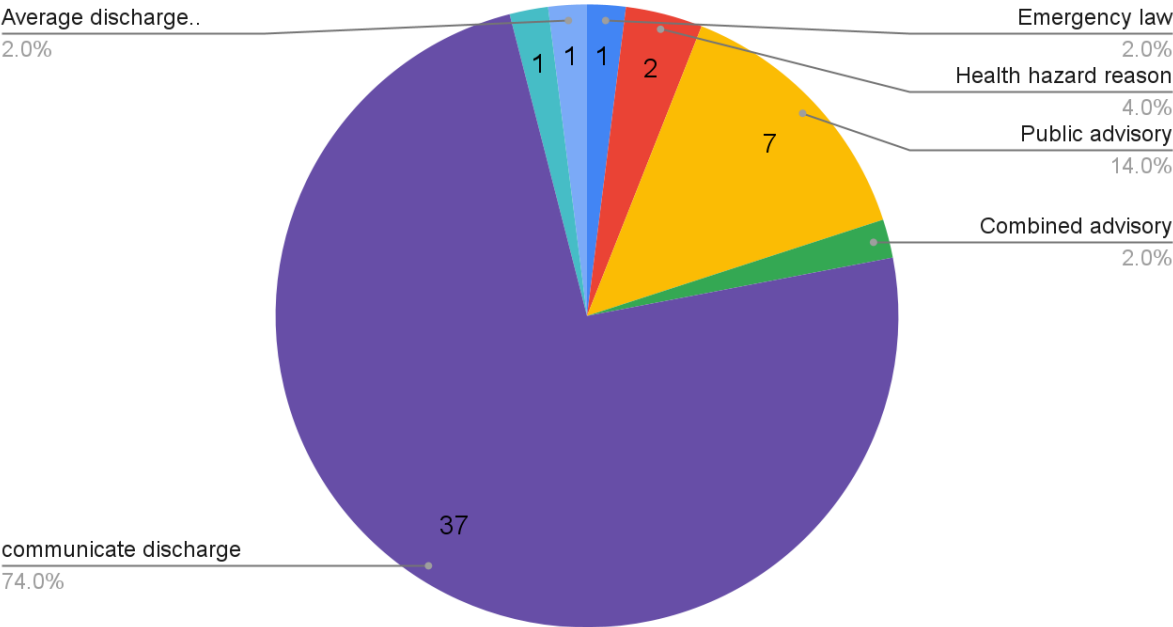


Chart 1: Pie chart depicts themes surrounding the importance of the Act codes and their frequencies.

Act Alert and Signage Requirements

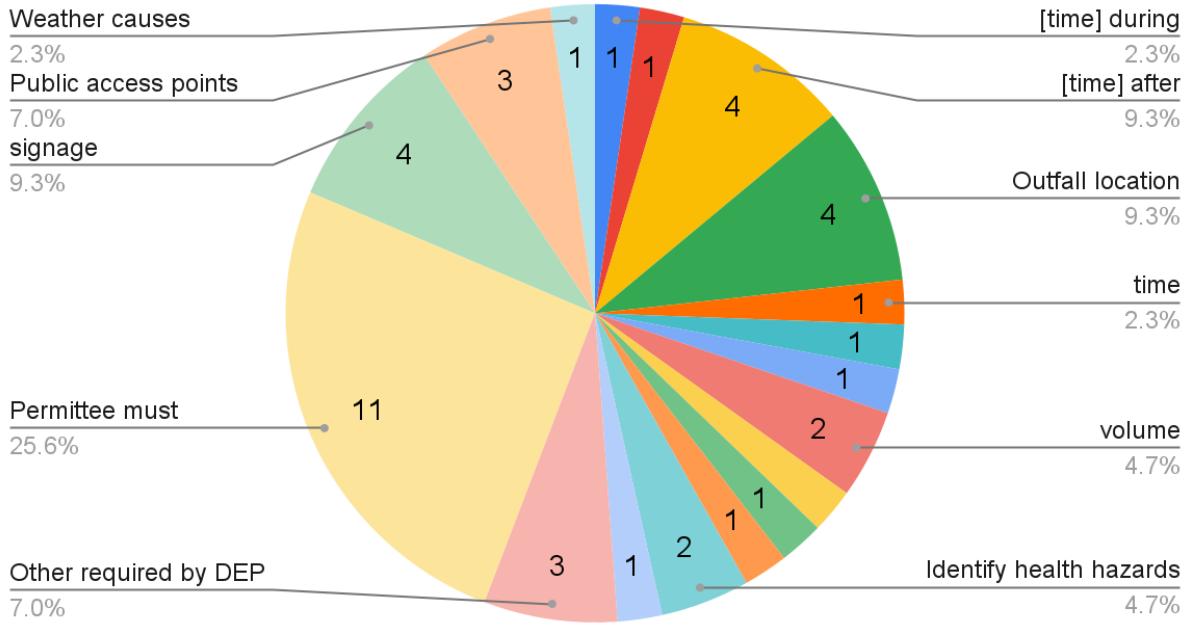


Chart 2: Pie chart depicts themes surrounding alert and signage requirements of the Act and their frequencies.

Departments Issuing Advisories

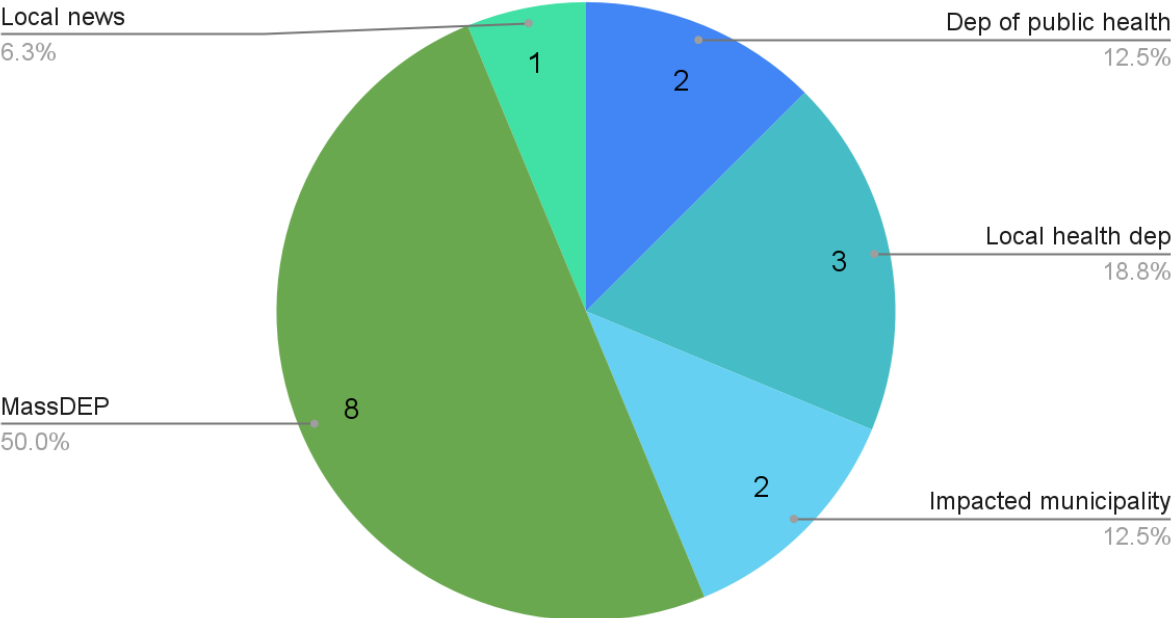


Chart 3: Pie chart depicts themes present in the Act that instruct departments to issue advisories and their frequencies.

Alert Methods

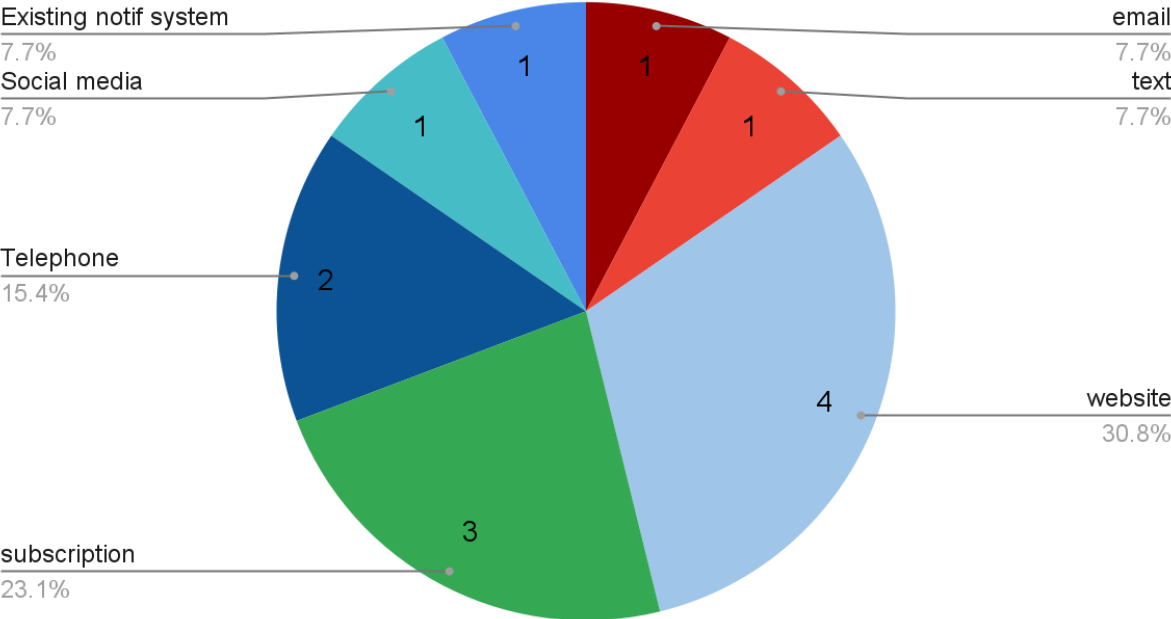


Chart 4: Pie chart depicts themes of alert methods outlined by the Act and their frequencies.

Data Monitoring

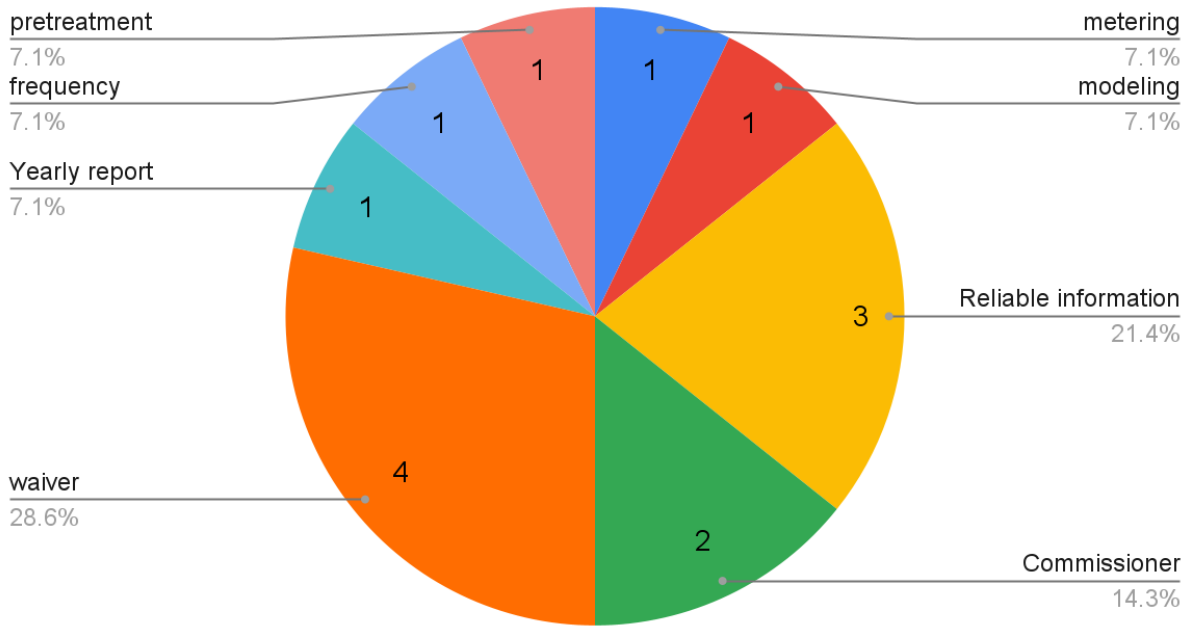


Chart 5: Pie chart depicts themes pertaining to data monitoring as outlined by the Act and their frequencies.

Appendix B

Section 1: Questions for Massachusetts River Alliance Member

Introductions

Project description -

[Interviewer 1] and [interviewer 2] will be interviewing you, and [note taker 1] and [note taker 2] will be note taking.

Goal of this call is to receive your feedback on communication methods for CSO discharges that we are planning to recommend to the DEP. to reach the public (especially EJ populations) and see what the advocates' specific concerns are.

We will keep records of your answers. The records will be accessed by the investigators (us), our sponsors at Massachusetts Department of Environmental Protection, and faculty advisors at Worcester Polytechnic Institute. The final data analysis will be available to the public. We will not disclose your name in our publications, however with your permission, we will use the name of your organization.

Do we have your permission to record and or transcribe this interview?

Questions that require feedback-

Question 1: What is the goal of your organization?
(Mass River Alliance)

Question 2: What region does your organization serve?

Question 3) How does your organization reach your members/audience?

Question 3 I) What platforms do you use?

Question 4: What are your organizations' greatest concerns when it comes to notifying the public of CSO Events? (examples: answers could be speed, range, information, accessibility, etc..) Why were you advocacy for Chapter 322 or act 2020

Question 4 i) Could you please identify the key concerns of your member organizations regarding notifying the public of CSO events? (Are you aware of any other organizations concerns that are unique or contracting to your own)

Question XX) What would be your recommendation for the best alert platform to use?

Question XX i) (if she does not list any of the following, ask about them) Social media, email, text messages, reverse 911, website postings.

Question YY) Do you have any more recommendations of notification systems or methods that you think we should look into?

Question 5) In your perspective, what hinders the community from receiving messages?

Do you have recommendations for other people / organizations to contact to get additional feedback? (Any member watershed/ river organizations?)

Question Final) Are there any final suggestions that you have for us?

We have created a survey that we hope your members or their constituents can help us by filling out by 09/27/2021. The feedback will be very helpful in constructing an effective and efficient notification system for Massachusetts. Would you be willing to share the survey with your constituents?

Draft regulations will be available later this fall and public hearings and opportunities to comment on the regulations will be available. This will not be the only opportunity to comment.

Thank you so much for your time.

Appendix B

Section 2: Massachusetts River Alliance Interview Transcript

This transcript begins a few minutes after the start of the interview. Import beginning notes are:
Mass rivers is an alliance of 80 organizations.

00:00:00 Mass River Alliance Director

[there was] no notification when there is sewage and river and we were kind of horrified that that wasn't actually a law, state or federal law.

Although it's now in some people's NPDES permits. So that was an issue, and it really does disproportionately affect environmental justice communities.

So, we thought that wasn't great either, and so we wanted, so it was certainly public health and environment, and so the second part of it for us is that one of the biggest needs that we see is to improve rivers is to upgrade water infrastructure and especially combined sewer water, you know, combined sewer issues.

And that if people don't know about a problem, they don't care about it.

And if they don't care about it, they're not going to support millions of dollars of investment into fixing it.

And so one way to get people to care about it is to at least make them more aware that this is indeed a big problem, and that there are, you know, over a billion gallons of water and per year of combined sewer and storm water going into our rivers and what we found is that you know, just doing a little research that it was actually helpful to have a law like this in other States in getting more support for water infrastructure upgrades.

So those are the primary reasons that we took an interest so good alignment with our mission, basically.

00:01:31 Interviewer 1

Thank you.

[here, we discovered that the computer recording was not working]

00:02:00

And you said you worked with 80 different organizations right under the Mass River Alliance. Are all those organizations mainly like in and around Boston, or all across the state?

00:02:12 Massachusetts River Alliance Director

There well, so, so we're in alliance so.. these are member organizations.

They all they all pay us annual dues to be a part of Mass Rivers and they are primarily in Massachusetts but we have a couple in Rhode Island.

We have one in Connecticut and then we do.

They are across the state.

I would say the sort of the highest density of organizations we have is in Eastern Massachusetts, because that's really where most people in our state live, so we have a lot of eastern Massachusetts groups, but they're everywhere we have them, you know, from Cape and islands to North Shore, South Shore, the West, that you know the Berkshires, Connecticut River Valley. Connecticut River Valley, you know.

Anyway, they're everywhere, so yes.

To answer your question.

But we're a small nonprofit.

We just have four staff.

We're small.

00:03:17 Interviewer 1

Okay.

So how do you reach these different organizations?

What kind of methods do you use to reach that, your members and an audience.

00:03:29 Massachusetts River Alliance Director

So we use... we have emails.

We have Instagram.

We have Facebook.

We have Twitter.

We have, uh, MailChimp.

We have to, you know we do both.

Sort of beautiful looking MailChimp emails and then we do regular old email emails.

We have meetings with people. We have zoom meetings with people we have a week ago, about a week and a half ago, we had 150 people in person outside for a celebration.

So, whatever we can think of to we do.

00:04:08 Interviewer 1

Awesome, you said you use MailChimp. What is that just?

00:04:11 Massachusetts River Alliance Director

It's like constant contact.

It's just one of those services that makes your emails look pretty.

00:04:21 Interviewer 1

And out of those different methods which you find the most effective?

00:04:26 Massachusetts River Alliance Director

Oh, we send people letters, we send people... you know, yeah, it depends on the purpose of the communication.

You know what we're trying to achieve and who our audience is.

So, I don't even know if I can answer that. Maybe with a website.

We don't have TikTok yet.

We have everything else.

I think it just depends and the thing about our organization, because we have the 80 groups.

If we have a very important thing that we're trying to achieve that we think we need to mobilize our groups on, even though we're you know, we're small, we have our 80 groups and we have about 1000 members.

We can really greatly increase the you know, our megaphone, our voice, by having our groups tell their group something so it can, you know, it multiplies, so the message you know, and sometimes the Boston Globe. We use the media.

00:05:30 Massachusetts River Alliance Director

We often use the media and WBUR.

00:05:33 Massachusetts River Alliance Director

Sometimes the radio, sometimes we talked to the radio and newspaper reporters, occasionally cable.

There's a lot of ways to get your message out as you guys, I'm sure, know.

00:05:53 Interviewer 1

We're planning right now, just using, like, email, text message, social media and reverse 911. These are four main recommendations as far as getting out CSO alerts, would you add any to that list that you think would definitely be beneficial?

00:06:15 Massachusetts River Alliance Director

So, I was actually asking my staff, who were younger and maybe more representative of a lot of people who were tend to go in rivers for some ideas and I'll just give you the feedback I got from them.

They said newspaper is not too good.

Nobody reads them anymore.

They said text message was their number one way that they communicate.

And they felt that it should be an opt in.

Obviously, you should reserve opt out for really, really, really important things, like a tornado is about to hit your house, or something like that, and even though we think this is important, let people opt in to it.

Social media: they thought Twitter would be useful and that there could be individual Twitter feeds for each specific river.

They especially thought it would be... oh and one thing I thought of was... and I don't know if this is for every town, but we have like these Facebook pages and neighborhood, I don't know what you call them, like listservs, where people communicate with each other about stuff like that, like that's another way that word gets out in my in my town, I don't usually do them, but I know a lot of my friends do.

But what people felt would be useful would be, in public parks, along the rivers and river access points, have information, you know, your basic information that: this is a river that has, you know, CSO's and after a storm it's not safe to go in.

And for more information or to get regular updates, go here and have like a QR code or something where It will take you right to the website and you can sign up.

So, you guys, I'm sure have... There's many of you, you're young, you're smart, you're engineers. You've all thought of these ideas already, but so hopefully it'll just at least validate what you've been thinking.

Also, they really like that Boston Water and Sewer have a map.

Like you need a graphic that's really easy that... because a lot of people... I look, I get the one from MWRA, and it's a little complicated about trying to figure out well where is that exactly? And so, if you have a map that shows where each CSO is and say it's down, if you're downstream of this, which means this part of the river. You should not go in the water. It's not just telling people there's a CSO, but telling people where it is and what it means for them.

00:08:57 Interviewer 1

So, the map that you were just talking about would be on the sign or the QR code would send it to you like a GIS?

00:09:04 Massachusetts River Alliance Director

It would send you.

I mean, the sign could certainly show, I think, actually, I mean the sign could show the river and where the CSOs are.

And you know you are here.

This is where the discharge is.

This is the direction of the river flow.

You kind of have an arrow in the river.

I mean, I just think I always overestimate how much people understand about things like this and I'm trying not to.

I mean, just people don't know which way the river flows.

They don't know why a sewage discharge [occurs].

To start, you know, and you can have a little explanation of why it happens.

Because, I know, wastewater treatment plant operators are very sensitive about the fact that they think people think that they're not doing their jobs properly, when in fact you know it's because the system is designed that way.

But I think the main message you want to get out is: You are here. The CSOs are here. There, it's flowing this way. If something happened within the last, you know 48 hours, or whatever the amount of time you guys think is the right amount of time. Do not go into this river or there may be risk to you! If you go into this river now and for more information go here.

And then of course you want to have that in, you know.

Where the EJ part I think really comes in is making sure that you have it in all the right languages for the local community that uses that access point.

And of course, you know, whether it's websites, Twitter, whatever you want to have those languages there as well.

But I know, I know you guys have been working on that.

Is that what you were kind of thinking?

00:10:43 Interviewer 1

Yeah no, that was perfect and we're actually working on a temporary sign, maybe it might be a better idea to be like a permanent sign at the different public access points.

So, I don't know if I could share my screen, but we did make a little template so this would be once there was a CSO at the different access points. Some people in the community would... or well no, I guess it would be the permit holders who should print these out and write [the information]. This would be 48 hours. We just have to double check how long.

But so, this would say 48 hours and then they fill in their facility name, their contact info and this QR code will scan you for the information needed.

Like in the background of CSO.

But I kind of like that deal, also having more permanent signage at this place, at different locations, to eliminate a lot of work for [permittees].

00:11:58 DEP Official

Well, the Act requires a permanent sign at all locations, I think already. All locations now actually do have those signs in place as well.

00:12:14 Interviewer 1

This is the one that.

For example, go to the discharge location.

But then they got different beaches and boat launch points. You would have this temporary sign if there's a storm in the last 48 hours.

Then you put this one up

But this would be at all CSO points.

But we saw that, I believe, it was Vermont, they had these temporary signs that they would put at different public points, so we thought that was a good idea.

00:12:45 Interviewer 1

But now I'm wondering if it would be a better idea to have it be a permanent sign that's always up.

Just at different points, warning. Or if that would just be too off putting to people, if they see that all the time?

00:13:04 Massachusetts River Alliance Director

Well, as [DEP member] said, you are going to have to put something.

I can say, from my experience, the last few summers going to Cape Cod and seeing enormous pictures of sharks with huge teeth. Saying, sharks have been sighted on this beach here! You may die if you go in this water!

He was an emergency kit, you know, to save your life.

Hopefully you know how to do all the emergency, whatever.

There's still people out on those beaches.

Although not as many.

I'm sure you'll figure out the graphics, but to me this is a little bit more ignorable than the shark picture, and you might want to think about how to make your point graphically in a way that really catches anyone's attention instead of like a black sign.

And also, I notice it says wet weather discharge but doesn't say sewage discharge. That's really what we're worried about, right?

So, I would say "wet weather sewage discharge location".

Yeah, and see if you can put map on there

I think the map is, I don't know, that would get, with an arrow and a picture of where the discharge is and explaining what's in it, which says partially treated or untreated sewage.

Yeah, I mean obviously, this is just a rough draft, but I don't know if it you know I was going to say it's a lot of work to have to keep putting these up and taking them down, but on the other hand, the folks that manage CSOs are going to have to check anyway.

But If you're checking one CSO, that's not the same as putting these up in multiple locations.

I mean, there might be a lot of locations. I think it's a good idea to do it, though.

I would.

Yeah, I would look at that shark sign. Do you know?

Have you guys been to Cape Cod at all?

Like the Oceanside beaches?

00:15:18 Interviewer 1

Right, yeah, I know the signs you're talking about.

00:15:25 DEP Official

Can I also show you something?

I'll share my screen.

Well, I don't know if you've [seen]. This is a map that we have recently added to our website.

I'm not sure you know about it yet.

It is a map of all the CSO's. Can you see it?

00:15:45 Massachusetts River Alliance Director

I can see it, and I think [Different DEP Official] might have sent that to me.

00:15:49 DEP Official

OK, oh that's great.

00:16:01 Massachusetts River Alliance Director

Also [was it done by] the same group?

00:16:04 DEP Official

No, this was done by folks at DEP GIS group along with our Wastewater Group. This team from WPI, though, is working on refining this map. So, if you can look at the details about what is displayed here for each point, I'll pick a random one that's discrete.

You'll be able to see the [information]. So, just you know unique identifiers: the system name, the receiving river, the address, location.

So, these are, you know, geo located on the map.

There's also a link to each permit, so each of these discharges has a NPDES permit.

This will take you directly to the permit itself.

I hope this still shows.

Does this show?

00:17:03 Massachusetts River Alliance Director

Yeah, it's still loading, though.

00:17:03 DEP Official

May take a while to load up, but this, I think, is probably an MWRA one. And our WPI team, who is here with us today, will be working on some additional fields to add into these little pop-up windows.

Eventually we would really like to be able to show whether the location has been metered or not. So that the volume of discharge is measured by a meter.

And in addition, I think, more immediately, this team is going to be working on collecting the website information for each of the discharging facilities so that you can link to their website from this page or from the map.

00:18:00 Massachusetts River Alliance Director

And each website will say whether they've recently had a discharge?

00:18:06 DEP Official

Well, eventually, once you know, once this Act becomes effective for purposes of the facilities reporting and providing notifications, they are required to have a website, as you know, and provide notice on the website and in various other ways.

So, once it becomes in effect, Greenfield should have a website that has all the most recent information about their CSO activation events.

00:18:38 Massachusetts River Alliance Director

Yeah no, I think that's good information, especially for people like me or my staff.

I'm thinking like just a typical user.

I think what they want to know is, well, how far down the river do I have to worry about this, and how long will it be before I can go in and can I swim? Can I kayak?

Can I go fishing?

Like what happens if my dog goes in the river?

I think people have like these really basic [questions].

00:19:18 DEP Official

So, like an individual... a more local map: You are here!

00:19:26 Massachusetts River Alliance Director

I think, or just you know, in that little [box] I saw that it said drains too, was one of the things that you guys were adding to it. I think, however, you can convey that information.

I live near the Mystic and the other day I went kayaking on Mystic and I thought, well, this is actually not that long after a storm event.

Are the CSO's upstream of me or downstream? Like, I actually didn't know.

That's the kind of information it would be really great to have at a glance.

Somewhere like, OK, I'm here the CSOs are actually all downstream, so I don't have to worry about them or they're upstream, and this was a dumb idea to go kayaking today.

I feel like, to make it, you know, just some really simple information.

For advocates... it's really good for us to know the volume of discharge and the frequency, and how many, and you know all of that because we're then making the case to the feds, you know, send us some money so that we can fix this problem.

But I think for just a regular person, they just want to know what they can safely do or can't.

I realize that even if there's not a CSO, they may not be able to safely do anything, and I do understand that there are many... you know, there's stormwater. There are all kinds of other things.

There's bacteria, there's this, there's that, but this is a big piece of information that you want them to know.

How fast will it move down this river?

How do you know if I go over there, is it OK?

Anyway, so I think you get what I'm saying.

I'm sure you have... have you met with a lot of people already and are they all saying the same thing?

00:21:30 Interviewer 1

Yeah, we have.

We met with a lot of people at the DEP.

But for the GIS Map...

00:21:40 Massachusetts River Alliance Director

When you see the little dots, you don't even see the rivers.

I think you have to zoom in to see them before you can see the rivers.

00:21:47 Interviewer 1

Yeah, they don't pop out too much, but we're planning on putting the GIS story map... Or making the GIS map a story map so it has the basic information and background, because one of our concerns is that the public doesn't really know anything about CSOs, so we want to have that kind of background information just like warning them about all the different health hazards. But we could definitely add in how long stuff should take.

00:22:21 Massachusetts River Alliance Director

It depends on how fast the water is moving and how fast the discharge is and what the dilution is. I mean, there's a lot of other factors.

And if it rained again. I mean it, it really is a.

And you can say that you can say "check back".

And you know, that's what the law says, I think that they have to let us know you know. They have to say when the discharge starts and then when it's over.

00:23:07 Interviewer 1

I mean, we can add that. So, the 48 hours, though... that's after it ends, no matter how fast the river is going, right?

00:23:14 Massachusetts River Alliance Director

That was just a number. That was just an estimate.

00:23:18 Interviewer 1

OK, because that's what Vermont used, too. They said 48 hours.

00:23:20 Massachusetts River Alliance Director

Yeah, yeah.

00:23:23 Interviewer 1

I don't know what everyone did...

00:23:36 Interviewer 2

So, I'm going to take over right now.

So, back to the alert platforms that we mentioned.

Personally, what would you recommend to be the best alert platform to send out these messages electronically about these CSOs?

Because I know you were mentioning texts earlier as something that was big, but there's also social media, email and the reverse 911 calls that we can use.

00:24:12 Massachusetts River Alliance Director

Yeah, I think that, certainly, what I've also found in doing this kind of work for so many years is that there's no one answer and no one size fits all communication techniques for people.

Older people tend to still like email and younger people tend to rely almost 100% [on text].

And I think I would give people a menu and say "check off" Would you prefer whatever that is the phone call, or something else, and we will also be posting it.

You know, some people don't want to get alerted, but they want to know that if they're going out to the river, there's a place they can look.

And so, you want to provide, you know, I would say, on the website or wherever you put on the sign, say: if you want regular information when there's been a spill, you can sign up for texts, for emails, for phone calls, or you can check. You know you can be on our Twitter. You can sign up to our Twitter or you can check our website.

You know I would probably do those, but don't do it in anything that's super-duper permanent, because who knows, Twitter might go away and we'll get some other thing.

And you know all these things, they're not really permanent at all.

Yeah, but I think I would give people a choice.

00:25:50 Interviewer 2

Alright, are there any other ways of notifying people that we haven't mentioned that you just kind of have or can try to recommend to us? Something that we haven't said before?

00:26:08 Massachusetts River Alliance Director

One idea that came up, I liked that I forgot to mention was scrolling. When the local weather stations, local TV stations, do their weather, you can ask them to put that in the scroll that goes on the bottom of the TV [screen].

That's good.

00:26:26 Interviewer 2

I like that.

00:26:30 Massachusetts River Alliance Director

Let me see if there's anything else.

Yeah, like the little banner on the bottom.

Yeah, and I think we all felt in my office that having physical signs at the places where people go into the river is really, really, really important.

It's why we put it in the bill.

That's why I think other state laws have done the same thing.

Because most people aren't going to do any of these things. They're just going to take their boat and say, "Oh my God, I shouldn't be going in. There's sewage today." Hopefully they'll say that. So that's probably, more than anything, really important, even if it doesn't look as pretty to have signs and people worry.

It will discourage folks from going in.

I think it's important.

00:27:21 Interviewer 2

I think it's important too. In in your perspective, what do you think would block or like hinder people from receiving these messages?

00:27:33 Massachusetts River Alliance Director

I think a couple things.

I mean one, is if they don't know about it.

And then this second is if they are afraid, they'd be bombarded with too many messages.

So, I think you have to be careful about the frequency of these messages especially.

Especially if it's texting, there's something to me that's sort of...

Texting and phoning are much to me more intrusive than emailing.

Or Twitter.

And then people will opt out again if they get too many, so.

00:28:14 Interviewer 2

I've done that before.

So, I understand it.

Do you have any recommendations for, like other people or organizations we can contact to get additional feedback?

00:28:31 Massachusetts River Alliance Director

Well, you probably... I don't know who's already on your list, but the people on our that we worked with to get this passed were:

Connecticut River Conservancy, Environment Massachusetts, Mystic River Watershed Association, Charles River Watershed Association, Merrimack River Watershed Council.

Maybe there's [Neponset] I can't remember.

I don't think they actually have any CSS in Neponset.

And then I would talk to community organizations in towns that are particularly affected to figure out how they communicate with each other and especially.

I'm sure you have, you know, like Green Roots and other groups like that that are environmental justice groups.

And you know one thing, I wish that we knew more about was, but we don't because we work statewide and not, you know, community by community is when you talk to those individuals, ask them, you know what are the languages spoken by the people that use the rivers or that live in the neighborhoods that [have] the rivers.

A couple of years ago I did a little [interview session].

It took my cell phone around and just asked people what are you doing [near the rivers]. What do you like about this river? And then I filmed them and it's on our website. You can see. Then, I was surprised at how many people didn't speak English and couldn't talk to me.

Because you know they spoke Portuguese or Spanish or some other language and it was... On one hand, it was wonderful to see all of them at the river.

But it was, you know, I felt like, oh, I wish I could talk to you.

So, I think there are a lot of people, especially people that fish, you know they don't... They come from other countries where they do subsistence fishing.

So, definitely, you want to reach those people. You don't want them to eat the fish that they catch in the river that has sewage in it.

00:30:31 Interviewer 2

And are there any final suggestions that you have for us?

00:30:38 Massachusetts River Alliance Director

No, I just want to thank you for doing this work.

I'm really, really glad.

Thank you and thank you team of wonderful, wonderful interns.

And I'm glad that you're putting so much people power into this and that you're, you know, really working on it.

Come back anytime you have any more questions for me.

But do ask our local member Groups, you know that our watershed based are much more.

They're closer to their communities and can help.

Who you know what languages are important, and maybe if there's something special about those communities about how best to communicate with people.

00:31:18 Interviewer 2

Thank you, thank you for meeting with us.

One more thing, we created a survey that we hope that maybe some of your constituents can help us fill out the feedback would be very helpful for us constructing an effective and efficient notification system for Mass.

Would you be willing to share the survey with your constituents?

00:31:48 Massachusetts River Alliance Director

Yeah, I could share it with my member groups if you'd like.

00:31:54 Interviewer 2

We could email you the link and everything right after this meeting.

00:31:59 Massachusetts River Alliance Director

OK and just give me a deadline for people.

We all work best with deadlines.

00:32:07 Interviewer 2

For sure.

We're thinking around or on the 27th, which is.

It's a Monday.

Morning Sunday.

00:32:17 Massachusetts River Alliance Director

The 27th of this month or next month.

00:32:20 Interviewer 2

This month, like next Monday.

00:32:23 Massachusetts River Alliance Director

That's a very short deadline.

00:32:26 Interviewer 2

Yeah, we're thinking either that or Wednesday. We're on a tight schedule, so we just need as much responses as you can in a short amount of time.

00:32:40 Massachusetts River Alliance Director

I'll send it out.

I can send it out today and hopefully it won't....

It will go right into a form, right?

So, it won't have to go back to me at all.

Alright, alright well you have to let me know if anybody fills it out.

Hopefully they all will.

But I'm not going to do the effort of figuring out which group has CSO's. I'll just do it to them all and let them select themselves.

00:33:05 Interviewer 1

Thank you.

00:33:07 Interviewer 2

Thank you for your time.

Appendix B

Section 3: Massachusetts River Alliance Interview Coded

Table color key based on general themes

Watershed Organizations: Purpose and Function	Things to consider in developing a communication system	What Should be Communicated	Media and Technology to Consider
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Code	Meaning(<u>underlined terms</u> = sub codes)	Frequency
Emergency law	<ul style="list-style-type: none"> Reason for implementing the act Law says when discharge starts and where ends 	2
Environmental justice	<ul style="list-style-type: none"> Are disproportionately affected by CSOs Use correct languages in signage Reach out to organizations 	6
language	<ul style="list-style-type: none"> Cater to community What are the languages? Ask EJ organizations Representatives interviewed people on river banks. Many didn't speak English. Spanish and portuguese What language is important: receive information from Watershed organizations 	7
Improve rivers	<ul style="list-style-type: none"> Goal of Mass Rivers 	1
Upgrade water infrastructure	<ul style="list-style-type: none"> Reason for the Act, it 	2

	make people care about the issue	
Combined sewer	<ul style="list-style-type: none"> Especially upgrade the system Overflow. Checked regularly Map of CSOs 	8
Don't know	<ul style="list-style-type: none"> People not knowing about the problem is an issue Prevents people from subscribing 	2
Don't care	<ul style="list-style-type: none"> People not caring about the problem is an issue 	1
investment	<ul style="list-style-type: none"> Need money to upgrade sewer systems 	1
measurements	<ul style="list-style-type: none"> People should know about over billion gallons of discharge per year 	1
Organizations	<ul style="list-style-type: none"> Mass Rivers is an alliance of 80 river organizations 1000 members communication/planning within organizations Boston Water and Sewer Connecticut River Conservancy Environment Massachusetts Mystic River Watershed Association Charles River Watershed Association 	20

	<ul style="list-style-type: none"> ● Merrimack River Watershed Council ● Reach out to EJ organizations and towns ● Watershed based organizations are closer to their communities 	
Massachusetts	<ul style="list-style-type: none"> ● Organizations are in MA ● Eastern MA 	3
Rhode Island	<ul style="list-style-type: none"> ● Organizations in RI 	1
Connecticut	<ul style="list-style-type: none"> ● Organizations in Connecticut 	3
Non profit	<ul style="list-style-type: none"> ● They are a non profit organization ● Small organization 	2
email	<ul style="list-style-type: none"> ● Mass River use this ● We are planning to use this ● Older people rely on emails ● Not that intrusive 	6
Social media	<ul style="list-style-type: none"> ● Use Instagram, Twitter, Facebook ● No tiktok yet ● We are planning to use social media ● Twitter is useful <ul style="list-style-type: none"> ○ Individual feeds for each river ● Facebook pages for neighborhoods ● Different languages ● Twitter might go away, so alerts are not permanent, which is okay. 	15

	<ul style="list-style-type: none"> ● Not that intrusive 	
text	<ul style="list-style-type: none"> ● We are planning to use this ● Number one way for young people at Mass Rivers to communicate ● Younger people tends to rely on text ● Careful not to overflow with messages ● intrusive 	7
Mailchimp	<ul style="list-style-type: none"> ● Emails system ● Constant contact 	2
meeting	<ul style="list-style-type: none"> ● In person, zoom 	3
mail	<ul style="list-style-type: none"> ● Mass Rivers uses this 	1
website	<ul style="list-style-type: none"> ● They use website ● Subscriptions ● Be displayed on sign ● Languages ● Facility on GIS: <ul style="list-style-type: none"> ○ Display if recently had a discharge 	7
Local news	<ul style="list-style-type: none"> ● Is used by mass rivers ● <u>News paper</u> reports ● Boston globe ● <u>Radio</u> ● <u>Cable</u> ● Newspaper not good! ● Scrolling banner on weather/tv stations 	7
telephone	<ul style="list-style-type: none"> ● Reverse 911 ● intrusive 	4
Purpose dependent	<ul style="list-style-type: none"> ● Decision of what 	3

	communication platform is purpose dependent	
Cross-group communication	<ul style="list-style-type: none"> • Organizations communicate with each other to reach members/audience • Talk to EJ communities and towns to see how to communicate within 	4
Public advisory	<ul style="list-style-type: none"> • Increase voice through inter organizational communication • Lots of ways to get the message out 	4
subscription	<ul style="list-style-type: none"> • People should opt-in, opt-out only in case of emergency • QR code take you to subscriptions • Sign up for any platform 	4
opt-in	<ul style="list-style-type: none"> • People should choose to subscribe 	2
opt-out	<ul style="list-style-type: none"> • People are subscribed automatically, can cancel • Only when emergency • People will if they get too many messages 	2
signage	<ul style="list-style-type: none"> • In public access points • Have map <ul style="list-style-type: none"> ○ river/water body and where CSOs are in relation to the public access point • Maybe focus on permanent signage 	11

	<ul style="list-style-type: none"> ● Make them eye catching ● REALLY important! 	
Public access point	<ul style="list-style-type: none"> ● Signage ● We thought temporary signs ● Maybe make it permanent signage 	8
QR	<ul style="list-style-type: none"> ● QR codes on signs ● QR for GIS, for sign ups 	2
map	<ul style="list-style-type: none"> ● Boston Water and Sewer have it ● Easy graphic ● Not too complex ● Where nearby CSO is: “if downstream” ● On sign ● GIS ● Additional fields ● Local map on signage ● Can’t see waterways on GIS ● Make a story map 	12
untreated	<ul style="list-style-type: none"> ● Say if treated or untreated on sign 	1
downstream	<ul style="list-style-type: none"> ● Signage at public access points ● People should know if their water recreational points are downstream of CSO ● Tells people where the CSO is 	3
discharge	<ul style="list-style-type: none"> ● People should know where it is ● Temporary sign after discovery ● “Sewage discharge” on sign!! ● GIS map should show 	7

	<p>this</p> <ul style="list-style-type: none"> ● Facility website say if had a discharge ● Time depends on discharge speed ● Discharge time 	
Reliable information	<ul style="list-style-type: none"> ● People should know if they swim/use water next to CSOs. ● Don't overestimate how much people understand ● “You are here! CSO is flowing your way!” on sign ● For a typical user: how far down the river? Time? Can I swim? Boat? Fish? Can my dog go into the water? ● Simple information 	7
waterways	<ul style="list-style-type: none"> ● People should know direction of flow ● “River” included here ● “How fast can I go down?” ● Can't see on GIS map ● Many non-English speakers near waterways 	13
[time] within	<ul style="list-style-type: none"> ● If something happened within the last 48 hours.. Risk! ● Depends how fast the water is moving ● Time of discharge start to end ● 48 hours is just an estimate 	6
Identify health hazards	<ul style="list-style-type: none"> ● On sign 	1

Temporary sign	<ul style="list-style-type: none"> • For 48 hours • Good idea 	4
Permanent sign	<ul style="list-style-type: none"> • Placed at public access points • Add a map • Picture of where discharge is • Eye catching • Most important 	3
Permittee must	<ul style="list-style-type: none"> • Print out temporary signs • Check CSOs • May be difficult to put up signs and take them down (for temporary) 	2
Shark signs	<ul style="list-style-type: none"> • At Cape Cod • Alarming signs for sharks as reference • Our sign is ignorable 	4
metering	<ul style="list-style-type: none"> • Collect info for GIS map 	1
volume	<ul style="list-style-type: none"> • Measured by meters • For advocates to know 	2
boating	<ul style="list-style-type: none"> • What people care about 	4
fishing	<ul style="list-style-type: none"> • What people care about • Immigrants may fish 	3
swimming	<ul style="list-style-type: none"> • What people care about 	2
speed	<ul style="list-style-type: none"> • Time depends on discharge speed and water speed 	2
Platform menu	<ul style="list-style-type: none"> • Give people platform options! 	5
Message overflow	<ul style="list-style-type: none"> • People might not sign 	2

	up or may opt-out if there are too many messages. Frequency is important	
Communication blocks	<ul style="list-style-type: none"> • Too many messages • Lack of knowledge • Language 	4

This table depicts the codes of the themes discussed during the interview with the director of Massachusetts River Alliance (Mass Rivers), the meaning of the codes and in what context themes are presented in the act, and the frequency of occurrence. The table is color coded into more general themes.

Appendix B
Section 4: Pie charts for Massachusetts River Alliance Interview Codes

Watershed Organizations: Purpose and Function

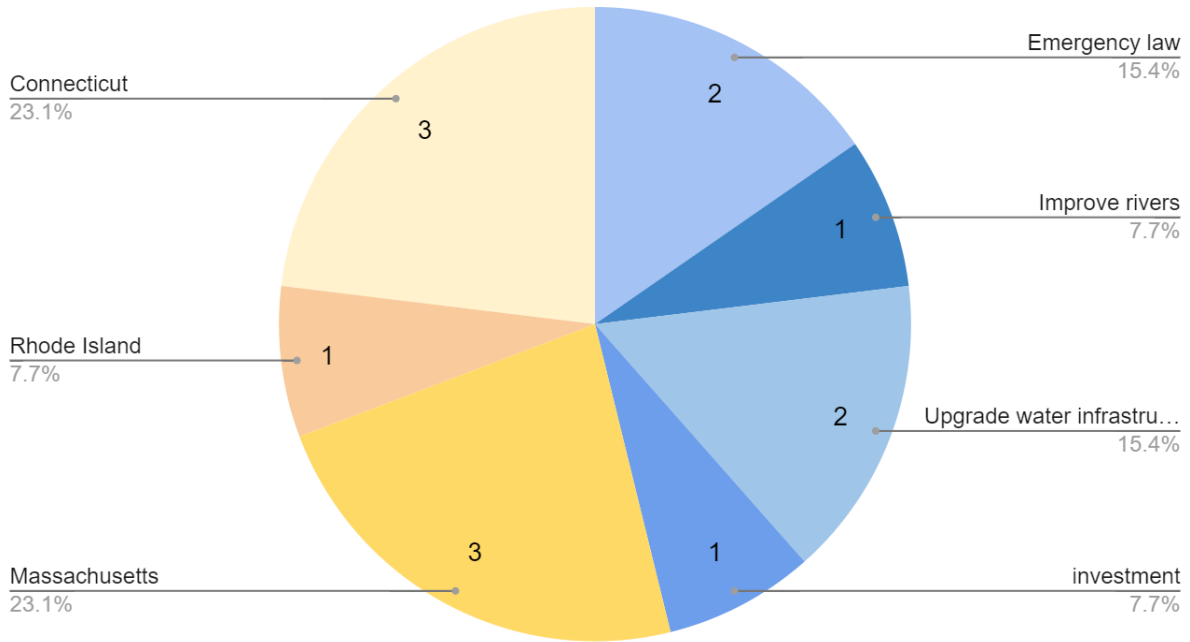


Chart 1: Pie chart depicts codes and their frequencies discussed during the interview pertaining to the purpose and functionalities of the Massachusetts River Alliance and other Watershed organizations. The states in which organizations are located are also included.

Things to Consider in Developing a Communication System

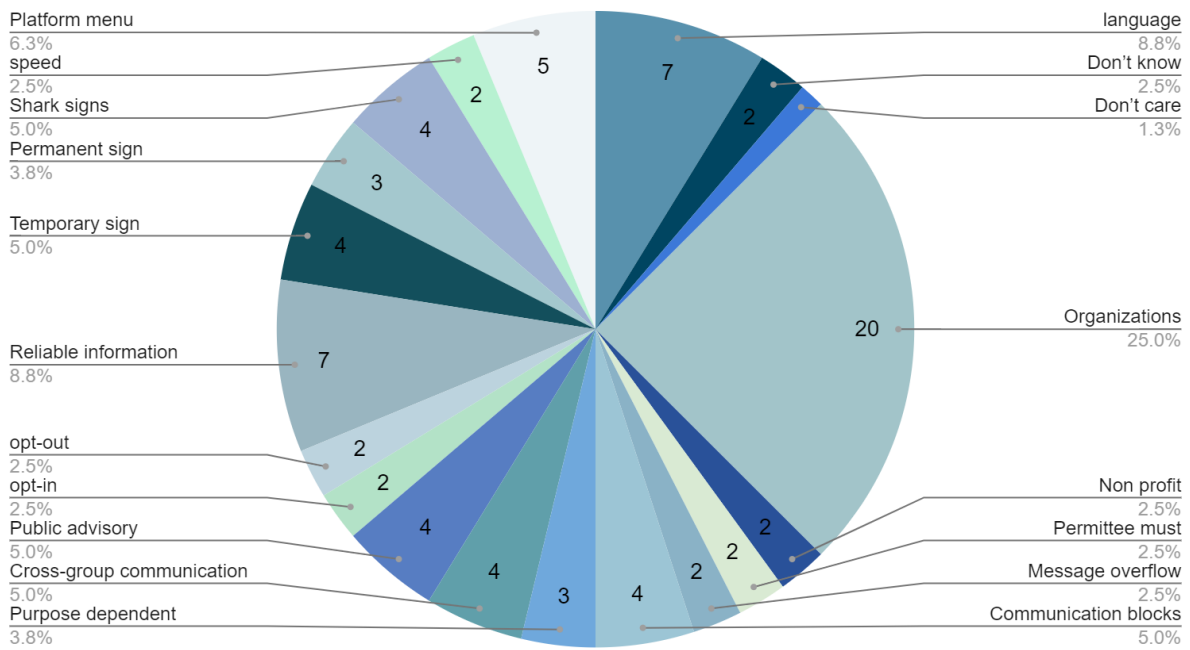


Chart 2: Pie chart depicts themes discussed during the interview pertaining to things we should consider before recommending a communication system and their frequencies.

What Should be Communicated

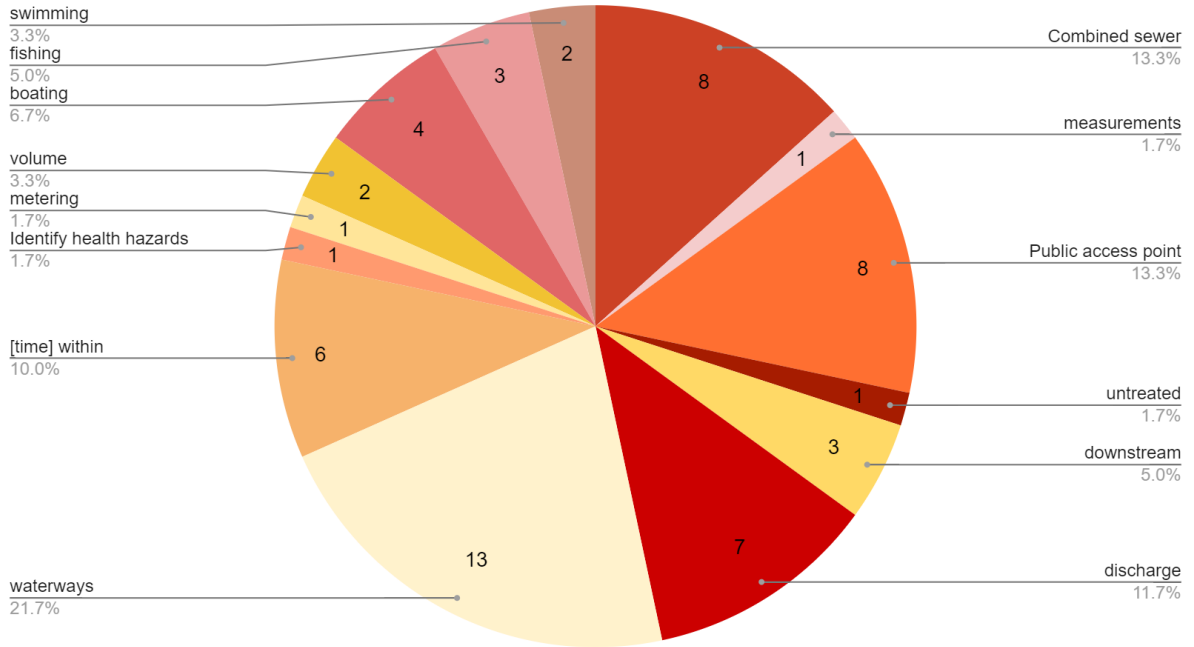


Chart 3: Pie chart depicts themes discussed during the interview pertaining to information which should be communicated by the communication system and their frequencies.

Media and Technology to Consider

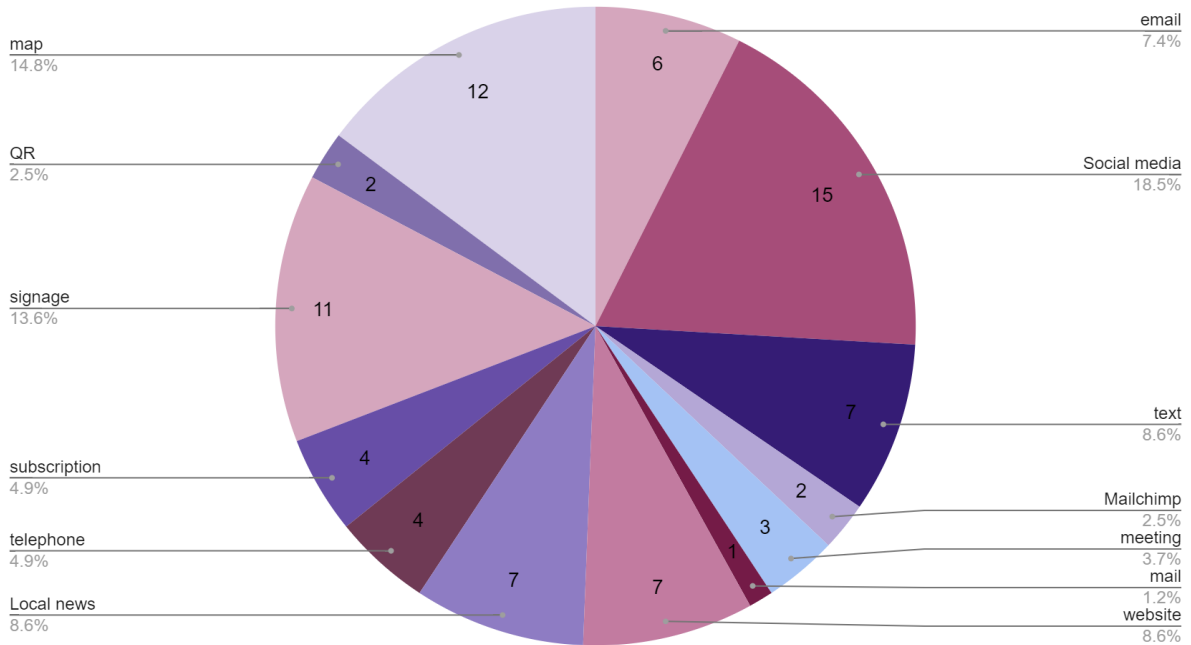


Chart 4: Pie chart depicts themes discussed during the interview pertaining to media and technology we should consider recommending in the communication system and their frequencies.

Appendix C

Section 1: Questions for Merrimack River Watershed Council Member

We are WPI interns working with MassDEP to recommend a CSO notification system.

Goal of this call is to receive your feedback on communication methods for CSO Merrimack River Watershed Council

Is it ok if we record this call? We will use the name of your organization, but not your name in our report.

Question 1) What platforms do you use? (specifically, what social media platforms? Other platforms?)

Question 2) You responded that you got 10,000 - 50,000 impressions. Do you have any suggestions on how to achieve an outreach this wide?

Question 3) Do you have any additional comments or suggestions/ recommendations on developing and promoting a communication system for CSOs?

Thank you!

Appendix C

Section 2: Transcript from Questionnaire Follow Up Phone Call with the Merrimack River Watershed Council Official

00:00:04 Interviewer

What platforms do you use specifically to send out notifications?

00:00:14 Merrimack River Watershed Council Official

So, we generally use two.

We use our website and we also use social media.

So, when we look at the two of them, social media is by far the better place to be posting. We might get a couple 100 people who look at our website when something happens and we'll get 10s of thousands through social media.

00:00:53 Interviewer

What different social media platforms do you use?

00:00:58 Merrimack River Watershed Council Official

We use primarily Facebook.

Sometimes we'll use Twitter.

00:01:07 Interviewer

Do most of those views or impressions come from Facebook?

00:01:17 Merrimack River Watershed Council Official

Yes, yeah, I'd say like 90%.

So, we've got a pretty big Facebook audience and then it gets shared a lot with some organizations that will just share whatever we put up there, you know.

00:01:32 Interviewer

That's nice, so is that like the main way of getting that outreach is through different organizations that you guys are linked with, and then they spread it to the necessary [people] ?

00:01:45 Merrimack River Watershed Council Official

Yeah, yep.

00:01:46 Interviewer

So, my second question was going to be [this]: you responded that you were getting like 10s of thousands of impressions. So, is that mainly because of the groups that you send them to? Or, what's the trick there? How can we get the same amount of views for [facility] notifications?

00:02:14 Merrimack River Watershed Council Official

I think that's probably what happens.

So, we've got I want to say like 4000 people who follow us. And, then we've got... you know, if I put up a post and say it's a hot weekend when everybody is on the water I might see like 30 or 40 other organizations that will share what I've posted.

Well, sometimes more than that, and they're just part of the network we've got, you know?

A lot of them are like town related or fishing or kayaking groups, so they're all you know.... They all have some kind of an interest in the river.

And they'll put it out to their people pretty quickly.

00:03:04 Interviewer

Thank you for that.

That actually helps a lot because we're trying to figure out a way to expand our, I guess, knowledge on how to spread awareness.

Are there any suggestions that you have for trying to make like a universal notification system?

00:03:36 Merrimack River Watershed Council Official

Yeah, so I think...

Most people are going to be tuned into their specific river or their waterway, so if you can segment it that way somehow, that would be great.

Like in the Merrimack, what we do is we get the email notifications from the sewer plants and then we put them together into one social media and one website post, so we've done all that collating and then push it out to people.

And that just affects the Merrimack, so I think that's why we get a good audience is it's just the Merrimack.

I mean, if we were to add in other rivers, if you're trying to do that, like a statewide thing they could run into some difficulties.

So maybe there's a way to delegate a group or something within a watershed to see if they'd be willing to help out.

Now we're going to continue to do it in Merrimack.

We think emails, maybe text, we haven't tried text... maybe text will do a little better than emails, but very few people sign up for the emails that the plants send up.

You know it's in there, like dozens.

We've got thousands of people in the river.

00:05:01 Interviewer

Alright, that sounds like a good idea.

We're trying to kind of have it so people can choose, I guess, which outfall or treatment facility that they get notifications from.

So, it kind of is in between having it more local but also having a place that, like MassDEP, might be able to link you to certain areas to sign up.

But yeah, thank you for the recommendations.

Were there any other I guess like, not troubles, but did you run into any obstacles at all, when trying to collate all the information?

I guess, what does it look like when you combine all the information?

00:06:03 Merrimack River Watershed Council Official

Yeah, so each plant reports it in a different way.

And there's no standard form for it, so you have to kind of have spent some time looking at them and understanding what they report and what that might mean.

So for example, we have a plant and Haverhill that's now suddenly reporting everything very quickly, even though the volume and the volume is very important from our point of view, it could be a sense of just how vast this event might be, and we have another plant that will tell you, like what locations have triggered.

And that's helpful, but not... Know you, need to know the volume, you know.

And I think a lot of these plants can do that.

So, I know that's not in the law, but.

We wish it was you know, it's just they can do it, you know.

So they should be held to doing it.

The other thing we've been thinking about is we have some Rotary clubs around here that want to develop an app that might allow for better distribution of information.

People just sign up for the app and then they're going to be alerted I suppose.

Maybe it would be better than a text message, I don't know. It would have more information.

00:07:28 Interviewer

And an app would be a good idea.

Especially if we connect them with all the different treatment facilities and they connect to it and have it standardized.

00:07:42 Merrimack River Watershed Council Official

Yeah, you know they're doing this in other parts of the country too, so that it's not something that's really new.

We're kind of behind the 8 ball, in Massachusetts, on it.

00:07:56 Interviewer

I think that's all the questions we had, unless anybody thought of anything else but.

Thank you for your time.

And the information was valuable.

00:08:09 Merrimack River Watershed Council Official

Thanks a lot! It's great, it's great to see you guys and good luck with this.

I mean this is important work and you know around here people are really concerned about, especially, CSOs, so.

But anyway, you can figure out [how] to get to people... would be much appreciated.

00:08:29 Interviewer

Thank you.

And yeah, well, we're trying our best.

Appendix C
Section 3: MRWC Interview Coded

Table color key

Technologies and Platforms for Issuing Notifications	Things to Consider when Developing a Sewage Discharge Communication System
--	--

Code	Frequency	Meaning
Website	1	<ul style="list-style-type: none"> ● Is used by MRWC to notify about CSOs ● About 100 people
Social Media	8	<ul style="list-style-type: none"> ● Is used by MRWC to notify about CSOs ● 10s thousands of people: huge outreach ● Facebook ● Sometimes twitter ● 90% interaction on facebook ● 4000 people follow them on social media
email	3	<ul style="list-style-type: none"> ● Notification to MRWC from a sewer plant ● Few people sign up
text	3	<ul style="list-style-type: none"> ● MRWC did not think of texts ● Maybe a good idea ● Maybe app is better than text
app	3	<ul style="list-style-type: none"> ● Have an app specifically to report sewage discharges ● More options for locations ● Standardized notifications
Standardize alerts	3	<ul style="list-style-type: none"> ● Plats report outfalls

		<p>differently, and it is difficult to figure out what information may mean each time</p> <ul style="list-style-type: none"> • An app may provide standardization
volume	5	<ul style="list-style-type: none"> • Must report the volume
Cross-organizational outreach	7	<ul style="list-style-type: none"> • Organizations spread the message: how to achieve outreach • If a post goes up during the weekend a during which lot of people use the river, 30-40 organizations will share it • Part of the network • Sewer treatment plants • Reach out to watershed organizations, and see if they will help
Locality	4	<ul style="list-style-type: none"> • People will want to know about their local waterways • A lot of audience because the notification is merrimack focused • Rotary clubs want to make an app for CSO notifications
State-wide communication system is a difficulty	1	<ul style="list-style-type: none"> • Less personal

The table above displays codes of themes discussed during the conversation with the MRWC official, the frequency of the themes, and their meaning.

Appendix C
Section 4: Pie charts for MRWC Interview Codes

Technologies and Platforms for Issuing Notifications

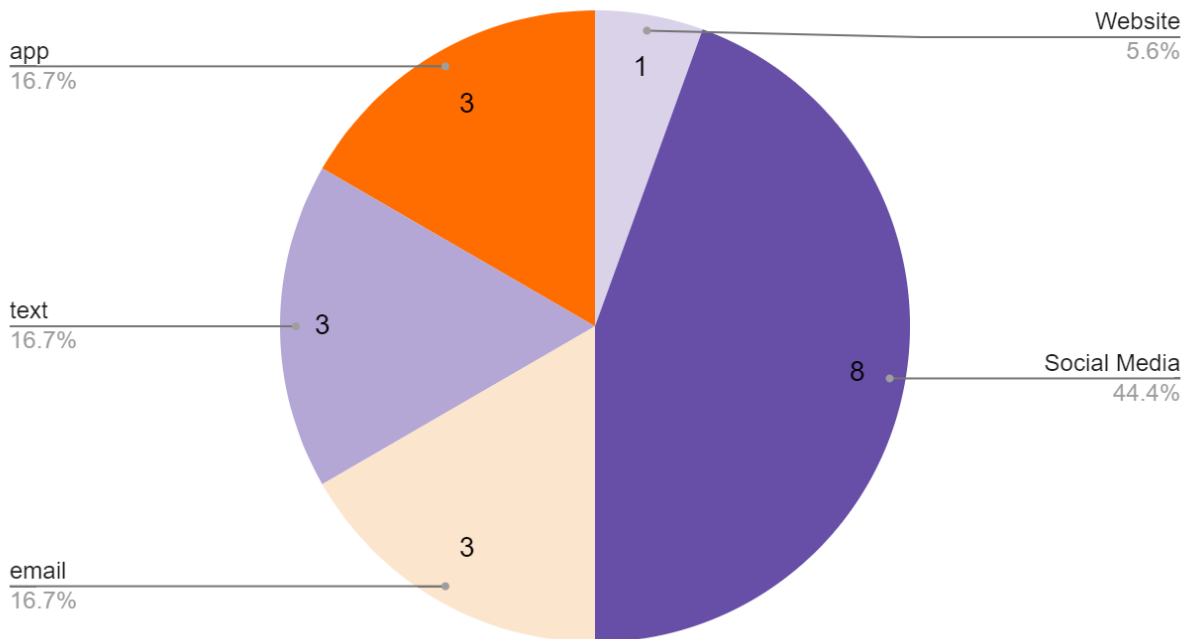


Chart 1: The pie chart above depicts the themes discussed during the MRWC conversation pertaining to the technologies which should be used for issuing notifications and their frequencies.

Things to Consider when Developing a Sewage Discharge Communication System

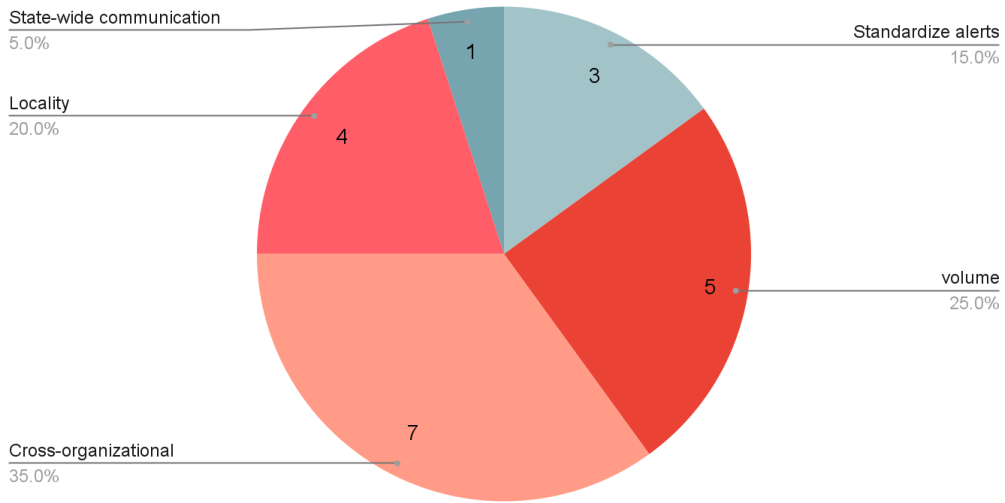


Chart 2: The pie chart above depicts the themes discussed during the MRWC conversation pertaining to the things to consider for issuing notifications about sewage discharges and their frequencies.

Appendix D
Section 1: Environmental Justice Organizations Survey

Informed Consent Agreement for Participation in a Research Study

Study Investigators: Julia S., Paul W., Sohrob Y., Anna C.

Contact Information: DEPtalks@mass.gov

Sponsor: Massachusetts Department of Environmental Protection

Purpose of the study: We are looking to determine the level of awareness of combined sewer overflow issues in affected communities. We also want to determine the best ways to notify community members about local combined sewer overflow events and their effects.

The survey will ask questions regarding your community, knowledge of sewage overflow events, and preferences for communications, including social media. You may keep the optional questions blank. Please fill out the survey by September 24th, 2021. The survey should take about five minutes to complete.

Benefits to research participants and others: The study results will help MassDEP and sewer facilities effectively notify communities affected by sewage discharge events about health hazards of sewage contaminated water, which will help manage the associated hazards.

Alternative procedures: If you would prefer, you may contact us to set up a 15 minute interview, instead of filling out the survey. The interview will address similar questions to the survey.

Record keeping and confidentiality: We will keep records of your answers. The records will be accessed by the investigators (us), our sponsors at Massachusetts Department of Environmental Protection, and faculty advisors at Worcester Polytechnic Institute. The final data analysis will be available to the public. We will not disclose your name, and you may request that we do not include your answers in our report. Records of your participation in this study will be held confidential so far as permitted by law. However, the study investigators, the sponsor, or its designee will be able to inspect and have access to confidential data that identifies you by name. Any publication or presentation of the data will not identify you.

For more information and additional questions about this research contact:

Ann Lowery

Email: ann.lowery@mass.gov

Survey for Environmental Justice Organizations on Public Advisories of Sewage Discharge Events

[Chapter 322 of the Acts of 2020](#), *An Act promoting awareness of sewage pollution in public waters*, requires MassDEP to create regulations about public notification of untreated or partially treated wastewater, including Combined Sewer Overflows, or sewer discharge events (when sewage is discharged with stormwater into waterways. MassDEP is directed to develop regulations for discharging facilities to implement a communication system to distribute public advisories of sewage discharge events.

To best understand your communication needs and preferences, we are asking you to provide feedback using this survey. This survey is being distributed prior to the public comment period for draft regulations. There will be other opportunities to provide input later this year.

Please fill out the information below:

I would like to remain anonymous

Name:

Email:

Phone number:

What city/town(s) are you located in?

Answer: _____

Are you affiliated with any of the environmental justice organizations below? (Check all that apply)

Alternatives for Community & Environment

Chinese Progressive Association

Clean Water Action

Neighbor to Neighbor

GreenRoots, Inc.

Chelsea Collaborative

Community Action Works

Coalition for Social Justice
Groundwork Lawrence
Lowell Alliance
Cultural Council
Hands Across the River Coalition
Environmental Stewardship City of New Bedford
Groundwork Somerville
Mystic River Urban Waters
ARISE for Social Justice
Community Action Works
Worcester Roots
OTHER: _____
NONE

If yes, indicate your role: _____

Combined Sewer Overflows (CSOs) occur when water overflows in the sewage system, leading to rainwater runoff, sewage, and industrial wastewater to be released into the waterways.

To clarify the definition of CSOs, feel free to refer to the following video.

[\[https://www.youtube.com/watch?v=ev64xXDYmaw\]](https://www.youtube.com/watch?v=ev64xXDYmaw)

To maintain consistency, we will refer to CSO events as “sewage discharge events”.

1. Prior to receiving this survey, did you know what a sewage discharge event was?
 - a. Yes
 - b. No (If no, skip to question #3)

2. Are you aware of any health hazards related to exposure to sewage water?
 - a. Yes
 - b. No

3. Do you know of any signage at sewage outfalls in your community? (add image example)
 - a. Yes
 - b. No

- c. Unsure
4. On average, how often do you hear community concerns regarding sewage in the waterways?
- a. Never
 - b. A few times a year
 - c. Every month
 - d. Weekly
 - e. Daily
 - f. Other: _____
5. To the best of your knowledge, what portion of your community has reliable internet access?
- a. 100%
 - b. 80% - 99%
 - c. 60% - 79%
 - d. 40% - 59%
 - e. 20% - 39%
 - f. 0% - 19%
 - g. Unsure
6. To the best of your knowledge, how many members in your community use a form of social media?
- a. 100%
 - b. 80% - 99%
 - c. 60% - 79%
 - d. 40% - 59%
 - e. 20% - 39%
 - f. 0% - 19%
 - g. Unsure
7. How does your organization communicate with the public? (for example: meetings, email, phone calls, etc.) (20 words maximum)

Answer: _____

8. Please rate the communication methods below on how effective they are in reaching the members in your community.

	Not effective at all	Slightly effective	Moderately effective	Very effective	Extremely effective
Social media (Twitter, Instagram, Facebook, etc.)					
Reverse 911 Calls					
Text Messages					
Emails					
Website postings					
Other (please specify):					

9. Which social media platforms are the most popular in your community? (choose more than one if necessary)
- Twitter
 - Instagram
 - Facebook
 - None
 - Other (please specify)
 - Unsure

10. Please add any additional thoughts regarding sewage discharge events. Any additional comments/suggestions will be greatly appreciated, and considered. (optional) (200 words maximum)

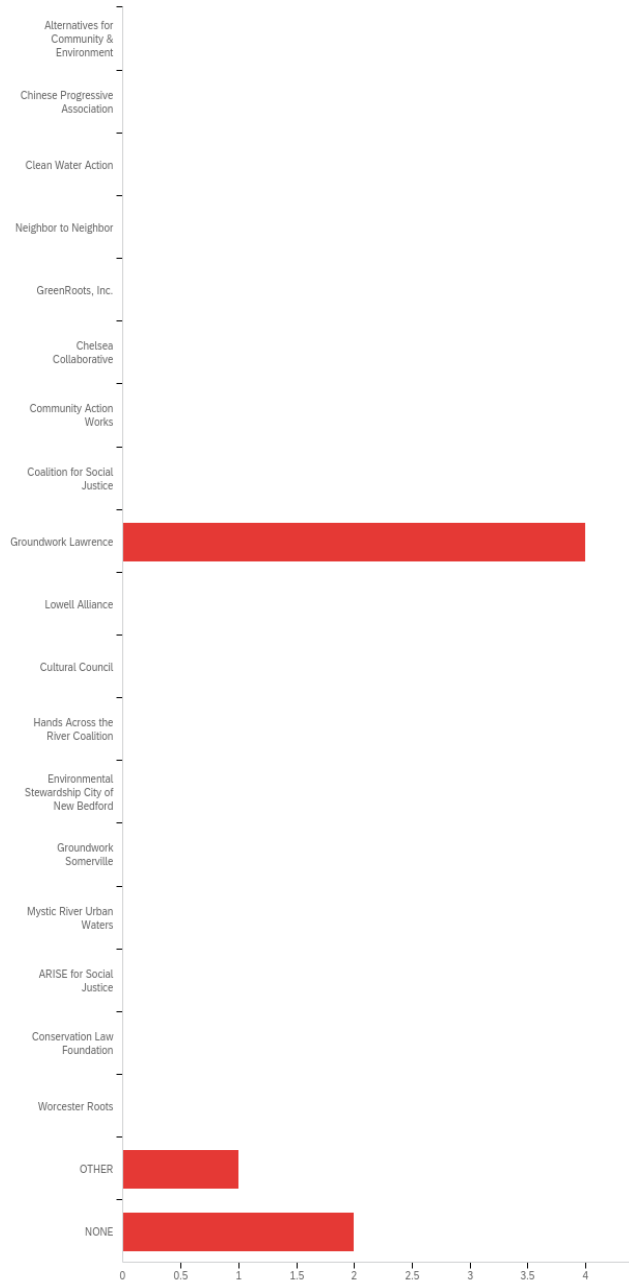
- I am available to further discuss my provided answers and information related to the development of potential sewage discharge event communications.

Thank you so much for your time. Your feedback will be very helpful in constructing an effective and efficient notification system for Massachusetts sewage discharge events.

Appendix D

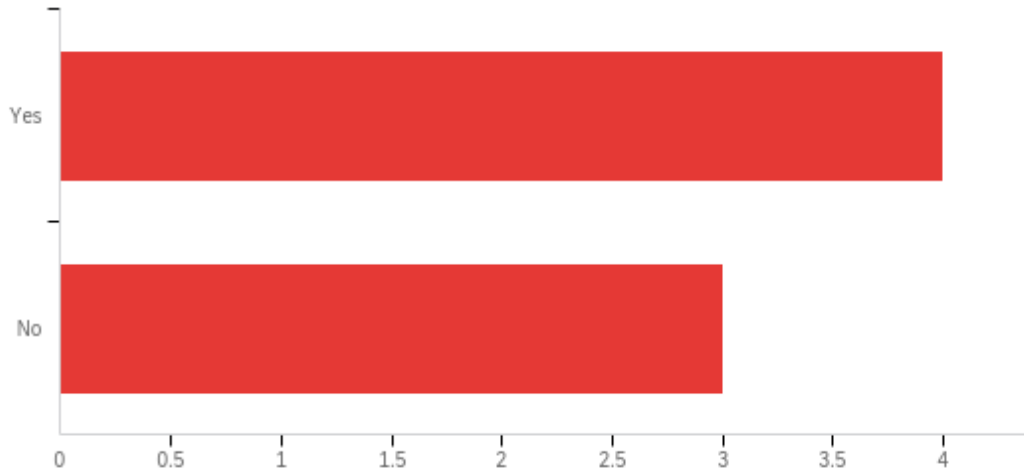
Section 2: Graphics for EJ Survey responses

Are you affiliated with any of the environmental justice organizations below? (check all that apply.)



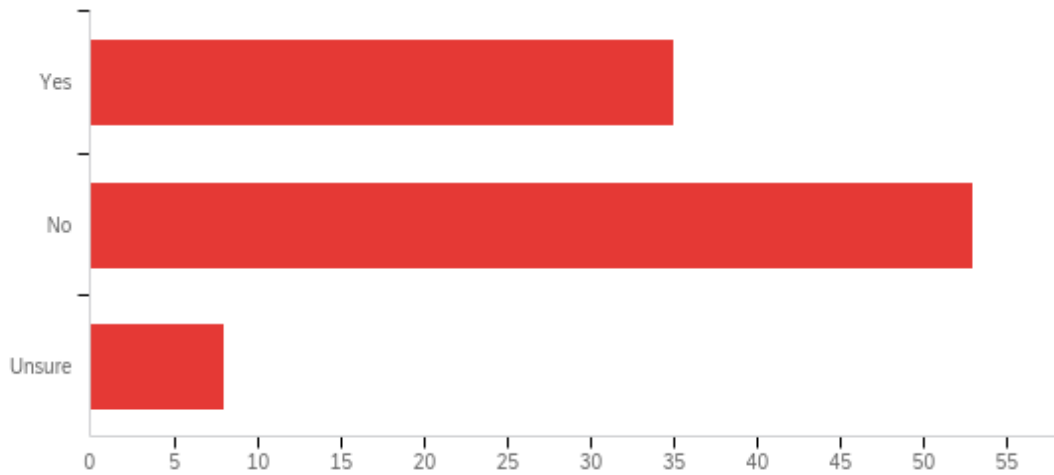
Graph 1: Distributions of organizations respondents are affiliated with

Prior to receiving this survey, did you know what a sewage discharge event was?



Graph 2: Responses to CSO awareness question

Do you know of any signage at sewage outfalls in your community? (add image example)



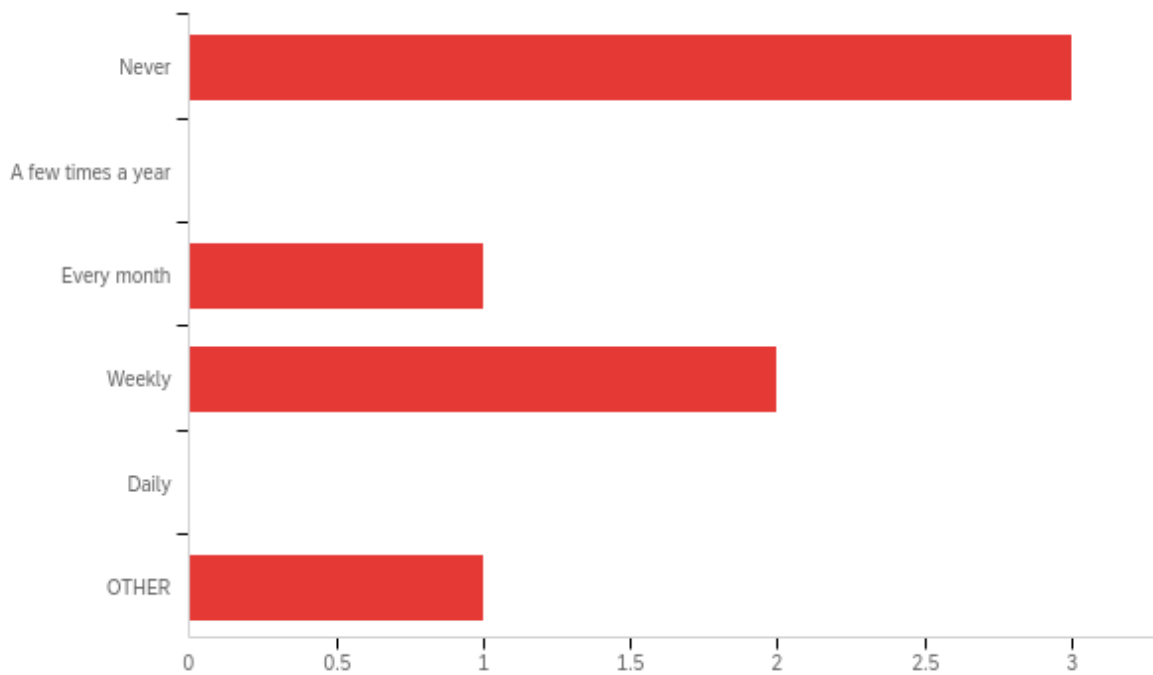
Graph 3: Responses for signage sightings

What city/town are you located in?

Haverhill
Lawrence
Lawrence, MA
Lawrence
Lawrence
Lawrence
Lawrence

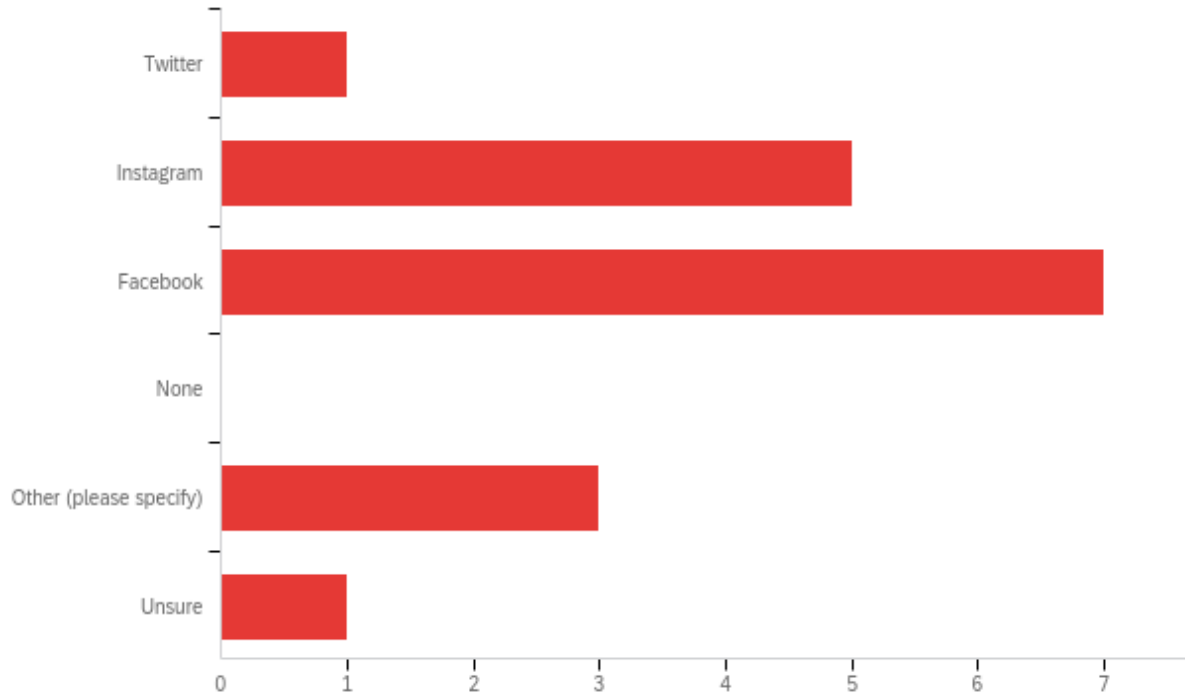
Table 1: Cities respondent organizations are located in.

On average, how often do you hear community concerns regarding sewage in the waterways?



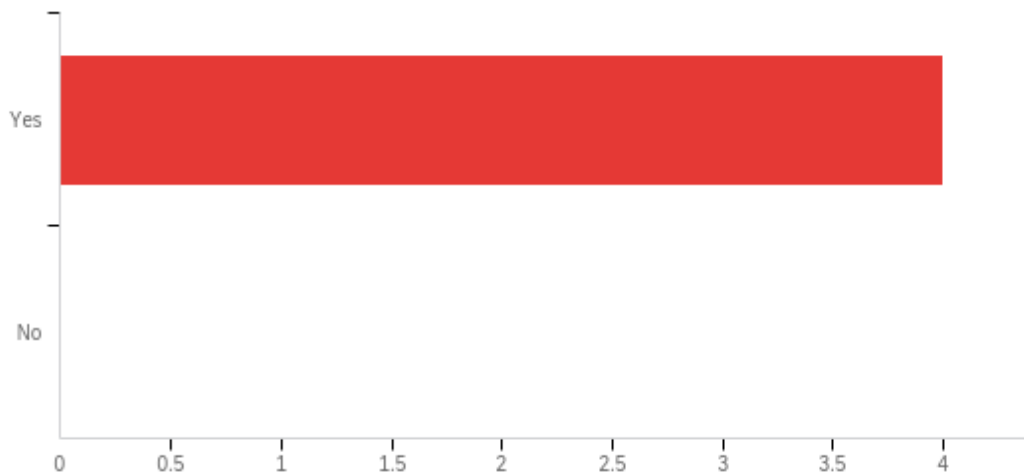
Graph 4: Distributions of how often CSO complaints are received

Which social media platforms are the most popular in your community? (choose more than one if necessary)



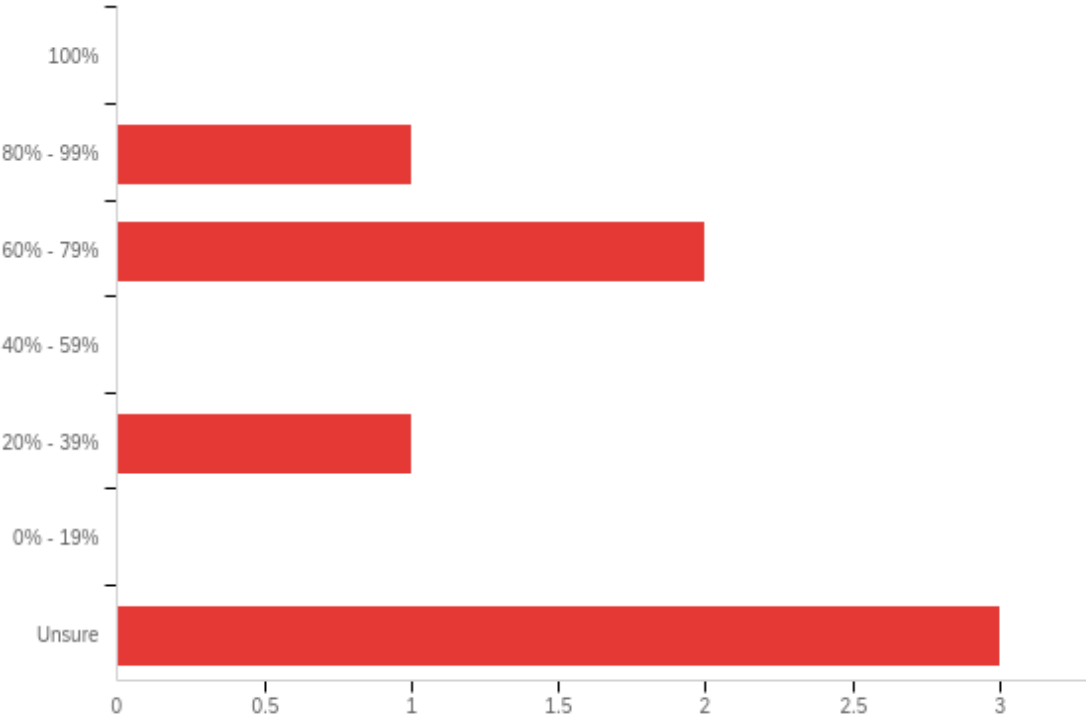
Graph 5: Responses for social media EJ community popularity.

Are you aware of any health hazards related to exposure to sewage water?



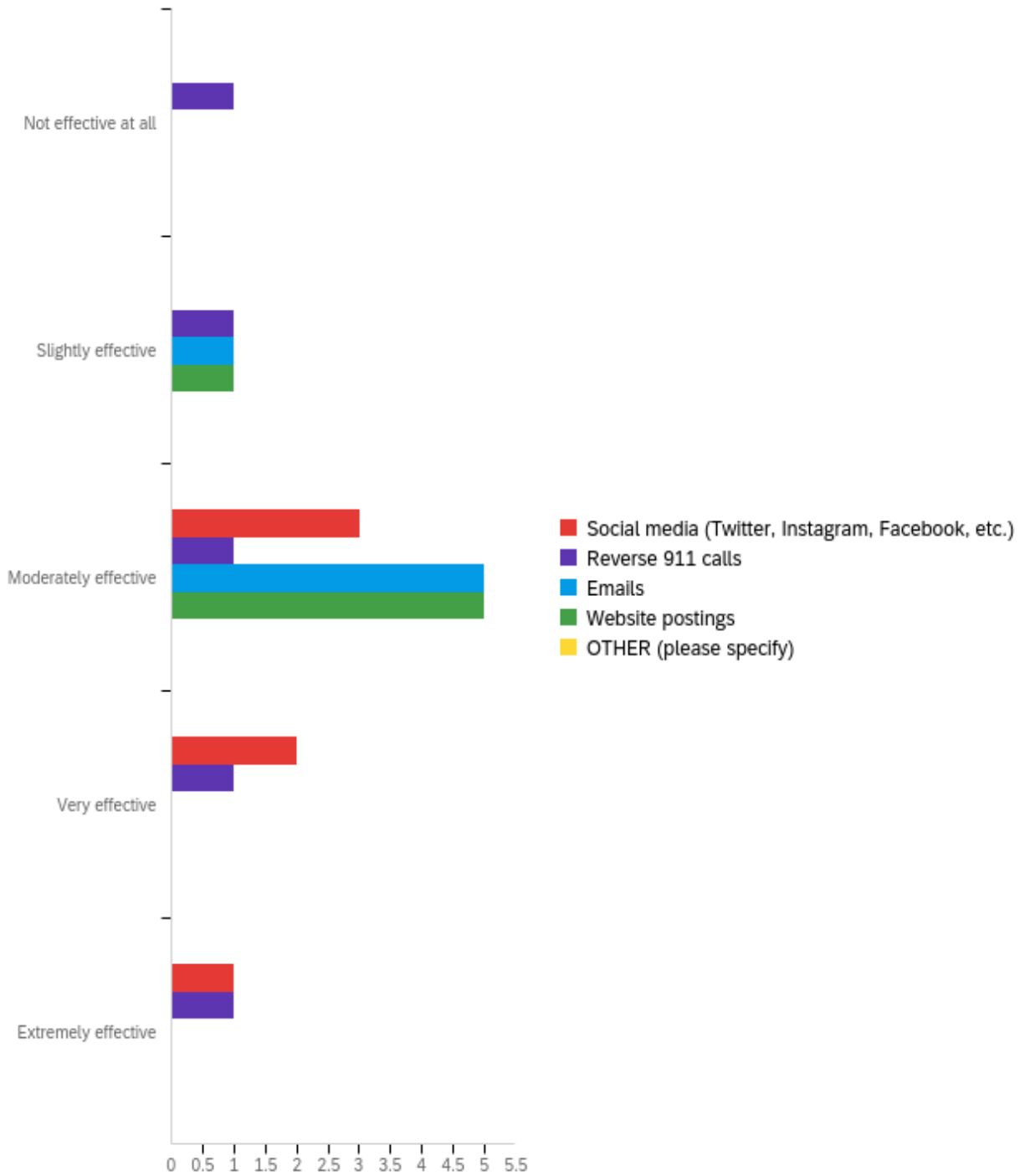
Graph 6: Responses for health hazard awareness. All respondents who know of CSOs knew of health hazards.

To the best of your knowledge, what portion of your community has reliable internet access?



Graph 7: Responses for percentage of EJ community that has reliable internet access.

Please rate the communication methods below on how effective they are in reaching the members in your community.



Graph 8: Distributions of effectiveness rates for media platforms.

Appendix D

Section 3: Environmental Justice Survey Coded

Table color key

Ways EJ organizations communicate with the public	Other important themes
---	------------------------

Code	Frequency	Question	Meaning
When rain	1	On average, how often do you hear community concerns regarding sewage in the waterways? - Selected Choice	They receive complains when it rains
Meetings	6	How an organization communicates with the public.	At meetings (also “walks” and community events) includes public gatherings (3 people)
email	6	How an organization communicates with the public.	Communicate through email
telephone	5	How an organization communicates with the public.	Through phone calls
text	1	How an organization communicates with the public.	Through text messages
website	2	How an organization communicates with the public.	Through website postings
Social media	7	How an organization communicates with the public.	Through social media <ul style="list-style-type: none"> ● Instagram ● Twitter ● LinkedIn

			<ul style="list-style-type: none"> • Facebook (4 people)
Organization outreach	4	How an organization communicates with the public.	Reach out to local orgs (child care centers, schools, councils) to reach their constituents (2 people)
Local news	3	How an organization communicates with the public.	<ul style="list-style-type: none"> • Radio • Newsletters • 2 people
Flyers	1	How an organization communicates with the public.	Give out/hang flyers
Door-to-door	1	How an organization communicates with the public.	Knock on doors
Local ej channels	1	Please add additional comments	Promote information through local access channels (especially for ej communities.. They may be in respective languages)
Other sewage pollutants	1	Please add additional comments	Announce discharges not related to CSOs
Discharge archive	1	Please add additional comments	Have one place where all discharge events are

			recorded and could be referenced in the future.
Whatsapp	3	What forms of social media are the most popular in your community? (Other)	Whatsapp is a media popular in the community
TikTok	2	What forms of social media are the most popular in your community? (Other)	Tiktok is a media popular in the community
Snapchat	1	What forms of social media are the most popular in your community? (Other)	Snapchat is a media popular in the community

The table above shows themes that appeared in the open response answers of the environmental justice survey, the frequency of each theme, the question identified theme served as an answer to, and the context and meaning of the theme.

Appendix D

Section 4: Pie Charts for Environmental Justice Survey Open Responses Codes

Ways EJ organizations communicate with the public.

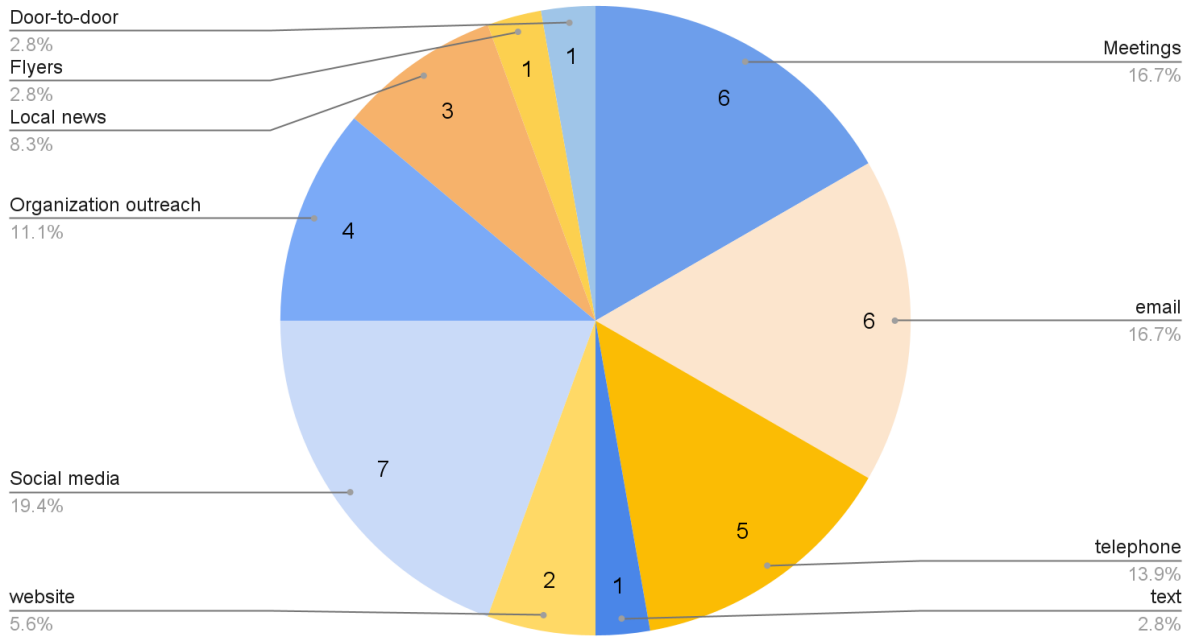


Chart 1: The pie chart above depicts frequencies of platforms and methods environmental justice organizations use to communicate with their audience.

Appendix E
Section 1: Public Questionnaire

Informed Consent Agreement for Participation in a Research Study

Study Investigators: Julia S., Paul W., Sohrob Y., Anna C.

Contact Information: DEPtalks@mass.gov

Sponsor: Massachusetts Department of Environmental Protection

Purpose of the study: We are looking to determine the level of awareness of combined sewer overflow issues in affected communities. We also want to determine the best ways to notify community members about local combined sewer overflow events and their effects.

The questionnaire will ask questions regarding your community, knowledge of sewage overflow events, and preferences for communications, including social media. You may keep the optional questions blank. Please fill out the questionnaire by September 24th, 2021. The questionnaire should take about five minutes to complete.

Benefits to research participants and others: The study results will help MassDEP and sewer facilities effectively notify communities affected by sewage discharge events about health hazards of sewage contaminated water, which will help manage the associated hazards.

Record keeping and confidentiality: We will keep records of your answers. The records will be accessed by the investigators (us), our sponsors at Massachusetts Department of Environmental Protection, and faculty advisors at Worcester Polytechnic Institute. The final data analysis will be available to the public. We will not disclose your name, and you may request that we do not include your answers in our report. Records of your participation in this study will be held confidential so far as permitted by law. However, the study investigators, the sponsor, or its designee will be able to inspect and have access to confidential data that identifies you by name. Any publication or presentation of the data will not identify you.

For more information and additional questions about this research contact:

Ann Lowery

Email: ann.lowery@mass.gov

Questionnaire on Public Advisories of Sewage Discharge Events

If you want to take this survey in Spanish / Portuguese click here:

SPANISH:

Si quieres realizar esta encuesta en español haz clic aquí. [link]

PORTUGUESE:

Se você quiser fazer esta pesquisa em português clique aqui. (Brazil) [link]

Se quiser fazer esta pesquisa em português clique aqui. (Portugal) [link]

[Chapter 322 of the Acts of 2020](#), *An Act promoting awareness of sewage pollution in public waters*, requires MassDEP to create regulations about public notification of untreated or partially treated wastewater, including Combined Sewer Overflows, or sewer discharge events (when sewage is discharged with stormwater into waterways. MassDEP is directed to develop regulations for discharging facilities to implement a communication system to distribute public advisories of sewage discharge events.

To best understand your communication needs and preferences to receive public advisories, we are asking you to provide feedback using this questionnaire. The questionnaire is being distributed before the public comment period for draft regulations begins. There will be other opportunities to provide input on the proposed regulations later this year.

Please fill out the information below:

I would like to remain anonymous

Name:

Email:

Phone number:

What city/town do you live in?

Answer: _____

Would you prefer to receive notifications in a language other than English? If yes, please identify the language(s)

Are you affiliated with any of the organizations below? (Check all that apply)

Alternatives for Community & Environment

Chinese Progressive Association

Clean Water Action

Neighbor to Neighbor

GreenRoots, Inc.

Chelsea Collaborative

Community Action Works

Coalition for Social Justice

Groundwork Lawrence

Lowell Alliance

Cultural Council

Hands Across the River Coalition

Environmental Stewardship City of New Bedford

Groundwork Somerville

Mystic River Urban Waters

ARISE for Social Justice

Community Action Works

Worcester Roots

MA Rivers Alliance

Mystic River Watershed Association

Charles River Watershed Association

Neponset River Watershed Association

Connecticut River Conservancy

Nashua River Watershed Association

Merrimack River Watershed Council

Environment Massachusetts
Environmental League of MA
Mass Audubon
NONE

OTHER: _____

If yes, indicate your role: _____

Combined Sewer Overflows (CSOs) occur when water overflows in a sewage system, leading to rainwater runoff or stormwater, sewage, and industrial wastewater to be released into a waterway.

To clarify the definition of CSOs, feel free to refer to the following video. [link]

To maintain consistency, we will refer to CSO events as “sewage discharge events” and CSO outfall pipes as “sewage outfalls” in this survey

1. Prior to receiving this survey, did you know what a sewage discharge event was?
 - a. Yes
 - b. No (If no, skip to question #3)

2. If you answered yes to Question 1, do you know why a sewage discharge event happens?
 - a. Yes
 - b. No

3. Do you know other causes of water quality problems? If so, what are they?
Yes: _____ (other causes: _____)
No

4. Are you aware of any health hazards related to sewage water exposure?
 - a. Yes
 - b. No

5. Have you seen any signage at sewage outfalls in your community? (add image example)
 - a. Yes
 - b. No
 - c. Unsure

6. If you have ever noticed a sewage discharge event, how often have you noticed an event?
 - a. Few times a year
 - b. Every month
 - c. Weekly
 - d. More than once a week
 - e. Never
 - f. Other: _____

7. How do you know it was a sewage discharge event? (optional) (100 words maximum)

8. On average, how often do you use waterways for recreational activities?
 - a. Daily
 - b. Weekly
 - c. Seasonally
 - d. Rarely
 - e. Never

9. Please name the waterways that you use (if known): (150 words maximum)

10. How do you use waterways? (check all that apply)
 - a. Swimming
 - b. Boating
 - c. Fishing
 - d. I don't use the waterways
 - e. Other: _____

11. Do you swim, boat, or fish near a sewage outfall?
 - a. Yes
 - b. No
 - c. Unsure

12. If you fish, do you consume the fish and shellfish you catch?
 - a. Yes
 - b. No
 - c. I don't fish

13. Do you have reliable access to the internet?
 - a. Yes

b. No

14. Do you use social media?

- a. Yes
- b. No (If no, skip to question #17)

15. If yes, what social media platforms do you use? (Select all that apply)

- a. Twitter
- b. Instagram
- c. Facebook
- d. Other (please specify)

16. How often do you use social media?

- a. Once a week
- b. Multiple times a week
- c. Daily
- d. Multiple times a day
- e. Hourly
- f. Other: _____

17. Using a scale of 1 = Least Preferred to 5= Most Preferred, please rate the communication methods below based on your preference to receive notifications about sewage discharge events?

	Least preferred	Slightly preferred	Moderately preferred	Very preferred	Most preferred
Social media (Twitter, Instagram, Facebook, etc.)					
Reverse 911 Calls					
Text Messages					
Emails					
Website					

postings					
Other (please specify):					

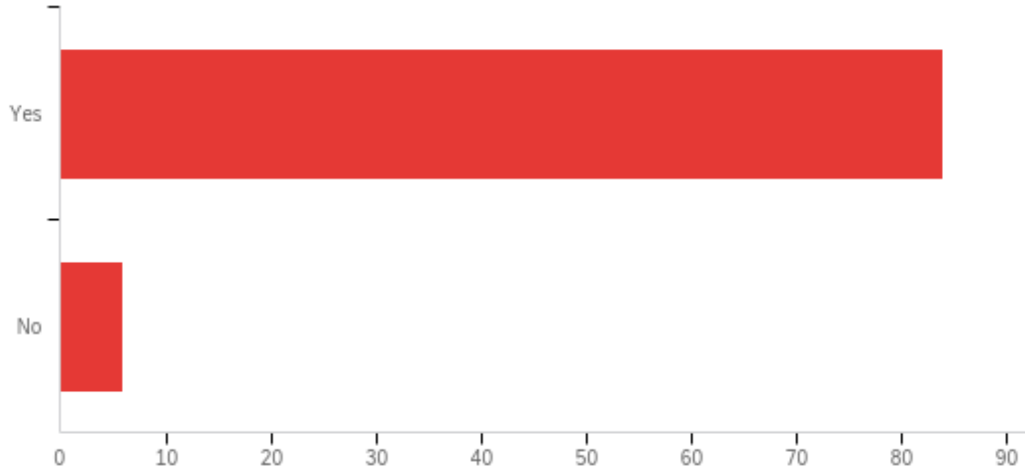
18. Would you be interested in signing up for notifications regarding sewage discharge events?

- a. Yes
- b. No

Thank you so much for your time. Your feedback will be very helpful in constructing an effective and efficient notification system for Massachusetts sewage discharge events.

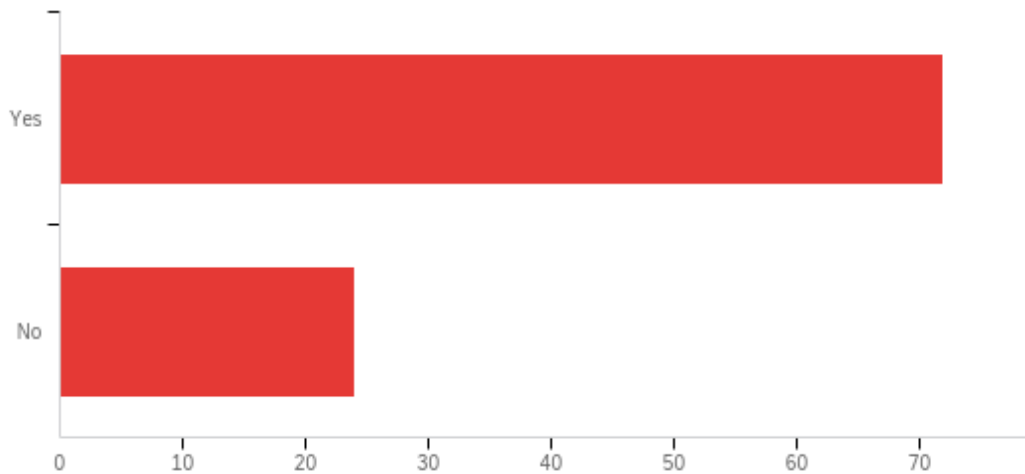
Appendix E
Section 3: Graphics for Public Questionnaire Results

Do you know why a sewage discharge events happens?



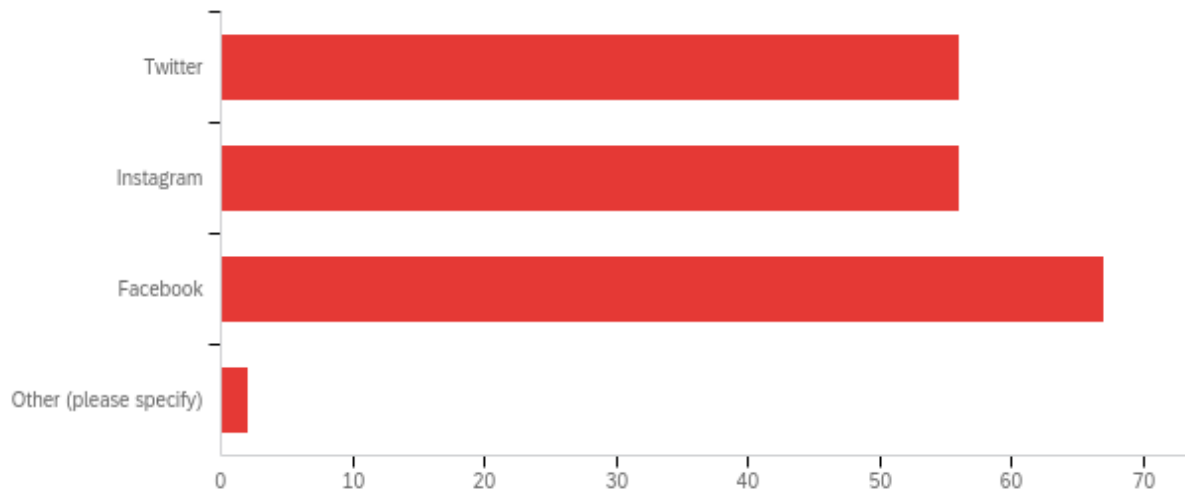
Graph 1: Distribution of respondents who knew why discharge events occur.

Do you know other causes of water quality problems? If so, what are they?



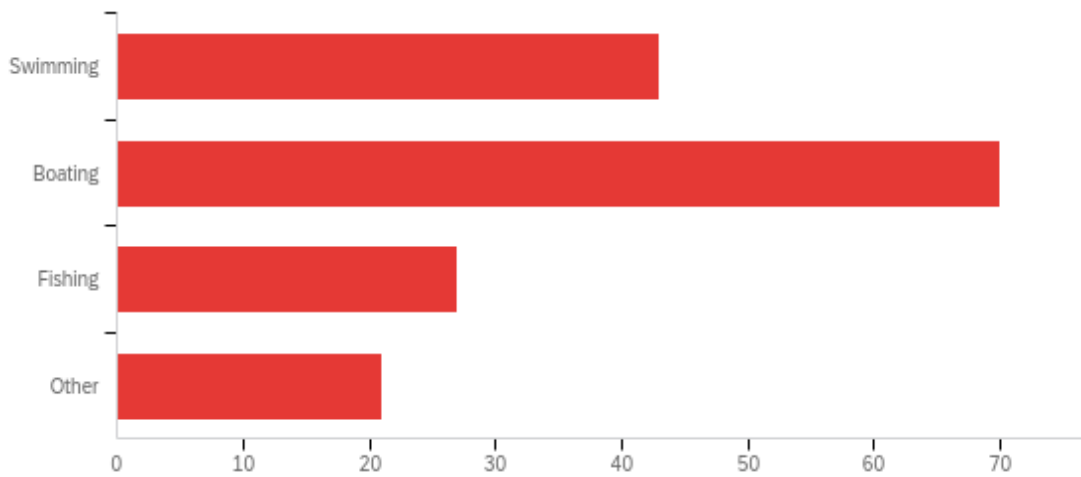
Graph 2: Distributions for awareness of causes of CSOs.

What social media platforms do you use? (Select all that apply)



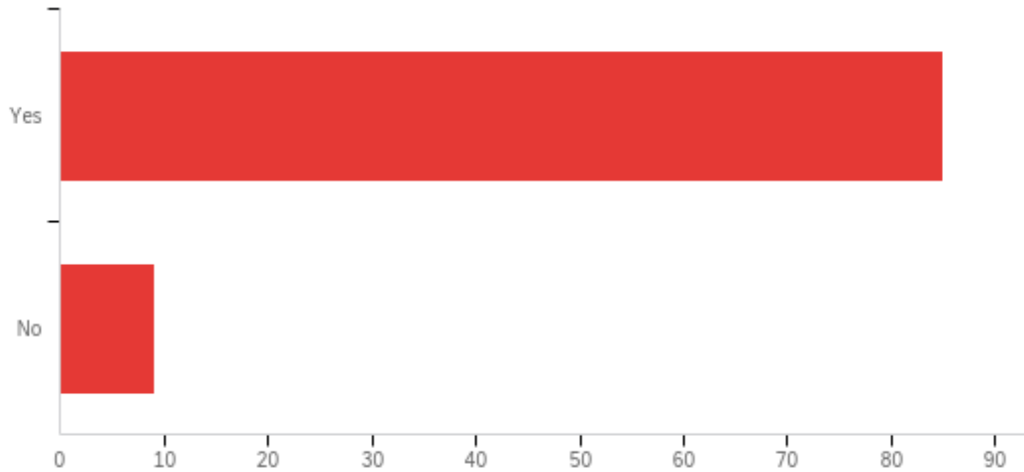
Graph 3: Distribution of the various social media platforms used by respondents.

How do you use waterways? (check all that apply)



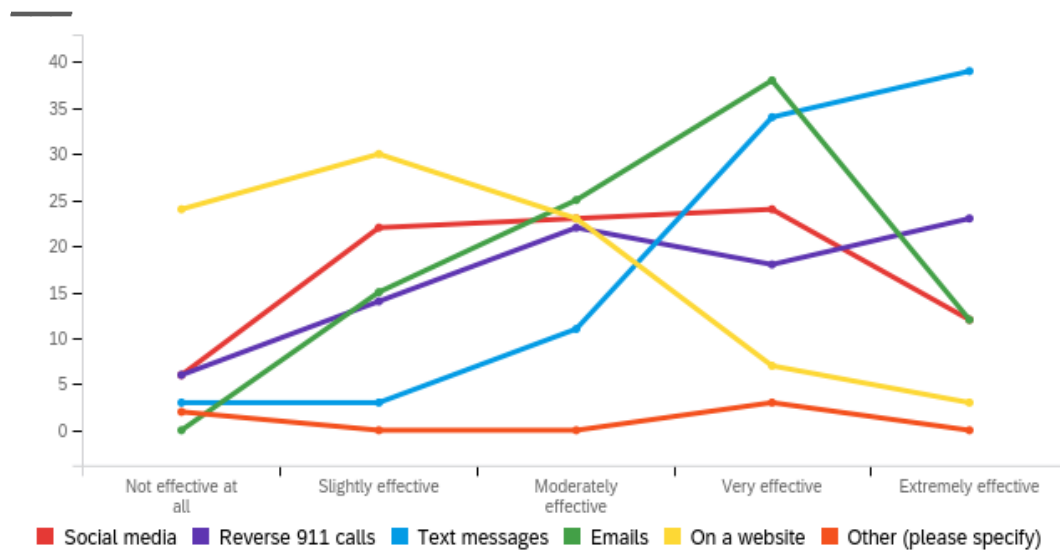
Graph 4: Distributions of recreational water activities the respondents participate in.

Do you use Social Media?

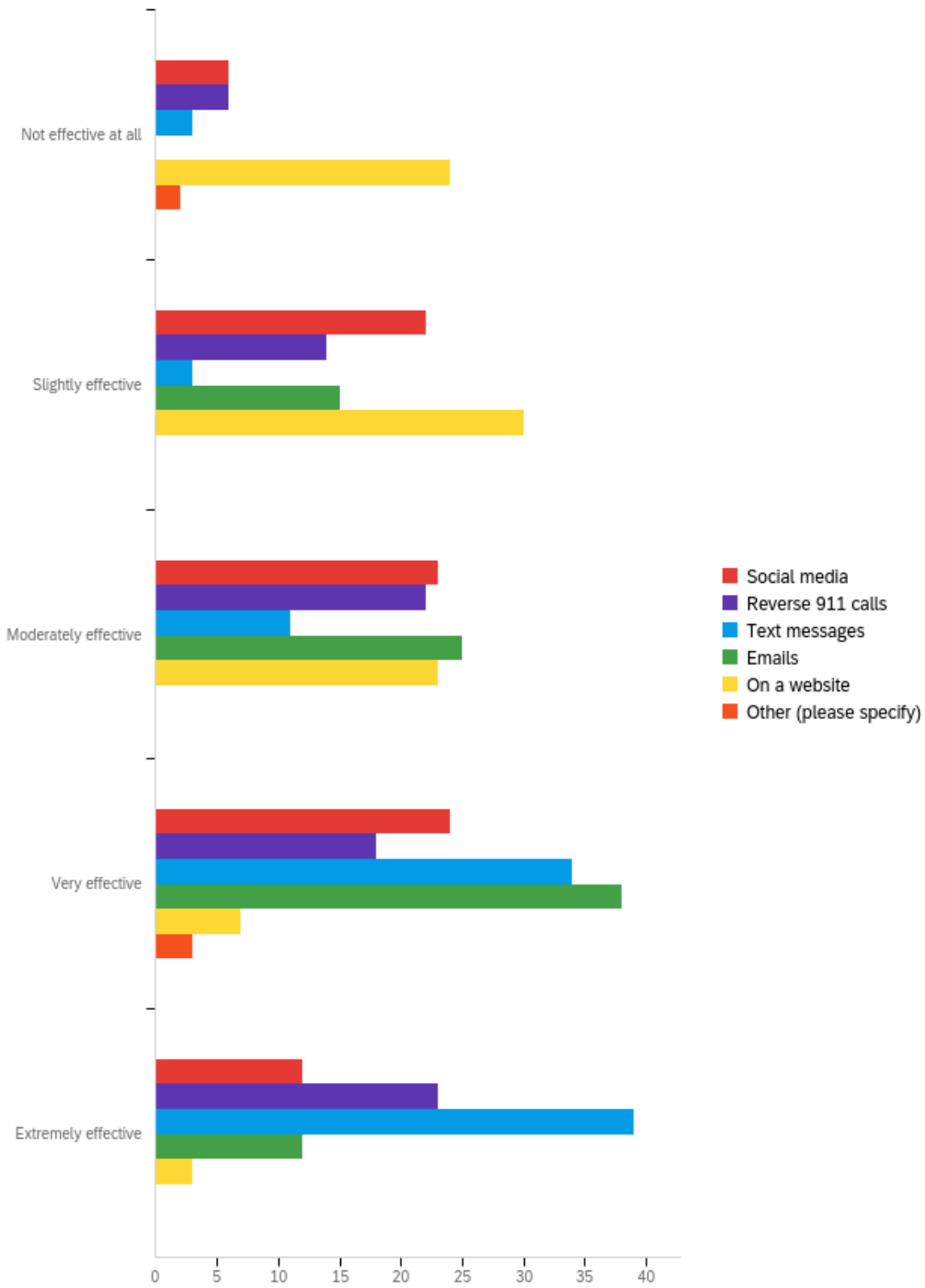


Graph 5: Distribution of social media use of respondents.

Please rate the communication methods below based on your preference to receive notifications about sewage outfall events.



Graph 6: Trends of preferences for each platform.

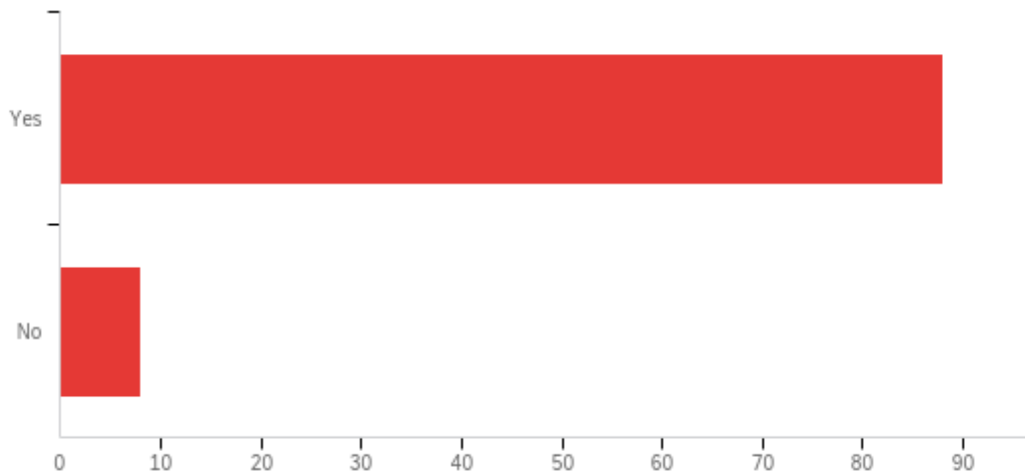


Graph 7: Responses for preferences for each platform.

#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
3	Text messages	1.00	5.00	4.14	0.98	0.97	90
4	Emails	2.00	5.00	3.52	0.92	0.85	90
2	Reverse 911 calls	1.00	5.00	3.46	1.25	1.57	83
1	Social media	1.00	5.00	3.16	1.15	1.33	87
6	Other (please specify)	1.00	4.00	2.80	1.47	2.16	5
5	On a website	1.00	5.00	2.25	1.05	1.11	87

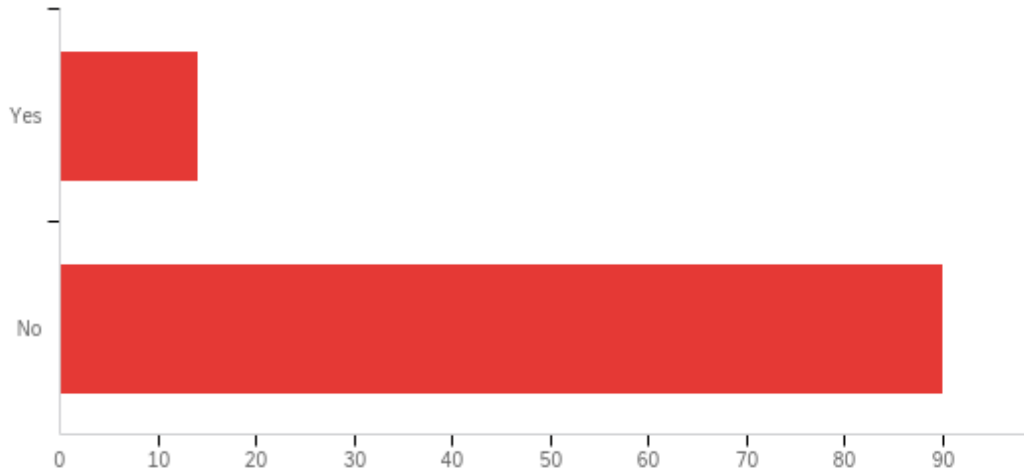
Table: Statistics for the responses for preferences of platforms.

Would you be interested in signing up for notifications regarding sewage discharge events?



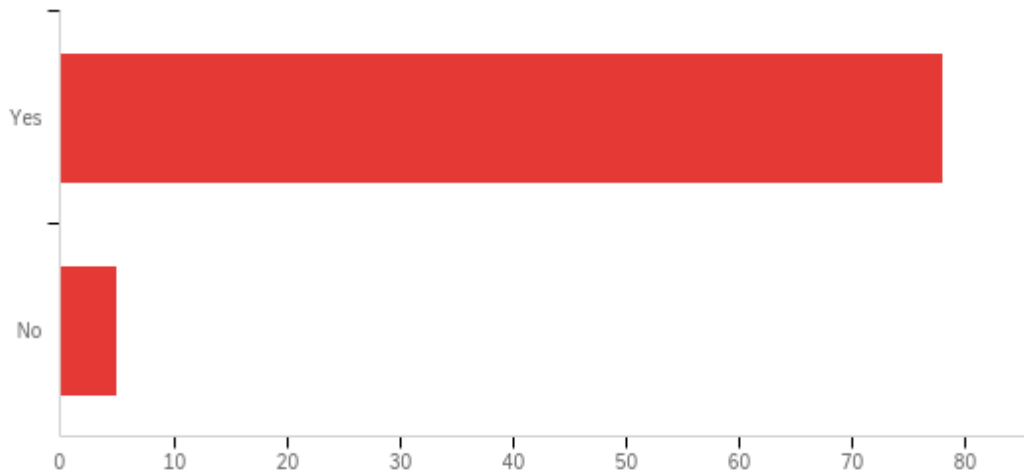
Graph 8: Distribution of respondents interested in signing up for sewage discharge event related notifications.

Would you prefer to receive notifications in a language other than English? If yes, please identify the language(s)



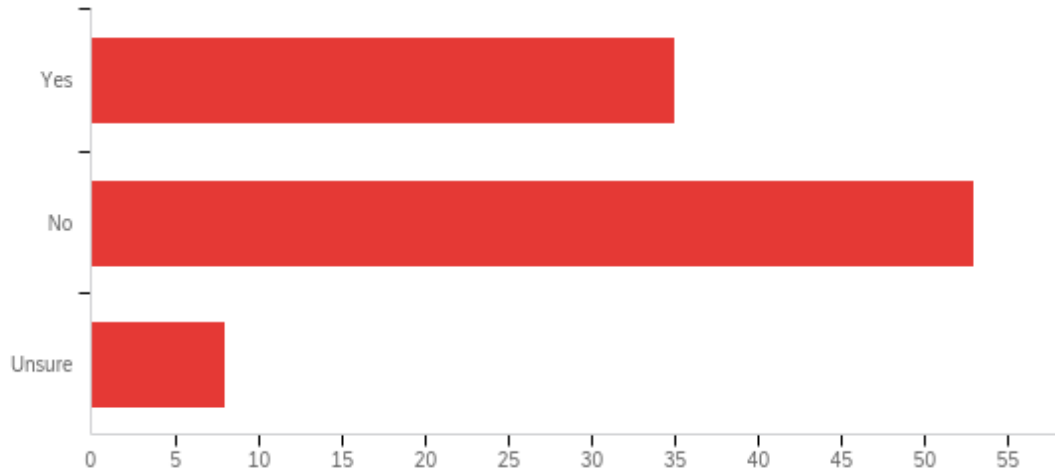
Graph 9: Portion of respondents that would prefer to receive notifications in a language other than English.

Do you swim, boat, or fish near a sewage outfall?



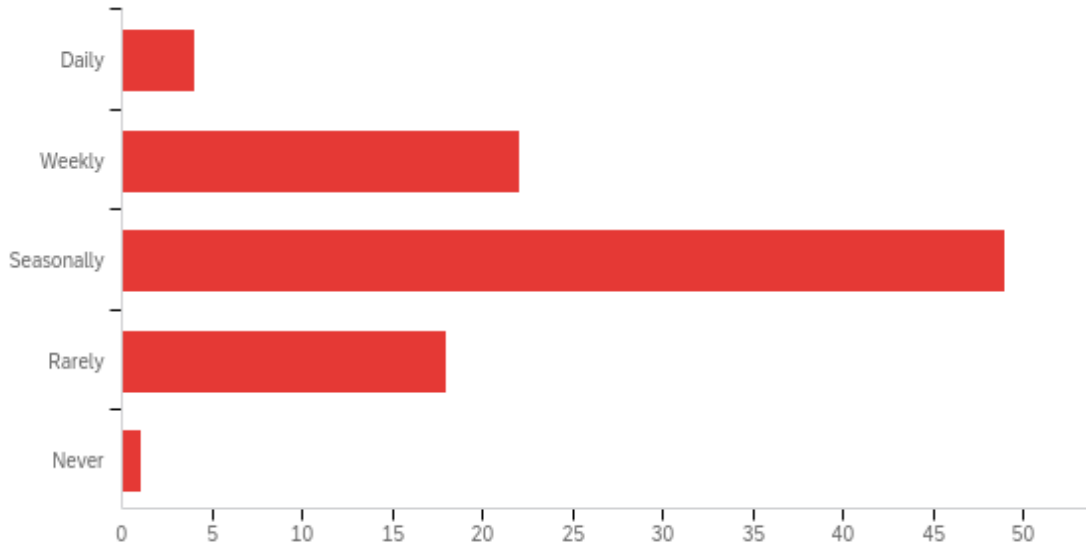
Graph 10: Portion of respondents that swim, boat, or fish, near a sewage outfall.

Have you seen any signage at combined sewage outfalls in your community like the one above?



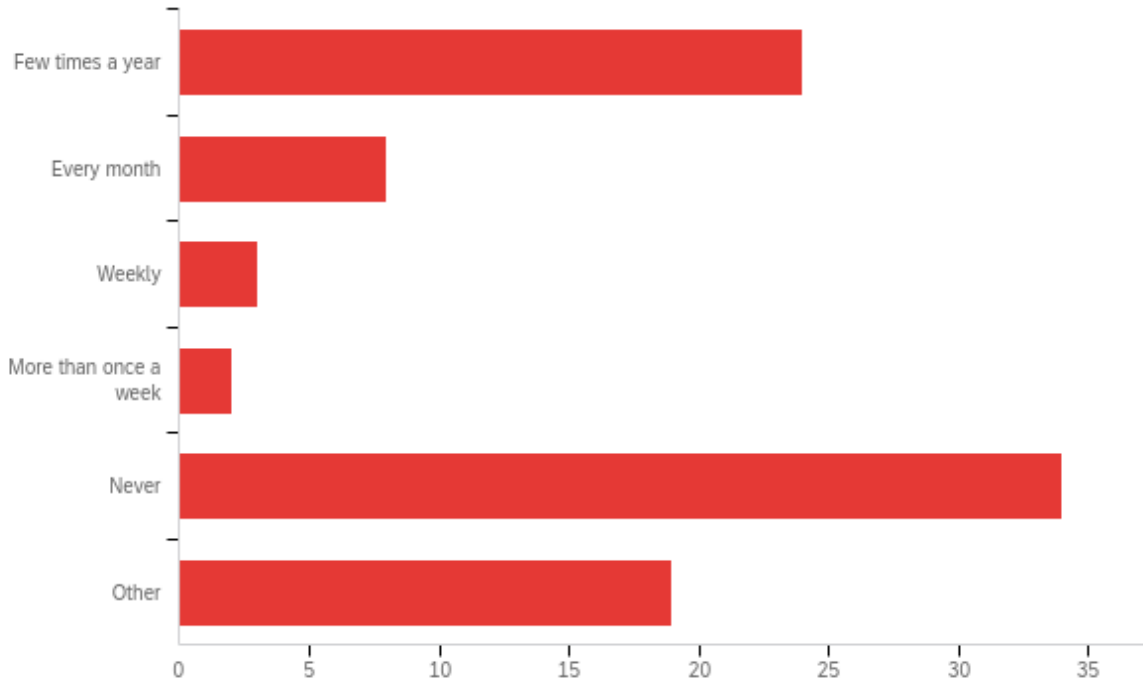
Graph 11: Distributions for signage sightings.

On average, how often do you use waterways for recreational activities?



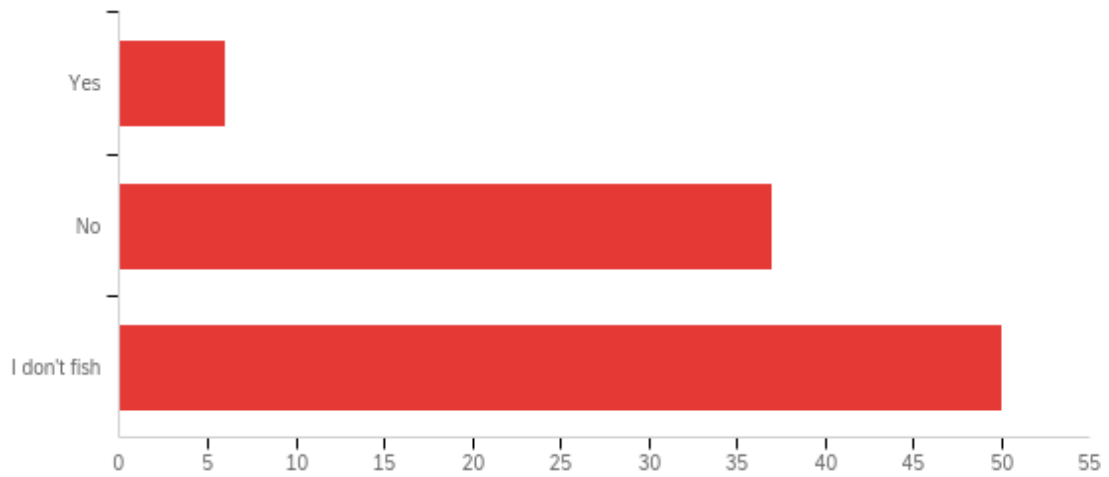
Graph 12: Distributions for waterway use frequency.

If you have ever noticed a sewage discharge event, what is the frequency?



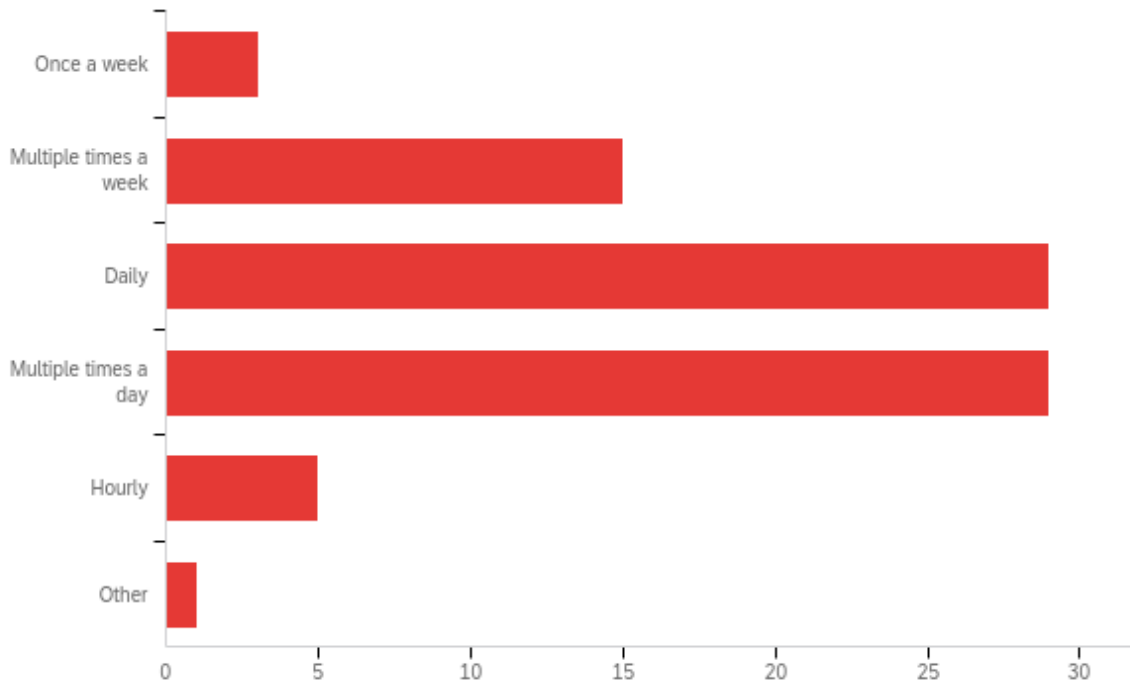
Graph 13: Distributions for frequency of outfall event sightings.

If you fish, do you consume the fish and shellfish you catch?



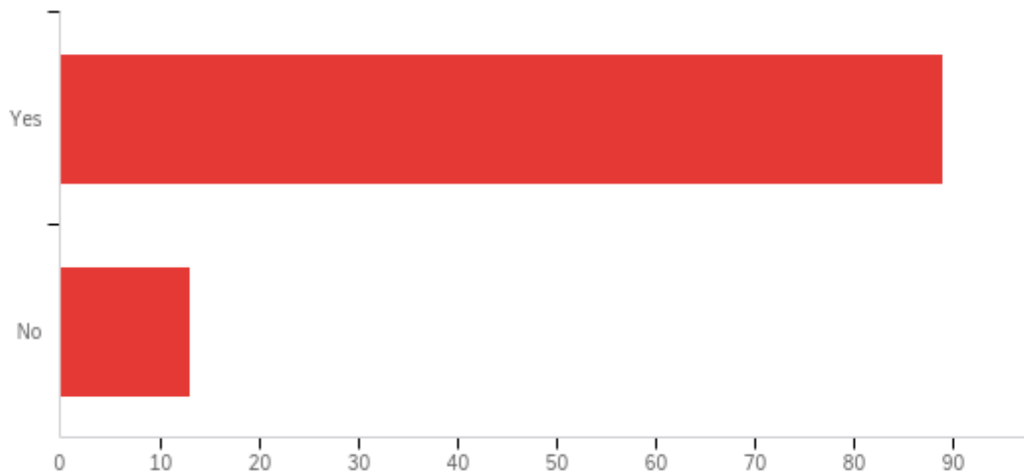
Graph 14: Distributions for number of people who consume the fish they catch.

How often do you use social media?



Graph 15: Distributions of the amount of social media use of respondents.

Prior to receiving this survey, did you know what a sewage discharge event was?



Graph 16: Portion of the respondents that know what a sewage discharge event is.

Appendix E

Section 4: Public Questionnaire Coded

Table color key

How they knew a discharge occurred	Waterway use	Other social media used	Communication methods not listed in the multiple choice preferred by respondent	Organizational role	Preferred languages to receive notifications in
------------------------------------	--------------	-------------------------	---	---------------------	---

Code	Frequency	Question	Meaning
Public official	3	How do you know it was a discharge event?	Discharge is identified by an official: <ul style="list-style-type: none"> • Treatment plants on social media • Watershed organization
Saw it occur	6	How do you know it was a discharge event?	Had a first-hand experience <ul style="list-style-type: none"> • Color of water • smell
news	3	How do you know it was a discharge event?	Heard it on the news
Notifications (general)	2	How do you know it was a discharge event?	Subscribed to notifications <ul style="list-style-type: none"> • MWRA or cambridge • charles
email	4	How do you know it was a discharge event?	Email notification
Social media	5	How do you know it	Through social

		was a discharge event?	media (Facebook groups, twitter..)
signage	1	How do you know it was a discharge event?	Saw a sign near a water body
connections	2	How do you know it was a discharge event?	<ul style="list-style-type: none"> ● Coworkers ● neighbor
reports	1	How do you know it was a discharge event?	From treatment plants
expertise	2	How do you know it was a discharge event?	Work with/oversee the waterways
Shellfish closures	1	How do you know it was a discharge event?	Saw that shellfish areas are closed.
website	1	How do you know it was a discharge event?	Saw a web posting (MWRA)
walk	10	How do you use waterways?	Walks near the waterways
Paddle boarding	2	How do you use waterways?	Use paddle boards
bike	1	How do you use waterways?	Bike near waterways
canoe/kayak	1	How do you use waterways?	Canoe or kayak
Dig swimming	1	How do you use waterways?	Perhaps: dive in to dig the bottom of waterways Perhaps: dog swimming? (<i>unsure</i>)

tiktok	1	What social media do you use? (other)	Use tiktok
Linkedin	1	What social media do you use? (other)	Use linkedin
news	2	Communication methods preferred (other)	Prefers: <ul style="list-style-type: none"> • Radio • newspaper
website	1	Communication methods preferred (other)	Prefers website postings, are effective
signs	1	Communication methods preferred (other)	Prefers signage, is effective
Twitter	1	Communication methods preferred (other)	Prefers specifically Twitter
director	10	Organizational role	Is the director of their organization
member	17	Organizational role	Is an organization member
secretary	1	Organizational role	Is the secretary to their organization
coordinator	4	Organizational role	Is a coordinator at their organization
volunteer	4	Organizational role	Volunteered at the organization
expertise	5	Organizational role	Is an expert working for organization <ul style="list-style-type: none"> • Implemented notif system • Aquatic scientist • Policy advisor • Water

			<ul style="list-style-type: none"> monitoring • commission
manager	2	Organizational role	Is a manager at the organization
intern	1	Organizational role	Is an intern at the organization
Vice president	1	Organizational role	Is a vice president of the organization
donor	4	Organizational role	Donates to the organization
Spanish	4	Would you like to receive notifications in another language? (If yes, please identify)	Wants to see notifications in Spanish
Vietnamese	1	Would you like to receive notifications in another language? (If yes, please identify)	Wants to see notifications in Vietnamese
Portuguese	1	Would you like to receive notifications in another language? (If yes, please identify)	Wants to see notifications in Portuguese
Arabic	1	Would you like to receive notifications in another language? (If yes, please identify)	Wants to see notifications in Arabic
Chinese	1	Would you like to receive notifications in another language? (If yes, please identify)	Wants to see notifications in Chinese (Mandarine)

Khmer	1	Would you like to receive notifications in another language? (If yes, please identify)	Wants to see notifications in Khmer (Cambodian)
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The table above shows themes that appeared in the open response answers of the public questionnaire, the frequency of each theme, the question identified theme served as an answer to, and the context and meaning of the theme. Note about the “roles”: some respondents are affiliated with different organizations and have different roles pertaining to different organizations.

Appendix E:

Section 4: Pie Charts for Public Questionnaire Open Responses Codes

How did the user know a discharge event occurred.

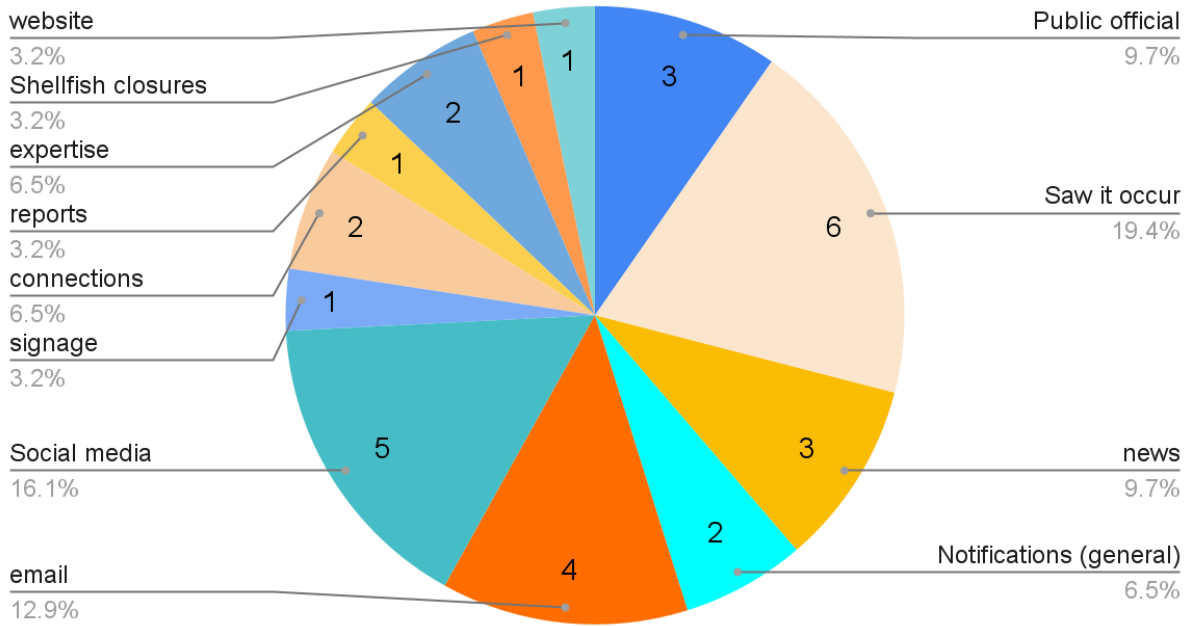


Chart 1: The pie chart depicts the frequency of themes expressed by questionnaire respondents, in relation to how they knew a discharge event occurred.

Role of survey takers associated with organizations

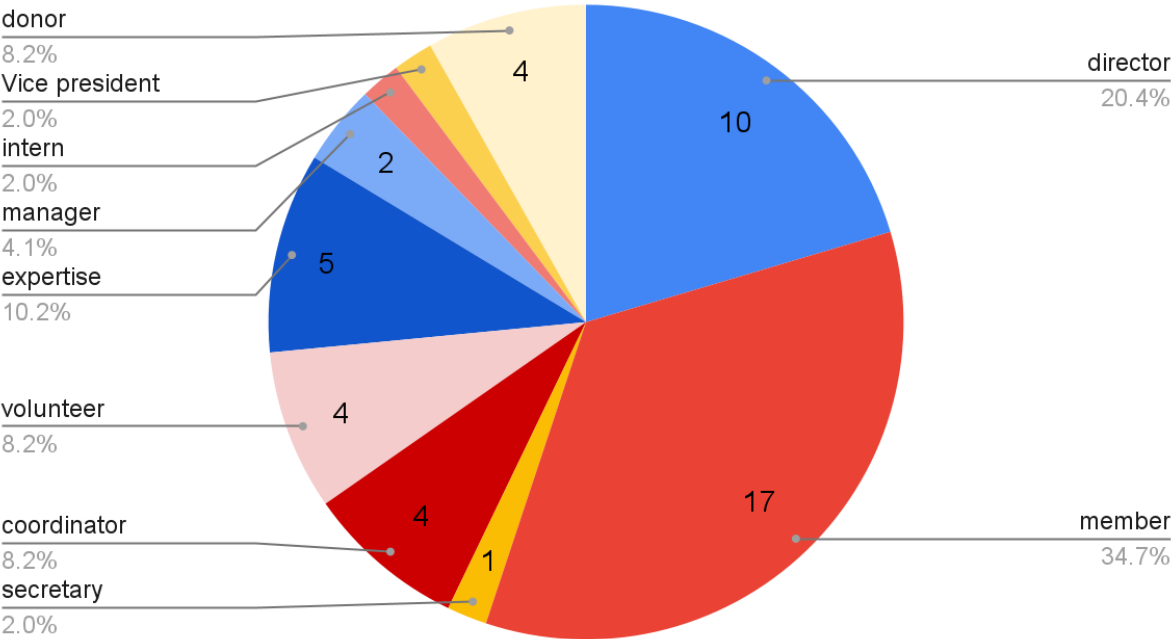


Chart 2: The pie chart above depicts the frequency of categories of roles the questionnaire respondents identified, pertaining to the organizations they are a part of.

Appendix F: Permit Holder Facility Websites

Permit Holder Facility Websites:

<u>Facility</u>	<u>Website</u>
City of Cambridge	https://www.cambridgema.gov/Services/combinedseweroverflows
Massachusetts Water Resources Authority	https://www.mwra.com/harbor/html/cso_sso_reporting.htm
City of Somerville	https://www.somervillema.gov/departments/alewife-brook-combined-sewer-overflow-cso-control
Boston Water and Sewer Commission	https://www.bwsc.org/environment-education/water-sewer-and-stormwater/cso-public-notification
City of Chelsea	https://www.chelseama.gov/public-works/pages/combined-sewer-overflows
Lynn Water and Sewer Commision**	http://www.lynnwatersewer.org/index.shtml
City of Gloucester**	https://gloucester-ma.gov/312/Utilities
City of Haverhill	https://www.cityofhaverhill.com/departments/public_works_department/water_wastewater/wastewater/wastewater_collection_system/combined_sewer_overflows_(cso)/index.php
Greater Lawrence Sanitary District	https://glsd.org/combined-sewer-overflow-2/
Lowell Regional Wastewater Utilities	https://www.lowellma.gov/637/Wastewater-Utility

City of Fitchburg	http://www.ci.fitchburg.ma.us/476/Wastewater-Division
City of Worcester	http://www.worcesterma.gov/water-sewer/sewer-system
Springfield CSO	https://waterandsewer.org/education/csos/
Chicopee WPC/CS	https://www.chicopeema.gov/246/Water-Pollution-Control https://www.chicopeema.gov/607/Integrated-Water-Resources
Holyoke WPCF/CS**	https://www.holyoke.org/dpw-sewer-and-waste-water/
Montague WPCF/C**	https://www.montague-ma.gov/p/33/Water-Pollution-Control-Facility
Taunton CSO**	https://www.taunton-ma.gov/department-public-works/pages/sewer-collection-and-treatment-plant
City of Fall River	https://www.fallriverma.org/waste-water-treatment-facility/
City of New Bedford	https://www.newbedford-ma.gov/public-infrastructure/wastewater/combined-sewer-overflows/

Facility websites for the GIS Map.

Appendix G
Section 1: Permanent CSO Sign Template

**WARNING: WET WEATHER
SEWAGE DISCHARGE LOCATION**
SEWER DISCHARGE MAY OCCUR DURING AND FOLLOWING WET
WEATHER

DANGER



AVOID FISHING, SWIMMING, WADING,
SHELLFISHING, AND BOATING AFTER A
WET WEATHER EVENT.
BACTERIA FROM SEWAGE DISCHARGES
MAY CAUSE SICKNESS.



For more information CONTACT:
(FACILITY CONTACT INFO)
Phone: XXX-XXX-XXXX
Email: XXXXXX@XXXX.COM

OUTFALL ID:
CSO WOR001



Register for the CSO notification system by scanning the QR code or visit WWW.PERMITEEWEBSITE.com
Regístrate en el sistema de notificación de CSO escaneando el código QR o visite WWW.PERMITEEWEBSITE.com

To learn more about combined sewage overflows, scan the QR code to the right.
Para obtener más información sobre los desbordamientos combinados de aguas residuales, escanee el código QR a la derecha.



Appendix G
 Section 2: Temporary CSO Sign Template

**WARNING: WET WEATHER
 SEWAGE DISCHARGE**
 SEWER DISCHARGE IS NOW OCCURRING OR RECENTLY
 OCCURRED AS OF
 DATE: _____



Discharge of partially treated or untreated sewage is occurring or has recently occurred upstream or at this location. Potential health hazards can arise from contact with untreated sewage. Refrain from boating, fishing, swimming, shellfishing, or wading when this sign is posted. This sign shall remain in place for at least 48 hours after the upstream discharge has stopped.



For more information CONTACT:
 Wastewater Facility Name: _____ Contact Info: _____

Register for the CSO notification system by scanning the QR code or visit WWW.MassDEPCSONotify.com
 Regístrate en el sistema de notificación de CSO escaneando el código QR o visite WWW.PERMITEEWEBSITE.com



To learn more about combined sewage overflows, scan the QR code to the right.
 Para obtener más información sobre los desbordamientos combinados de aguas residuales, escanee el código QR a la derecha.



WARNING