Clarifying and Connecting Ocean Sewage

By using key messages and frameworks for connecting with the "boots on the ground", we can foster a multi-sector ecosystem that works on decreasing sewage in our oceans

FLUSH

Connecting to Ocean Practitioners

Through 32 key stakeholder interviews and 25 survey responses from individuals in the marine conversation and aquaculture sectors

How We Got Here

FLUSH used the following process to create two audience profiles for OSA. In the following slides, we briefly outline and describe important steps.

STEP 1
Identify the Audience

STEP 2
Research Online

STEP 3
Develop Interview Questions

STEP 4
Identify Interviewees in Own Network

STEP 5
Contact Interviewees & Interview

STEP 6
Develop Survey Form

STEP 7 + 8
Identify Survey Groups & Invite to Respond

STEP 9
Analyze Study Responses

FLUSH has created a guide for this process that OSA can easily replicate.

Understanding OSA's Audiences

This project focused on understanding two key audiences. OSA and FLUSH chose these audiences based on their regional focus and relationship to ocean sewage.

Regional Focus

OSA is a global nonprofit focused on building a global community of partner organizations, communities and governments who are working to reduce untreated sewage in the ocean. For this project, FLUSH recommended **pursuing a regional focus on the United States** (US) because:

- OSA has a strong cultural understanding of the United States, with the secretariat team and majority of partners located in the United States
- The United States is facing unprecedented algae blooms caused by excessive nutrients and pollutants from sewage
- The United States does not have a thriving ecosystem focused on ocean sewage pollution

Stakeholder Focus

OSA is interested in understanding the different audiences of coastal areas **based on their relationship to ocean sewage: (1) those affected by ocean sewage and (2) those controlling ocean sewage.**

With a regional focus in the United States, FLUSH and OSA decided to focus on two audiences based on their relationship to ocean sewage:

- OSA's existing partnerships network in ocean conservation (controlling ocean sewage)
- Aquaculture and commercial fisheries (affected), who often represent low-income coastal communities--a new market opportunity for OSA (see next slides for details).

Identifying the Audience

After deciding that the US would be the focus of this project, FLUSH worked with the “Uniting Our Voices” team to determine two priority audiences.

Main Goals for this Project

- Inform OSA’s external messaging and guidance for its members,
- Set a base level of understanding of OSA’s target audiences that they can track, and
- Develop an approach that is replicable for the future.

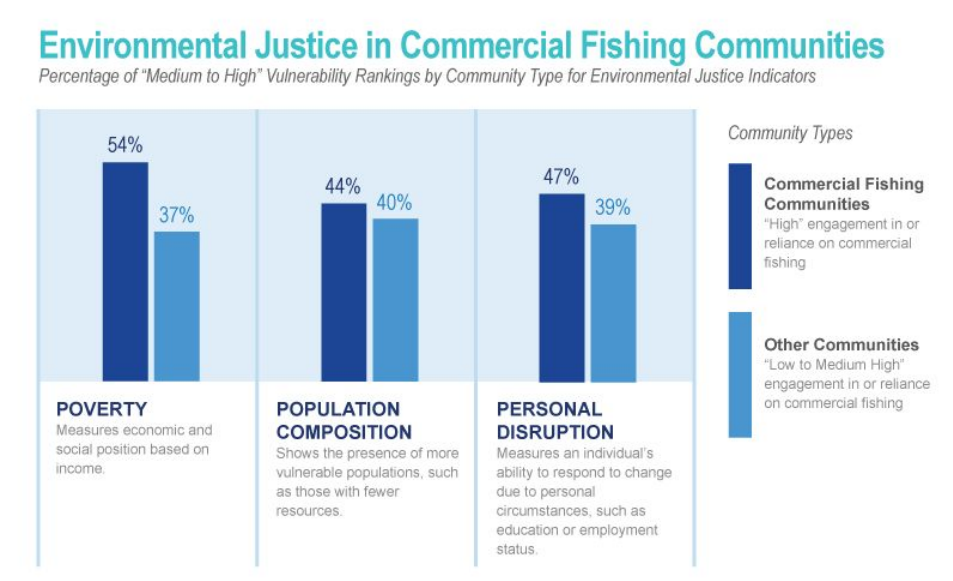
OSA previously identified its goal to reach lower-income coastal communities relying on the ocean for their economy and livelihood. See slide 7 for more information on this.

For this study, based on research and discussions with the OSA team, FLUSH prioritized the following audiences:

- **Coastal Conservation Groups** (aquariums, sanctuaries, ocean conservation, ocean restoration)
- **Aquaculture**/**Commercial Fishing** (salmon, oysters, crab, seaweed/kelp farming)

Research Online Low-Income Coasts

Industries and organizations are beginning to understand the effect of pollution on indigenous & low-income communities. Many of these communities are affected by ocean sewage - including commercial fisheries & aquaculture.



"Spillovers from sewage, livestock farms, and urbanization transport pathogenic viruses, bacteria and parasites, **become insidious biological pollution that increasingly trigger emerging infectious diseases, and compromise marine fauna and subsequently human health and well-being."[1]**

Commercial fisheries are starting to understand the importance of including environmental justice in their operations.

1.Environmental (in)justice in the Anthropocene ocean (2021)

Surveying and Interviewing

FLUSH used interviews with key stakeholders in the audience groups and a public survey sent out to individuals, organizations, and listservs in our networks.

Key Stakeholder Interviews

FLUSH contacted **80 contacts** across the US to include perspectives from different areas. This included the East Coast, West Coast, Gulf Coast, and Great Lakes. FLUSH interviewed **32 people** - a 40% interview response rate.

Public Survey

FLUSH and OSA sent the survey to **~12+ listservs with a reach of about 1,500 individuals**. FLUSH and OSA colleagues also sent out the survey link to stakeholders and promoted the survey on FLUSH's social media. This resulted in **25 individuals** completing the survey.

Respondents' Regional Breakdown

35% of participants in this study were from the East Coast, while 26% were from the West Coast, following general US population trends.
The final contact list can be seen here.

The Great Lakes and Gulf Coast were the least represented regions in this study, with **only 12%** of participants being from either region. This was slightly lower than our planned ratios.

	Contacted		Interviewed		Surveyed*		Perspectives Included	
National	20	25%	9	28%	6	24%	15	26%
East Coast	18	23%	11	34%	9	36%	20	35%
Gulf Coast	9	11%	1	3%	2	8%	3	5%
Great Lakes	9	11%	2	6%	2	8%	4	7%
West Coast	24	30%	9	28%	6	24%	15	26%
TOTAL	**80**	100%	**32**	100%	**25**	100%	**57**	100%

*Includes individuals counted twice, if they represented National and other viewpoints such as National and the Great Lakes.

Respondents' Sectoral Breakdown

FLUSH's connections were with a majority of ocean conservation NGOs (44%) based on OSA's partner organizations, signaling that OSA's network is currently primarily NGOs with a focus on ocean work.

Included in this research were **16 (28% of participants) aquaculture** organizations/groups and **41 (72%) ocean advocacy** organizations

Sector Focus	Interviewed		Surveyed		Included	
Advocacy & Education	2	6%	3	*12%*	5	9%
Aquaculture - General	1	3%	5	*20%*	6	11%
Aquaculture - Kelp	1	3%	0	*0%*	1	2%
Aquaculture - Shellfish	5	16%	2	*8%*	7	12%
Aquarium/Marine Rescue	2	6%	1	*4%*	3	5%
Commercial Fishing	2	6%	0	*0%*	2	4%
Government	2	6%	1	*4%*	3	5%
Ocean Conservation NGO	14	44%	11	*44%*	25	44%
Ocean Restoration (VC/Investors/Companies)	3	9%	2	*8%*	5	9%
Other - Ocean Climate	0	0%	0	*0%*	0	0%
TOTAL	***32***		***25***		***57***	

Respondents' Complete Breakdown

ALL INCLUDED (INTERVIEWS + SURVEYS) - 2 people were double counted.
10% of interviewed were indigenous or minority

Sector Focus	National	East Coast	Gulf Coast	Great Lakes	West Coast
Advocacy & Education	0.0%	3.5%	0.0%	0.0%	0.0%
Aquaculture - General	1.8%	10.5%	0.0%	0.0%	1.8%
Aquaculture - Kelp	0.0%	0.0%	0.0%	0.0%	1.8%
Aquaculture - Shellfish	0.0%	5.3%	0.0%	0.0%	3.5%
Aquarium/Marine Rescue	0.0%	3.5%	0.0%	0.0%	0.0%
Commercial Fishing	1.8%	0.0%	0.0%	0.0%	1.8%
Government	0.0%	1.8%	1.8%	0.0%	1.8%
Ocean Conservation NGO	15.8%	7.0%	3.5%	7.0%	15.8%
Ocean Restoration (VC/Investors/Companies)	7.0%	3.5%	0.0%	0.0%	0.0%
Other - Ocean Climate	0.0%	0.0%	0.0%	0.0%	0.0%

Sector groups were located mostly on the East and West coasts, with some having national scopes.

The largest group contributing to this project were Ocean Conservation NGOs.

What We Heard

The following slides include insights from the 32 unique participants interviewed over three months.

Sewage Can Be Approachable

OSA is a strong coalition of organizations and individuals passionate about preventing pollution from wastewater and septic tanks from entering the ocean.

People are actively working on preventing sewage from entering the oceans

Individuals enjoy OSA's upbeat and humorous style of communication, making ocean advocacy fun

Contacts were easy to connect with and excited to engage more with OSA (though they had varying degrees of knowledge about OSA)

OSA brings an approachable human voice to ocean sewage - sharing a message that change is within reach while showing what change looks like.

Common Ground in a Vast Sea

Though organizations in and around the ocean can have very different missions, goals, and objectives, some general common ground emerged.

Working to decrease sewage in our ocean has a long history in **ocean-adjacent industries,** especially the shellfish industry.

Reducing the sewage entering the ocean is a **complex issue that diverse organizations have started tackling to protect their water, product, or environment**

Due to its complexity and multifaceted nature, much of the work to **prevent sewage contaminating the ocean is done in silos.**

Key Focus Areas Among Participants: Climate Change, Ocean Acidification, Nature-Based Solutions, Warming Ocean and Bacterial Blooms

A Community as Large as the Ocean

In general, the US ocean ecosystem contains a positive attitude toward collaboration but values organizations with “boots on the ground.”

A majority of participants surveyed operate in ecosystems that are are locally-based and strengthened through word-of-mouth efforts

Members of the US ocean community tend to be collaborative and excited to make connections

Many mentioned not having a go-to resource for sewage information, advice, and help

“In the Santa Cruz community, we're pretty connected face-to-face.”
-Ocean Conservation NGO

Survey respondents mentioned intermingling at conferences, and those interviewed prioritize facetime with local or regional networks and with people “on the ground” of conservation group. Interactions happen in-person, on the phone.

Are WWTPs Friends or Foes?

We must be thoughtful when working with or addressing Wastewater Treatment Plants (WWTPs), as many in these audience members have differing opinions.

There was consensus across the US that **water quality has improved** in their areas over the last 10 to 20 years - partly due to WWTPs. However, WWTPs in the US need money to update their infrastructure to reduce sewage outflows, nutrients and emerging contaminants. Operating with a lack of funding and support, how does OSA invite them into the conversation?

Participants surveyed have taken many different approaches to work with WWTPs. Other actions taken in relation to WWTPs included:

1. A shellfish company writing septic policies with regulators that limit nitrogen from entering the ocean
2. Waterkeepers monitoring and then suing non-compliant WWTPs
3. An organization working with the public not to flush right after storms

Pinpointing Source Pollution is Hard

Pollution entering the ocean comes from multiple sources, such as ocean vessels, septic, and agricultural runoff. However, it's difficult for communities to understand its origin.

FROM LITERATURE

"For example, wastewater treatment facilities thoroughly filter pathogens but are less effective at removing nitrogen. They are also costly to build, operate and maintain. Septic systems are cheaper and can capture most of the nitrogen, yet they are less effective at preventing pathogens from entering the environment. **Identifying places where sewage-borne nitrogen and pathogens are separate or combined problems can help policy makers identify the most effective solutions" [1]**

"Pollution is coming from septic, agricultural and manure lagoons. Everyone points the finger at everyone else." - Ocean Conservation NGO

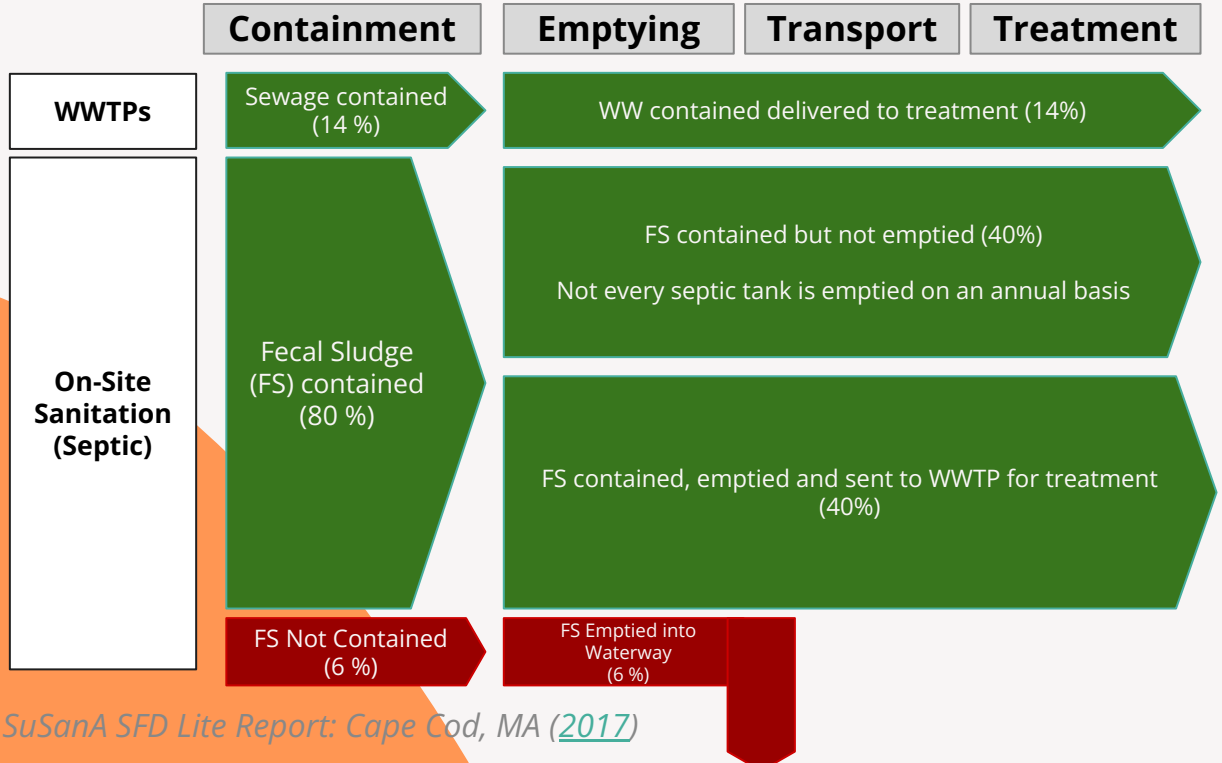
"Moreover, the researchers showed that **nitrogen from human sewage reaches about 58% of the world's coral reefs and 88% of seagrass beds**." [1]

1. *Half of the Worlds Coastal Sewage Pollution Flows (2021)*

Example Source Data

Sewage Sources in Coastal US Towns

Before bringing up WWTPs in its communications, OSA could consider evaluating where ocean sewage comes from in different coastal areas.



SuSanA SFD Lite Report: Cape Cod, MA (2017)

A major difficulty in addressing ocean sewage is understanding pollution sources and their nutrient concentrations. **OSA could partner in collecting this data** with sensor entrepreneurs, aquaculture businesses, and conservation organizations.

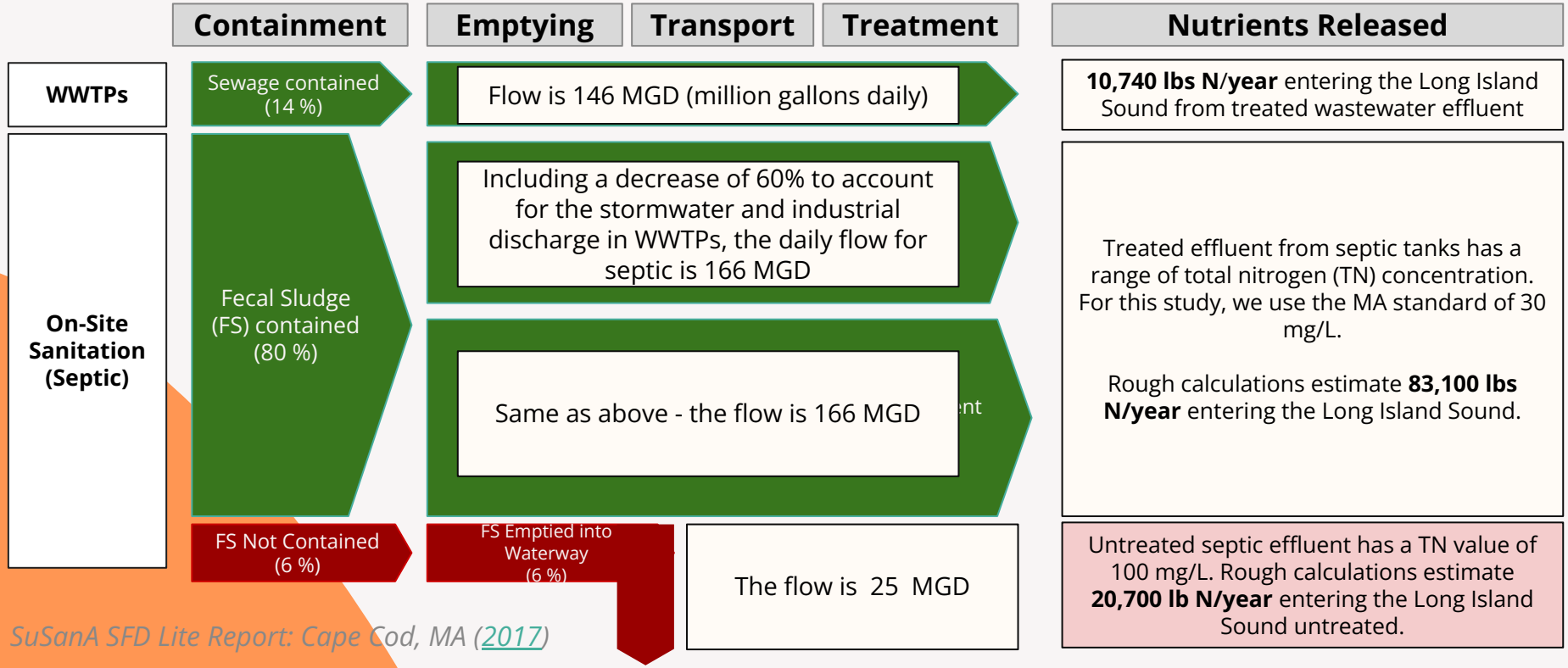
A common way of showing sewage source data is a Shit Flow Diagram (SFD). Below is an example of a SFD for coastal Cape Cod, MA. **You can see that all human waste in the environment there happens in septic systems.** These shit flow diagrams however do not account for the nutrients in our untreated or treated waste.

OSA could connect these diagrams to nitrogen, phosphorous, and pollutants released in each source.

Example Source Data

Sewage Sources in Coastal US Towns

Before bringing up WWTPs in its communications, OSA could consider evaluating where ocean sewage comes from in different coastal areas.



SuSanA SFD Lite Report: Cape Cod, MA (2017)

Sewage Coliforms Affect Everyone

Interviewees from all industry also spoke about their concerns fecal bacteria in the environment affecting public health, including beach closures. Shellfish workers had strong technical knowledge of and interest in ocean sewage.

The shellfish industry is acutely impacted by ocean sewage into state waters, affecting their livelihoods and their ability to maintain food safety. Oyster livelihoods were deeply affected by ocean sewage since the 1800s after oysters caused an outbreak of foodborne illnesses due to untreated sewage polluting oyster beds.

The Interstate Shellfish Sanitation Conference (ISSC) started in the 1980s in response to growing concerns and regulations pertaining to clean water and its potential effects to shellfish sold for consumption. The ISSC sets the detailed guidelines for shellfish on all coasts, including frequency and kinds of water quality testing, acceptable proximity to urban areas and wastewater discharge points, and best practices for harvesting in extreme weather conditions.

"I use the beach and we would get our E. coli readings every day, but there was a 24 hour lag so people are technically swimming [in E.coli]."

-Coastal Conservation NGO

"I would like to have been clued in if there were sewage issues in the ocean, especially while being in the harbor. In the fisheries community, we are genuinely concerned about how healthy our fish and shellfish are because it affects our food."

-Commercial Shellfish Harvester

External Messaging Is Unclear

Though participants had diverse needs relative to communication and messaging, FLUSH determined a few, helpful overarching takeaways. These specifically were around articulating the need for OSA to communicate concepts clearly.

Key terms and phrases used by OSA are very important to various stakeholders.

- OSA's name could be improved. It is received as specific yet unhelpful by those interviewed.
- **Need to define "ocean waters" and "coastal"**

Creative marketing strategies have been implemented, but there are **still large gaps in connecting with the general audience**, especially increasing awareness of sewage and its effect on water quality

Several participants were **unaware of existing materials and diagrams that could help them** on OSA's and OSA partner's websites. Participants also expressed interest in joining working groups

Insight from Survey

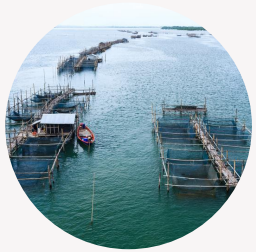
OSA's Role, from Survey Results

Survey respondents felt OSA could maintain public information.

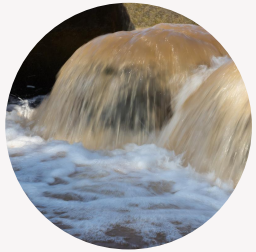
Ocean Conservation NGOs are interested in OSA **providing knowledge management platforms**, **amplifying members' voices**, and **maintaining updated public information** about ocean sewage.

Meanwhile, Aquaculture & Fisheries were more interested in OSA conducting **advocacy on water quality and pollution**, **hosting general & technical trainings** on ocean sewage issues, and **maintaining updated public information**.

	Number of Respondents	
What kind of activities could OSA do that would be most effective in engaging with your field?	**Aquaculture & Fisheries**	**Ocean Conservation NGOs**
Providing a platform for knowledge management & sharing across interested industries	1	11
Amplifying the voices of its members, providing educational webinars for people in your field	1	9
Maintaining up-to-date information on current situations related to ocean sewage	2	8
Hosting **general & technical training on ocean sewage issues** and solutions	3	7
Offering **technical assistance/advisory work**, i.e. one-on-one consulting on wastewater mitigation for your organization	1	6
Conducting advocacy on water quality/pollution	4	5
Grant technical assistance/capacity building more broadly	0	1
Providing funding for stakeholder education and engagement	0	1
Drive steeper penalties, and comprehensive policy change for treatment plants. More action less "advocacy" please.	1	0
Monitoring and, to the extent possible, lessening the threat of increased problems from local water pollution	1	0
Influence regulation and policy	1	0
Show us how it impacts us	1	0





Industry Personas

From our research, we set a base level of understanding of these target industries, articulating their interests, challenges, and understanding of ocean sewage.

A shareable PDF of the industry profiles can be found here.

COASTAL US AUDIENCES

INDUSTRIES	Marine-focused industries that are concerned about coastal water quality. This currently includes (1) aquaculture/commercial fishing (salmon, oysters, kelp farming) and (2) coastal conservation groups (aquariums, sanctuaries, ocean conservation nonprofits & think tanks).
LOCATION	US - East, West, Gulf Coasts + Great Lakes In 2018, 128 million people in the US lived in coastal counties - 40% of the population - and it's growing. Approximately 40% of Americans in coastal counties have an elevated coastal hazard risk. The most socially vulnerable coastal communities rely heavily on commercial fishing, and are more likely to be poor and have a larger percentage of minority and tribal populations.
NOTEWORTHY INSTITUTIONS	Federal agencies: National Oceanic and Atmospheric Administration (NOAA); Environmental Protection Agency; Coast Guard (enforces maritime discharges); US Fish and Wildlife; US Army Corps of Engineers; United States Geological Survey Research: Institution of Oceanography International: International Maritime Organization

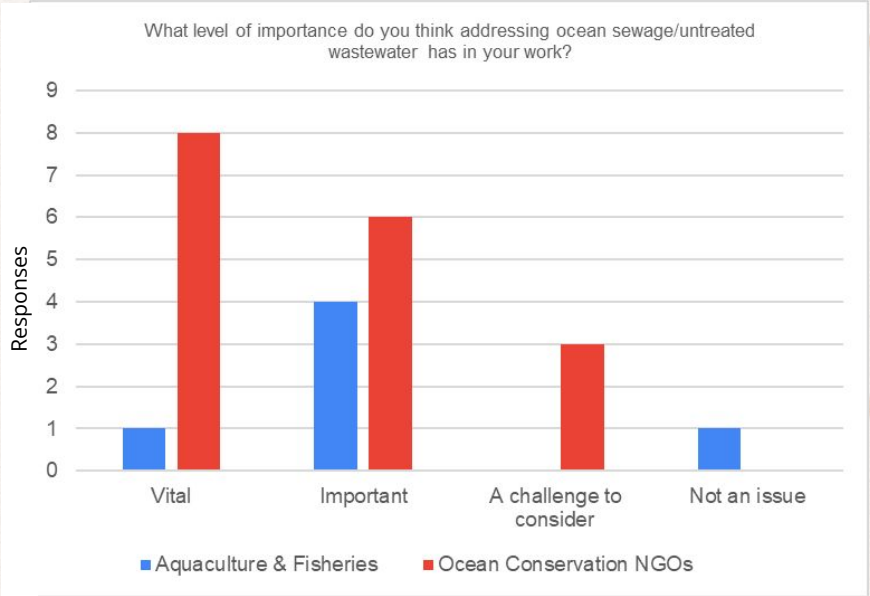
COASTAL US AUDIENCES - GENERAL FINDINGS

Do these 2 audiences understand wastewater pollution / ocean sewage?

In terms of understanding wastewater pollution and ocean sewage knowledge, ocean conservation has the largest range, but also has more people confident about their understanding. Aquaculture & fisheries have the most mid-range confidence in their understanding.

On a scale of 1 (novice) to 10 (expert), Aquaculture & fisheries had a score of 6.42, while Ocean Conservation NGOs had a score of 6.88.

Do these 2 audiences think wastewater pollution / ocean sewage are important to address?



US COMMERCIAL AQUACULTURE & FISHING

OF TOTAL INTERVIEWED/SURVEYED*

LOCATION	East Coast	16%
	West Coast	9%
	Gulf Coast	0%
	Great Lakes	<1%
	National	3.5%
FOCUS WORK	Shellfish	9%
	Fish	3.5%
	Kelp	2%

* This data reflects the total number of respondents for the study to remind the reader that there are 2 profiles

GOALS/ MOTIVATIONS	Source funding to continue work & building fleets Building awareness of sector and research *Shellfish & Kep:* Caring for filtering marine life, knowing where can harvest to sell - deeply affected by water ocean sewage
INTERESTS	Ocean sewage is important (ex: sewage spills, vessel dumping, wastewater treatment standards) Food codes *Shellfish & Kelp:* Education & awareness to help support efforts (on growing shellfish not fit for human consumption, septic influence on water quality, how shellfish/kelp are grown), Getting data on water quality and impacts on harvesting, Shellfish embracing seaweed culture because of similar challenges
CHALLENGES & PAIN POINTS	Government challenges - burdensome & strict regulations, hard-to-access permitting, slow moving changes, inconsistent enforcement of regulations for seafood safety Water pollution & contamination (shellfish & kelp are particularly impacted - causes foodborne illnesses) Climate change events (flooding & storms) Poverty - Commercial fishing communities are 46% more likely to be impoverished than other communities *Shellfish & Kelp:* pet & bird waste in harvesting fields, consumers not understanding regional seafood issues and blanketing all seafood problems together
UNDERSTANDING OF OCEAN SEWAGE	High understanding, some confidence in topic Some states issue release maps that outline safe zones and zones barred from production *Shellfish & Kelp*: Very high understanding, and have a clear awareness of the changing ocean affecting harvests.Sewage outbreaks halt harvesting and destroy products. Have very clear regulations since the mid-1900s about ocean sewage (see: Interstate Shellfish Sanitation Association & regional offshoots) **"I think people outside of the seafood industry are pretty oblivious to all of the considerations that the seafood industry is making regarding sewage pollution in the water." - Government & Former Shellfish Harvester** *Fish*: Do not feel is relevant for them
COMMON OBJECTIVES TO OCEAN SEWAGE	Outside of scope & abilities / not a "front of mind" concern for them ("We're focused on quotas") Unsure how to address it Regulatory bodies are already addressing this issue for us *Fish*: Not affected by ocean sewage, not a challenge for them...but surprised environmental groups don't include waste management as an issue
SOURCES OF INFO & KNOWLEDGE	Conferences & word of mouth (WOM) "Boots on the ground" organizations as seen as information authorities - examples include regulatory enforcers, listservs, & social media affinity groups

US COMMERCIAL AQUACULTURE & FISHING | UNIQUE COASTAL POINTS BY REGION

NAME	East Coast	West Coast	Gulf Coast & Great Lakes
GOALS		*Kelp*: Researching water restoration Addressing precautionary principles	Balancing profit with environmental conservation ethos
INTERESTS		Growing the workforce (ex: youth development initiatives)	
PAIN POINTS	CSOs are discharging into coastal areas	Massive wildfires and mudslides result in debris in waterways Reduced harvesting periods due to climate change (particularly for crab) Dams affect fish populations negatively, while dam decommissioning worsens water quality in rivers	Industrial runoff, particularly from agriculture, impacting Great Lakes (ex: eutrophication)
UNDERSTANDING OF OCEAN SEWAGE		Shellfish don't take a stand on polluting colleagues & don't talk to agricultural buddies	Less confident in understanding "Ocean" isn't relevant for the Great Lakes
OBJECTION TO OCEAN SEWAGE			"Ocean sewage" not relevant for Great Lakes

Blanks indicate that there is no uniquely coastal thing to mention that wasn't already captured in the general profile

US OCEAN CONSERVATION GROUPS

OF TOTAL INTERVIEWED/SURVEYED*

LOCATION	East Coast	11%
	West Coast	16%
	Gulf Coast	3.5%
	Great Lakes	7%
	National	23%
FOCUS WORK	Ocean Conservation	49%
	Restoration	11%
	Advocacy & Education	3.5%

* This data reflects the total number of respondents for the study to remind the reader that there are 2 profiles

GOALS/ MOTIVATIONS	Sourcing funding (not a problem with big federal bills) Saving the ocean and its marine life Building expertise on how things work with a holistic view & building collaborations, dealing with climate change Habitat restoration & building resilient coastal communities
INTERESTS	Infrastructural updates/upgrades, particularly for drinking water and wastewater Climate change & its links to changing water quality (flooding, temperature changes, sewage, agricultural runoff) Advocating for changes in & implementing policies backed by scientific evidence Pollution & plastic reduction Blue resilience initiatives & piloting innovative projects & technologies Building workforce trained on management practices
CHALLENGES & PAIN POINTS	A myriad of overwhelming, complex issues - “wicked problems” (Advocacy & Education) Government challenges - permitting for innovative initiatives when permits were not built for restoration efforts, rigid/outdated policies & regulations (and some regulations on swim zones), poor communications on changes and enforcement, poor implementation of policies, contracts not set up to incentivize outcomes Low political buy-in & confusion where the buy-in should be (state versus federal) Silos in the sector between land and ocean efforts, & not so many coastal groups - Who is doing what? Restoration money is tied to specific geographies & land-related issues
UNDERSTANDING OF OCEAN SEWAGE	Very mixed understanding and the ability to address it - Some are experts, some are relatively unaware Consensus that water quality has improved in their areas over the last 10-15 years Wastewater treatment plants & public infrastructure as a large conversational piece - How do we get them to reduce overflows? There are questions about what causes water quality issues and level of impact (ex: wastewater plants, septic, agriculture, urban runoff) **“Water quality plays an indispensable role in the facilitation of maritime and ocean trade and commerce, which is our primary line of work. Clean waterways ensure the smooth navigation of vessels. Contaminated waters can lead to sediment build-up or the growth of harmful marine organisms, which may obstruct shipping channels, demanding frequent and costly dredging operations. My personal level of understanding of ocean sewage is minimal at best. It's clear that the world needs a more comprehensive and deeper understanding of these issues. With the vastness of the oceans and the intricacies of global wastewater management practices, the topic is complex and multifaceted.” - East Coast Conservation**
COMMON OBJECTIVES TO OCEAN SEWAGE	Most reported doing something about ocean sewage - seen as an important aspect of managing coastal areas and water quality “Someone else” is working on it (ex: government) - ocean sewage work is being done in silos & difficult to navigate It doesn’t align with their work - it is not a priority Unclear leaders advocating for the issue clearly and providing resources to different audiences
SOURCES OF INFO & KNOWLEDGE	Conferences & WOM, Newsletters Follow specific groups & local organizations

US CONSERVATION GROUPS | UNIQUE COASTAL POINTS BY REGION

NAME	East Coast	West Coast	Gulf Coast & Great Lakes
GOALS	NYC has the watershed with the 9th highest nitrogen levels in the world		Mississippi River is the watershed with the 7th highest nitrogen levels in the world Great Lakes only area without emphasis on wastewater pollution
INTERESTS	NC has a mitigation program to build restoration projects before issues happen MD has innovations around ocean conservation & wastewater pollution	Being a leader in innovation and efforts to address wastewater pollution (CA & WA) CA has an initiative to help cut the “green tape”	Gulf Coast states have mixed efforts (FL is negotiating funds with PPPs, LA has opposition killing restoration)
PAIN POINTS			Low understanding of laws for Great Lakes Agricultural runoff is the leading issue for water quality
UNDERSTANDING OF OCEAN SEWAGE		Considers personal input and impact on wastewater infrastructure	Little confidence in understanding topic “Ocean” not relevant for Great Lakes
OBJECTION TO OCEAN SEWAGE	Who do we go to for sewage information?	Some only really understand what’s going on in the news (aka: the bad guys reported in the media)	Great Lakes does not prioritize ocean sewage - agriculture runoff is more important

Blanks indicate that there is no uniquely coastal thing to mention that wasn’t already captured in the general profile

INDUSTRY PROFILES - ANALYSIS

KEY TERMS NEED TO BE CLEAR

Definitions for terms need to occur to include all necessary audiences, such as “ocean sewage” and “coastal”. See slide 34 for more terms.
“Ocean” means different things to different audiences (state vs federal waters). Also, “sewage” is often interpreted to mean only “sewers” and wouldn’t include septic systems. Generally, the Great Lakes don’t identify with ocean sewage being an issue. Even “coastal” has different definitions (and Great Lakes are included in the US Code only when referred to in “estuaries,” NOT “coastal” or “coastal states,” so if they want to include Great Lakes, they have to be inclusive with their words).

CONFERENCES & WORD-OF-MOUTH ARE KEY

All audiences found conferences and word of mouth as key ways to share and collect information. Also, many groups used email-based communications (ex, newsletters, listservs), particularly if it meant getting information from the “boots on the ground.” Lastly, social media affinity groups appear to be an emerging information-sharing method.

FUNDING & GOVERNMENT ISSUES

All audiences struggled with sourcing funding for their initiatives and dealing with diverse challenges related to the government. Government challenges included slow-changing policies delaying innovations and not accommodating rapidly changing environments, variable implementation and enforcement, difficult regulations and permitting to obtain or follow, and unclear communications about changes affecting their work.

PRIORITIES & ROLES HINDER OCEAN SEWAGE WORK

The common objections for both audiences about addressing ocean sewage were that (1) it was outside their priorities and (2) they felt it was someone else’s work to address it.
Aquaculture & Fisheries felt that ocean sewage was a role for the regulatory agencies. Ocean Conservation Groups felt that “someone else” more generally was working on it, though some acknowledged that it was siloed across different groups and institutions.

Thank you!

Please let us know if you have any additional questions or concerns about this research.

FLUSH