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Environmental Technical Working Group

A Stakeholder Engagement and Advisory Process to Advance the Environmentally Responsible Development of Offshore Wind Energy for New York State



NYSERDA

December 5, 2024

Introductions



- > E-TWG Lead: NYSERDA - 518-862-1090
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Meeting Agenda

- Welcome
- New York State Offshore Wind
- Prioritization of E-TWG Efforts 2025-2027
- 2024 State of the Science Debrief
- Update on Environmental Mitigation Plans
- Other E-TWG and NYSERDA Activities
- Next Steps and Wrap Up



Ground Rules

- Contribute – your perspectives are important
- Share time – lots to cover and many people around the table (virtually and in person)
- Integrate ideas and pose questions
- Stay focused on the agenda
- Avoid multitasking and other distractions
- We all have our unique challenges in a hybrid environment – it will take all of us being mindful to make this work

In Person

Make space for virtual participants
Avoid side conversations – impacts sound quality

Virtual

*Please stay on camera
Bring a tech-adaptive mindset

New York State Offshore Wind

NYS Offshore Wind

- New York State has a mandate to develop at least 9,000 MW of offshore wind energy by 2035
 - Empire Wind I and Sunrise Wind (1,734 MW)
- As co-chair of the U.S. Climate Alliance, Governor Hochul has made clear her commitment to NYS's plan for a net-zero future
- NYSERDA will assess potential impacts to our programs, but our role as an objective, credible, and trusted resource serving all New Yorkers is more important than ever
- Project-level updates starting in 2025



Prioritization of E-TWG Efforts 2025-2027 Part 1

E-TWG Priorities 2021-2024

E-TWG Priorities	Improvement of coordination between states	Review and Synthesis of Data to Inform Stakeholder Groups	State of the Science Workshops	Guidance for regional monitoring and research	Guidance for pre- and post-construction monitoring and research	Technology Advancement for Mitigation and Monitoring
Mechanism	Coordination of calls/meetings among state representatives	Development of webinar library, NYSERDA webinar series, and comms materials	Continued biennial workshops	Synthesis of regional research priorities	Taxon-specific pre- and post-construction monitoring guidance	Review funded projects by R&D consortium
						If gaps exist, explore DOE funding and inclusion in NYSERDA RFP
E-TWG Role	Provide suggestions for topics of discussion	Provide input on library setup & webinar topics, Specialist Committee	Input on topics/structure	Specialist committee	Specialist committee	
			Planning Committee			
Timeline	Ongoing	Library updates 2x/yr, Webinar Series ongoing, FAQ 2023-2025	Workshops every two years (...2022, 2024, 2026)	2021-2023	2022-2024	
End Products	Continued coordination among states	Webinar Library, NYSERDA Learning from the Experts, Whales and Offshore Wind FAQ	Workshops, proceedings, recordings, & other outputs	Database of Research Recommendations & Guidance Document	Guidance Document	

Prioritization of E-TWG Efforts 2025-2027

- > The E-TWG goes through a prioritization process every few years to identify focal efforts for the group
- > The last prioritization effort occurred in 2020-21
- > **Current and ongoing E-TWG efforts**
 - **Whale Communications Committee** – published 3 of 8 planned FAQ updates; wrapping up in spring 2025
 - **Bird Communications Committee** – efforts will kick off this month, following similar process to whale communications
 - **State of the Science Workshop** – starting to plan for 2026 workshop (discuss later in the agenda)
 - **Mitigation Practices Database Tool** – E-TWG and F-TWG support staff working on an update to the tool



Prioritization of E-TWG Efforts 2025-2027

> Recap of prioritization activities to date

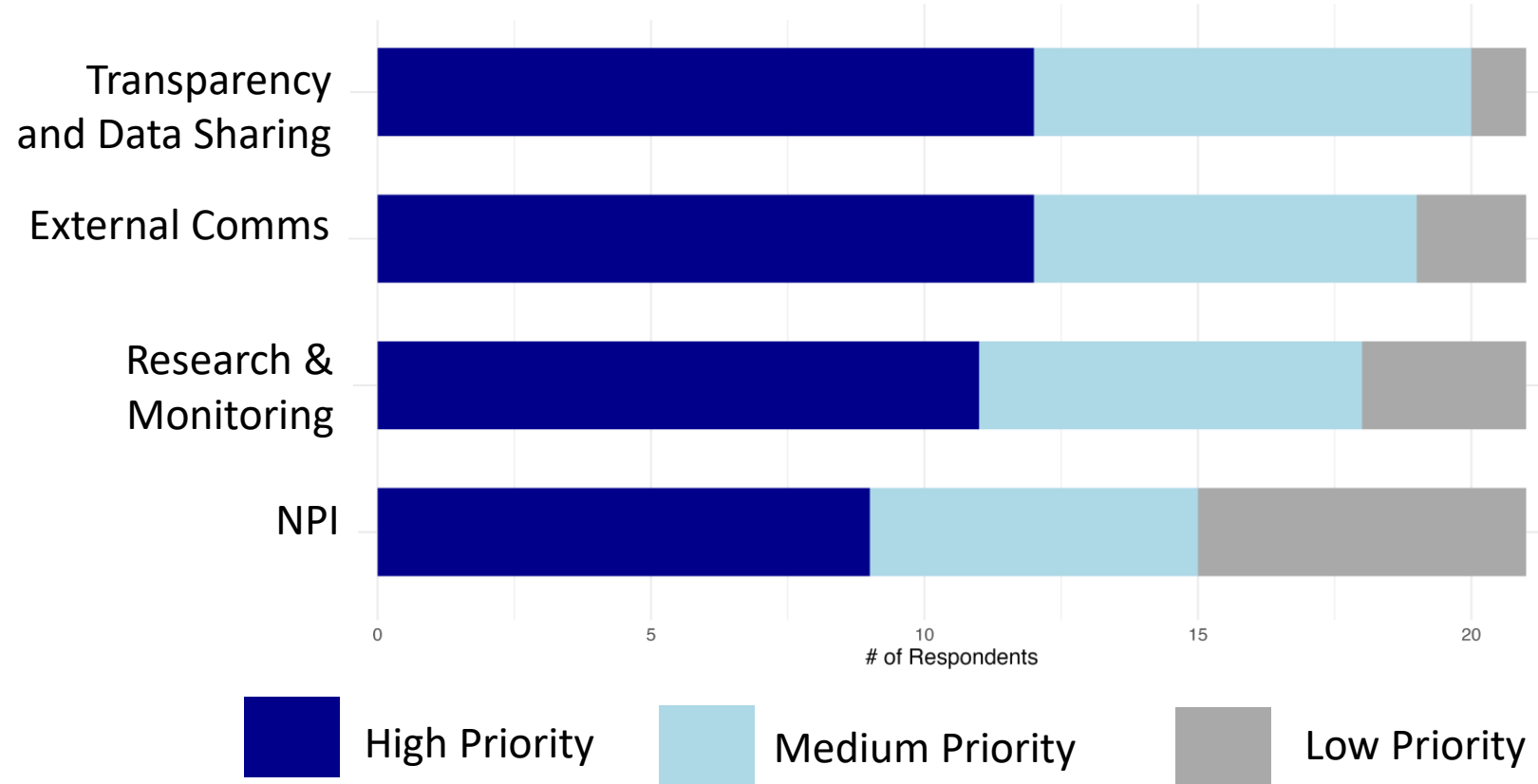
- Preliminary brainstorming of long list of topics (May 2024 E-TWG meeting)
 - Topics related to compensatory mitigation deemed outside of scope of E-TWG
- Discussions with NYSERDA and RWSC to refine topics (summer 2024)
 - Note: We will discuss potential areas of collaboration with the RWSC on specific topics
- Online survey (November 2024)
- Finalize plans for 2025-207 (this meeting into early 2025)

Prioritization of E-TWG Efforts 2025-2027

Survey Results

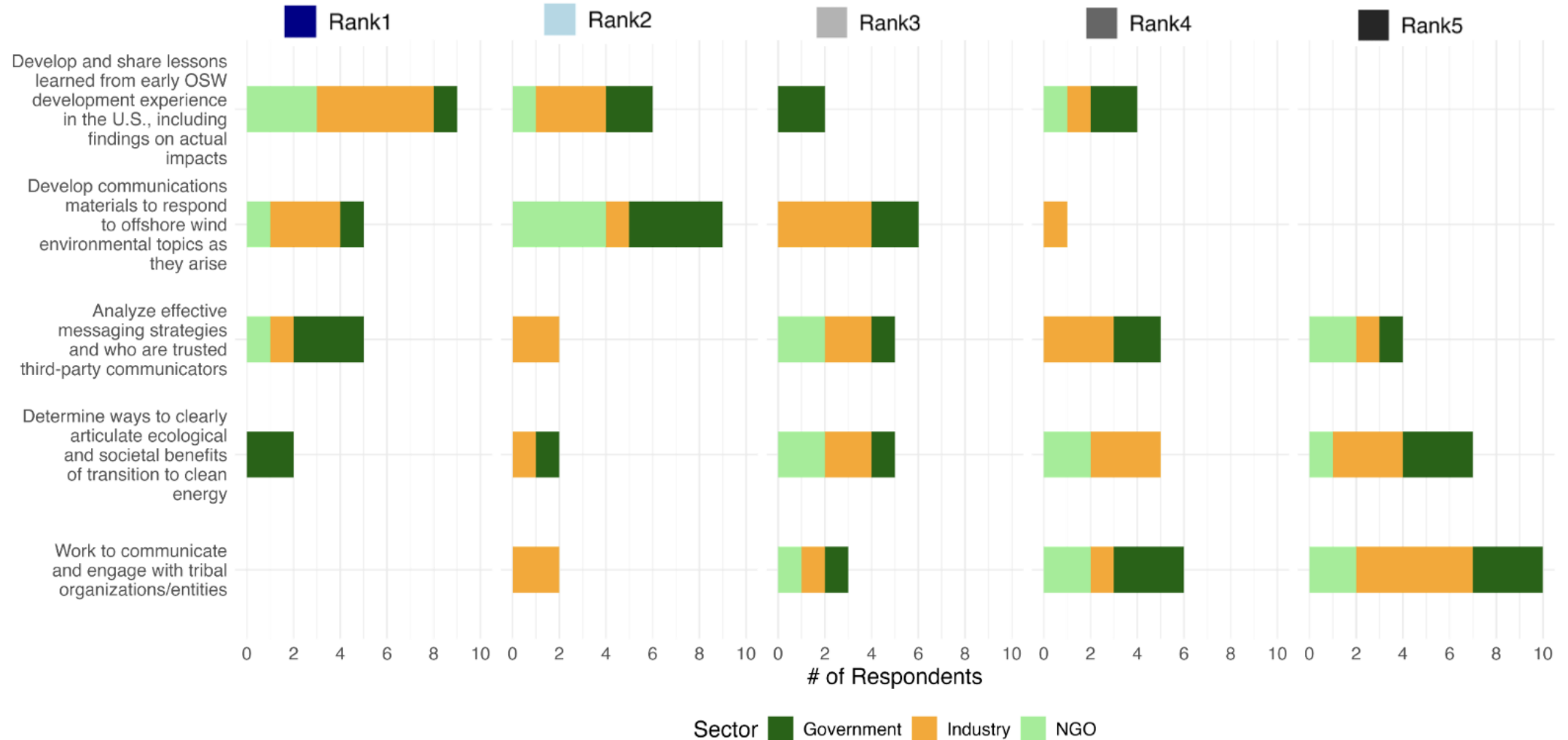
- > 21 total responses
 - Government (33%, n=7)
 - Industry (43%, n=9)
 - eNGO (24%; n=5)
- > Ranked four major themes
 - Transparency and Data Sharing
 - External Communications
 - Research and Monitoring
 - Net Positive Impacts (NPI)

Theme Prioritization



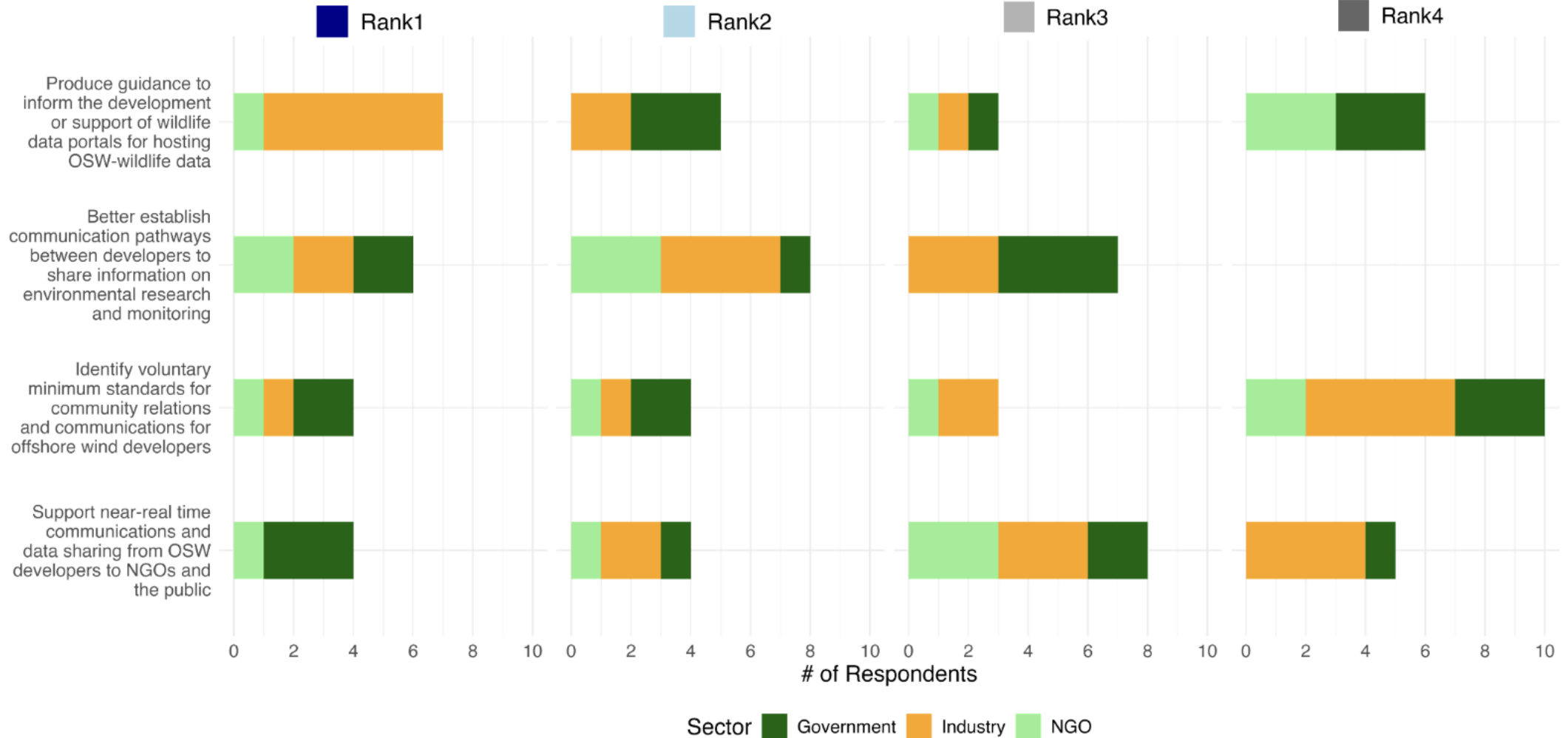
External Communications Topics

Sector breakdown: External Communications



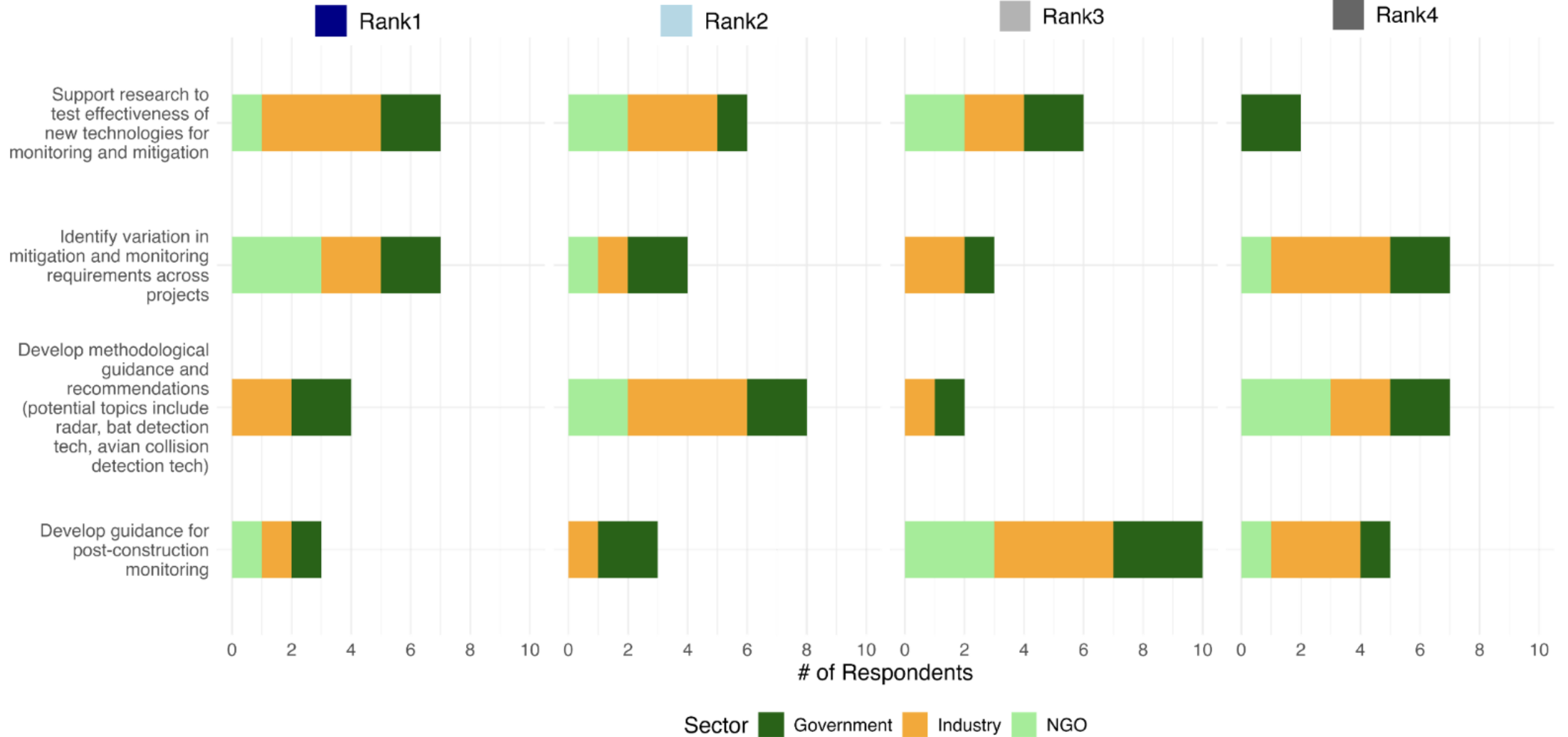
Transparency and Data Sharing

Sector breakdown: Transparency and Data Sharing

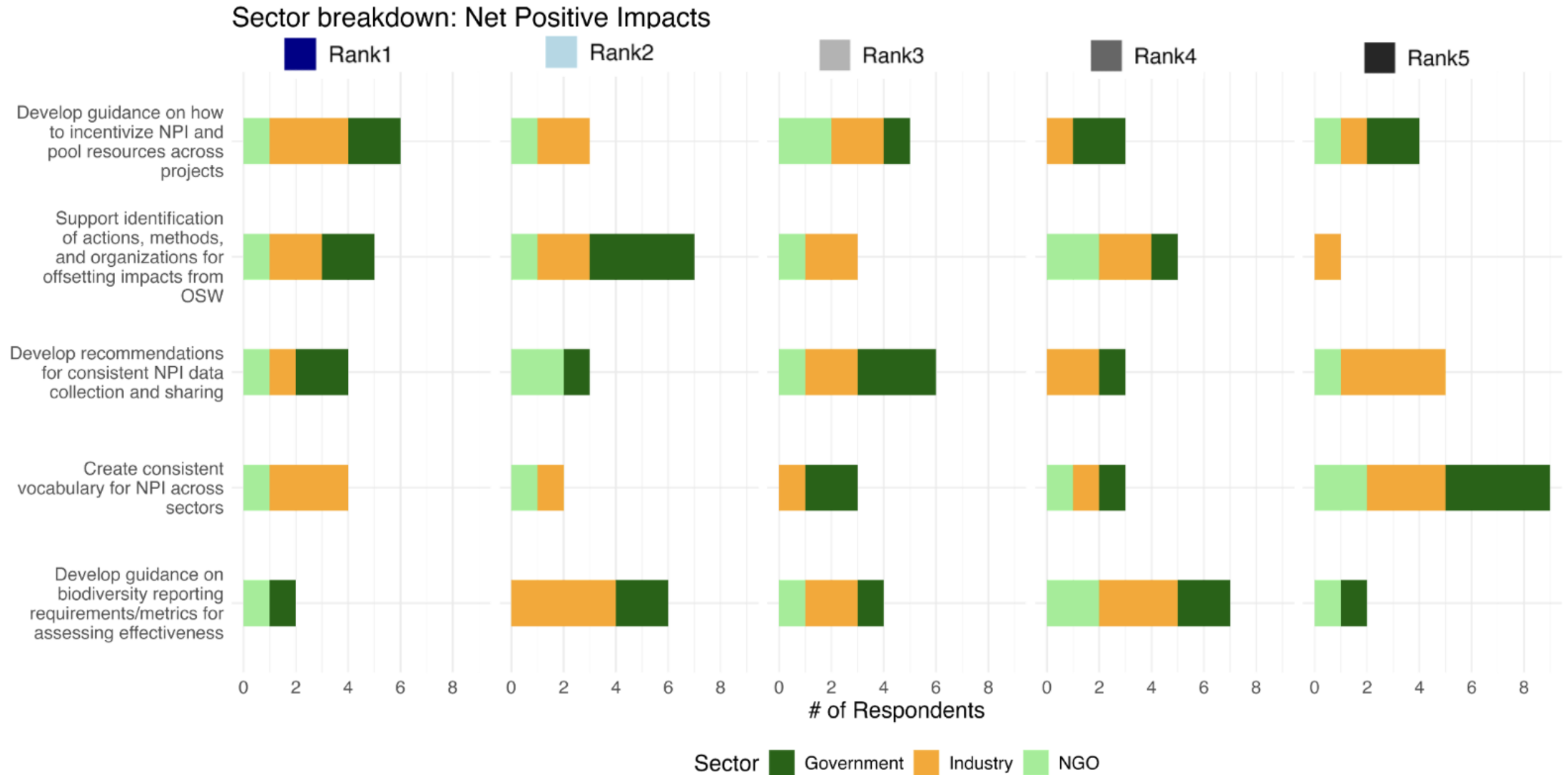


Research and Monitoring Topics

Sector breakdown: Research and Monitoring



Net Positive Impact (NPI) Topics



Prioritization of E-TWG Efforts 2025-2027

> Other Potential Priority Topics (examples)

- Development of regionally administered/managed wildlife monitoring networks and programs
- Streamlining offtake bid processes and coordination with other States
- "One stop shop" for all offshore wind project information
- A dashboard of developer activities (including development activities, monitoring, etc.)
- Where/how to 'bank' NPI funds mitigation projects
- Coordination between New York and New Jersey

What is the highest priority across themes?

> Transparency and data sharing:

- Data sharing between developers/public (x3) - real-time comms, pathways, data portals
- Identify voluntary minimum standards for community relations and communications for OSW developers (x1)

> Research and monitoring:

- Research to develop + test effectiveness of new monitoring/mitigation tech (x3)
- Identify variation in monitoring and mitigation (requirements?) across projects (x1)
- Regional monitoring networks (x1)

> External Communications:

- Develop communications materials to support sound science, respond to concerns/political climate (x4)
- Develop and share lessons learned and impacts from early OSW projects to inform future mitigation and monitoring (x2)

> Net Positive Impacts (NPI):

- Recommendations for NPI data collection and sharing (x2)

RWSC

Regional Wildlife Science Collaborative
for Offshore Wind



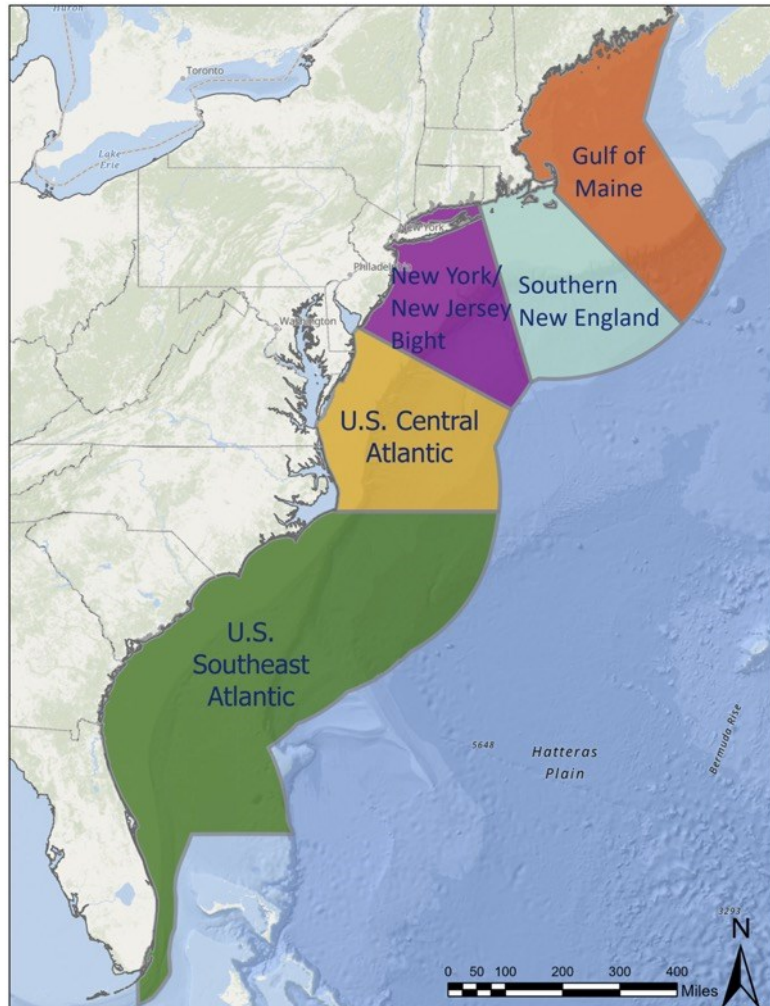
NYSERDA E-TWG Collaboration opportunities with RWSC

December 5, 2024

Emily Shumchenia, PhD
RWSC Director

Coordinating offshore wind & wildlife research

rWSC.org/science-plan



States, federal agencies, offshore wind companies expressed common goals of funding and implementing research and data collection that is:

- Collaborative
- Aligned with current data needs
- Results in data that are **Findable, Accessible, Interoperable, Reusable (FAIR)**
- Made available to support decision-making and future research as soon as possible
- Enable future regional-scale analyses

Growing list of resources will continue to be posted at <https://rWSC.org/research-data>

E-TWG Advisory and Observer Members are already working with/through RWSC on:

- Transparency and Data Sharing activities
 - Coordination among Sectors on transparency and data sharing recommendations (RWSC Data Policy, sharing suggested contract language)
 - Guidance for data portals/repositories
- Research and Monitoring
 - Identifying variation in requirements
 - Supporting research on new tech
 - Guidance/recommendations for specific data collection methods
 - Guidance for post-construction monitoring

RWSC

Regional Wildlife Science Collaborative
for Offshore Wind

What isn't RWSC working on?

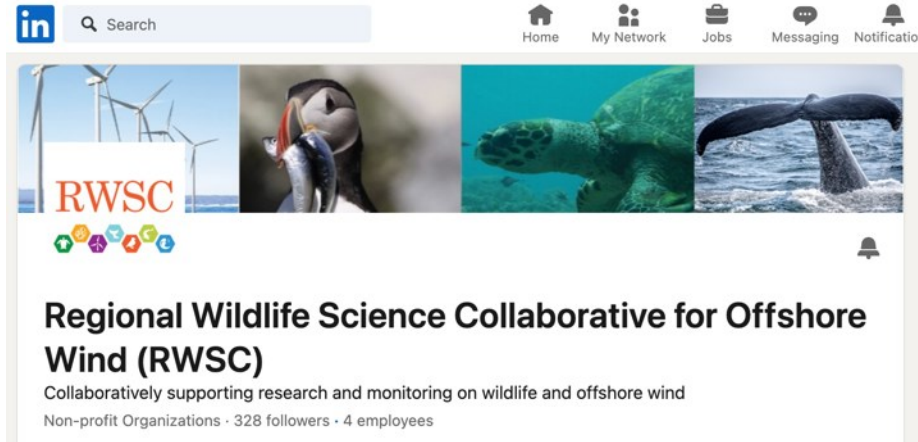
- Net-positive impacts activities
- External communications – opportunity to work with eNGO Caucus to assess and compile existing resources (fact sheets, websites). Is any redundancy good? Do we need assistance from professional comms strategists?
- Identify voluntary minimum standards for community relations and communications for offshore wind developers
- Support near-real time communications and data sharing from OSW developers to NGOs and the public

What isn't RWSC working on?

- Net-positive impacts activities
- External communications – opportunity to work with eNGO Caucus to assess and compile existing resources (fact sheets, websites). Is any redundancy good? Do we need assistance from professional comms strategists?

These seem to be relatively immediate-term opportunities for RWSC-ETWG collaboration

How to receive updates



All RWSC Subcommittee meetings are open to the public: visit <https://rwsc.org/events>

Monthly e-newsletter: meeting invites and other news

Contact information

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RWSC

Regional Wildlife Science Collaborative
for Offshore Wind

Wildlife monitoring and mitigation requirements in RODs and COP approvals

	A	B	C	D	E	F	G	H	I	J
1	Section Topic	Required Plan	Required Activities	Pre Construction	During Construction	Post Construction	Plan Content Requirements	Reporting Frequency	Actions	Data Availability
11	Benthic Habitat and Ecosystem Monitoring Conditions	Optical Surveys of Benthic Invertebrates and Habitat	camera surveys targeting benthic invertebrates and their habitat for durations of, at a minimum, 1 year during pre-construction, 1 year during construction, and 3 years post-construction.	✓			Stations must be established on a 0.9-mile (1.5-kilometer) grid, with four (4) samples taken at each station twice per year.			
12		Plankton Surveys	Lessee must conduct plankton surveys to estimate the relative abundance and distribution of planktonic species for durations of, at a minimum, 1 year during pre-construction, 1 year during construction, and 3 years post-construction.	✓	✓	✓	Surveys may be conducted in conjunction with other surveys (e.g., ventless trap surveys or bottom trawl surveys).	1 year during pre-construction, 1 year during construction, and 3 years post-construction.		
13		Passive Acoustic Monitoring	Lessee must deploy moored or autonomous Passive Acoustic Monitoring (PAM) devices to record ambient noise and marine mammal species vocalizations in the WDA a minimum of 30 calendar days before construction activities begin, during all construction activities, and for at least 3 years of operation.	✓		✓	The archival recorders must have a minimum capability of detecting and storing acoustic data on vessel noise, pile driving, WTG operation, and marine mammal vocalizations in the WDA.			
14		Trawl Survey for Fish and Squid		✓	✓	✓	postconstruction trawl surveys, consisting of 40 tows (20 in the WDA, and 20 in control areas) four times during the year, with one survey conducted each season. The Lessee must sample a minimum subset of 3 tows in the spring and fall in both the WDA and control sites for biological parameters, including: weight, length to the nearest centimeter, consistent with the species-specific measurement type (e.g., total vs. fork) identified in the Northeast Observer Program Biological Sampling Guide; age through age-length keys, stomach contents, and sex and spawning condition (e.g., spent, ripe, ripe and running, etc.) consistent with Northeast Fisheries Science Center sex and maturity codes. If readily available and feasible to install on a survey vessel, the Lessee must also employ a conductivity, temperature, and depth instrument or similar device to measure environmental parameters. The Lessee must also, in conjunction with the spring and fall trawl surveys in the WDA, sample a minimum	The Lessee must conduct trawl surveys a minimum of 1 year before, 1 year during, and 3 years after construction.		

Developers are sharing final monitoring plans with RWSC for awareness of data being collected

RWSC

Regional Wildlife Science Collaborative for Offshore Wind

Tracking the data collection activities described in required monitoring plans in project COP approval letters:

- Avian and bat post-construction monitoring plans
- Fisheries and benthic monitoring plans (RWSC focus on benthic portion only)
- Long-term/archival PAM plans
- Plankton surveys
- Compensatory mitigation plans
- Federal survey mitigation activities
- Other required surveys
- Observations of any ESA-listed species

Strawdog: Possible Priority Topics

- > Used “top priority” responses from survey, along with feedback from May in-person meeting, to draft a list of potential E-TWG priorities (and possible mechanisms, though that is not today’s main focus)
- > Document sent around this week identified where priorities may overlap with RWSC, and where further development of ideas is needed

Potential Priority	Potential Mechanism	
1. Develop website/dashboard for coordinated sharing of OSW activities	Specialist Committee to inform development? (E-TWG website? Separate?)	
2. Develop communication materials to respond to OSW and environmental issues as they arise	Bird communications committee (for now)	
	Directory of resources?	RWSC collab?
3. Develop and share lessons learned from past projects and recommendations for improvement	Workshop? Lessons learned section of E-TWG agenda?	
4. Develop regionally administered/managed wildlife monitoring networks	Lend E-TWG support staff or E-TWG members to RWSC working group?	RWSC collab?
5. Develop guidance/ recommendations for specific data types or taxa	Specialist Committee to develop guidance document?	RWSC collab?
6. Support research to test effectiveness of new technologies for monitoring and mitigation	Letter referring this need to other entities (NOWRDC, states, etc.)	
7. Develop recommendations to inform NPI/mitigation efforts	Guidance document via specialist committee?	RWSC collab?



Full Group Discussion

- Does this list of topics make sense?
- Are there other topics that have recently arisen given the upcoming change in administration?



Breakout Groups 25 min

- 5-6 people per group
- We will assign virtual participants into groups
- **Goal: Identify the top 3 priority topics for the E-TWG to address in some way**
- Tally results in template



Lunch



- What's something that's important to you about your OSW work that you think others might not understand or appreciate?
- What's something you want to better understand about others in the E-TWG?
- When discussions go well in the E-TWG, what makes them successful?
- Conversely, when conversations don't go well, what's at play?



Full Group Discussion — Continued

- Where is there agreement across breakout groups in where to focus E-TWG efforts?
- Which ideas require further refinement?
- How should the E-TWG consider addressing each topic?

State of the Science Debrief

2024 State of the Science Workshop

- > "Taking an Ecosystem Approach: Integrating Offshore Wind, Wildlife, and Fisheries"
- > Held July 16-19 at Stony Brook University
- > First time incorporating a fisheries track and having a Student Equity Fund to help support student participation
- > 394 in-person attendees and 205 virtual attendees
- > 14 symposia sessions, 13 oral presentation and discussion sessions, 57 posters, and 7 side meetings.



2024 State of the Science Workshop

- > Venue options for 2026
 - Return to Stony Brook University
 - University at Albany
- > Growing student mentorship opportunities
- > Environmental and OSW job opportunities
- > Focused conference theme with more working sessions?

2024 State of the Science Workshop

> Option 1: Stony Brook University

- **Meeting space:** Large auditoriums and ballrooms available, and a large auditorium available for the Tech Café. Some walking between buildings but all within 5 mins of each location.
 - Posters can only be up during poster receptions
- **Logistics:** Dorm rooms do not seem like a viable option, looking at hotel room blocks near the venue, but on-campus hotel cannot accommodate full group
 - Different options for transportation to Long Island (train, bus, driving, etc).
 - Long Island can be difficult to access in the summer, and we would need to use the hotels 10–30 mins away and utilize the shuttles for transporting participants
- **Proximity to OSW Activities:** Near offshore wind activities, opportunities for field trips to OSW sites or touring SBU labs.
 - Higher student turnout due to location.

2024 State of the Science Workshop

> Option 2: University at Albany

- **Meeting space:** Large meeting spaces for general talks, side meetings, and poster sessions. Meeting spaces are ballroom style, not the same aesthetic as the auditoriums at SBU.
 - Posters can be kept up throughout the conference.
- **Logistics:** Dorm room availability for \$70 per person/per night, as well as hotels within walking distance
 - Transportation may be slightly more expensive if more people need to fly in.
 - There are hotels and restaurants on or near campus which keeps everyone together in the same general area. Enough close hotels and dorm options for all participants.
- **Proximity to OSW activities:** Not near any OSW activity, but other possible options for field trips/activities (weather station?)

2024 State of the Science Workshop

- > Venue options for 2026
 - Return to Stony Brook University
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Other E-TWG and NYSERDA Activities

New York Transmission Solicitation

- > The New York Independent System Operator (NYISO) received 28 proposed Public Policy Transmission Projects to deliver at least 4,770 MW of offshore wind generation into New York City by 2033.
- > To support this process, NYSERDA:
 - Convened a working group composed of State, local, and federal agencies to address constraints to transmission cable routes and identify potential permitting requirements
 - Released a Request For Information (5925) to identify opportunities to develop offshore wind transmission more efficiently and effectively
Comments are due by December 20, 2024

Environmental Mitigation Plans

- > Continuing to assess current mitigation plan structure and content and discussing opportunities to standardize and simplify while maintaining/increasing value
- > RWSC plans to convene meetings to discuss solicitation requirements between states and industry and states and federal government in Q1 2025
- > Following that, NYSERDA will reach out to E-TWG members for additional input

Master Plan 2.0 Studies

- > Status update on Master Plan and environmental and fisheries studies

**Written feedback due
December 20**

Source: TenneT, SylWin alpha, North Sea



Cooling Water Use at Offshore Converter Stations



Brian Dresser

05 December 2024

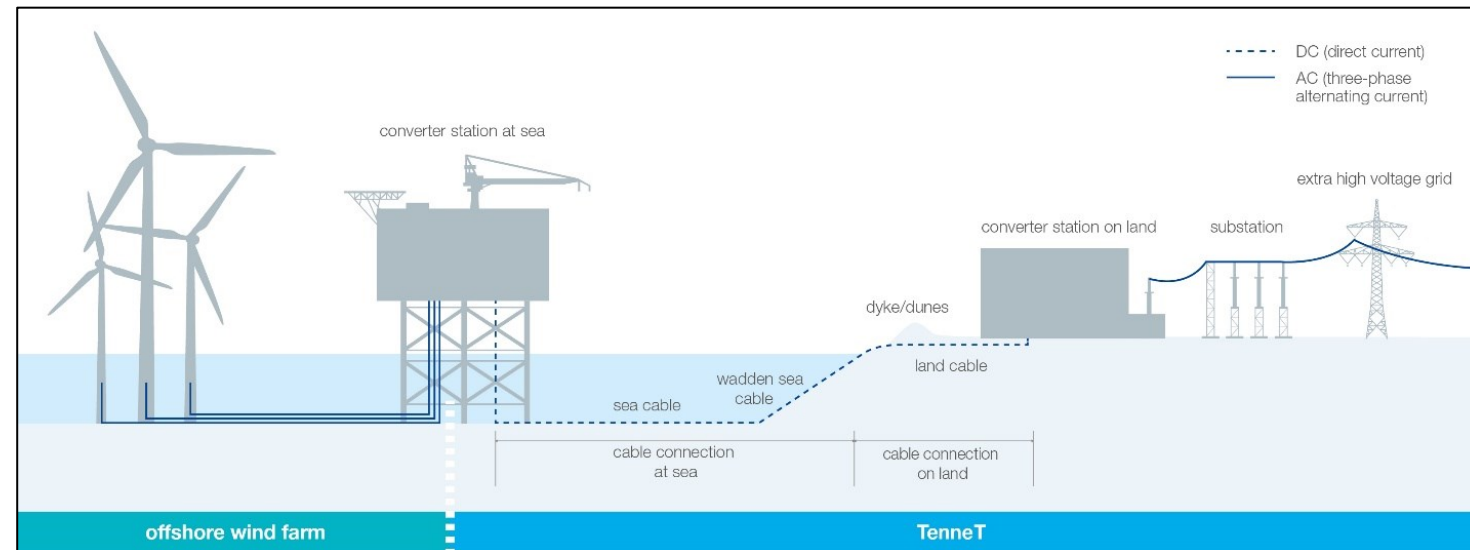
Report Outline

- Introduce the general concepts of an offshore converter station and the use of cooling water
- Overview of the regulatory setting
- Comparison with other facilities, including;
 - offshore oil & gas platforms,
 - offshore LNG ports,
 - onshore conventional power generation, and
 - other sources of cooling water in the ocean environment
- Overview of the risks and impacts
- “Best Technology Available” to minimize impacts to fish populations
- Mitigation and monitoring

Objective:

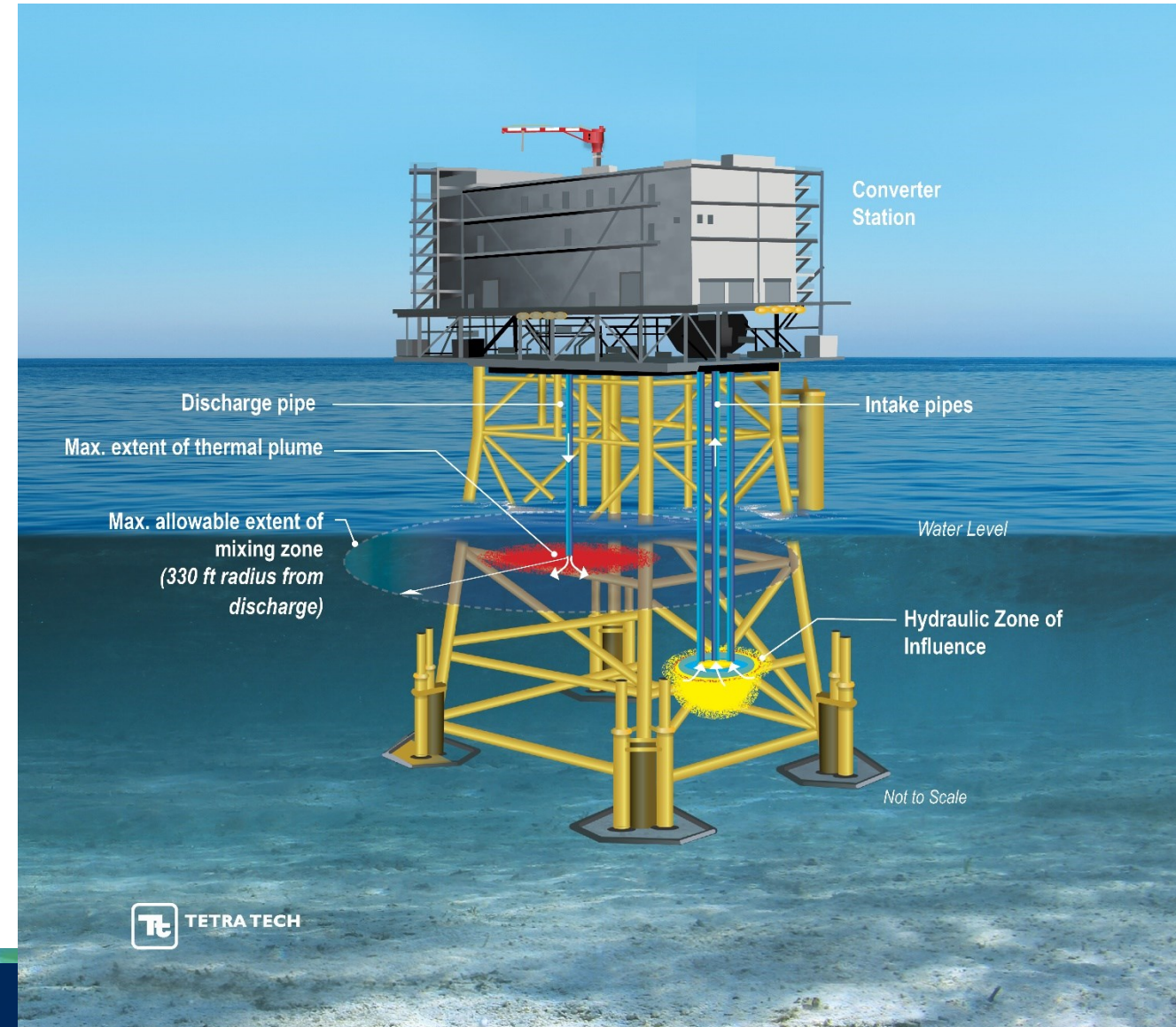
Provide an overview of the use of cooling water for offshore wind projects, as a tool to inform stakeholders, agencies, and developers.

Source: TenneT



What is an Offshore Converter Station?

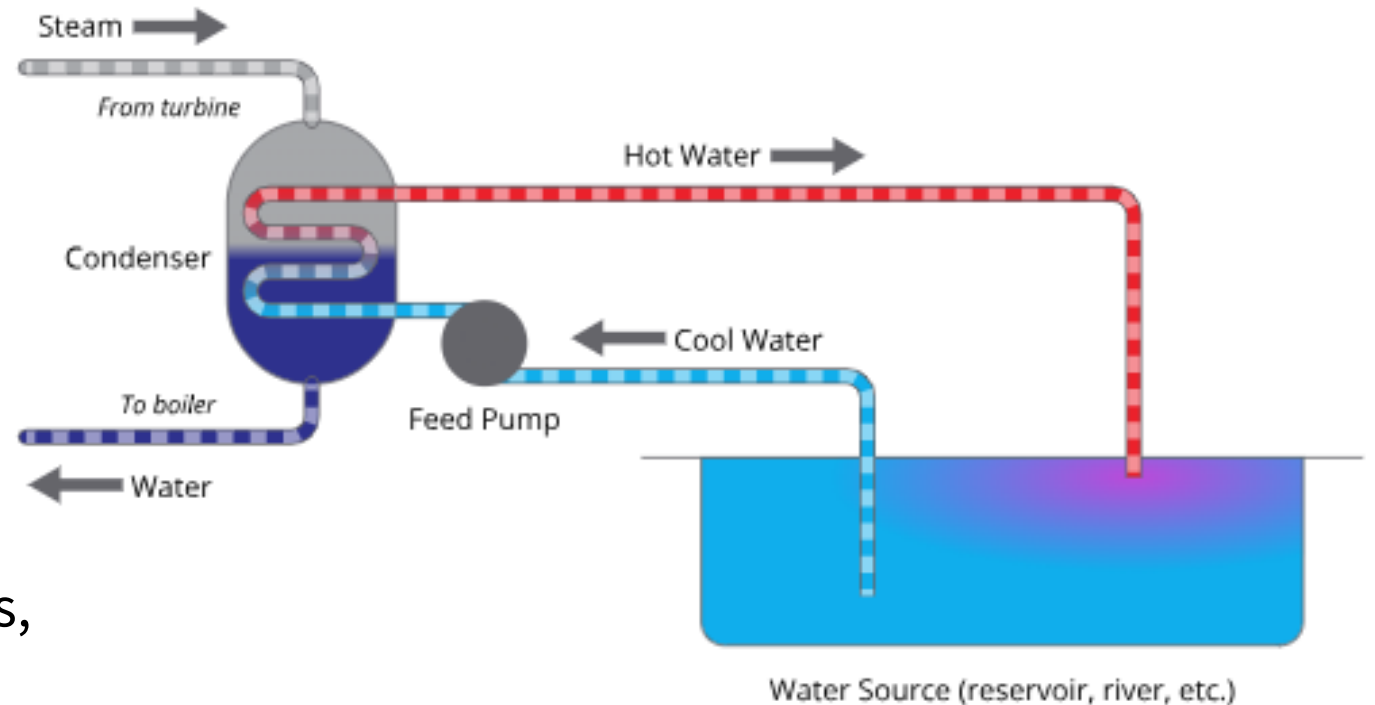
- Specialized substation that converts the AC power generated by the windfarm, into DC power for transmission via HVDC export cables
- Typically only needed for projects with long export cables > 50 km (27 nm)
- Conversion process generates heat, which requires cooling
 - Once-through cooling
 - Closed-cycle cooling
 - Other technologies/alternatives
- Concept first presented by Sunrise Wind to the F-TWG in Nov. 2021 ([Final NPDES Permit](#) issued, June 2024)
- As projects get further away from shore, converter stations may be increasingly necessary



What is Once-Through (Open-Loop) Cooling?

- Non-contact once-through cooling water removes waste heat by passing through a heat exchanger.
- Heated water is then discharged back into the source water.
 - The temperature difference between the intake and discharge is referred to as the delta-T or ΔT .
- The source of once-through cooling water is typically a lake/reservoir, river, or ocean.
- Similar in-principle to how the heat exchanger of a marine engine works.
- Used to cool many types of coastal power generating facilities, oil/gas platforms, offshore LNG ports, vessels, etc.

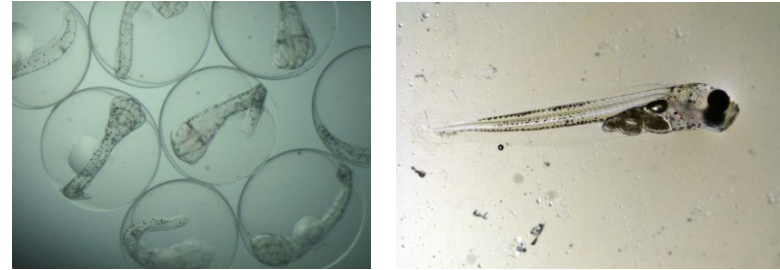
Source: Webber Energy Group



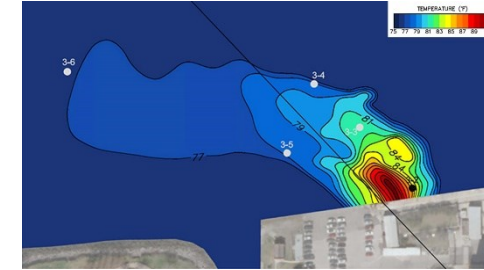
Regulatory Setting

- Cooling water intakes are regulated by the 1972 Clean Water Act (CWA):
 - §402 – National Pollutant Discharge Elimination System (NPDES) Permits,
 - §403 – Ocean Discharge Criteria
 - §316(a) – thermal impacts
 - §316(b) – impingement & entrainment impacts
- Informed by 50+ years of NPDES permitting and entrainment/thermal assessments at onshore and offshore facilities
- Offshore Wind is a new industry for cooling water intakes in the U.S.

Source: NOAA Fisheries



Source: Ocean Surveys, Inc.



Source: Recharge News



Example Facilities – OSW Converter Stations

- ~10 operational converter stations in the North Sea, each using once-through cooling (400 to 900 MW capacity each)
 - 5 to 10 million gallons per day (MGD) of once-through cooling water
- One air-cooled converter station (DolWin epsilon) is expected to be operational in 2025 (900+ MW capacity)
- Additional air-cooled converter stations (2,000+ MW capacity) are in-development, expected to be operational ~2030
- Most converter stations using once-through cooling water can be un-manned, but air-cooled converter stations are typically larger, manned facilities

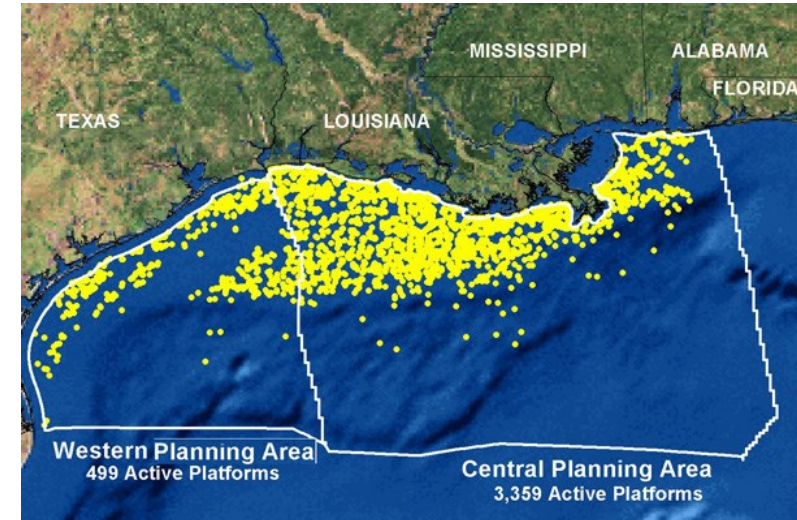
Source: TenneT



Example Facilities – Offshore Oil & Gas Platforms

- Thousands of active facilities in the Gulf of Mexico
- < 50 MGD of once-through cooling, under a programmatic NPDES Permit

Source: BOEM



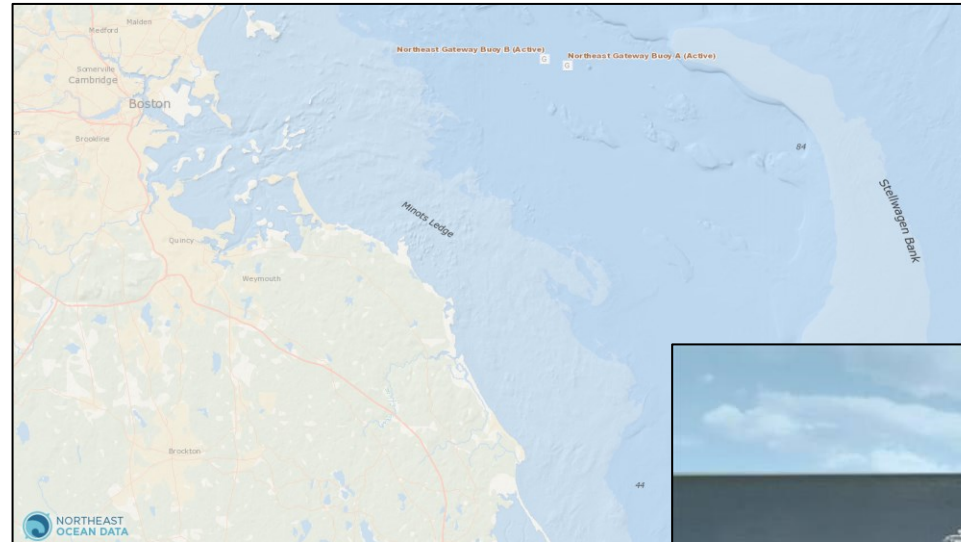
Source: Shell



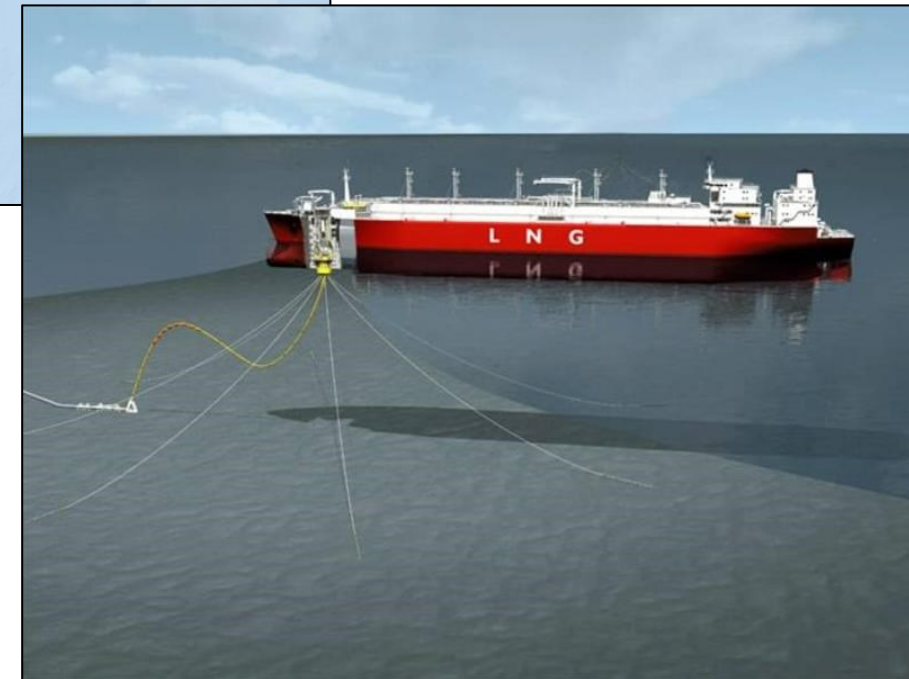
Example Facilities – Offshore LNG Ports

- Northeast Gateway in operation offshore of Massachusetts since ~2011
- > 50 MGD of once-through cooling
- Ongoing seasonal entrainment and water quality monitoring required during operations

Source: Northeast Ocean Data Portal



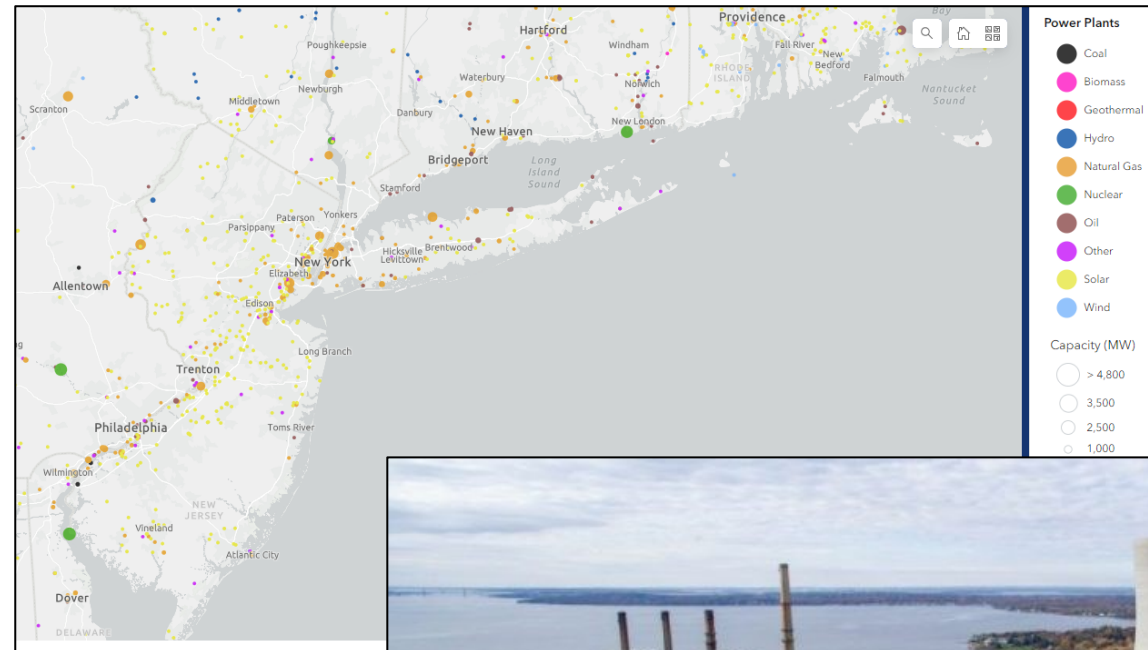
Source: Excelerate



Example Facilities – Onshore Power Generation and Industrial Facilities

- Hundreds of conventional power generating facilities throughout the US, many in the northeast
- ~500+ MGD, with some more than 3 billion gallons per day (Ravenswood, Millstone, etc.)
- Once-through cooling is primary source of cooling, but many utilize closed-cycle (closed-loop) cooling

Source: Synapse Energy



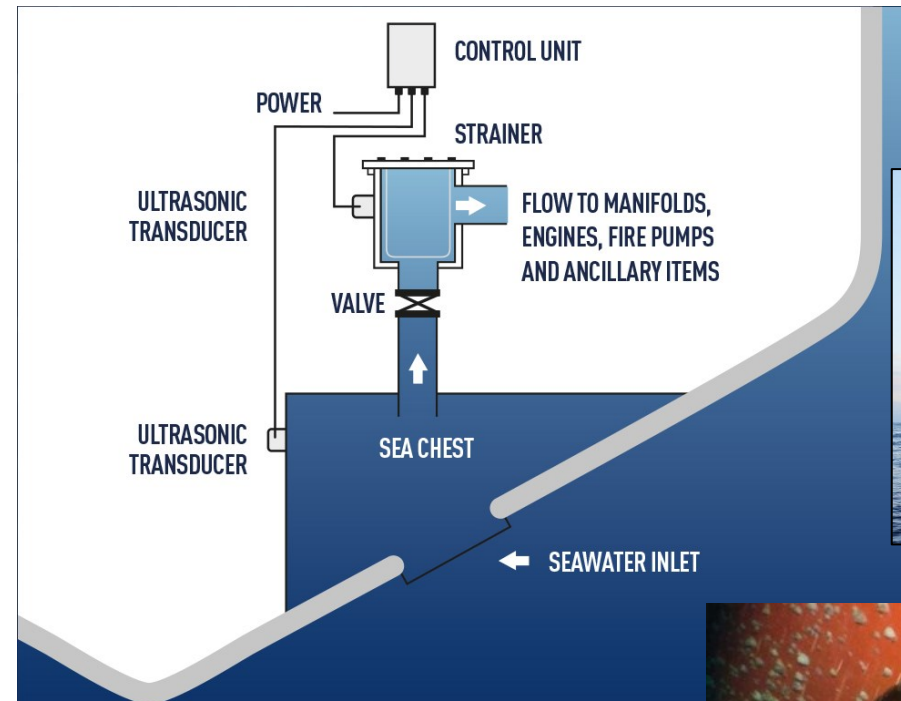
Source: Fall River Reporter



Other Sources of Cooling Water in the Ocean

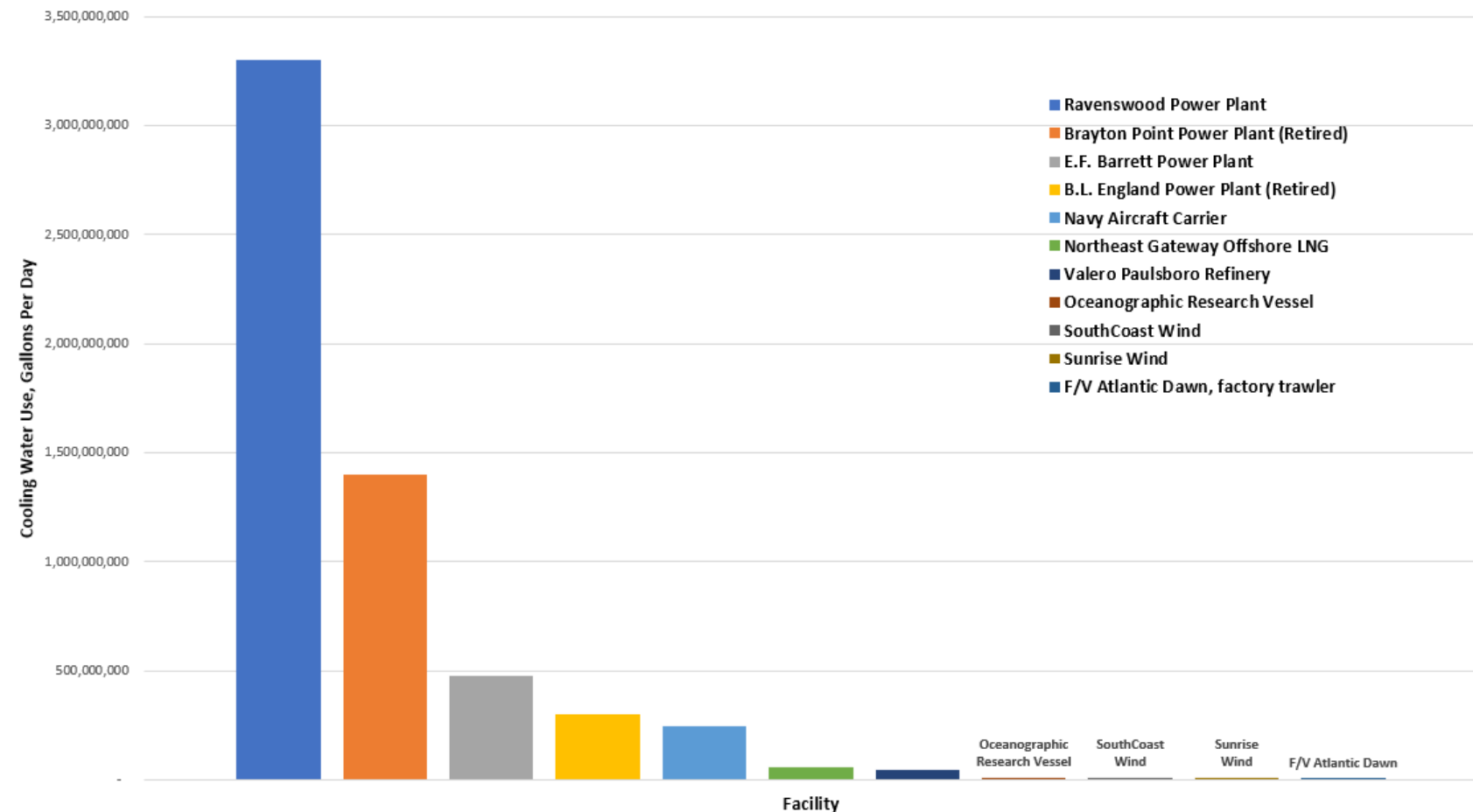
- Vessels of all sizes utilize some form of cooling water
- Large tankers/cargo ships have sea chest intakes to supply once-through cooling and other water uses
 - 10 MGD for global-class (AGOR) oceanographic research vessels
 - 50+ MGD for tankers
 - 4 to 245 MGD for Navy ships
- EPA Vessel General Permit for some commercial vessel types

Source: Ultrasonic Antifouling, Commercial Diving Services, WHOI



Scaling-up Cooling Water Uses in the Ocean/Coastal Habitats

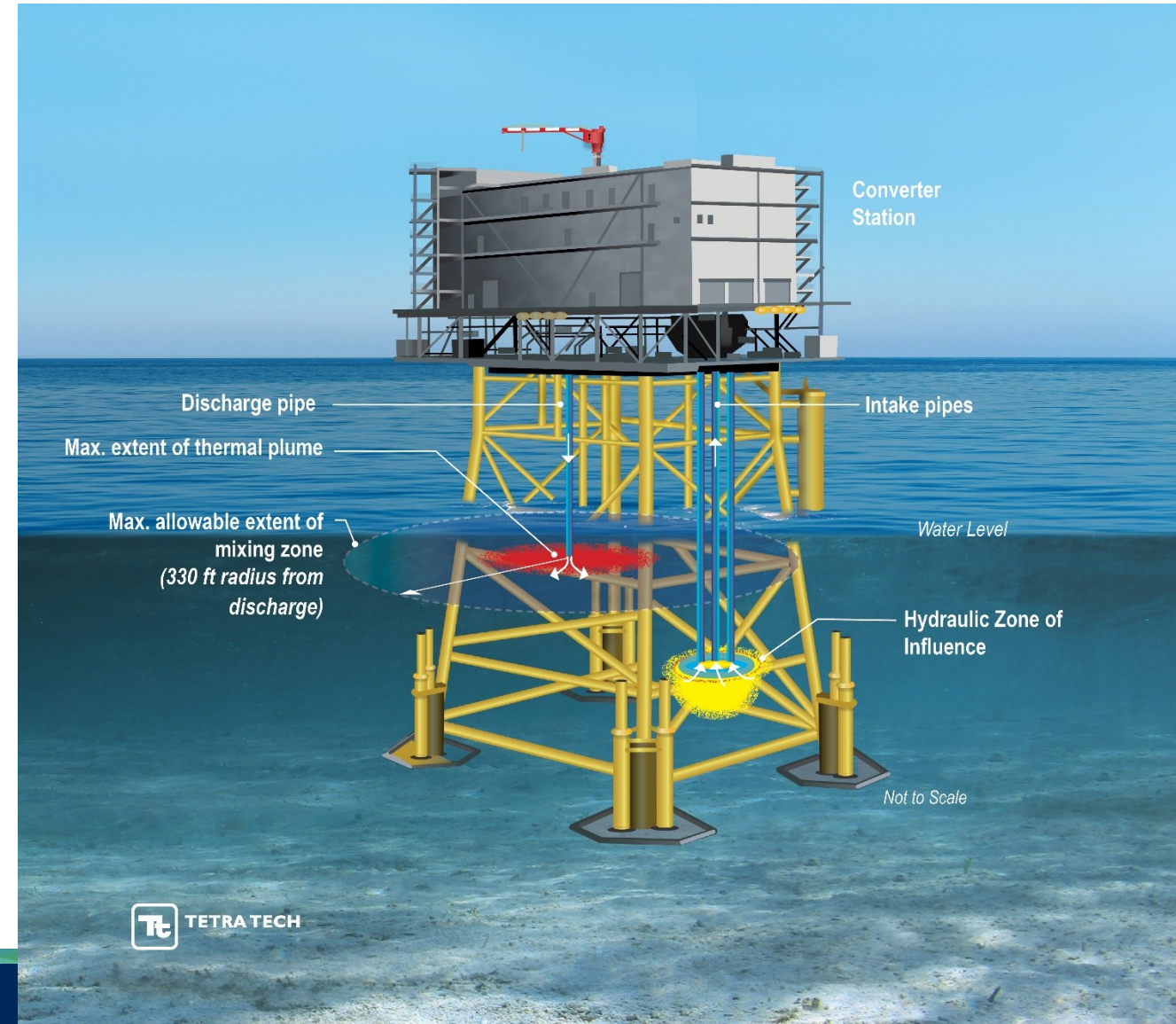
Source	Volume of Cooling Water (gallons per day)
Coastal/Onshore Power Plants	250,000,000 to 3,300,000,000
Coastal/Onshore Refineries	45,000,000 to 300,000,000
Navy Vessels, in-transit	4,000,000 to 245,000,000
Offshore LNG Ports (Northeast Gateway)	up to 56,000,000
Offshore Oil & Gas Platforms	up to 50,000,000
Oceanographic Research Vessel	up to 10,000,000
Offshore Wind Converter Stations*	5,000,000 to 10,000,000
Other Commercial Vessels, in-transit (tug, ferry, fishing, etc.)	100,000 to 3,000,000



*Sunrise Wind max. cooling water flow = 7,800,000

Risks & Impacts of Once-Through Cooling Water

- Hydraulic Zone of Influence (HZI)
 - Portion of water column partially-influenced by intake, relative to ambient currents
- Impingement
 - Not a concern if intake velocity does not exceed 0.5 fps
- Entrainment
 - Eggs/larvae withdrawn into cooling water intake
- Chlorination
 - Electrochlorination system used to minimize biofouling
 - Total residual oxidants must be below compliance level (30 $\mu\text{g/L}$) at point of discharge
- Thermal Discharge*
 - Mixing zone
 - Must return to within 1.8°F (1°C) of ambient seawater, within 100 m (330 ft) radius of discharge



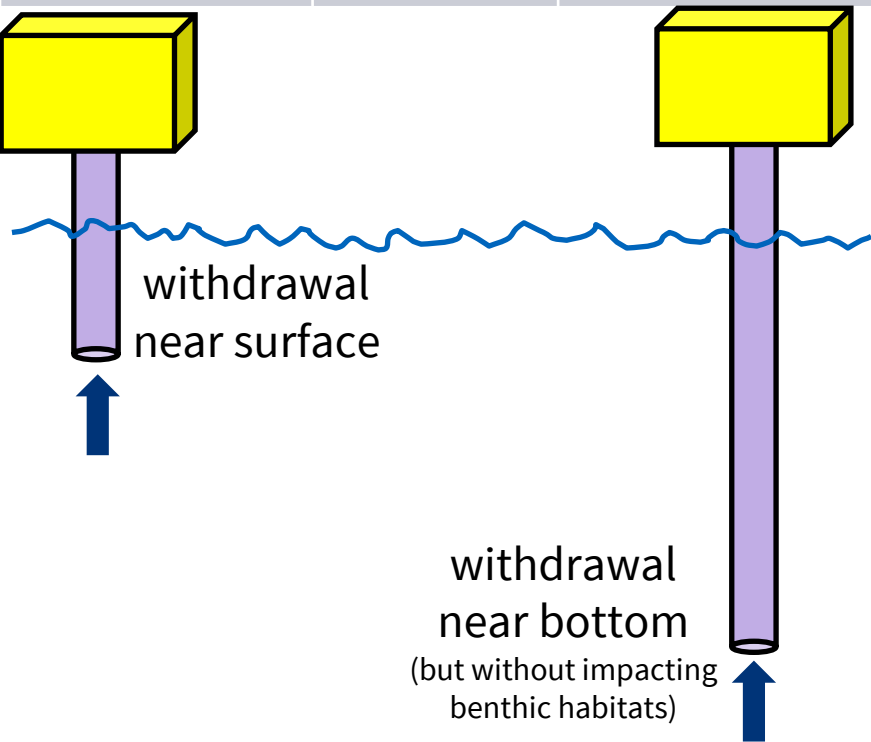
*Sunrise Wind end-of-pipe max. discharge temp. = 90°F

Risks & Impacts of Once-Through Cooling Water

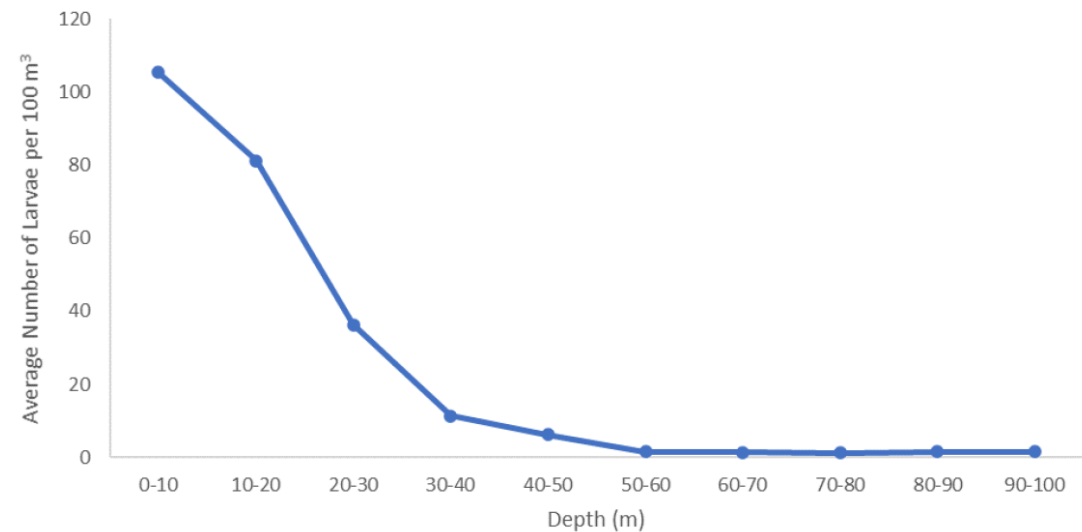
Risk/Impact	Data/Modeling Inputs	Avoidance/Minimization/Mitigation Options	Anticipated Monitoring Requirements for Compliance with NPDES Permit
Hydraulic Zone of Influence (HZI)	Calculation of HZI radius surrounding the intake caisson/pipe	<ul style="list-style-type: none"> Intake sited in a manner that avoids or minimizes the extent of the HZI, particularly within complex habitats, spawning locations, or other features. 	<ul style="list-style-type: none"> None
Impingement	Calculation of anticipated intake velocity	<ul style="list-style-type: none"> If applicable, the facility must maintain a maximum intake velocity of 0.5 ft/s to comply with impingement mortality standards 	<ul style="list-style-type: none"> Calculation/verification of actual intake velocity during operations
Entrainment	Calculation of entrainment densities based on MARMAP/EcoMon data	<ul style="list-style-type: none"> Depth of withdrawal from the lower portion of the water column, where larval densities are lowest Flow reductions, where feasible Consideration, and evaluation, of emerging technologies, such as closed-cycle cooling (e.g., air cooling, closed-loop subsea cooler, etc.) 	<ul style="list-style-type: none"> Seasonal ichthyoplankton sampling during operations Data will be used to calculate site-specific entrainment densities during project operations.
Chlorination	Electrochlorination system parameters	<ul style="list-style-type: none"> Maintain concentrations of Total Residual Oxidants (TRO) within compliance levels 	<ul style="list-style-type: none"> Direct-measure of residual chlorine (as TRO) with either inline meter, or laboratory analysis of grab-sample.
Thermal Discharge	CORMIX modeling to predict the size/extent of thermal plume	<ul style="list-style-type: none"> Ensure that the thermal plume will dissipate within a mixing zone (radius of 330 ft [100 m]) such that the average monthly water temperature at the edge of that mixing zone is within 1.8°F (1.0 °C) of the ambient ocean temperature 	<ul style="list-style-type: none"> Conduct seasonal thermal and water quality monitoring during project operations to verify the assumptions of the thermal model and document the extent of the thermal plume.

Alternatives & Best Available Technology Examples – Depth of Withdrawal

Technology, Operation, or Design Feature	Typically Implemented?	Potential for Fish Protection?	Feasibility for Implementation
Depth of withdrawal (intake caisson depth)	Sometimes part of the design	Yes, for some species/lifestages	POTENTIALLY FEASIBLE – Configuration of the intake and discharge locations in the water column can be effective at mitigating adverse environmental impacts for both water withdrawal and discharge.

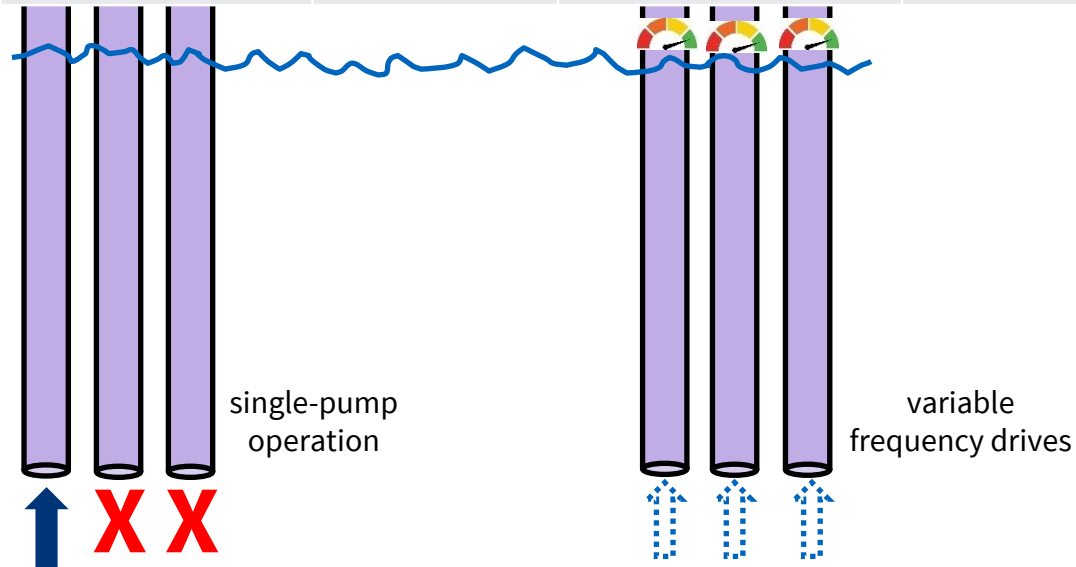


Source: EPA



Alternatives & Best Available Technology Examples – Flow Reductions

Technology, Operation, or Design Feature	Typically Implemented?	Potential for Fish Protection?	Feasibility for Implementation
Single pump operation	Sometimes part of the design	Yes – flow reduction → proportional entrainment reduction	POTENTIALLY FEASIBLE – if design flow is based on two-pump (or more) operation, then a flow reduction may be achieved during times when the facility can safely operate using only one pump, with proportional entrainment reductions expected.
Seawater lift pumps with variable frequency drives (VFDs)	Sometimes part of the design	Yes – flow reduction → proportional entrainment reduction	POTENTIALLY FEASIBLE – VFDs can be used to optimize minimum flows needed to meet cooling needs, and resulting proportional entrainment reductions, compared to design flow. However, this is not part of the design for all facilities, and therefore needs to be incorporated early in the design stage of the project. Included in the Sunrise Wind Final NPDES Permit.



Alternatives & Best Available Technology Examples – Closed Cycle Cooling/Air Cooling

Technology, Operation, or Design Feature	Typically Implemented?	Potential for Fish Protection?	Feasibility for Implementation
Closed cycle re-circulating cooling (closed-loop) – cooling towers	Not part of the design	Yes – flow reduction → proportional entrainment reduction	NOT FEASIBLE – Cooling towers for use in unmanned offshore applications are not commercially viable, and based on current evaluations, would not be commercially feasible for an unmanned offshore wind converter station, based on existing supplier and engineering capabilities for HVDC converter stations of this type (Middleton and Barnhart 2022).
Closed cycle re-circulating cooling (closed-loop) – Subsea coolers	Not part of the design - emerging technology	Yes – flow reduction → proportional entrainment reduction	POTENTIALLY FEASIBLE – Subsea heat exchangers are not an available technology for unmanned offshore facilities, based on existing supplier and engineering capabilities for HVDC converter stations of this type. As discussed in the New York Bight Final PEIS, subsea coolers are an emerging technology for offshore converter station applications (Middleton and Barnhart 2022; BOEM 2024).
Air cooling	Not part of the design - emerging technology	Yes – flow reduction → proportional entrainment reduction	POTENTIALLY FEASIBLE – Air cooling with fan arrays may be theoretically implemented on an unmanned offshore converter station but would require substantial additional design/engineering beyond current standards to become feasible (DNV 2021; Middleton and Barnhart 2022). As discussed in the New York Bight Final PEIS, air cooling is an emerging technology for offshore converter station applications (BOEM 2024).

Mechanical-Draft Cooling Tower. Source: Tetra Tech



Subsea Cooler. Source: Bronswerk



Air Cooling Fan-Array. Source: EvapCo



Depending on site-specific characterization and design specifications, closed-cycle cooling has the potential to substantially reduce (or eliminate) cooling water needs, compared to conventional once-through cooling systems. However, some are not feasible for offshore applications, or still emerging technologies in-development

Next Steps

- Draft Report – currently under F-TWG review
(comments due on 12/20)
- Incorporate F-TWG review/feedback – pending
- Final Report (winter 2025) – pending

Questions?

E-TWG Charter Update

**We welcome additional written feedback
on the charter by January 15**

> E-TWG charter drafted in 2018 with group's inception

> 2024 update (first update since original drafting) includes:

- Update to the geographic scope (discussed previously with the E-TWG)
- Intersection between the E-TWG and Regional Wildlife Science Collaborative (discussed previously with the E-TWG)
- Additional detail on mechanisms by which the E-TWG identifies and pursues priorities sector (discussed previously with the E-TWG)
- Membership
 - Not requiring equal numbers of representatives by sector (discussed previously with the E-TWG)
 - Clarifying relationship with New York State agencies
 - Possible new members: RWSC representative, F-TWG Liaison

Whale Communications Specialist Committee

- > Published 16 FAQ responses to date
- > Another 17 FAQs in development or review
- > Committee's current plan:
 - End with the last round of FAQs in development now
 - Continue revisions/publications of updates over the next few months
 - Wrap up committee activities in late spring of 2025
- > If there are any burning topics that you want to make sure the FAQ includes, please reach out to E-TWG support staff ASAP

Planned E-TWG Efforts 2025

- > Finishing up the Whale Communications Committee effort
- > Initiating/continuing Bird Communications Committee effort
- > Regular outreach activities (webinar library, annual bulletin, etc.)
- > Planning for SotS 2026
- > Updating MPD Tool
- > Priorities identified during today's discussions...?



Wrap Up & Next Steps

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> Questions? Comments?

> Thank you!