Early-Stage Environmental Baseline Assessments

Best Practices for Offshore Wind (*Benthic & Fisheries*)

27 February 2025

Agenda

Early-Stage Environmental Baseline Assessments: Best Practices for Offshore Wind (Benthic & Fisheries)

Early-stage decisions play a crucial role in the success of an offshore wind project. We present on our experiences to help you leverage our successes and avoid common pitfalls.

Three Success Stories

1. Non-extractive environmental assessment methods collect equivalent or better data and significantly reduces environmental impact
2. Imagery-based approaches to benthic assessment better support habitat mapping
3. Early stakeholder engagement aids project success

Mistake to Avoid

1. Failing to sample adaptively based on in situ data review

Success Stories: Best Practices

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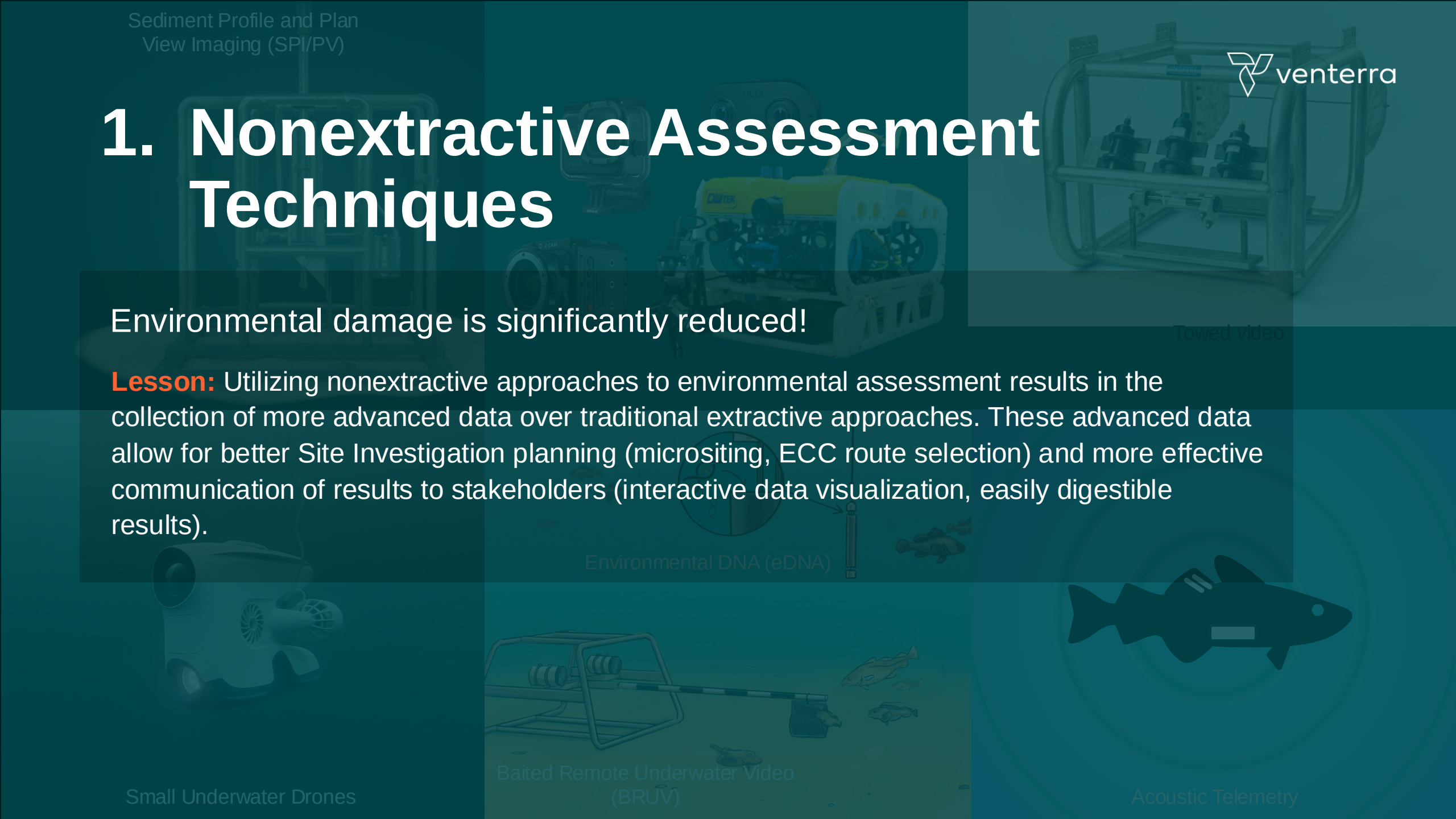
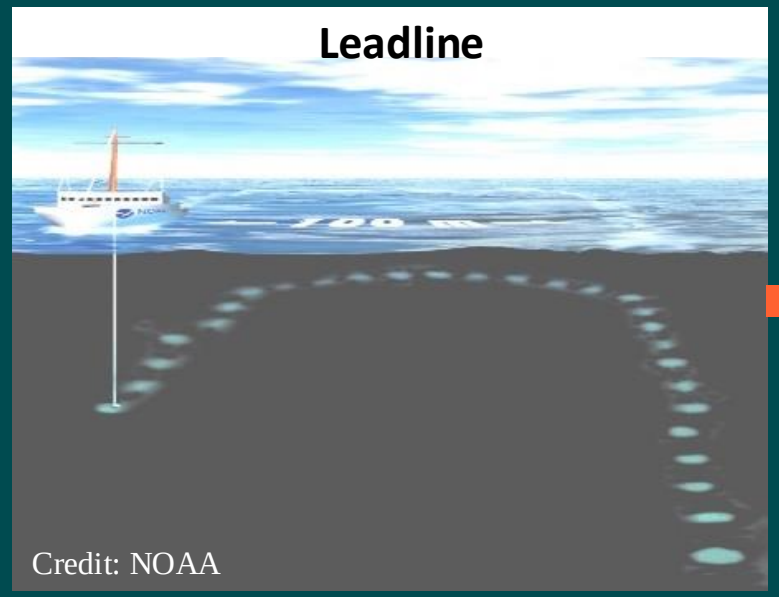


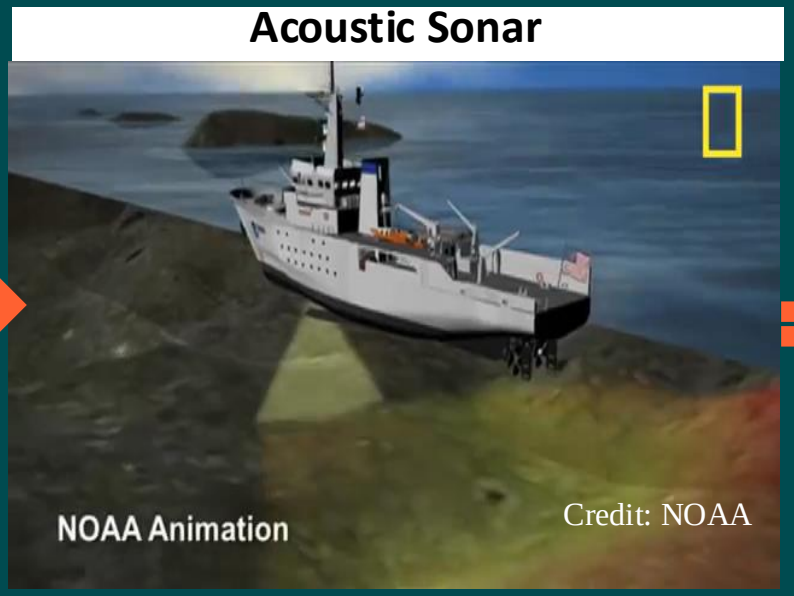
1. Nonextractive Assessment Techniques

Environmental damage is significantly reduced!

Lesson: Utilizing nonextractive approaches to environmental assessment results in the collection of more advanced data over traditional extractive approaches. These advanced data allow for better Site Investigation planning (micrositing, ECC route selection) and more effective communication of results to stakeholders (interactive data visualization, easily digestible results).

Technology Advancements Yield Better Data





Sediment Profile Imaging:

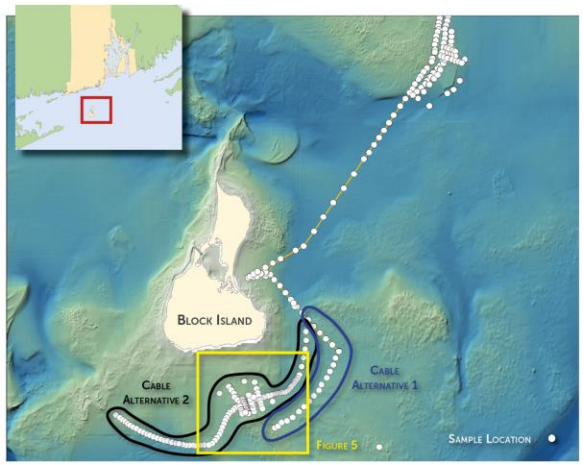
Novel advancement in benthic habitat assessment and characterization

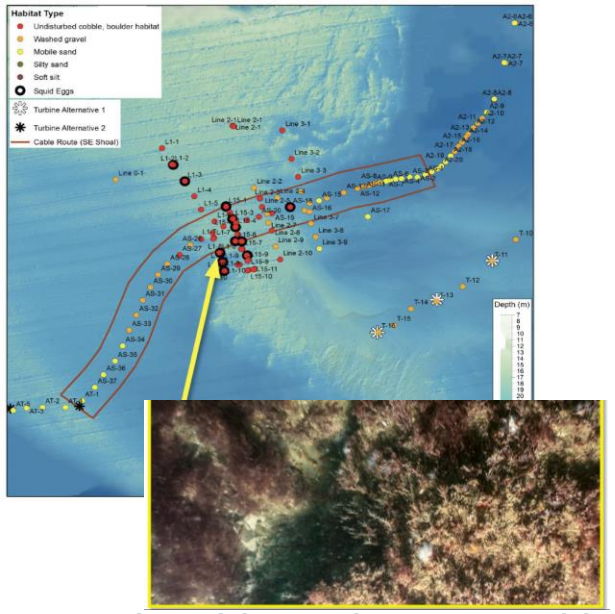
Block Island Wind Farm

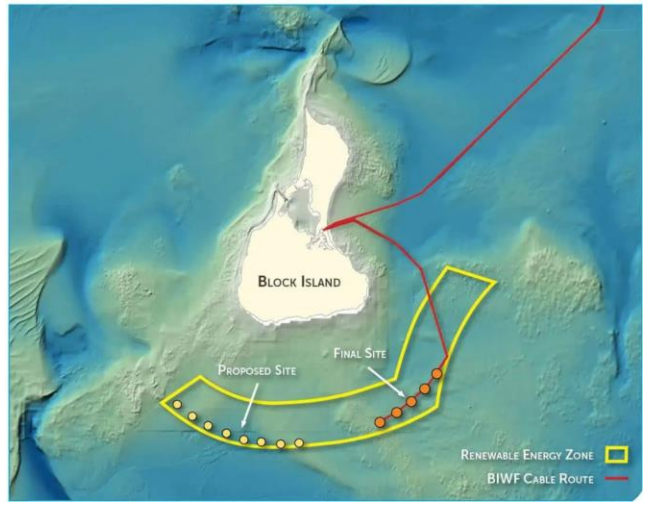
Application of novel environmental assessment techniques for permitting success

Example: Block Island Wind Farm (Block Island) is the first fully operational wind farm in the U.S., and Venterra was instrumental in securing myriad federal and state permits by conducting federal and state environmental impact analyses and resolving complicated siting and design decisions due to environmental and engineering constraints. The project was also subject to intense public scrutiny from a wide array of interested parties. Venterra was only able to navigate the complicated permitting process through the application of modern and novel environmental assessment strategies.

Site Identification & Micro-siting with SPI/PV



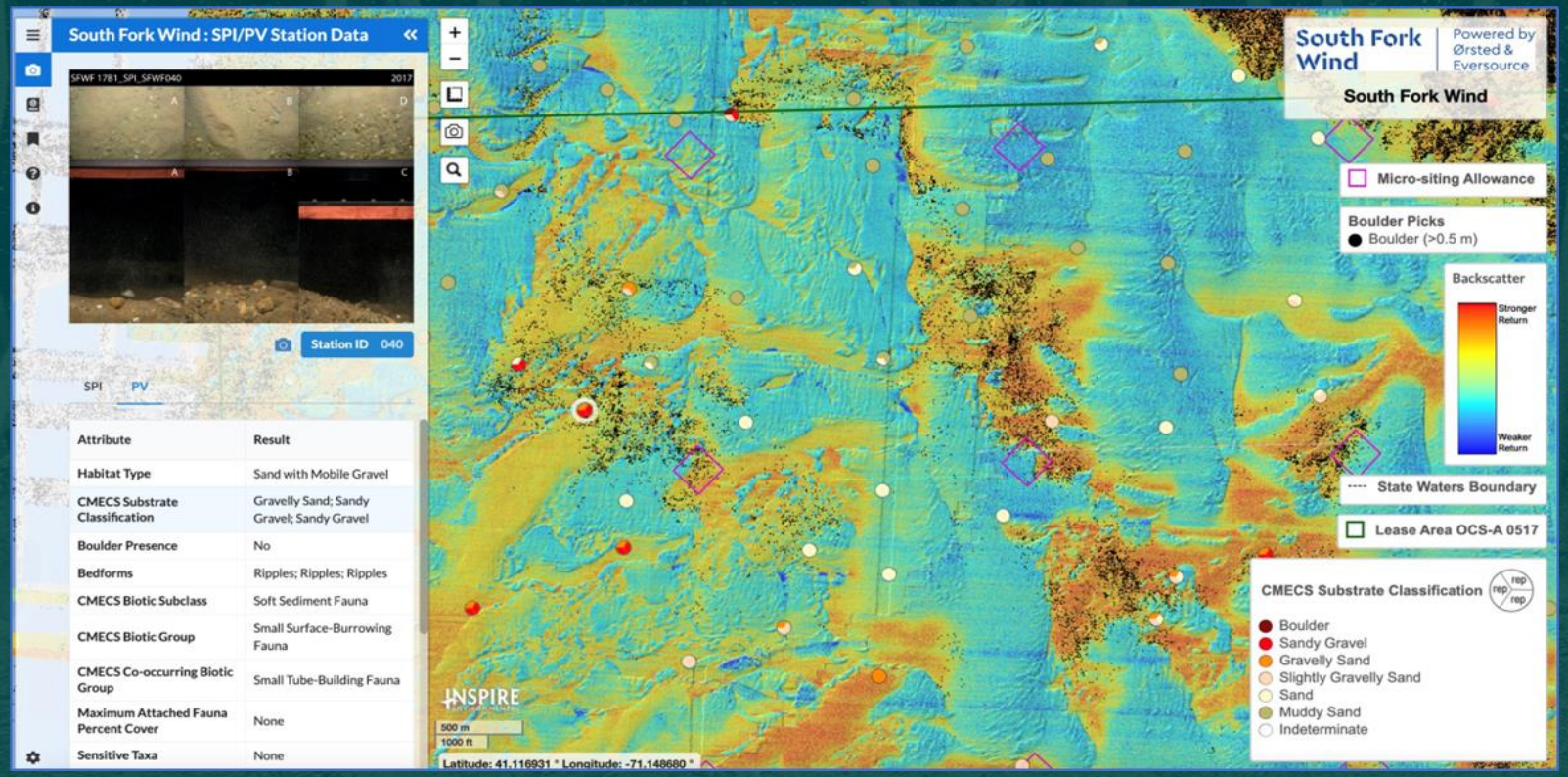




The region consists of a spatially heterogenous benthic environment with engineering constraints (boulders) and environmental constraints (sensitive taxa and habitat). Venterra designed and conducted an adaptive SPI/PV survey, collecting images from 282 stations over 2 days. Reviewing the images in real-time, we could adjust our sampling to spatially constrain the engineering and environmental conflicts to identify a narrow corridor of suitable bottom-types where development could occur. The images themselves were the most effective and powerful communicators of the message.

2. Imagery-Based Approaches to Benthic Assessment

Better support for habitat mapping and benthic characterization!

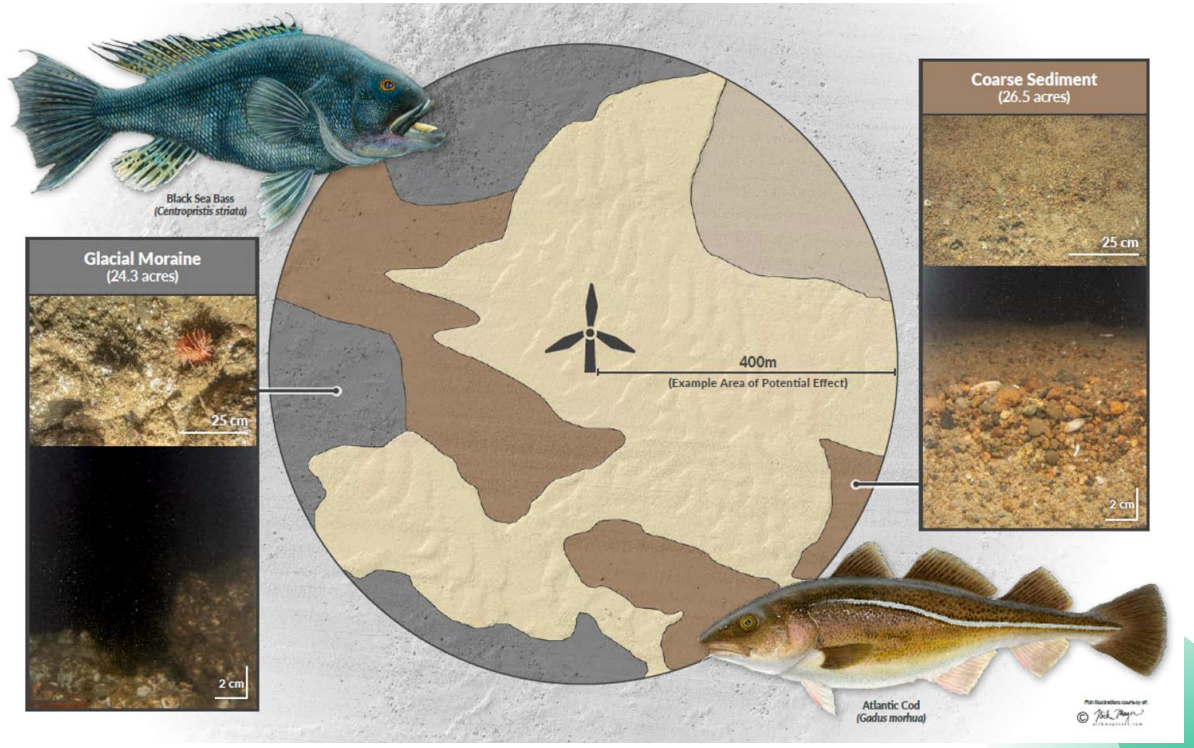


Lesson: It's important to consider the end goal of an environmental assessment project and employ the most effective tools to achieve this objective. The end goal for benthic assessments is habitat mapping (integrating geophysical and benthic data)

Habitat Mapping for US Offshore Wind

Example:

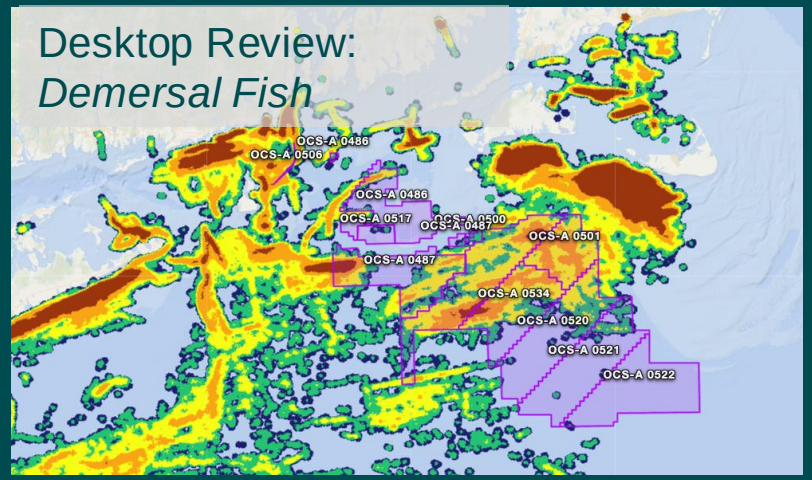
1. Venterra pioneered the application of SPI for habitat mapping.
2. By leveraging the quantitative visual data to ground-truth the geophysical data, accurate habitat mapping analysis was executed.
3. Visual identification of habitat mapping classifications is easily possible and aids in planning.
4. Aids agency consultation: regulatory approval was much smoother because the regulator can visualize the data and habitat classifications.

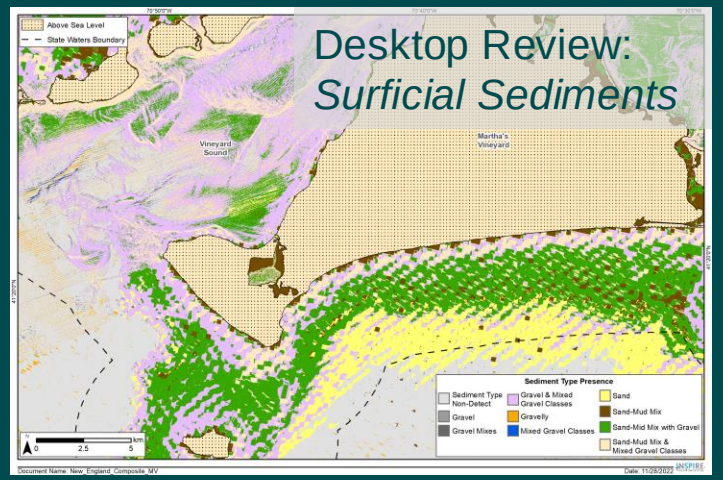


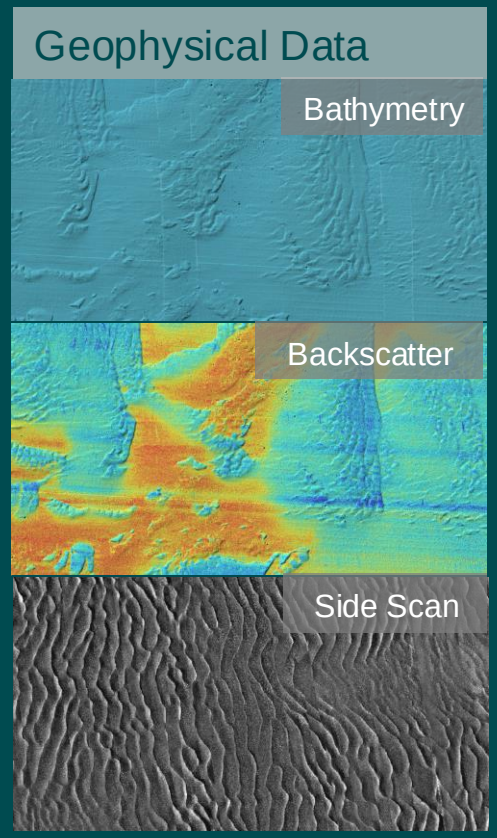
Habitat Mapping Best Practices

1. Desktop review of benthic resources, identify gaps
2. Review preliminary project-specific geophysical data
3. Design project-specific benthic survey – combination of approaches, gridded and adaptive

Benthic Survey Protocol
Discussions with agencies
Incorporate feedback

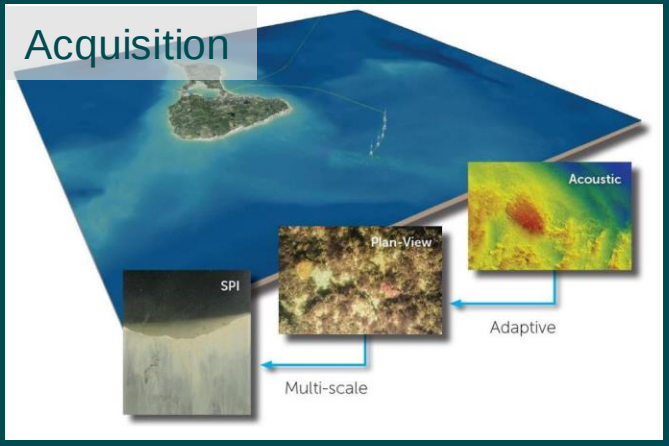


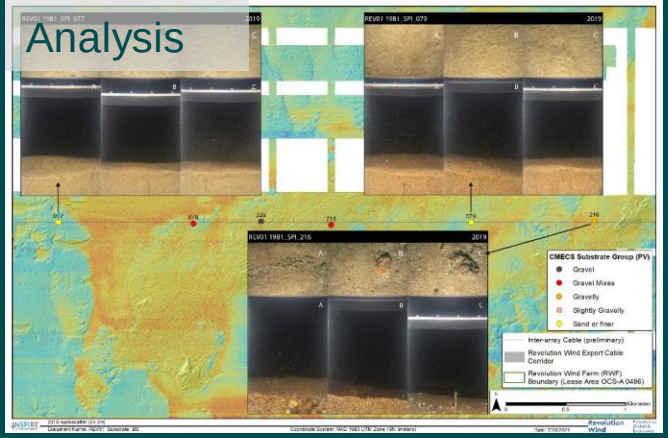


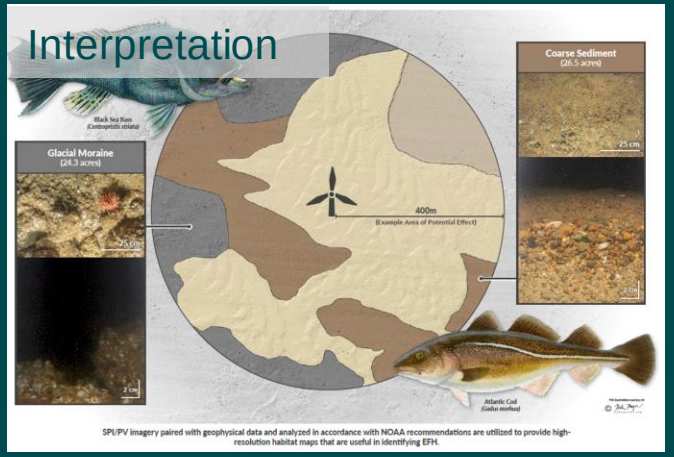


Habitat Mapping Best Practices

4. Acquisition - execute Benthic Survey Protocol, with adaptive sampling as needed
5. Analysis - detailed habitat delineations
6. Interpretation - utilization by valuable fish resources
7. Disseminate with interactive data visualization viewer to facilitate agency consultations and discussions







3. Early Stakeholder Engagement

Addressing stakeholder concerns upfront limits challenges on the backend

Lesson: Engage stakeholders early and often with specific questions

- Inform study designs (extractive vs non-extractive; before-after-control vs before-after gradient)
- Target species
- Traditional owners have valuable and unique perspectives
- Protected species interactions
- Permitting timelines and uncertainties

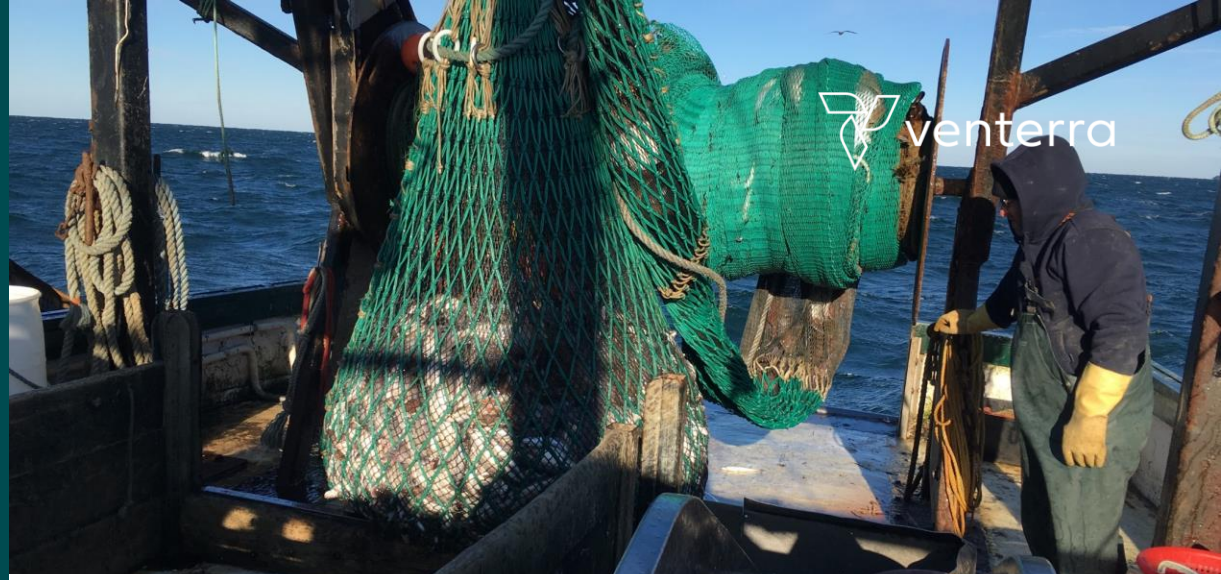
Block Island Wind Farm Fisheries Assessment

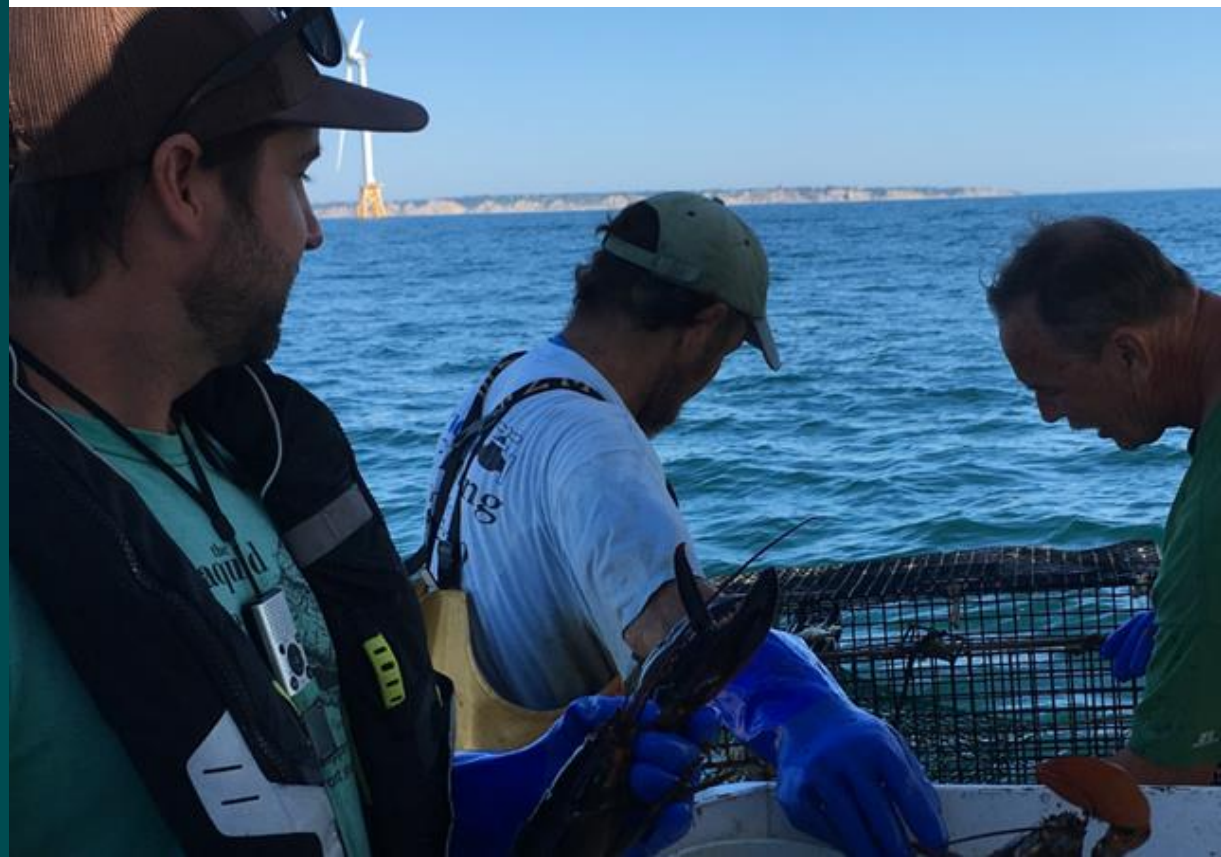
Concerns

1. Buy-in of results by local fishermen
2. Adequate sampling effort to detect change
3. Transparency in results. Data sharing.

Solutions

1. Partnered with commercial fishermen
2. Adapted monitoring to address fisheries' concerns
3. Published results in peer-reviewed journals





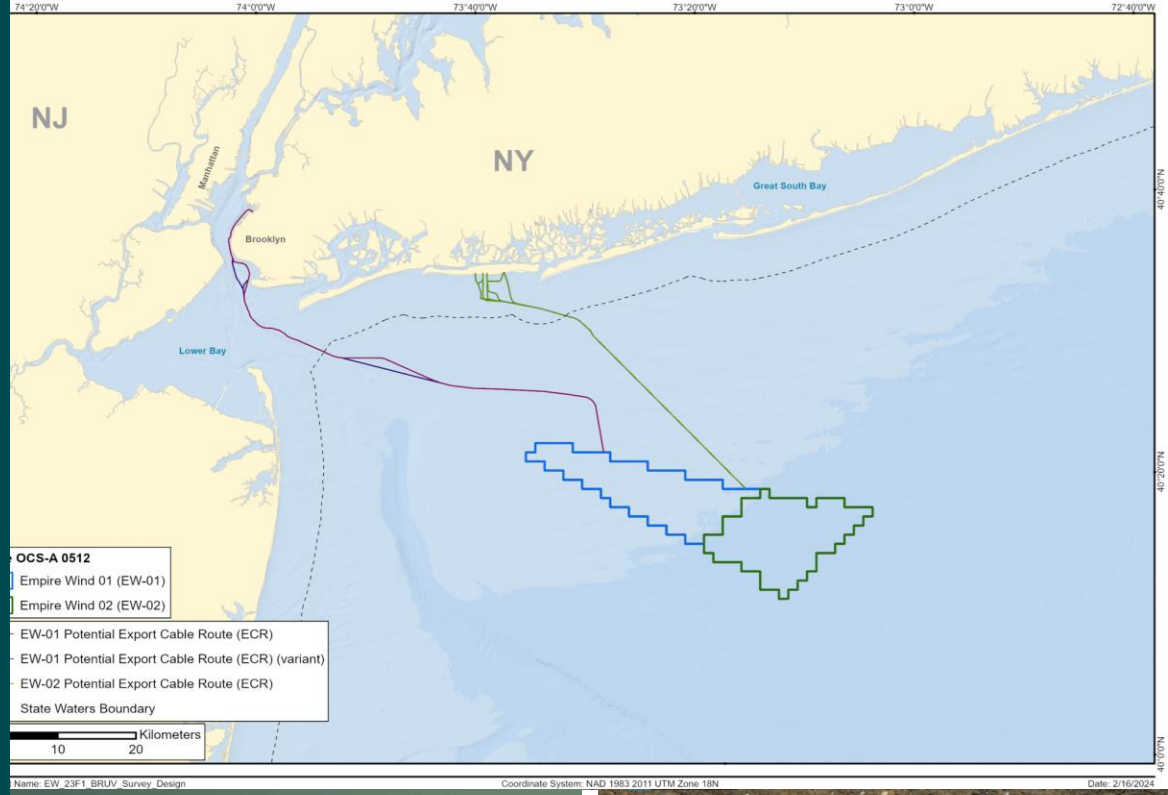
Empire Wind Farm Fisheries Monitoring

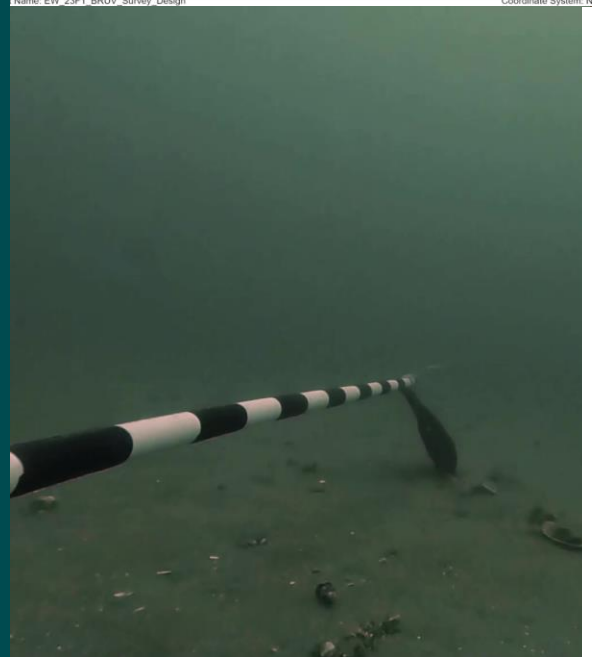
Concerns

1. Impact of extracting so many fish
2. Industry identified scallops and longfin squid as resources to monitor
3. Incorporation of and engagement with local fishermen

Solutions

1. Shift to non-extractive monitoring (Video, imagery, eDNA, acoustic telemetry)
2. Squid to be monitored with trawl survey (Timing of survey shifted due to industry recommendations)
3. Commercial fishing vessels used for BRUV, fish tagging, and trawl survey





Mistakes to Avoid:
Learning Lessons From Experience

Failing to sample adaptively based on in-situ data review

Lesson: The natural world is highly variable and even with proper preparation unexpected observations are not uncommon when executing benthic assessment surveys. When features of concerns (permitting [sensitive taxa or habitat] or construction [boulders]) are observed at one of the planned stations, it's imperative to spatially constrain the feature and collection additional data at a higher spatial resolution than the planned survey design. Utilizing a survey approach that allows for real-time data review (imagery based) facilitates adaptive sampling, saving costs and time by collecting all the necessary data during a single survey campaign and avoiding the need to wait for data to be processed before recognizing the need to collect additional data.

E.g. Offshore Wind Farm

Examples:

1. Sensitive taxa/habitat were identified along the main ECC during the initial baseline characterization survey
2. No additional data were collected; only planned baseline stations were sampled
3. During agency review, regulators stated that the ECC would not be approved given the sensitive habitat. The options were to abandon the route or collect additional data to spatially constrain the sensitive habitat/taxa.
4. A second survey was mobilized focused specifically on spatially constraining the sensitive taxa/habitat
5. Second survey showed that the sensitive taxa was representative of a larger regional feature that could not be avoided.
6. During follow-up agency review, regulators acknowledged the extent of the sensitive habitat and gave approval for the ECC given the impact would be limited relative to the spatial expanse of the habitat.
7. Time and costs could have been avoidable by adaptively sampling during the initial baseline survey

Get in touch

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