BOEM BUREAU OF OCEAN ENERGY MANAGEMENT

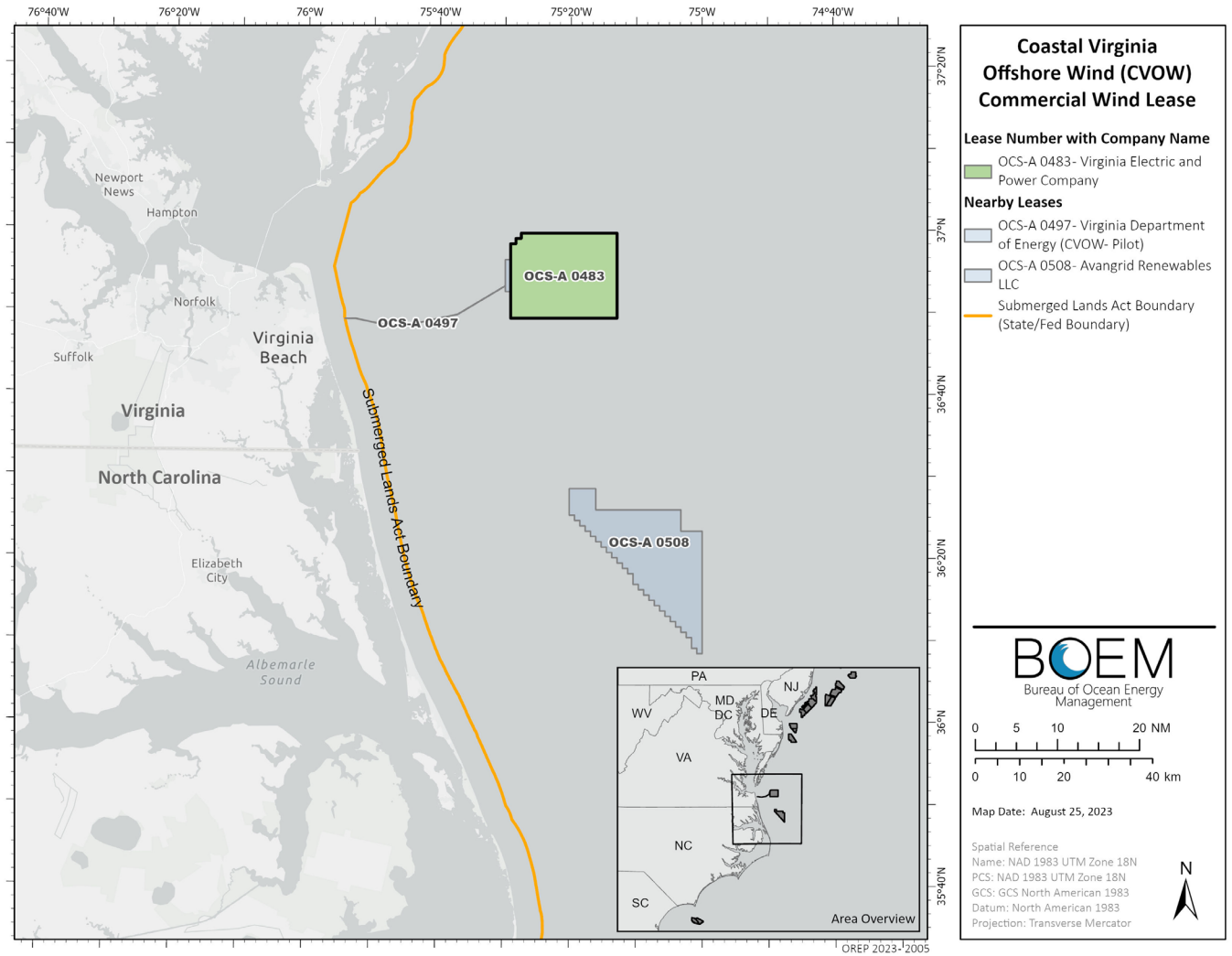
Atlantic Croaker at the Coastal Virginia Offshore Wind Farm

July 16th, 2025

SAFMC Habitat and Ecosystem Advisory Panel
Summer 2025

Coastal Virginia Offshore Windfarm (CVOW)

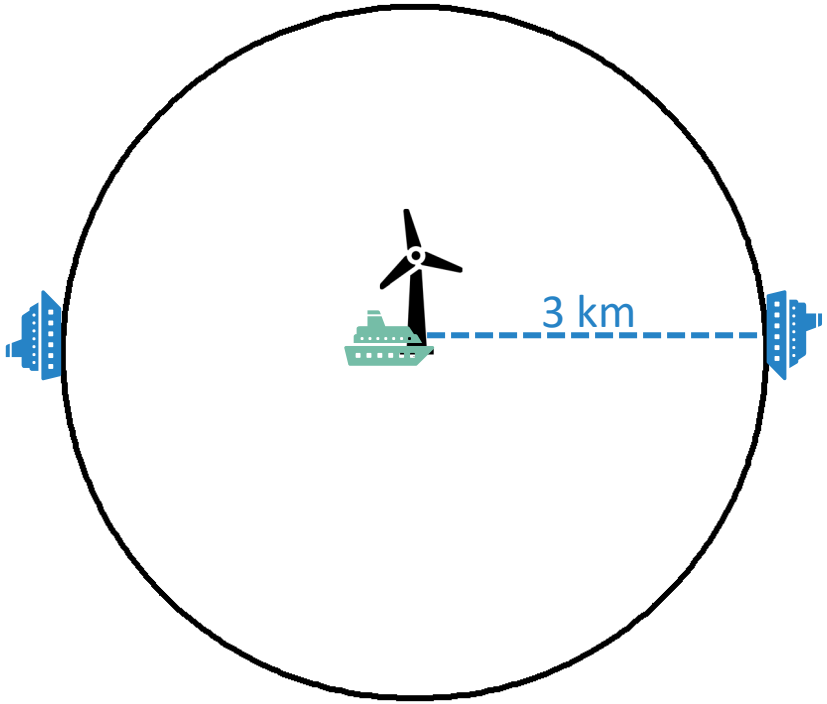
- WTG foundation installation began in May 2024 (176 WTG foundations)
- First observation of deceased croaker on May 25th 2024 (50 fish)
- 2024 WTG foundation installation season ended in November
- 2025 foundation installation season began in May



What defines an observation?

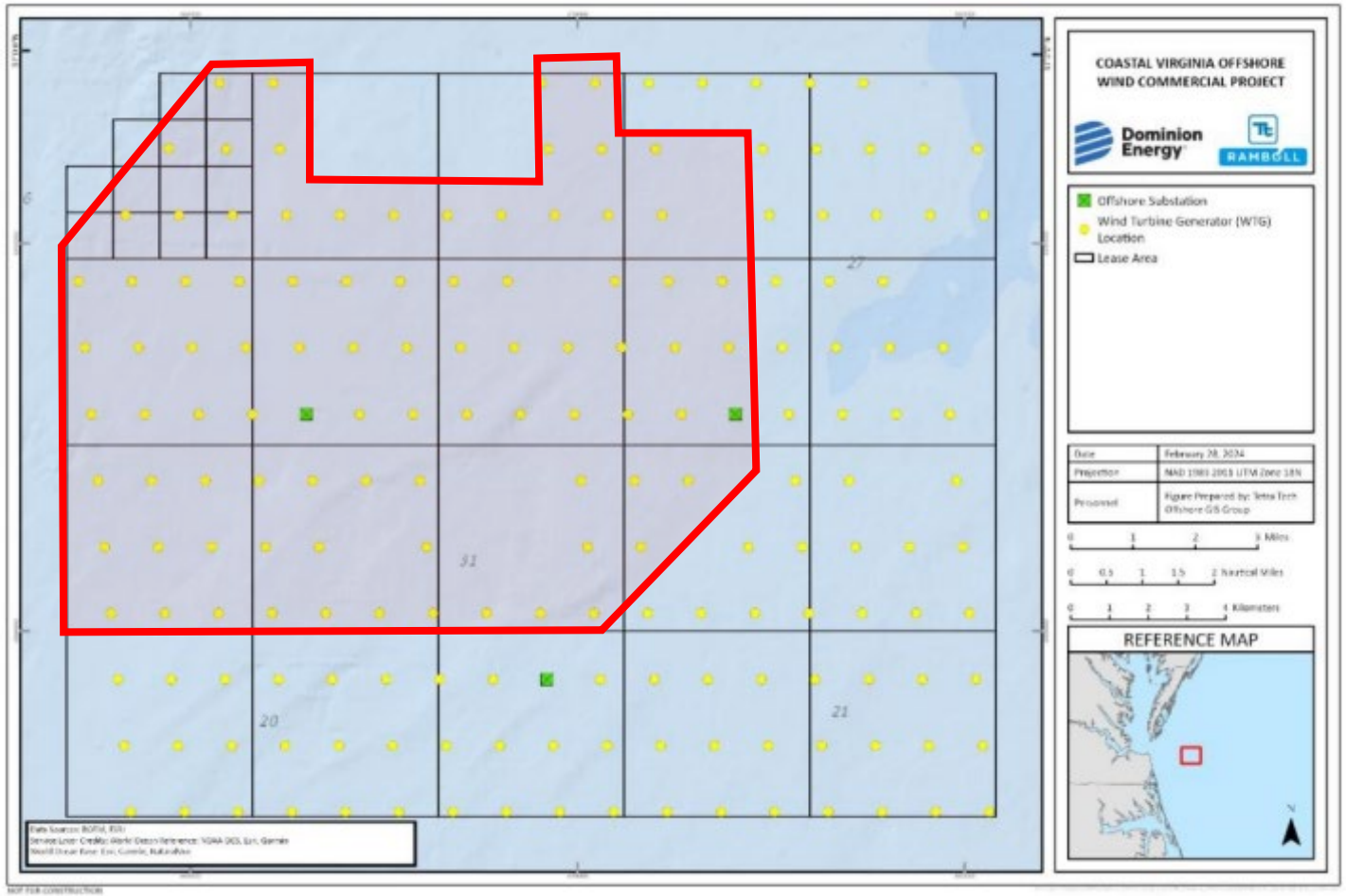
- Protected species observers (PSO)
- 3 PSO's per vessel
  - One installation vessel
  - Two support vessels
- Number of fish based on PSO estimates
- Drift & PSO locations could duplicate observations
- Small fraction of observations include spot

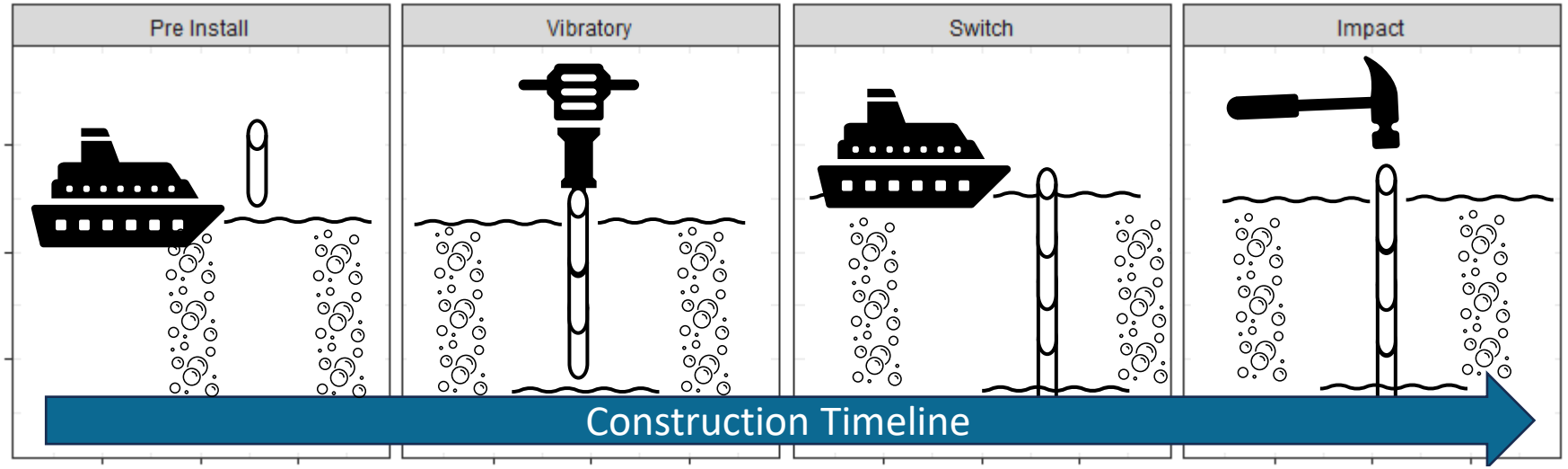
> 5.16.3.4 Detected or Impacted Dead Non-ESA-Listed Fish. The Lessee must report any occurrence of at least 10 dead non-ESA-listed fish within established shutdown or monitoring zones to BOEM and BSEE as soon as practicable (taking into account crew and vessel safety), but no later than 24 hours after the sighting. BOEM or BSEE will notify NMFS GARFO. The Lessee must confirm the relevant point of contact prior to reporting and confirm the reporting was received.



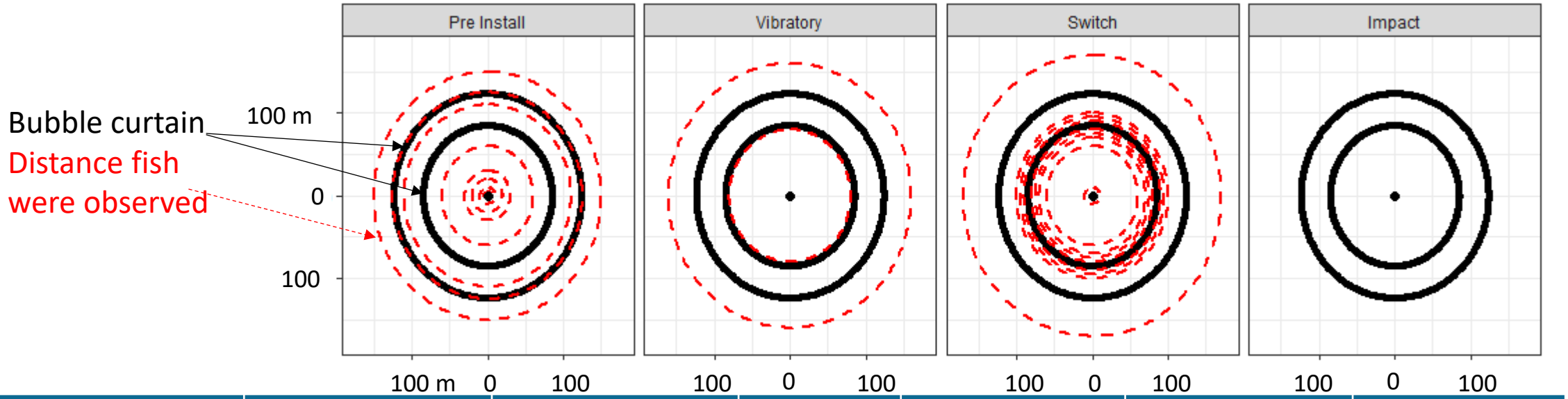
Observations of Deceased Croaker at CVOW

- 39 observations at 24 foundation locations
  - Average is 450 fish per observation
  - Observations occurred at ~ 30% of the installed foundations
  - No observations in July or September





Construction Event	Mean Distance from Pile (m)	Mean Num. of Fish Observed	Total Fish	Num. of Observations	Percent of Observed Fish	Percent of Observations
No Construction	2,420	690	3,450	5	19%	13%
Pre-install	487	716	10,740	15	59%	38%
Vibratory piling	99	194	970	5	5%	13%
Post vibratory, pre impact (“switch”)	606	163	1,792	11	10%	28%
Impact piling	3038	383	1,150	3	6%	8%
			18,102	**39**		



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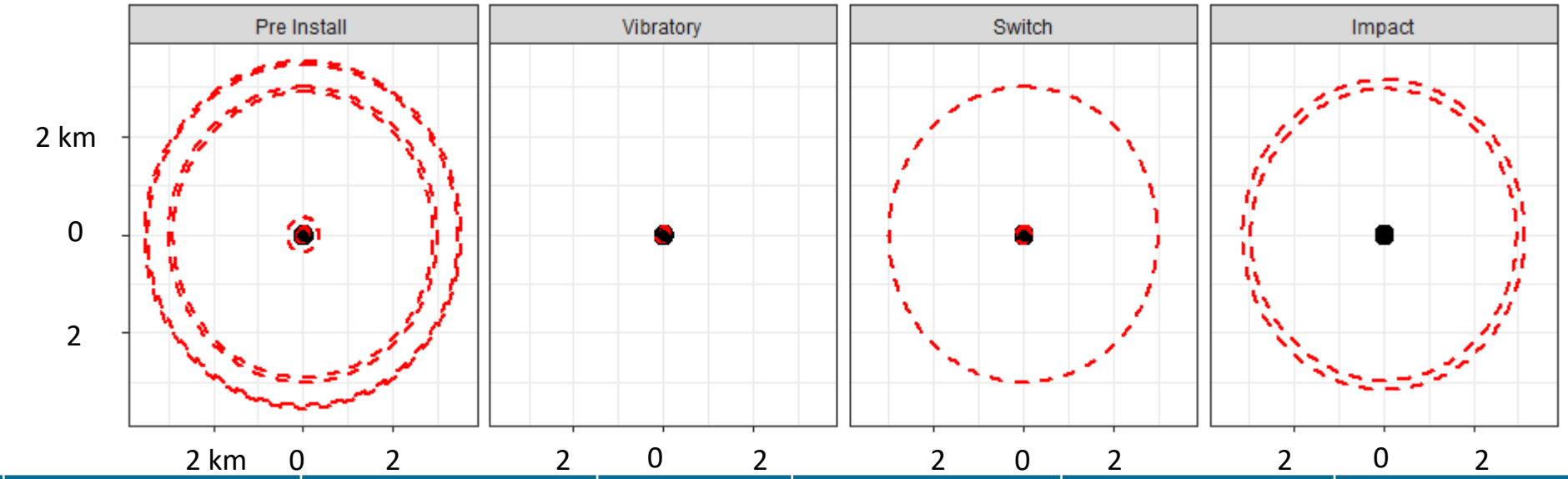
25% of observations occurred greater than 1 km away from the pile



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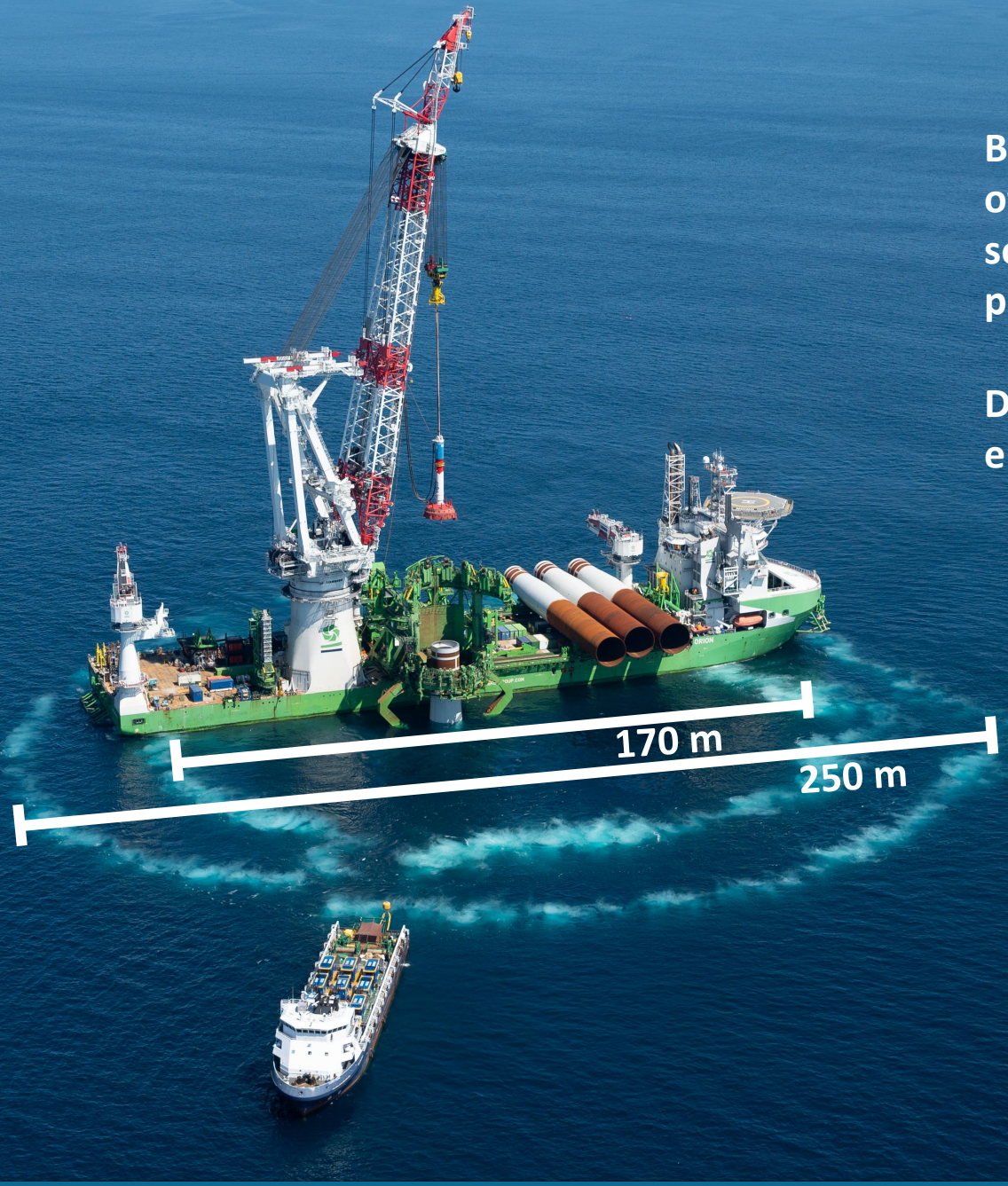


Bubble curtains are used during installation of monopile foundations to attenuate sound, thereby reducing noise impacts for protected species & fish

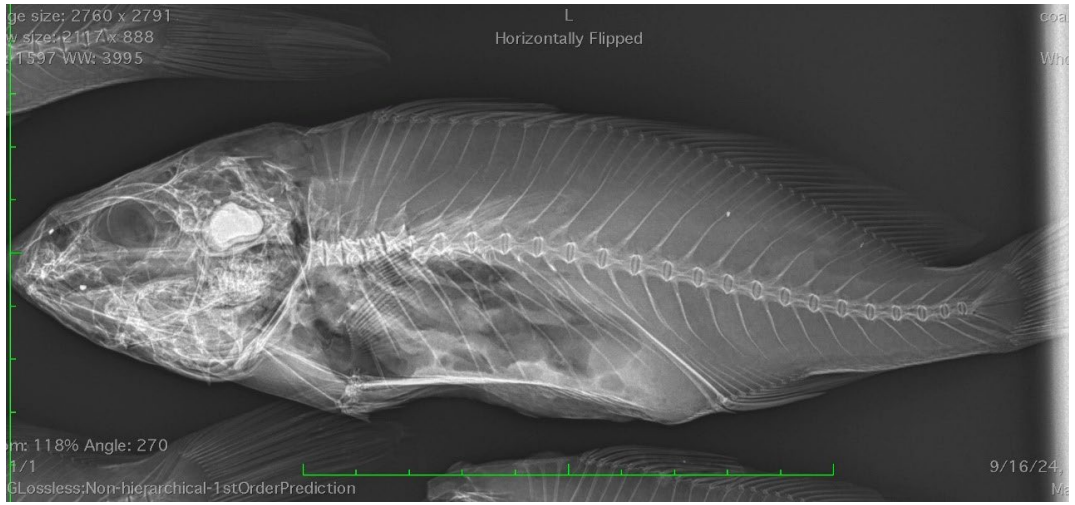
Double bubble curtains can reduce sound energy level by 90 %

DEME

Past and Current Efforts

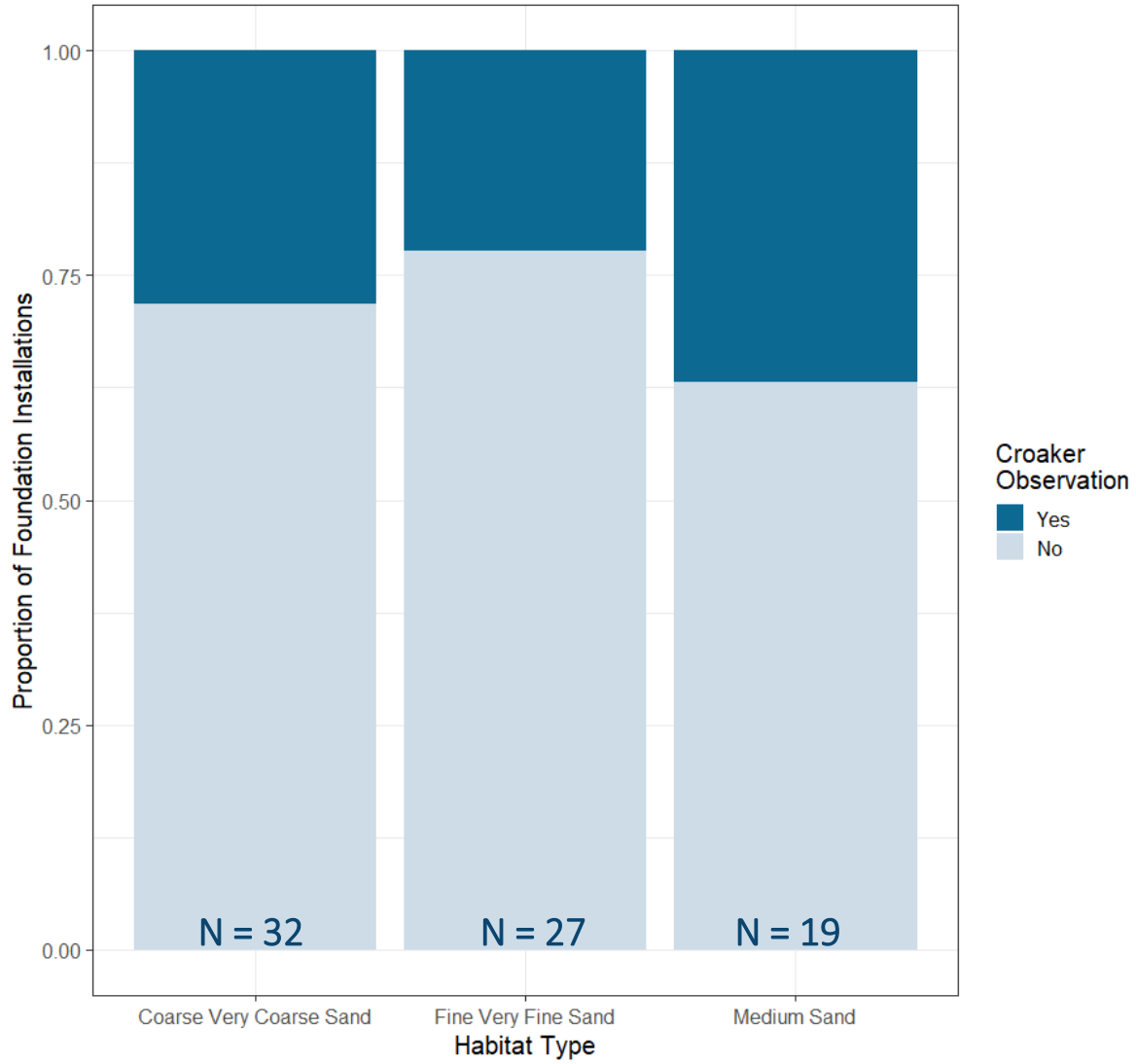
- Coordinated data review with Dominion Energy, DEME, and Bureau of Safety and Environmental Enforcement (BSEE)
- Worked with experts at VIMS, NC State, and NOAA fisheries to identify probable causes
  - Necropsies
  - Pathology
  - Acoustic monitoring
- Continuing to coordinate with NMFS in their analysis.

- Necropsy reports indicate
  - Acute trauma
  - Signs of barotrauma
  - "A definitive cause for the skeletal trauma is not grossly or histologically evident"



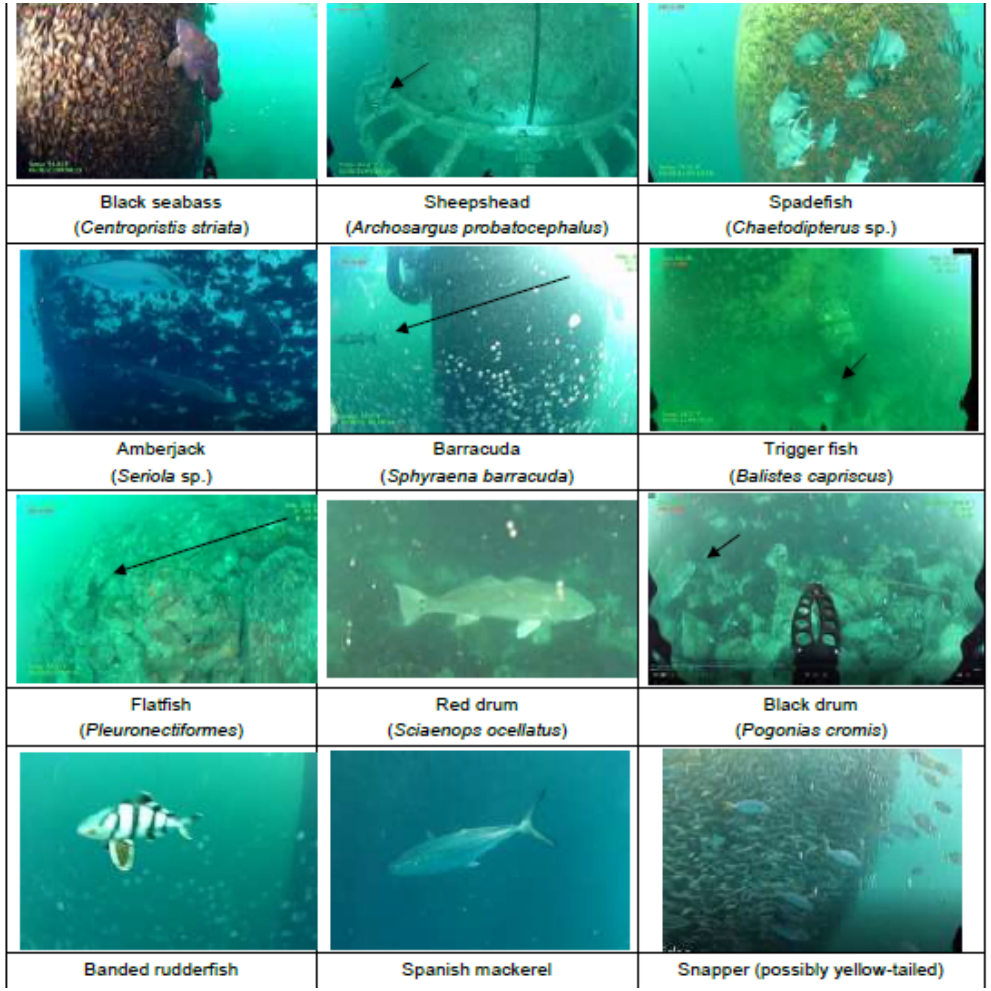
Preliminary Analyses

- Considering a variety of drivers to see if observations are associated with
  - Time of year / temperature
  - Sediment type
  - Construction activity / duration
  - Sound levels
  - Distance to construction
  - Water turbulence
- Preliminary analyses indicate sediment type, and temperature do not appear to be drivers of the mortality events



CVOW-Research Habitat Modification

- The CVOW-R project has been used to look qualitatively and quantitatively (i.e., RODE) at changes to the pelagic and benthic environment.
  - RODEO Project evaluated bio-fouling (27 months) at CVOW-R (RODEO | Bureau of Ocean Energy Management). Direct report: Field Observations During Offshore Wind Structure Installation & Operation Vol 3



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