



## Empire Wind Project (EW1 and EW2)

### What sounds will be made?

Pile driving and potential unexploded ordnance (UXO) detonation are the primary sources of acoustic concern associated with the proposed project. Not all project-related sounds are expected to be harmful. Some sounds will only present during certain stages over the life of an offshore wind facility



*Studies in European waters show that harbor porpoises may leave an area and feed less when pile driving begins but generally return within weeks after pile driving activities end.*

### What man-made and natural sounds are in the project area?

- Commercial and recreational boats
- Scientific surveys
- Fishing and navigational sonars
- Animal vocalizations
- Wave action, storms

### What information informed the analysis?

- Technical information on sound sources
- Underwater sound models
- Animal movement models to assess realistic exposure
- The seasonal occurrence of protected species in the lease area
- Information on animal responses to sound
- National Oceanic and Atmospheric Administration guidance on assessing the effects of sound on marine mammals



*The population of North Atlantic right whales has shown to be declining, and they are a species of interest in the waters off New York and New Jersey. Photo taken under NMFS permit number 19674*

### What are the possible impacts to marine mammals and sea turtles from pile driving?

#### Hearing Impacts

- Temporary hearing loss
- Permanent hearing loss

#### Behavioral Impacts

- Avoidance of the area
- Impacts to hearing ability (temporary or permanent)
- Changes to feeding success, resting, migratory behavior
- Disrupted Communication
- Stress

