BOEM BUREAU OF OCEAN ENERGY MANAGEMENT

# BOEM & NOAA Ocean Quieting and Industry Feedback

October 15, 2024

BOEM's Center for Marine Acoustics



# Introduction

- BOEM is advancing quieting goals across all of our program areas.
- We anticipate this to be a 1-2 year process where we work together collaboratively.
- We will work with you on identifying targets. Today's call is to start defining that process.
- This will NOT disrupt current ESA Biological Opinion – this is a completely separate effort.

# National Fish and Wildlife Foundation (NFWF) Pilot Study

Parallel (but separate) Effort: NOAA/NFWF Pilot Study - Sound source verification for alternative technologies

- Deepwater Horizon Restoration Program—Open Ocean Trustee Implementation Group
- Project: Reduce Impacts of Anthropogenic Noise on Cetaceans
  - 2022/23: Risk Assessment/proposed pilot options
  - 2024/26: Pilot Study implementation
  - https://www.gulfspillrestoration.noaa.gov/2024/05/pilot-projects-identified-reduce-noise-marine-mammals

# BOEM's *Draft* Noise Reduction Framework



- **Three foundational goals:**
  1. Implement impact-reduction limits for more impactful sound sources
  2. Provide direction to affected industries on noise mitigation planning
  3. Improve rigor for cumulative effects analyses of aggregate sound sources

**Sources of concern:** impact pile driving, surveys using air guns, vessel noise, explosives, vibratory pile driving

# Potential Options for Air Gun "Quieting"

## Current Operational Approaches:

- Temporal avoidance
- Area avoidance
- Reduction in the acoustic output of an air gun array **(reduce the amplitude; reduce number of active array elements)**

## Engineering Modifications:

- Modify air gun design to reduce bandwidth **(e.g., eSource, BluePulse)**
- Cluster elements in an array to tilt the output to lower frequencies **(e.g., Harmony, Gemini)**
- Desynchronize the air gun firing times in the array **(e.g., eSeismic, Popcorn)**

## New Technologies:

- Marine Vibroseis
- Very low frequency sources **(e.g., Tuned Pulse Source)**
- Initial cost for both is high, and limited numbers of units available as of now, but both appear promising in terms of data quality

# Possible Ways To Reduce Impacts

NOAA and BOEM CMA provide the following Draft metrics as a starting point for discussions on sound source reduction techniques:

- If using an impulsive source:

1. reduce SEL (SEL, in dB re 1 µPa$^2$s) – this is for single strike SEL
2. reduce peak SPL (Lpk, in dB re 1 µPa) – can include kurtosis here?
3. reduce low - mid frequency energy = anything > 100 Hz – 10 kHz
4. reduce very low frequency energy = anything < 100 Hz

- If using a continuous source:

1. reduce SEL (SEL, in dB re 1 µPa$^2$s) – this is for marine vibroseis (MV) or a continuous source, normalized across survey type duration metric (e.g., % of time source is active / survey time). Will need to consider the integration time (e.g., airgun = 2 ms vs MV = 10 sec = 3 orders of magnitude longer in time). Focus on low frequency cetaceans.
2. to be determined: possible future goals once we have experience operating MV and other continuous sources

* SEL = sound exposure level; SPL = sound pressure level

* Order of #3 and #4 may be dependent on environment

* N days of survey time should be considered, and operational metrics should continue to be followed

# How To Quantify “Baseline”

- *How much* reduction will be required?
- We need to know what to compare the alternative technology surveys against
  - e.g., what size, what kind of array configuration, etc.
- We will be looking for your help with this!

# Discussion

- Do you have any questions about the intent or the approach?
- What would be the most meaningful incentives for you?
- What else should we consider?
- What are we missing?
- How would you like to be involved?

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