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NOAA Draft Guidance for Assessing Effects of Anthropogenic Sound on Marine Mammals








Acoustic Threshold Levels for Onset of Permanent and Temporary Threshold Shifts

Public Meeting/Webinar – January 14, 2014



Meeting Overview



-  **Welcome and Introduction**
-  **Meeting Logistics**
-  **Purpose of Meeting**
-  **Overview of Draft Guidance**
-  **Public Comment**
-  **Steps in Process**
-  **Oral Comments**



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Welcome and Introductions

 **Nicole LeBoeuf**, Chief, Marine Mammal and Sea Turtle Conservation Division - Moderator

 **Amy Scholik-Schlomer**, Biologist, Marine Mammal and Sea Turtle Conservation Division - Presenter

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Meeting Logistics

-  **Registration Table**
 - Sign in (webinar participants are already registered)
 - Written comments (webinar participants submit electronically)
-  **Order of Speakers**
 - Will alternate between meeting and webinar
-  **Meeting/Webinar is being recorded**
-  **Length of Comments**
-  **Timekeeper**
-  **Location of Microphones**
-  **No Designated Breaks**
-  **Restrooms**

Purpose of Meeting



- 🐟 **Opportunity to provide oral comments on Draft NOAA Acoustic Guidance**
- 🐟 **Not a forum for debate or press interviews**
- 🐟 **Will present an overview of Draft Acoustic Guidance**
- 🐟 **Will answer limited clarifying and process questions**
- 🐟 **Will not answer detailed technical questions or questions relating to specific regulatory actions or implementation**

What is the Draft NOAA Acoustic Guidance?



- **Updated acoustic threshold levels (received dB level):**
 - Permanent and Temporary Threshold Shifts (PTS & TTS) onset (information synthesis): all underwater sources
 - Updates best available science, not regulatory application
- **First time threshold levels written in one place**
- **They are not:**
 - The entirety of an impact assessment (rather they serve as a tool to help evaluate effects & make findings).
 - Meant to address mitigation measures that may be associated with particular activities.
 - Applicable to marine species other than marine mammals under NOAA jurisdiction (i.e., doesn't cover fishes, sea turtles, walruses, etc.).





Sections of Draft Guidance



Main document (summary)

- What most people will use
- Contains:
 - Updated PTS & TTS onset threshold levels (based on 26 peer reviewed studies)
 - Regulatory context (MMPA, ESA, NMSA)
 - Process for updating Guidance



Appendices (more detailed)

- Development of PTS & TTS onset threshold levels (all sources)
- Peer review process
- Glossary

Proposed PTS Onset Threshold Levels



Sources divided into 2 groups

- Impulsive: explosives, seismic, impact pile driving
- Non-impulsive: drilling, sonar, vibratory pile driving



Dual metric threshold levels

- Peak pressure
- Cumulative sound exposure level (SEL_{cum})



Marine mammals divided into functional hearing groups

- Low-, mid-, and high-frequency cetaceans
- Phocid and otariid pinnipeds



Auditory weighting functions incorporated

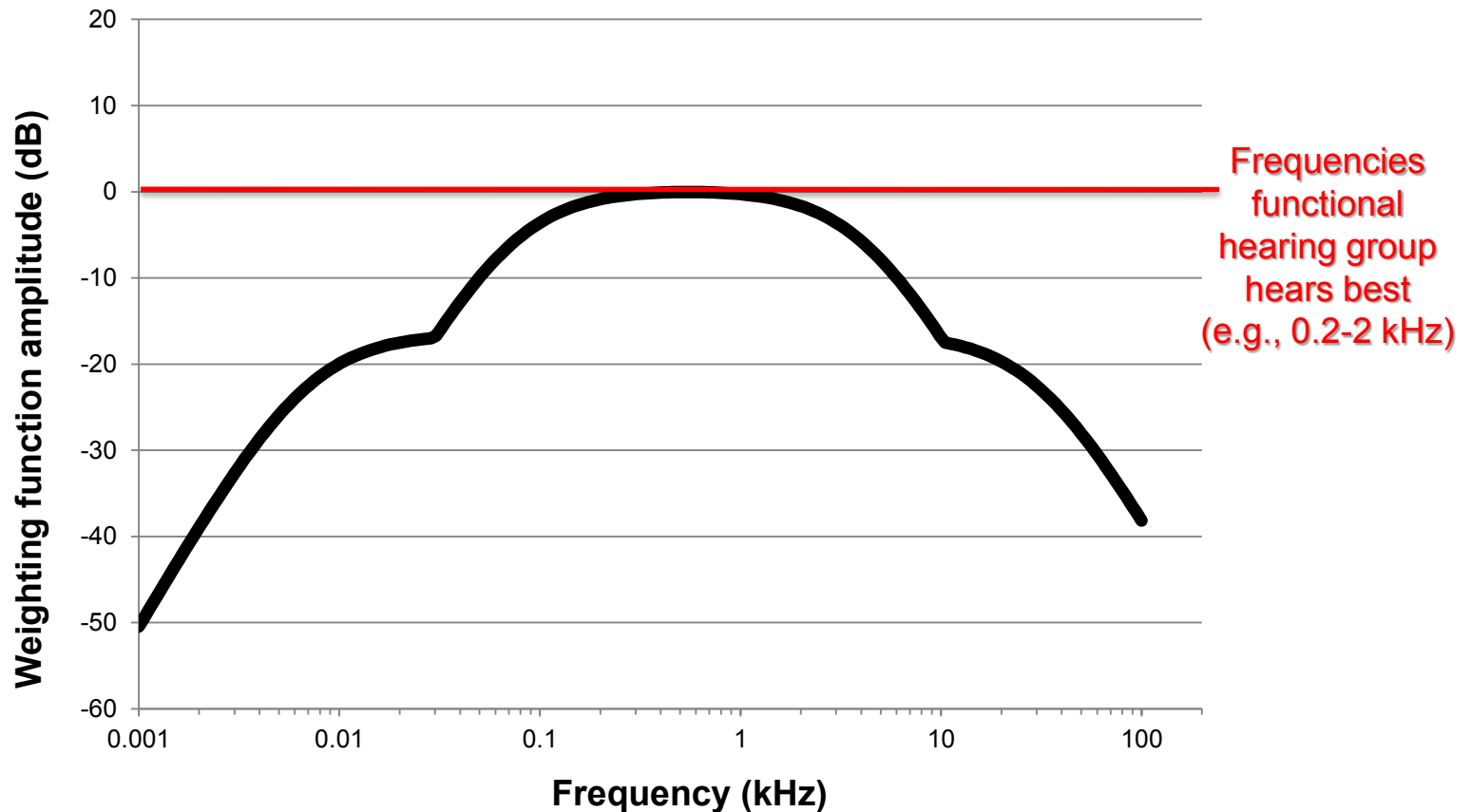


Marine Mammal Functional Hearing Groups

| Functional Hearing Group | Functional Hearing Range* |
|--|---------------------------|
| Low-frequency (LF) cetaceans ⁺ (baleen whales) | 7 Hz to 30 kHz |
| Mid-frequency (MF) cetaceans (dolphins, toothed whales, beaked whales, bottlenose whales) | 150 Hz to 160 kHz |
| High-frequency (HF) cetaceans (true porpoises, <i>Kogia</i> , river dolphins, cephalorhynchid, <i>Lagenorhynchus cruciger</i> and <i>L. australis</i>) | 200 Hz to 180 kHz |
| Phocid pinnipeds (true seals) | 75 Hz to 100 kHz |
| Otariid pinnipeds (sea lions and fur seals) | 100 Hz to 40 kHz |
| <p>* Represents frequency band of hearing for entire group as a composite (i.e., all species within the group), where individual species' hearing ranges are typically not as broad.</p> <p>+ Estimated hearing range for low-frequency cetaceans is based on behavioral studies, recorded vocalizations, and inner ear morphology measurements. No direct measurements of hearing ability have been successfully completed.</p> | |

Some changes from what was proposed in Southall et al. 2007

Marine Mammal Auditory Weighting Functions



Proposed PTS Onset Threshold Levels

| Hearing Group | PTS Onset* (Received Level) | |
|---|---|---|
| | Impulsive | Non-impulsive |
| Low-Frequency (LF) Cetaceans | 230 dB _{peak} & 187 dB SEL _{cum} | 230 dB _{peak} & 198 dB SEL _{cum} |
| Mid-frequency (MF) Cetaceans | 230 dB _{peak} & 187 dB SEL _{cum} | 230 dB _{peak} & 198 dB SEL _{cum} |
| High-Frequency (HF) Cetaceans | 201 dB _{peak} & 161 dB SEL _{cum} | 201 dB _{peak} & 180 dB SEL _{cum} |
| Phocid Pinnipeds (Underwater) | 235 dB _{peak} & 192 dB SEL _{cum} | 235 dB _{peak} & 197 dB SEL _{cum} |
| Otariid Pinnipeds (Underwater) | 235 dB _{peak} & 215 dB SEL _{cum} | 235 dB _{peak} & 220 dB SEL _{cum} |
| * Dual criteria: Use one [dB _{peak} or dB SEL _{cum}] exceeded first. All SEL _{cum} thresholds (re: 1 µPa ² -s) are weighted. | | |

Developing companion User Guide to provide examples and help applicants employ Guidance correctly.

Application of Guidance



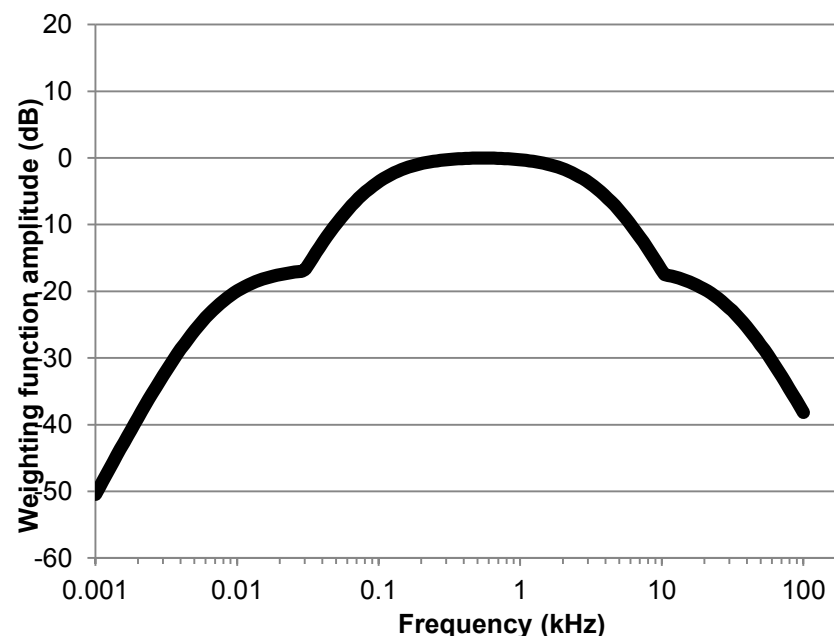
- 🐠 **Updates science, not regulatory application**
- 🐠 **Recognizes complexity with updated thresholds**
 - Best reflect current science
 - Difficult to directly compare with previous NOAA thresholds
- 🐠 **Provides alternatives for applicants unable apply more complex thresholds/weighting to exposure modeling**
 - Auditory weighting functions (Table 7 in Guidance)
 - SEL_{cum} metric (Section 2.3.1.1 in Guidance)
- 🐠 **User Guide (in development)**
 - Assists with application of updated thresholds
 - Released with Final Guidance

Seeking Input on Specific Topics



Low-frequency cetacean auditory weighting function

- No direct data available on hearing for baleen whales
- NOAA proposed weighting function modified from recently proposed function (Finneran & Jenkins 2012)



Seeking Input on Specific Topics



Baseline accumulation period for SEL_{cum} metric

- Accumulation period needed to use metric
- Proposed Accumulation Period:
 - 24 h: Exposure models capable of simulating relative movement of receiver and/or source
 - 1 h: Exposure models not capable of simulating relative movement of receiver and/or source
- Case-specific circumstances if:
 - Individuals closer to source for longer duration (e.g., confined activity area or resident population)

Public Comment



 **Draft NOAA Guidance may be reviewed at:**
<http://www.nmfs.noaa.gov/pr/acoustics/guidelines.htm>

 **Written comments may be turned in at registration desk**

 **Submit electronic comments at [regulations.gov](http://www.regulations.gov)**
• Docket Number: NOAA-NMFS-2013-0177

 **Comments can be viewed by the public on [regulations.gov](http://www.regulations.gov)**

Steps in Process



- 🕒 **Peer Review: July 17- August 26, 2013**
 - Nominated by Marine Mammal Commission
- 🕒 **Public Comment Period opened: December 27, 2013**
- 🕒 **Public Meeting/Webinar: January 14, 2014**
- 🕒 **Public Comment Period closes: January 27, 2014**

- 🕒 **Next Steps:**
 - Peer Review Report for PTS/TTS thresholds will be available when finalized.
 - Audio or transcript of meeting will be posted on website when available.
 - All comments will be reviewed and considered.
 - Substantive comments will be addressed.
 - Guidance will be revised as necessary and finalized, including User Guide (Target finalization: Spring 2014)



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Ground Rules and Oral Comments

- 🕒 Please review the ground rules handout.
- 🕒 Before providing comments, please clearly state and spell your name for the record.
- 🕒 You are encouraged to include your oral comments in any written comments you may submit.
- 🕒 If not submitting written comments, or if oral comments are in addition to written comments, please indicate so.
- 🕒 Time limit for each speaker is: 3 minutes (maximum).