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NOAA Draft Guidance for Assessing Effects of Anthropogenic Sound on Marine Mammals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-  **Overview of Draft Guidance**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



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- 🇺🇸 **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Sections of Draft Guidance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

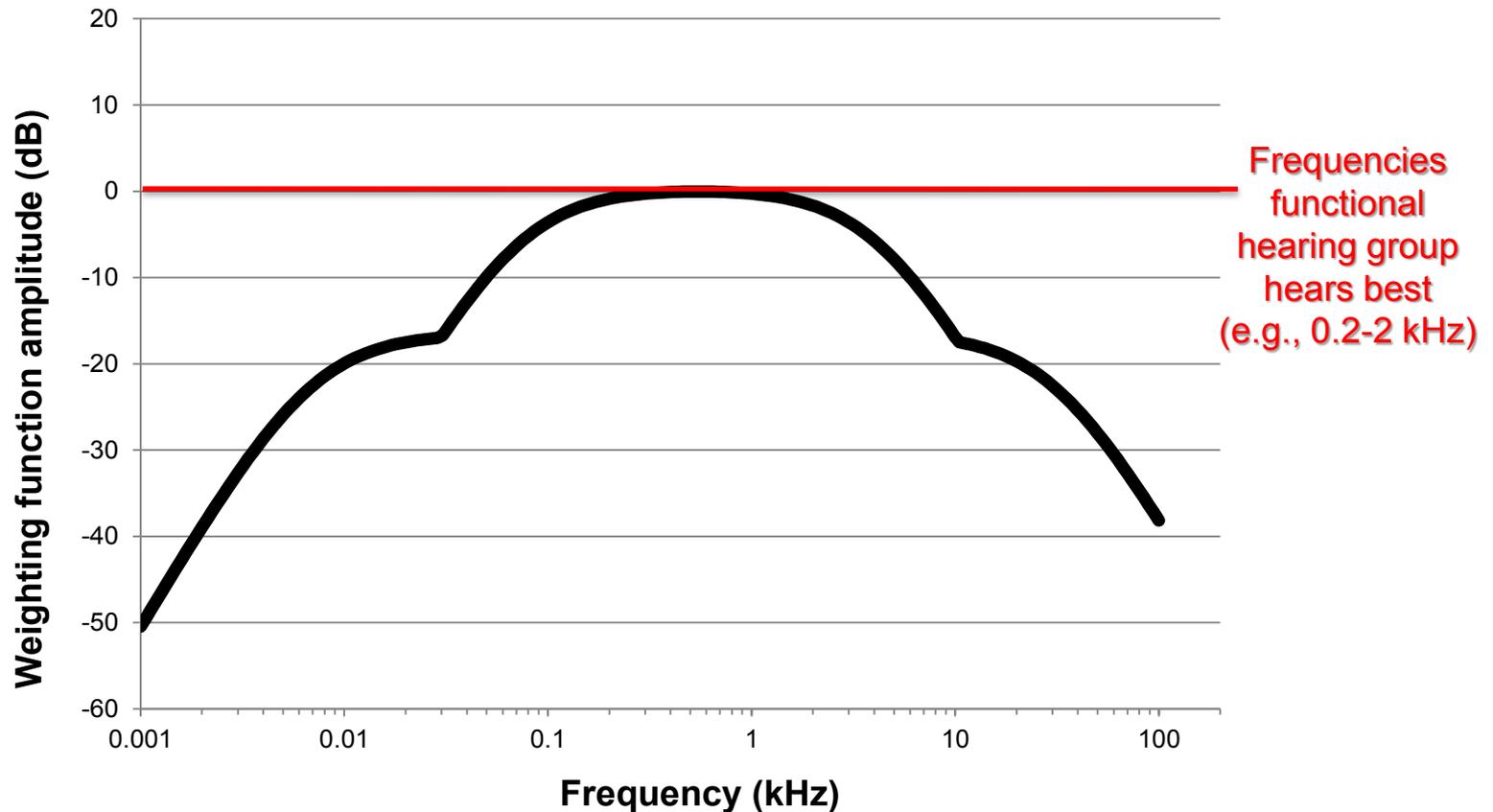
- 🌐 **Auditory weighting functions incorporated**

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



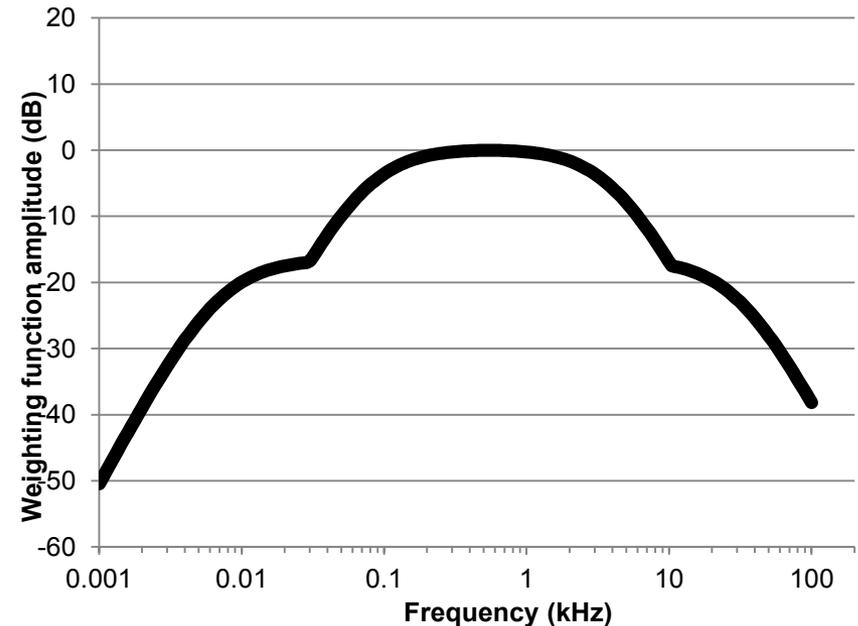
- **Updates science, not regulatory application**
- **Recognizes complexity with updated thresholds**
 - Best reflect current science
 - Difficult to directly compare with previous NOAA thresholds
- **Provides alternatives for applicants unable apply more complex thresholds/weighting to exposure modeling**
 - 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).