

# Underwater Acoustics: Webinar Series for the International Regulatory Community

**Webinar Outline: Potential Effects of Sound on Marine Mammals**  
**Wednesday, March 16, 2016 at 12:00pm (US East Coast Time)**

## ***Temporary Threshold Shift (TTS): Causes, Effects and its Role in Acoustic Impact Assessments***

**Dr. Dorian Houser, National Marine Mammal Foundation**

### **Presentation Outline:**

- What is Temporary Threshold Shift (TTS)?
- The impact of frequency, duration, and sound amplitude
- The role of TTS in assessing acoustic impacts to marine mammals
  - Continuous sound
  - Impulse sound
- TTS studies in marine mammals
  - Change in susceptibility by frequency
  - Species' differences in susceptibility
  - Recovery from TTS
- “Is TTS injury?” – and the impact of TTS work in laboratory animals

### **Additional information on the DOSITS website:**

Science of Sound > What sounds can animals hear?

<http://www.dosits.org/science/soundmeasurement/soundsanimalshear/>

Science of Sound > How is hearing measured?

(<http://www.dosits.org/science/soundmeasurement/hearingmeasured/>)

Science of Sound > Why do sounds have different properties?

(<http://www.dosits.org/science/soundsinthesea/properties/>)

Science of Sound > How do people and animals use sound in the sea?

(<http://www.dosits.org/science/soundsinthesea/peopleanimalsuse/>)

Science of Sound > Advanced Topics > What is intensity?

<http://www.dosits.org/science/advancedtopics/whatsintensity/>

Animals and Sound > How do marine mammals hear?

(<http://www.dosits.org/animals/soundreception/mammalshear/>)

Hearing in Land Mammals

(<http://www.dosits.org/animals/soundreception/mammalshear/landmammals/>)

Hearing in Pinnipeds, the Amphibious Ear

(<http://www.dosits.org/animals/soundreception/mammalshear/hearinginpinnipeds/>)

Hearing in Cetaceans and Sirenians, the Fully Aquatic Ear

(<http://www.dosits.org/animals/soundreception/mammalshear/hearingincetaceans/>)

Animals and Sound > Potential Effects (Marine Mammals) > Hearing Loss

<http://www.dosits.org/animals/effectsofsound/marinemammals/hearingloss/>

Animals and Sound > Advanced Topics > Temporary Threshold Shift (TTS) Studies

<http://www.dosits.org/animals/advancedtopics/temporarythresholdshift/>

Animals and Sound > Advanced Topics > What components of sound are used for hearing?

<http://www.dosits.org/animals/advancedtopics/componentsofsound/>

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***The Golden Age of Marine Mammal Behavioral Response Studies: Recent Progress and Paradigm Shifts in Evaluation and Mitigation***

**Dr. Brandon Southall, Southall Environmental Associates, Inc.**

**Presentation Outline:**

- Historical Studies of Marine Mammal Behavioral Responses to Noise
- New Technologies - New Capabilities
- Recent Progress in Marine Mammal Behavioral Response Studies
- New Paradigms - The Importance of Exposure Context in Response Probability

**Additional information on the DOSITS website:**

Science of Sound > What sounds can animals hear?

<http://www.dosits.org/science/soundmeasurement/soundsanimalshear/>

Science of Sound > What are common underwater sounds?

(<http://www.dosits.org/science/soundsinthesea/commonsounds/>)

Science of Sound > How do people and animals use sound in the sea?

(<http://www.dosits.org/science/soundsinthesea/peopleanimalsuse/>)

Animals and sound > Why is sound important to marine animals?

(<http://www.dosits.org/animals/importanceofsound/whyissoundimportant/>)

Animals and Sound > How do marine mammals hear?

(<http://www.dosits.org/animals/soundreception/mammalshear/>)

Hearing in Land Mammals

(<http://www.dosits.org/animals/soundreception/mammalshear/landmammals/>)

Hearing in Pinnipeds, the Amphibious Ear

(<http://www.dosits.org/animals/soundreception/mammalshear/hearinginpinnipeds/>)

Hearing in Cetaceans and Sirenians, the Fully Aquatic Ear

(<http://www.dosits.org/animals/soundreception/mammalshear/hearingincetaceans/>)

Animals and Sound > How do marine animals use sound?

(<http://www.dosits.org/animals/useofsound/animalsusesound/>)

Animals and Sound > Marine Mammal Communication

Individual-specific vocalizations

(<http://www.dosits.org/animals/useofsound/mammalscommunicate/individualspecific/>)

Group-specific vocalizations

(<http://www.dosits.org/animals/useofsound/mammalscommunicate/groupspecific/>)

Vocalizations associated with reproduction

(<http://www.dosits.org/animals/useofsound/mammalscommunicate/reproduction/>)

Sounds associated with aggression

(<http://www.dosits.org/animals/useofsound/mammalscommunicate/aggression/>)

Animals and Sound > How do marine mammals use or make sound when feeding?

(<http://www.dosits.org/animals/useofsound/howdomarineanimalsuseormakesoundwhenfeeding/>)

Animals and Sound > How do marine mammals use sound to navigate?

(<http://www.dosits.org/animals/useofsound/soundtonavigate/>)

Animals and Sound > Potential Effects > Behavioral Changes

<http://www.dosits.org/animals/effectsofsound/marinemammals/behavioralchanges/>