

# A study of Jet Ski effects on megafauna

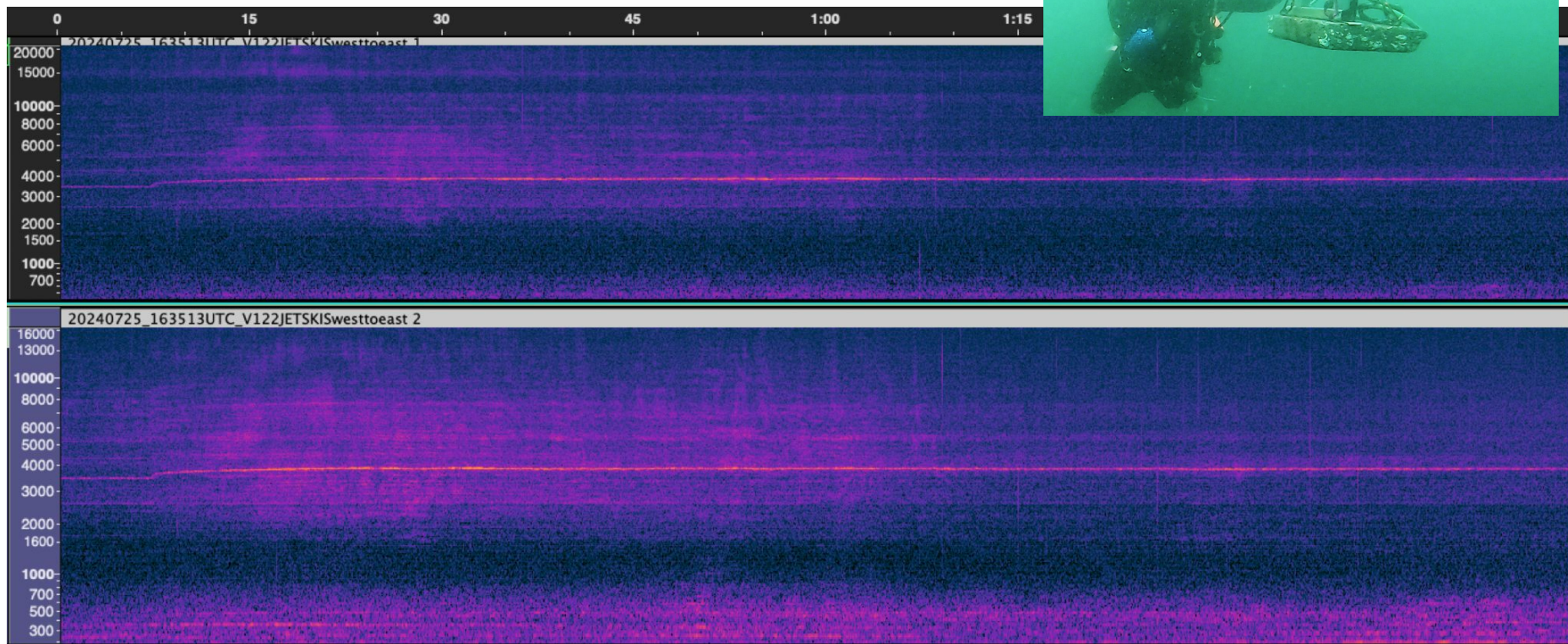
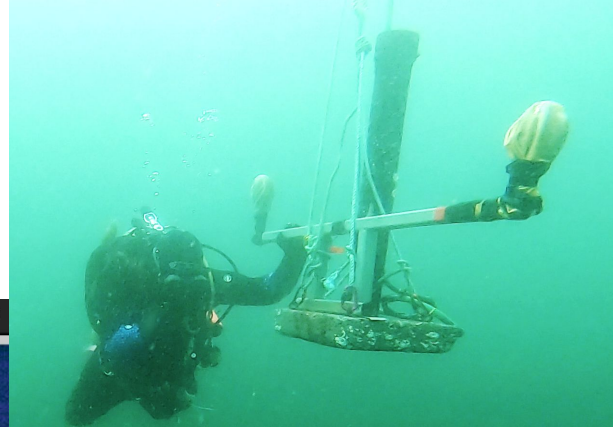
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Nominated at National research council  
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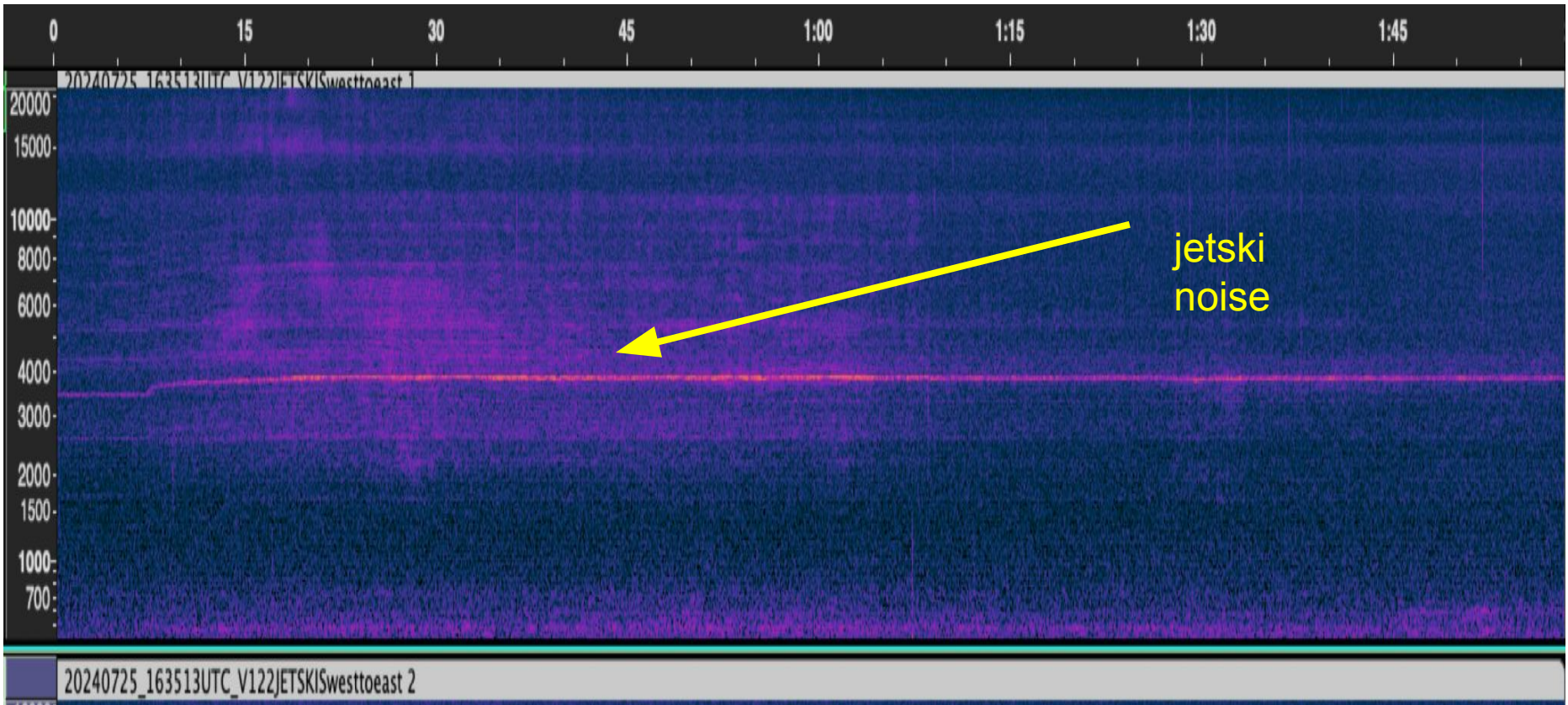
&

ORCALAB team  
Paul Spong, Helena Symonds, Jeremie Collado et al



Jet ski recorded in stereo  
20240725 in Blacknet Pass, Front of OrcaLab  
Hanson Isl.





dB re uPa<sup>2</sup>/Hz

2024 July 25th 16h35, SeaState = 2

90

69

60

54

45

10Hz

100Hz

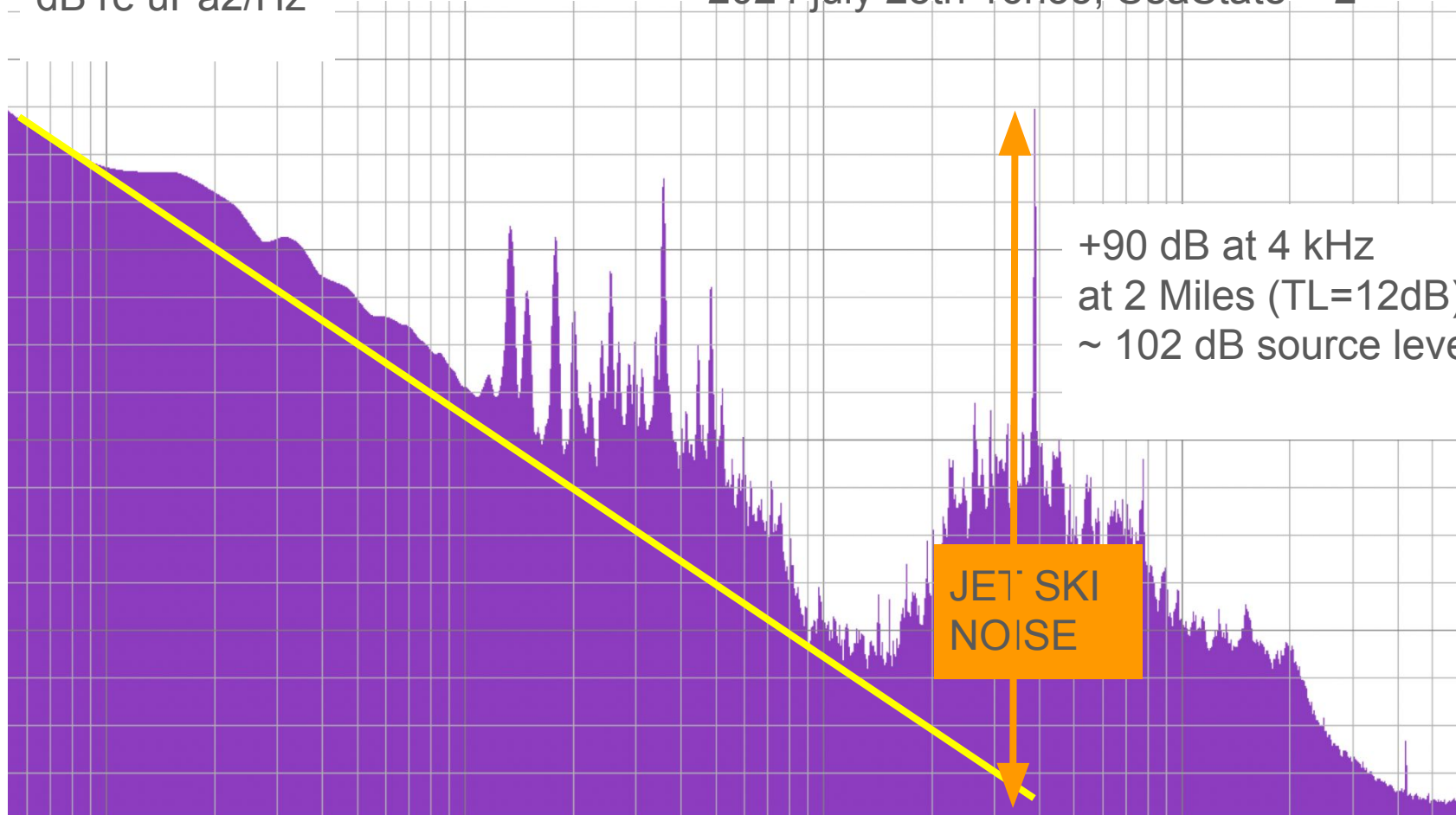
1000Hz

4 000Hz

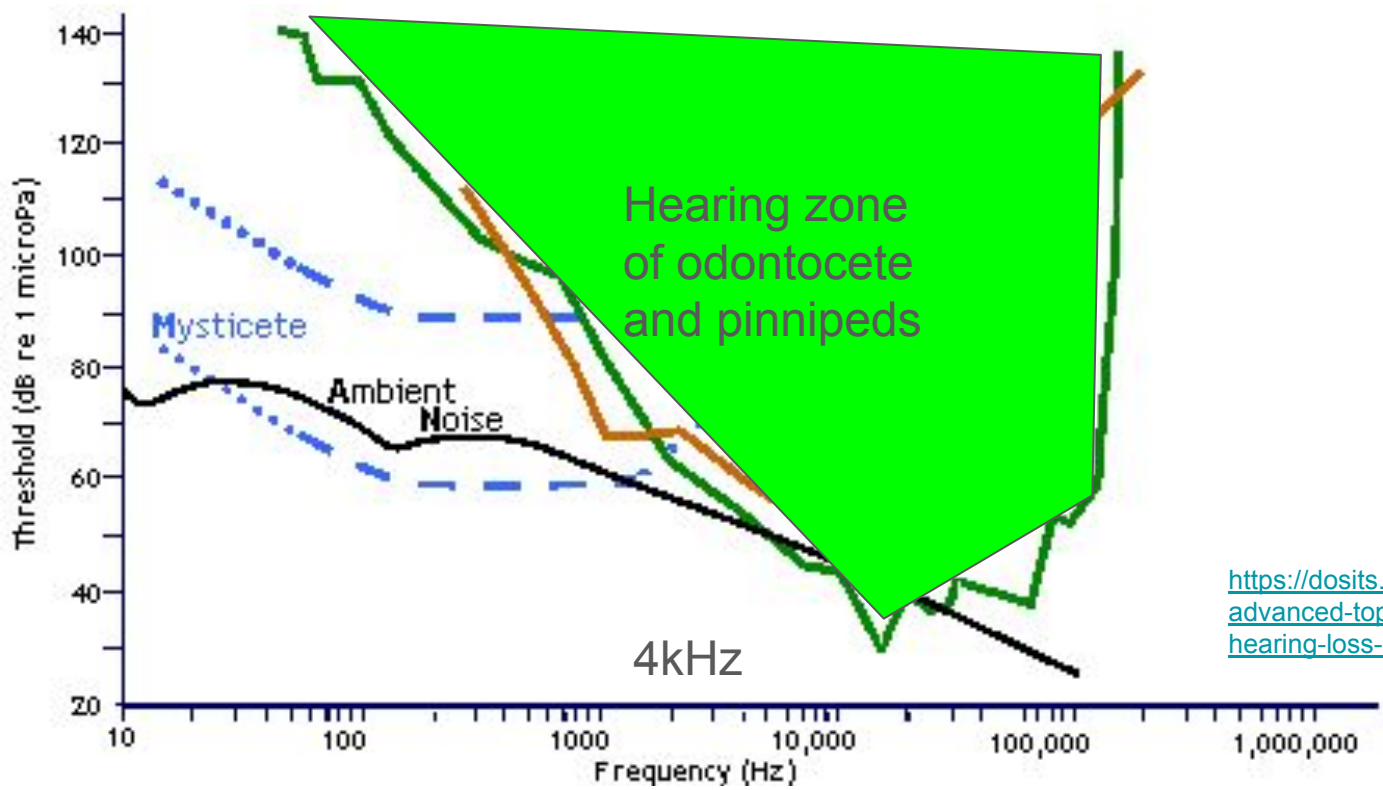
10 000Hz

+90 dB at 4 kHz  
at 2 Miles (TL=12dB)  
~ 102 dB source level

JET SKI  
NOISE



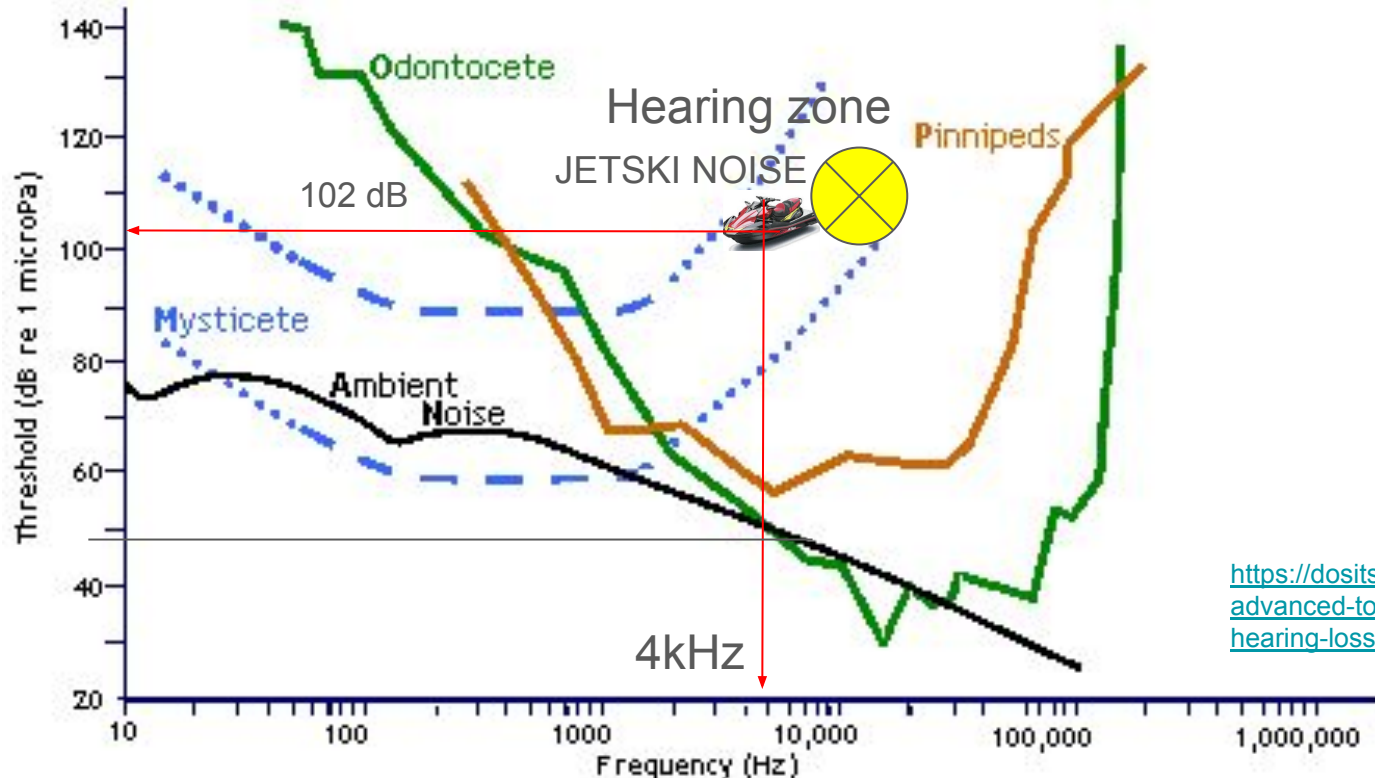
# Hearing in cetaceans and others



<https://dosits.org/animals/advanced-topics-animals/hearing-loss-advanced/>

Estimates of the hearing thresholds for some groups of marine mammals along with typical ambient noise levels. The y-axis (vertical) for the hearing thresholds is relative intensity in underwater dB. The y-axis for the ambient noise curve is spectral level in 1 Hertz frequency bands with units of dB re 1  $\mu\text{Pa}^2/\text{Hz}$ . The x-axis (horizontal) is the frequency of a sound on a logarithmic scale. (Figure is adapted from Office of Naval Research, 2001)

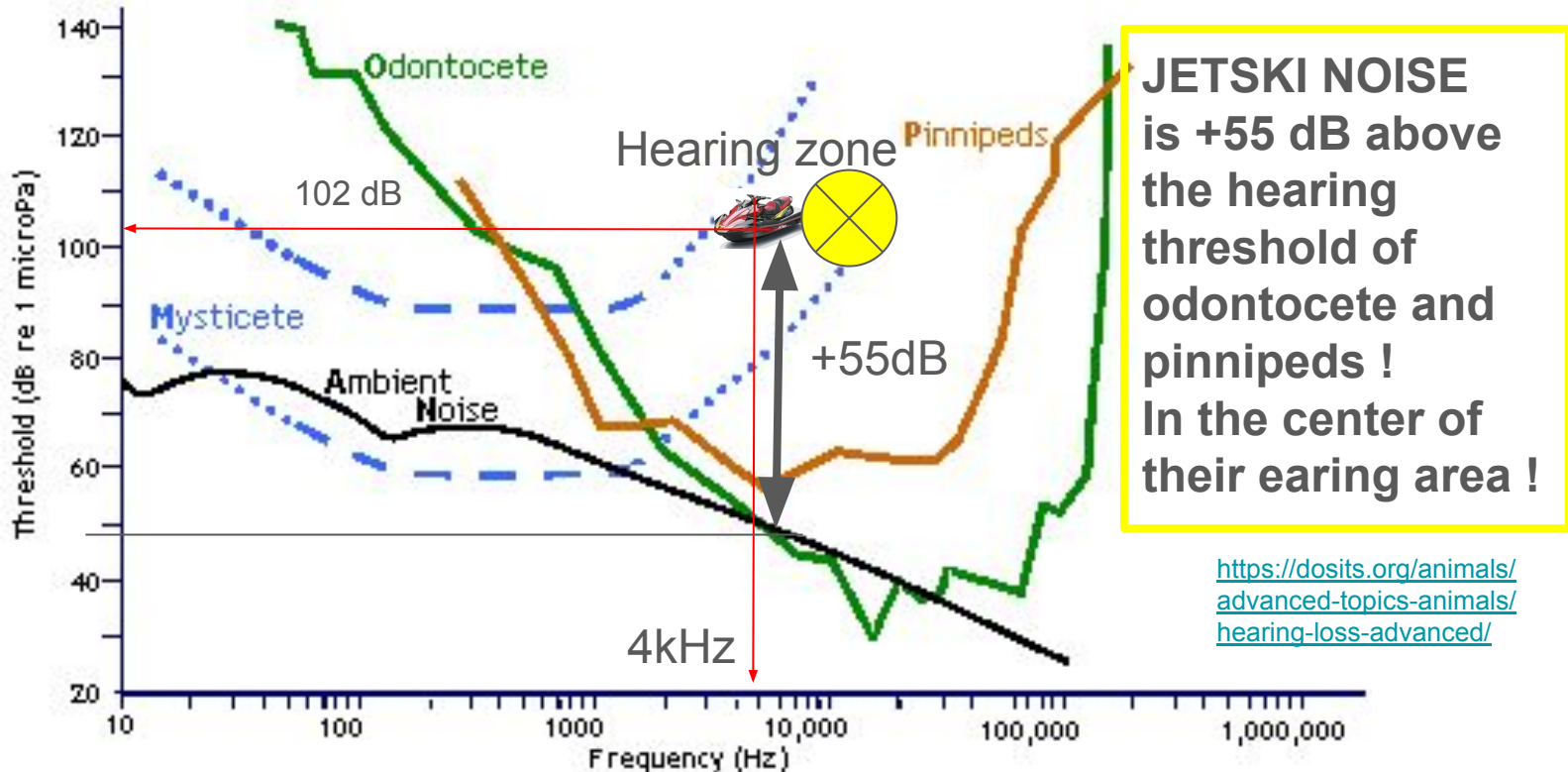
Hearing in cetaceans and others & this Jet ski noise : it is in the middle of the Hearing area of Odontocete and Pinnipeds, then it disturbs their audition, communication and foraging



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Then the effect of this jet ski noise is significant on population abundance of odontocete & pinnipeds & their Key Life Cycle Activities as it covers communication & foraging activities. It shall be avoided by principle of precaution towards these items :

<u>Species or Population Vulnerability</u> : Areas containing habitat important for the survival and recovery of threatened and declining species
<u>Distribution and Abundance</u> : Areas supporting at least one resident population, containing an important proportion of that species or population, that are occupied consistently
<u>Distribution and Abundance</u> : Areas with underlying qualities that support important concentrations of a species or population
<u>Key Life Cycle Activities</u> : Areas that are important for a species or population to mate, give birth, and/or care for young until weaning
<u>Key Life Cycle Activities</u> : Areas and conditions that provide an important nutritional base on which a species or population depends
<u>Key Life Cycle Activities</u> : Areas used for important migration or other movements, often connecting distinct life-cycle areas or the different parts of the year-round range of a non-migratory population
<u>Special Attributes</u> : Areas which sustain populations with important genetic, behavioural or ecologically distinctive characteristics
<u>Special Attributes</u> : Areas containing habitat that supports an important diversity of marine mammal species



# Annex

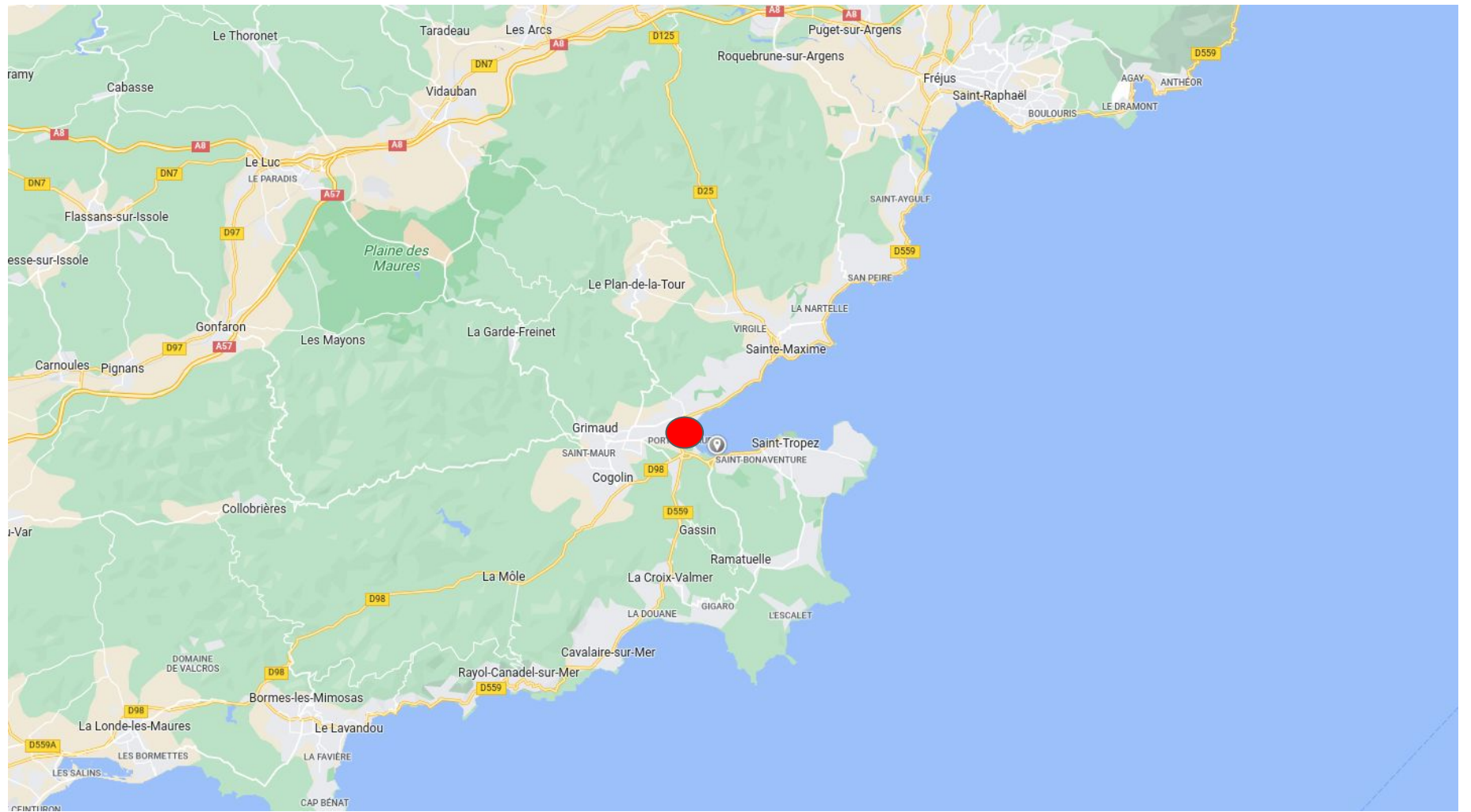
## Antropophony & JETSKI

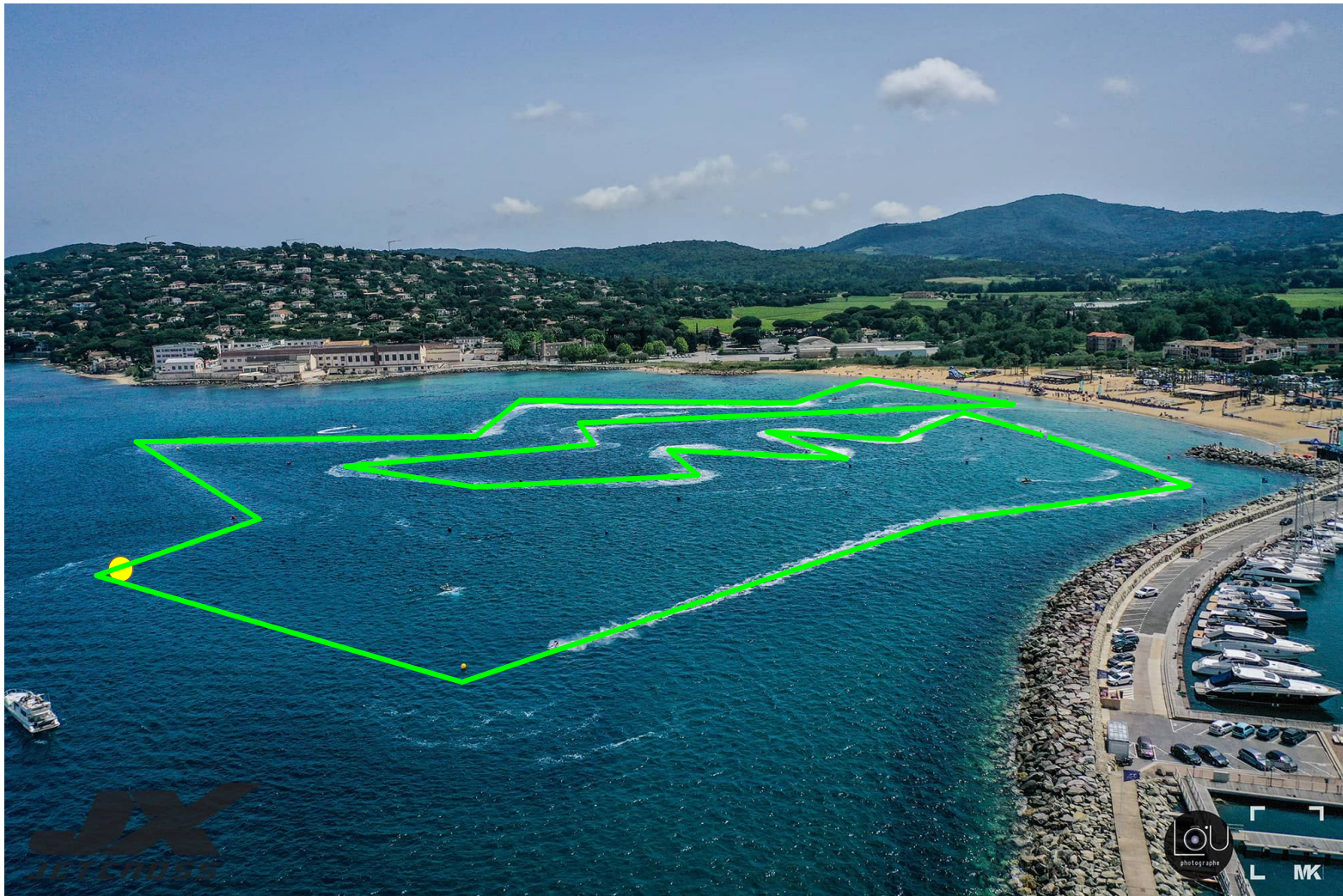
Previous study of Glotin's lab  
Recording and analysis of Jet ski cup in

St Tropez, France, 21th May 2022



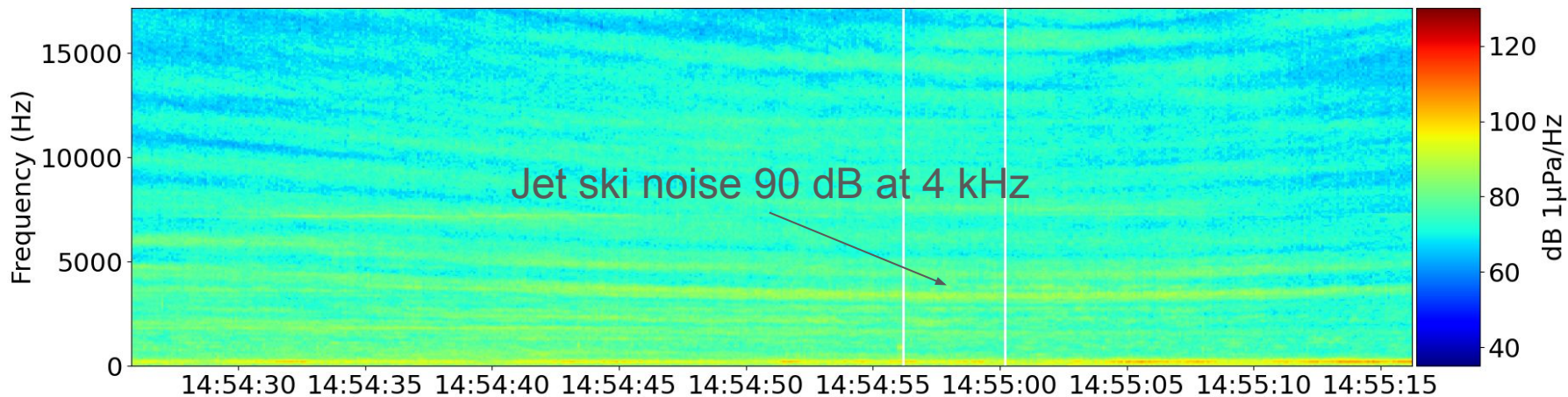
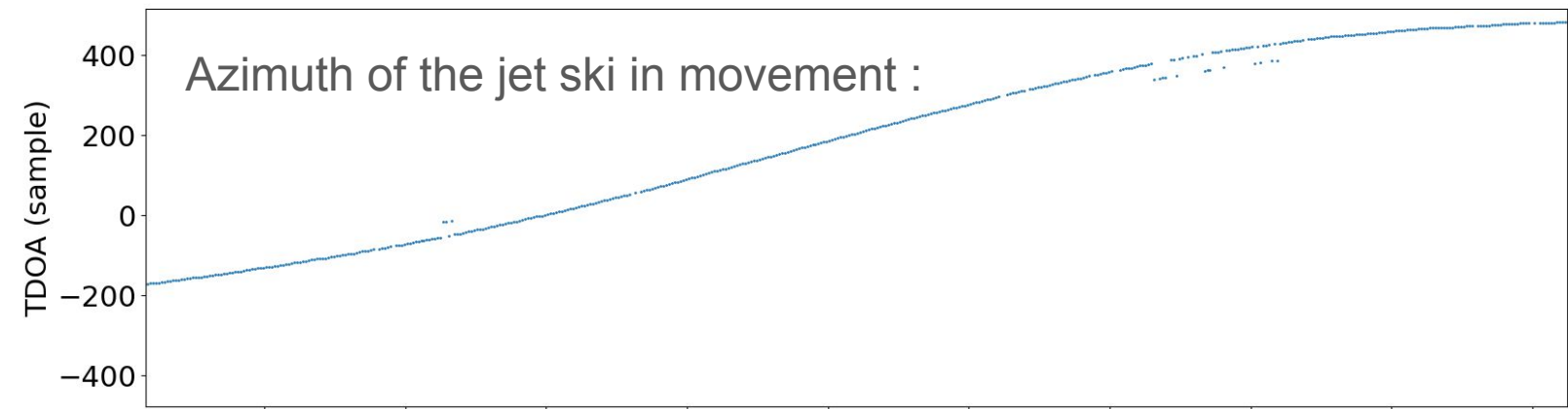
Présenté au Conseil National  
Scientifique Pelagos de 2022 (oct.)







Results shows also almost 100 dB re  $\mu\text{Pa}^2/\text{Hz}$  at 4 kHz



## Annex 2

Effect of AZIPOD noise  
on Orca communication

Study of the Ferry “Norwegian Jewel”  
and its “Azipop” engines  
recorded in 2022  
front of Orcalab in Blackney Pass

by Hervé Glotin

**Norwegian Jewel** is powered by a diesel-electric propulsion system comprising five MAN - B&W 12V48/60B diesel engines providing power to two Azipod thrusters. The system is variably rated at 75,000 kilowatts (100,000 hp), and 39,000 kW (52,000 hp). This gives the cruise ship a maximum speed of 25.6 knots (47.4 km/h; 29.5 mph).

**Laid down:** 28 October 2003

**Launched:** 12 June 2005

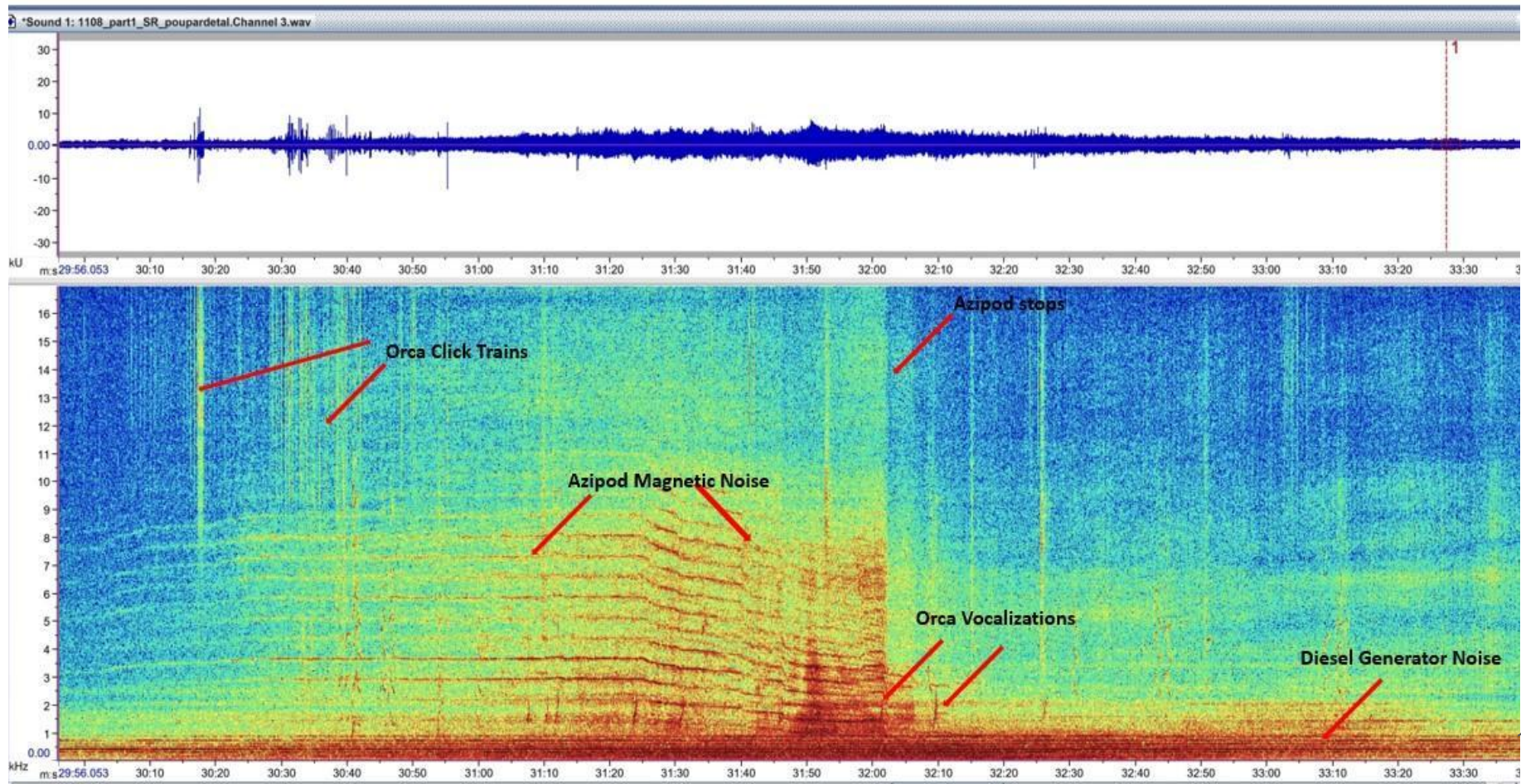
**Length:** 294.13 m (965 ft 0 in) *oa*, 263.5 m (864 ft 6 in) *pp*

**Speed:** 25.6 knots (47.4 km/h; 29.5 mph)

*The Norwegian Jewel appeared to be following existing Canadian regulations regarding speed in waters known to have Orcas present.*

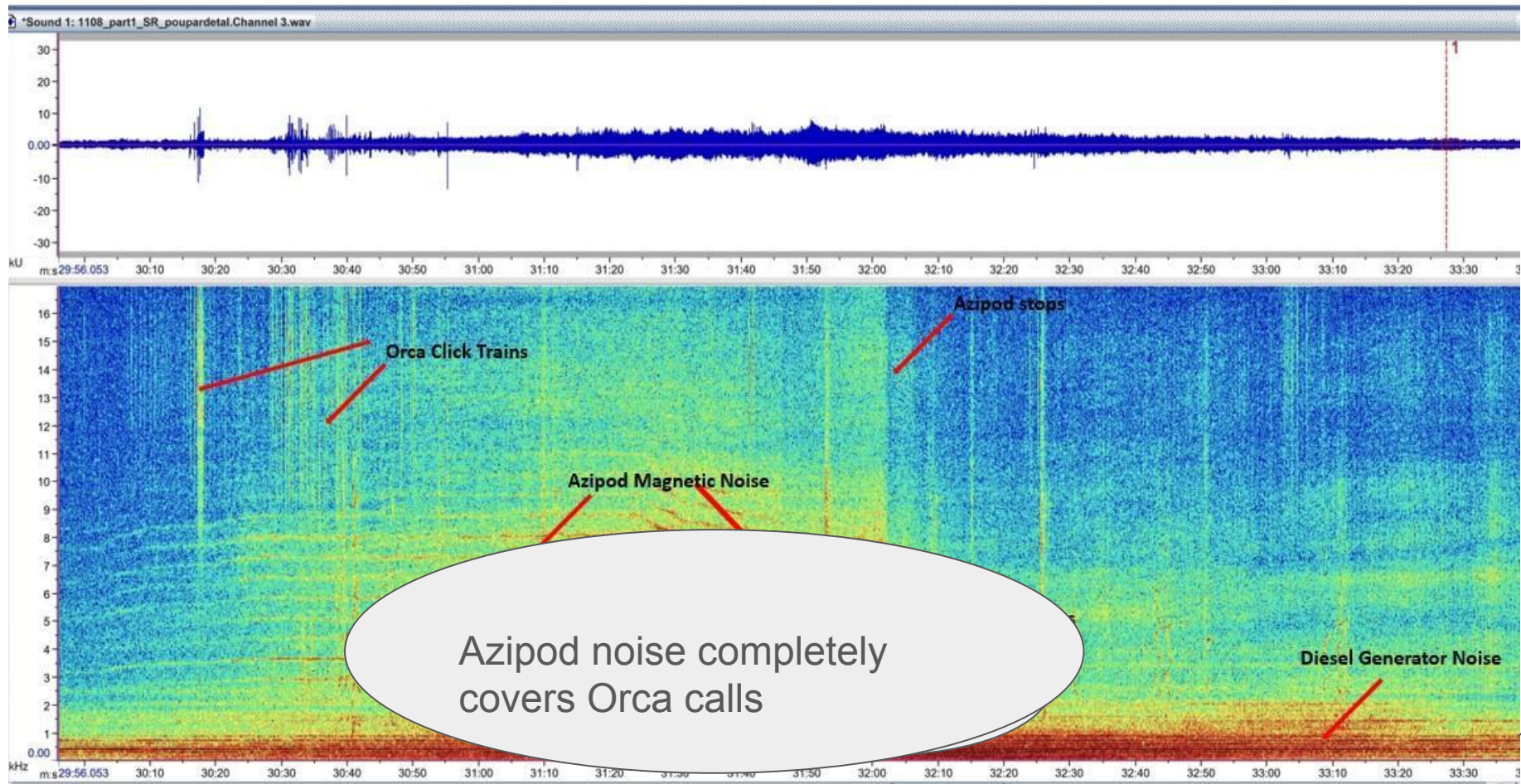


Underwater Radiated Noise with Orcas Present





Underwater Radiated Noise with Orcas Present



# Annex noise level at sea (From Wentz 1985)

