



# Onderwatergeluid

JOINT MONITORING PROGRAMME FOR AMBIENT NOISE IN THE NORTH SEA

IMO What's next?  
18 juni 2019



# Overzicht

- ▶ Onderwatergeluid
  - ▶ Algemeen
  - ▶ Scheepvaartgeluid
- ▶ Jomopans project
- ▶ Internationaal perspectief
  - ▶ IMO
  - ▶ ECHO (Enhancing Cetacean Habitat and Observation )

# Natuurlijke bronnen van onderwatergeluid

► Regen



► Onweer



► Langoest



► Ombervis



► Griend



Langoest



Griend



Lightning



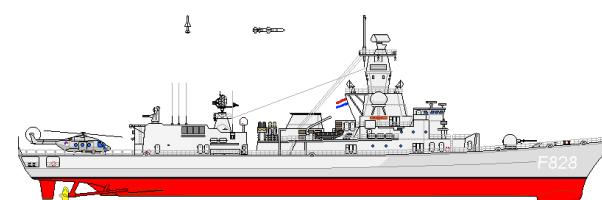
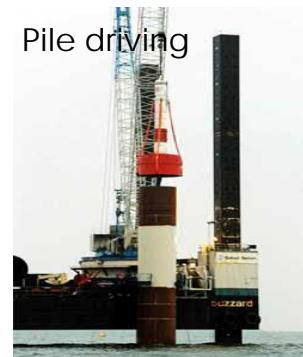
Rain @ sea



Ombervis

# Menselijke bronnen van onderwatergeluid

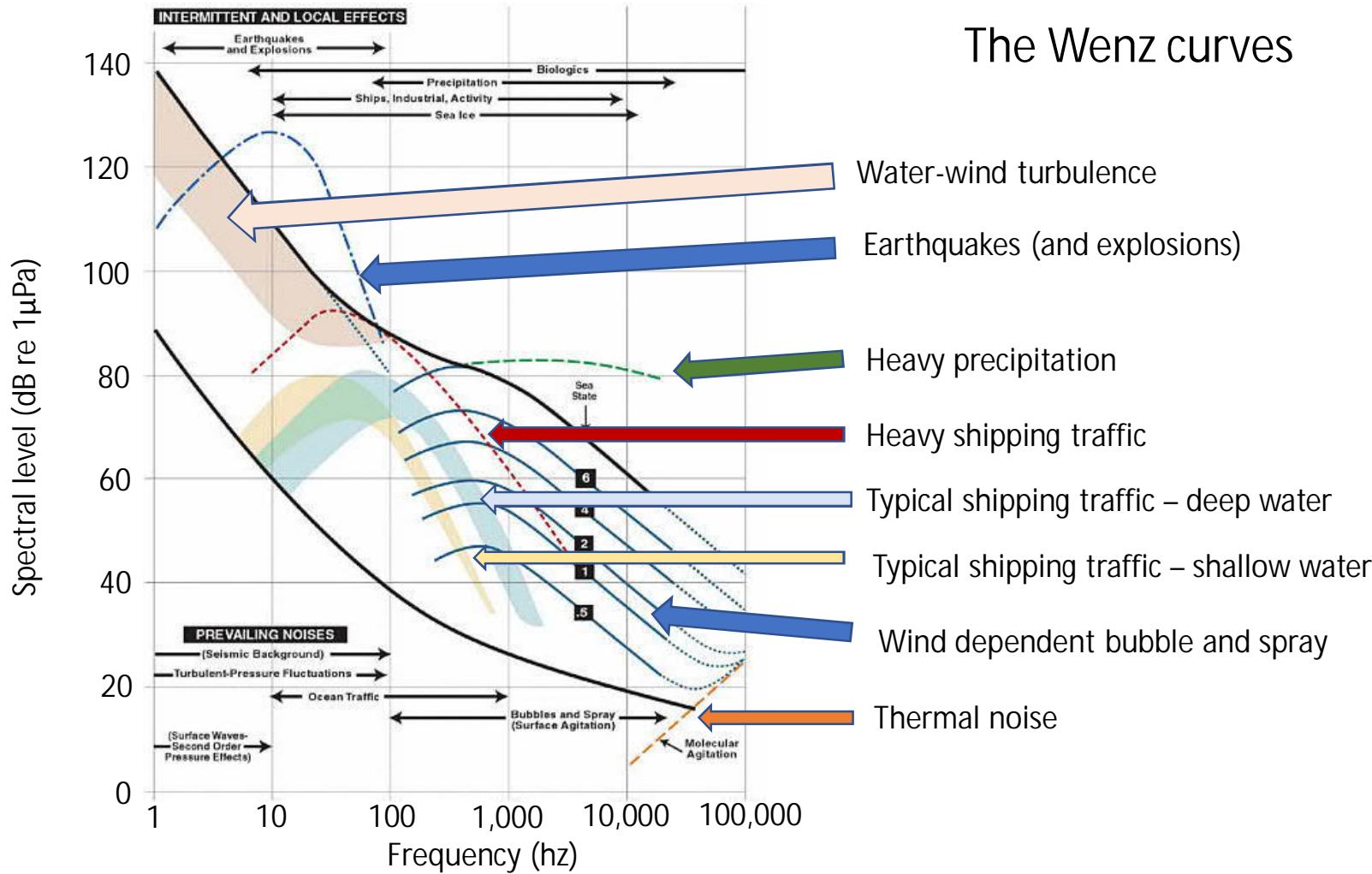
- ▶ Heien
- ▶ Seismische surveys 
- ▶ Scheepvaart 
- ▶ Sonar 
- ▶ Explosies



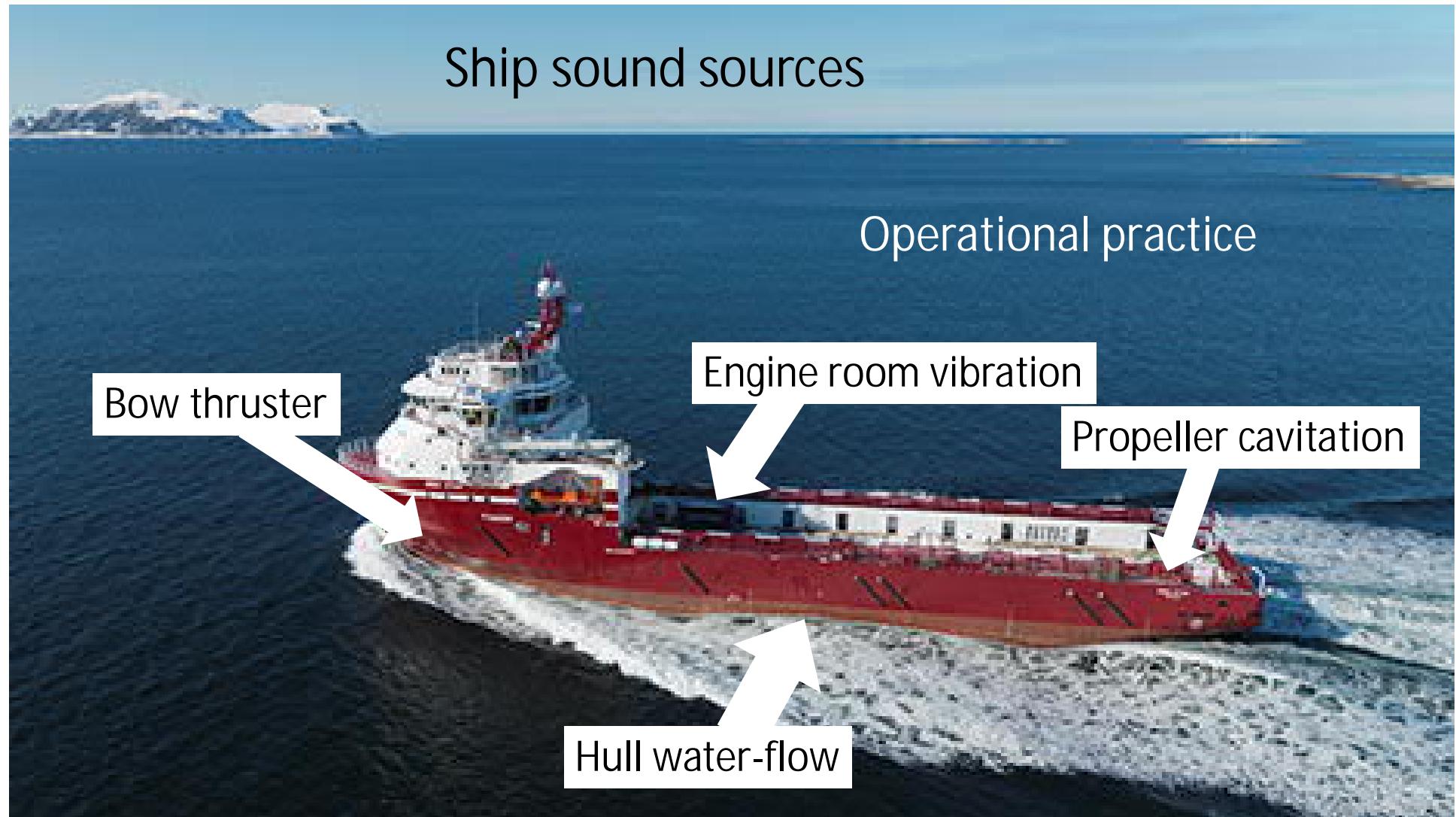
Netherlands, Karel Doorman Class  
(Ministries & Vossie)

# Effecten van geluid op dieren

- ▶ Gehoorschade
  - ▶ Permanent
  - ▶ Tijdelijk
- ▶ Vermijding
- ▶ Verstoring communicatie ('masking')



# Ship sound sources



# JOMOPANS – Project Presentation

- ▶ Funding: EU - Interreg North Sea Region

- ▶ Priority 3



- Sustainable North Sea Region: Protecting against climate change and preserving the environment

- ▶ Duration: Jan 2018 – Dec 2020

- ▶ Budget: € 3.5 Million

- ▶ Consortium: 11 partners

- ▶ Project Coordinator:  
Rijkswaterstaat, The Netherlands

# Kaderrichtlijn Mariene Strategie (KRM)

- ▶ Goede Milieu Toestand(GMT) in de EU mariene wateren in 2020
- ▶ Ecosysteem benadering
  - ▶ Milieubescherming
  - ▶ Duurzaam gebruik
- ▶ Regionale samenwerking



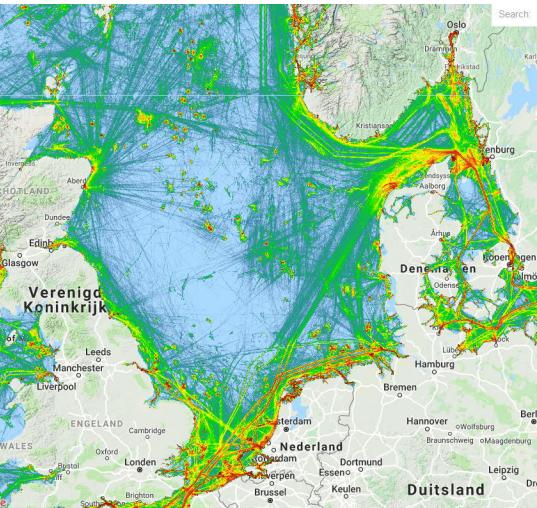
# Project Objectives & outputs

- ▶ Aim: to develop a framework for a fully operational joint monitoring programme for ambient noise in the North Sea
- ▶ Outputs: tools for managers, planners and other stakeholders
  - ▶ assessment of effects of ambient noise the environmental status of the North Sea
  - ▶ evaluation of measures

# PARTNERS

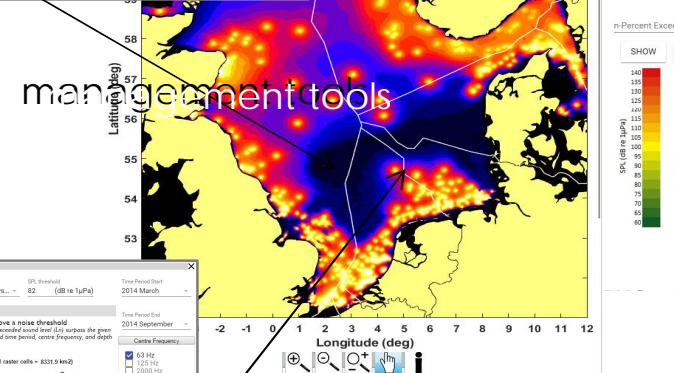
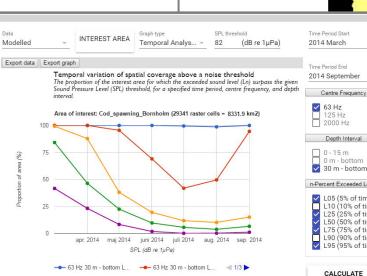
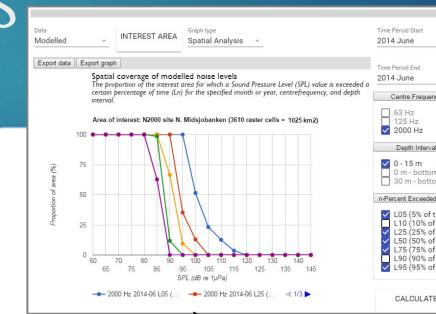
-  ► Rijkswaterstaat - NL(lead)
-  ► Centre for Environment, Fisheries & Aquaculture Science (Cefas) – UK
-  ► Federal Maritime and Hydrographic Agency – DE
-  ► TNO – NL
-  ► Aarhus University – DK
-  ► Swedish Defence Research Agency – SE
-  ► Royal Belgian Institute for Natural Sciences – BE
-  ► Marine Scotland – UK
-  ► Norwegian Defence Research Establishment - NO
-  ► National Physical Laboratory – UK
-  ► Institute of Marine Research - NO

# Elements of Jomopans



measurements

modelling



management tools

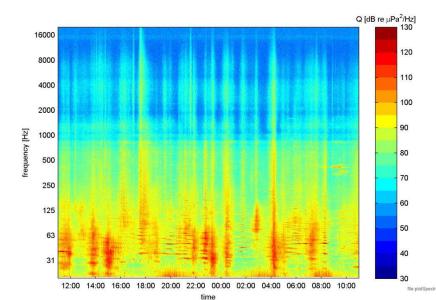
Impression based on BIAS  
Soundscape planning tool.

**Interreg**  
North Sea Region  
**Jomopans**

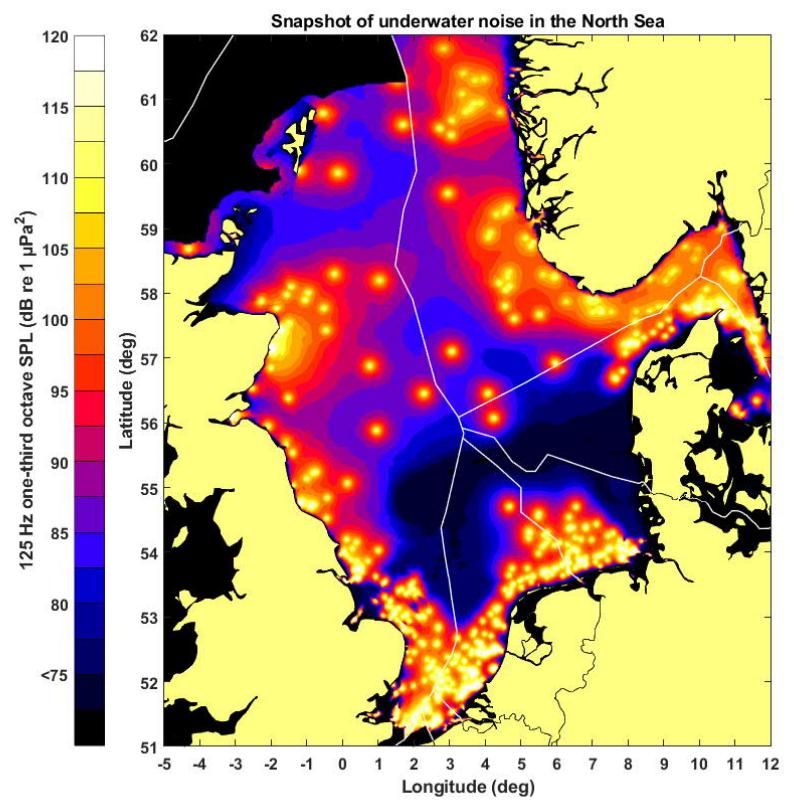
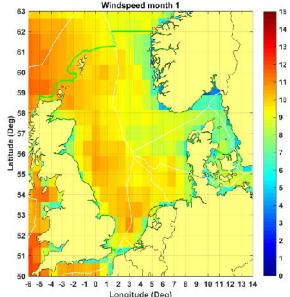
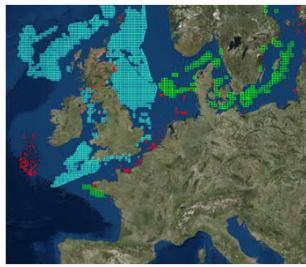
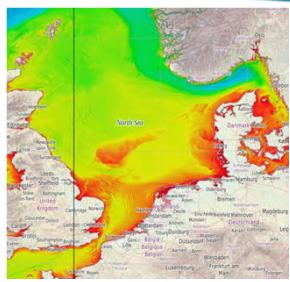
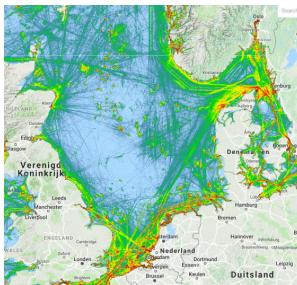


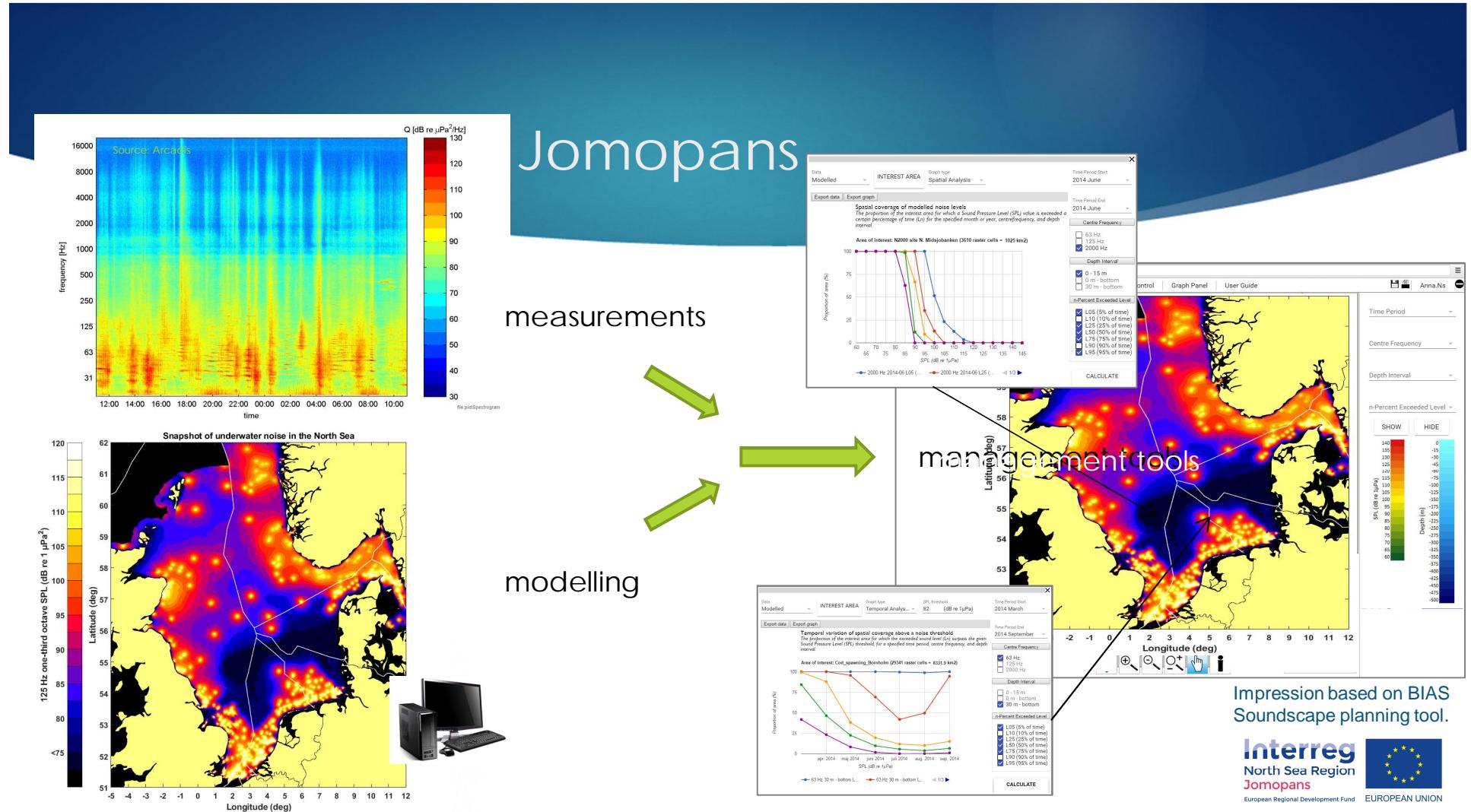
European Regional Development Fund

# Metingen Schotland



# Numerieke modellering







INTERNATIONAL  
MARITIME  
ORGANIZATION

E

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Telephone: +44 (0)20 7735 7611      Fax: +44 (0)20 7587 3210

MEPC.1/Circ.833  
7 April 2014

## GUIDELINES FOR THE REDUCTION OF UNDERWATER NOISE FROM COMMERCIAL SHIPPING TO ADDRESS ADVERSE IMPACTS ON MARINE LIFE

1 The Marine Environment Protection Committee, at its sixty-sixth session (31 March to 4 April 2014), with a view to providing guidance on the reduction of underwater noise from commercial shipping, and following a recommendation made by the Sub-Committee on Ship Design and Equipment, at its fifty-seventh session, approved the annexed *Guidelines for the reduction of underwater noise from commercial shipping to address adverse impacts on marine life*.

2 Member Governments are invited to use the annexed Guidelines from 7 April 2014 and to bring them to the attention of all parties concerned.

**QUIETING SHIPS TO PROTECT THE MARINE ENVIRONMENT TECHNICAL WORKSHOP**

THE GOVERNMENT OF CANADA WILL BE HOSTING A TECHNICAL WORKSHOP TO SHARE KNOWLEDGE AND ADVANCE WORK ON QUIET SHIP DESIGNS AND TECHNOLOGIES TO HELP PROTECT THE MARINE ENVIRONMENT.

**WHEN:** JANUARY 30 TO FEBRUARY 1, 2019

**WHERE:** International Maritime Organization (IMO) headquarters, 4 Albert Embankment, London, United Kingdom

**WHO:** Underwater noise experts, naval architects, national policy makers, marine engineers, ship owners and operators, shipyards, industry associations, researchers and academics.

For more background information please consult **MEPC 73/18/4**

**FOR INQUIRIES:** Please contact [TC.QuietShips-Naviressilencieux.TC@tc.gc.ca](mailto:TC.QuietShips-Naviressilencieux.TC@tc.gc.ca)

**RSVP:** <https://en.xing-events.com/FUPYYKX>

# Modelling noise exposure reductions from vessels meeting prescribed emission thresholds



David Hannay

Alex MacGillivray, Heloise Frouin-Mouy

Zizheng Li, Jennifer Vladichuk, Zahra Alavizadeh

JASCO Applied Sciences

Quieting Ships to Protect the Marine Environment

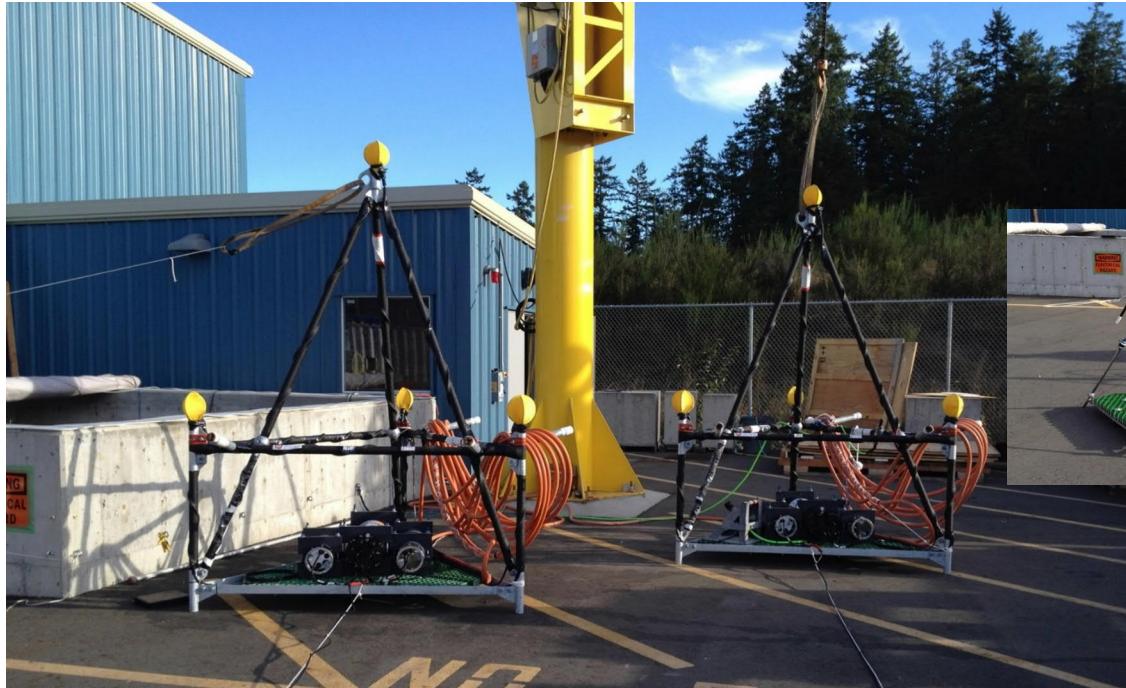
London, U.K. January 31, 2019



Transport  
Canada



## Port of Vancouver's ECHO Program Underwater Listening Station arrays



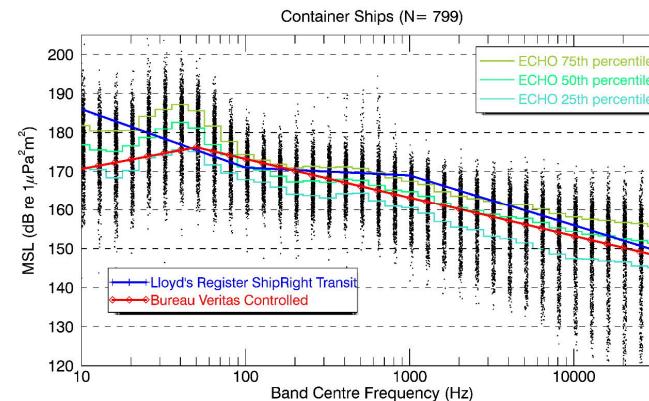
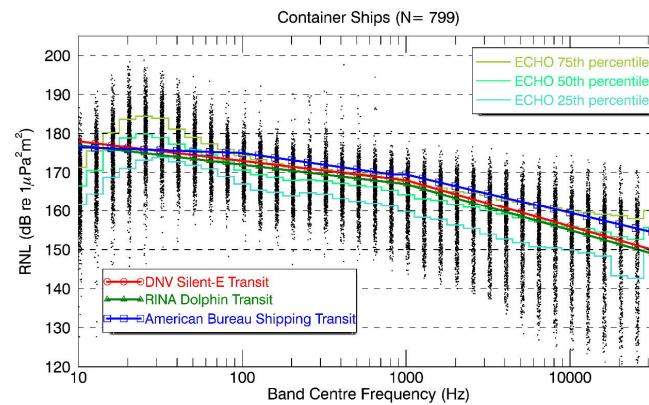
Projectors for daily  
Calibration signal  
broadcast



Underwater Listening Station (ULS) tetrahedral Arrays

# Large database of systematic vessel noise measurements to ANSI S12.64

Vessel Class	# of measurements
Ferries	3142
Container Ships	799
Tankers	292
Bulkers	1728
Vehicle Carriers	202
Tugs	582
Cruise Ships	81



RNL=Radiated Noise Level, MSL=Monopole Source Level

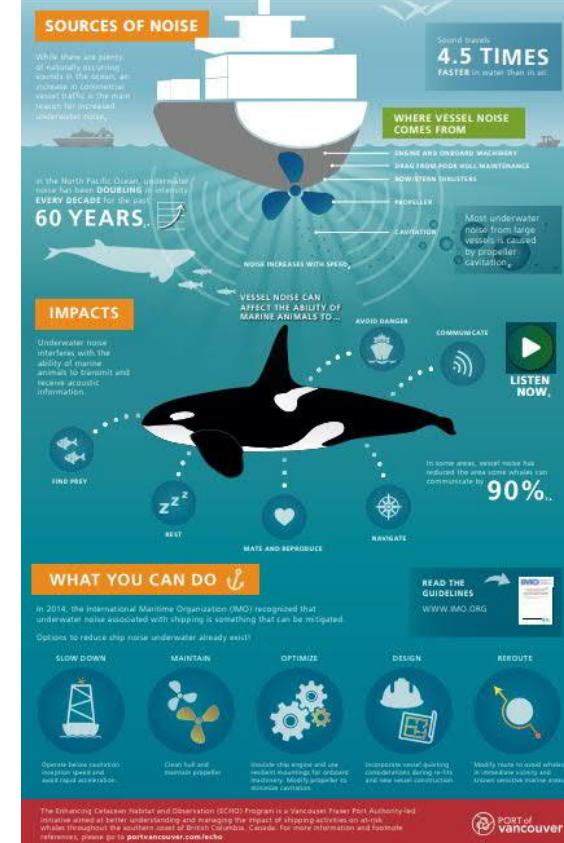
Bron: Dick Brus, lenW



## IMO mogelijke nieuwe maatregelen 8 geluid

- > 2014 IMO richtlijn: GUIDELINES FOR THE REDUCTION OF UNDERWATER NOISE FROM COMMERCIAL SHIPPING TO ADDRESS ADVERSE IMPACTS ON MARINE LIFE
- > Afgelopen haren IMO documenten met recente studies geluid
- > 2019 Februari IMO Workshop geluid met wereldwijde experts, 100 deelnemers
  - Zeevaart geluid overstemt andere geluiden
  - Zeevaartgeluid verstoort communicatie tussen zoogdieren.
  - Geluid versterkt stress level zoogdieren het meest, maar ook vissen
- > Eind 2019 organiseert Canada een bijeenkomst voor beleidmakers over zeevaart geluid
- > Toekomst: verplichte regelgeving?

### THE EFFECTS OF VESSEL UNDERWATER NOISE ON WHALES AND WHAT MARINERS CAN DO ABOUT IT



# Vragen?



Photo: Peter Hilz