

Interreg
North Sea Region
Jomopans



European Regional Development Fund

EUROPEAN UNION

JOMOPANS

JOINT MONITORING PROGRAMME FOR AMBIENT NOISE IN THE NORTH SEA

London, 8 October 2019

AARHUS UNIVERSITY



Cefas

FFI Forsvarets
forskningsinstitutt
Norwegian Defence Research Establishment



Scottish Government
Riaghaidh na h-Alba
gov.scot
marinescotland



Rijkswaterstaat
Ministerie van Infrastructuur en Waterstaat

NPL
National Physical Laboratory

Institut royal des
Sciences naturelles
de Belgique
museum



TNO





Questions of marine managers

- ▶ Is there a problem?
- ▶ Where is the problem?
- ▶ What is causing the problem?
- ▶ Will measure X solve the problem?
- ▶ Will activity Y create a problem?












Questions of marine managers

- ▶ Is there a problem?
 - ▶ What is the noise level?
- ▶ Where is the problem?
 - ▶ Can you make a map?
- ▶ What is causing the problem?
 - ▶ What are the relative contributions of sources?
- ▶ Will measure X solve the problem?
 - ▶ Can we design measure X?
- ▶ Will activity Y create a problem?
 - ▶ Can we allow activity Y?

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

Jomopans

-  ► 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

Outline

- ▶ Background for Jomopans
- ▶ Project activities
- ▶ Connecting to the community
- ▶ Plans for second half and beyond
- ▶ Presentation of Policy Brief

Marine Strategy Framework Directive

- ▶ Good Environmental Status (GES) in EU marine waters in 2020
- ▶ Ecosystem approach
 - ▶ Environmental protection
 - ▶ Sustainable use
- ▶ Regional co-operation



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*Protecting and conserving the
North-East Atlantic and its resources*



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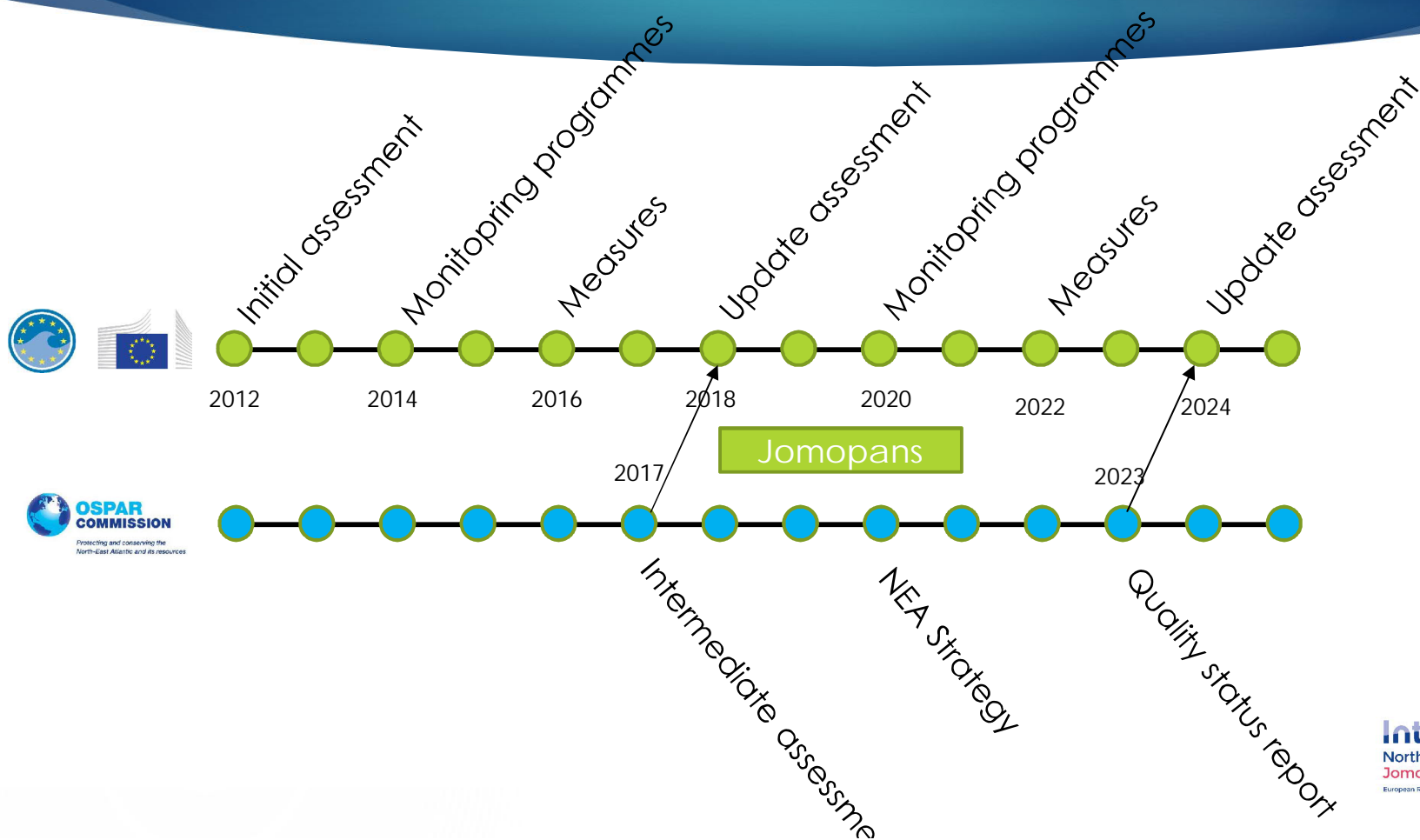
Descriptors

1. Biodiversity
2. Non-indigenous species
3. Commercial fish
4. Marine food webs
5. Eutrophication
6. Sea-floor integrity
7. Hydrographical conditions
8. Contaminants
9. Contaminants in fish
10. Marine litter
11. Energy, including underwater noise

Criteria

- Impulsive noise
- Continuous noise

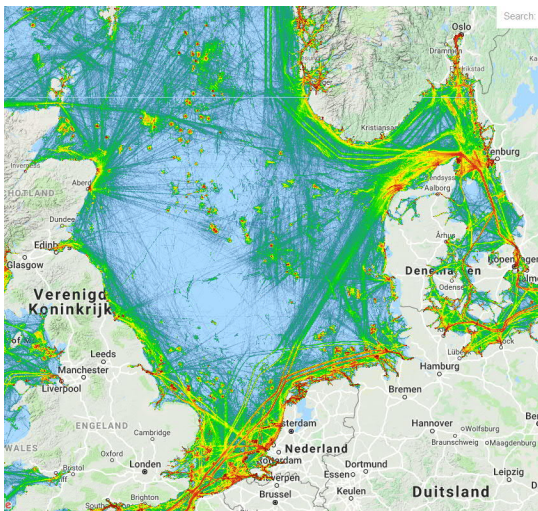
Time lines



TG Noise Guidance documents

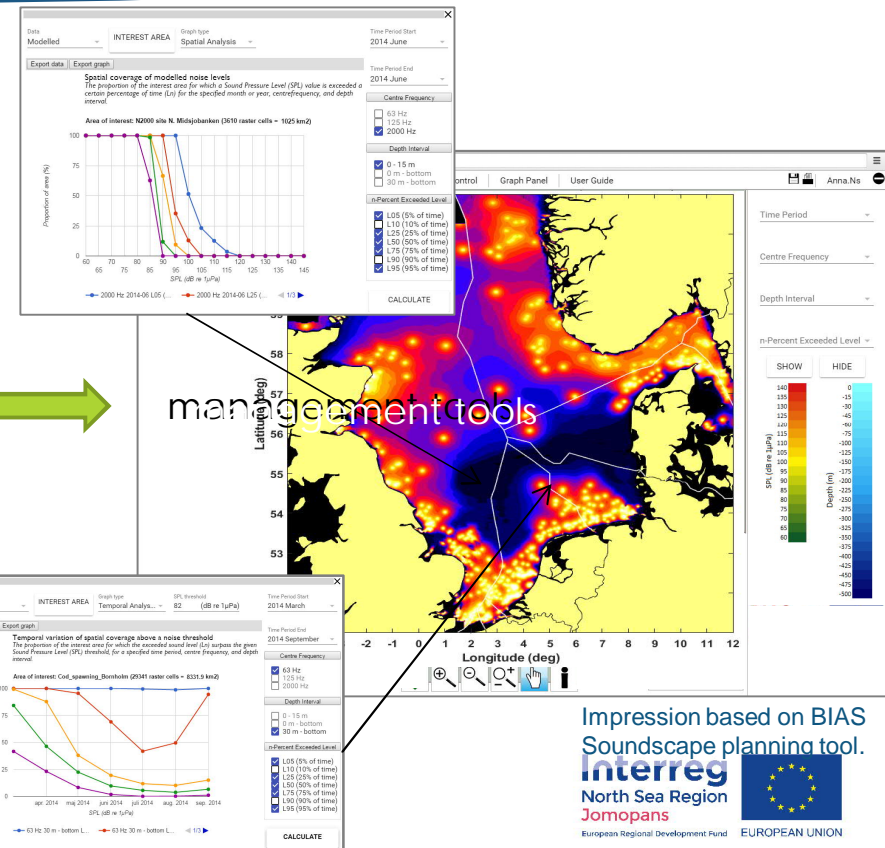


Elements of Jomopans

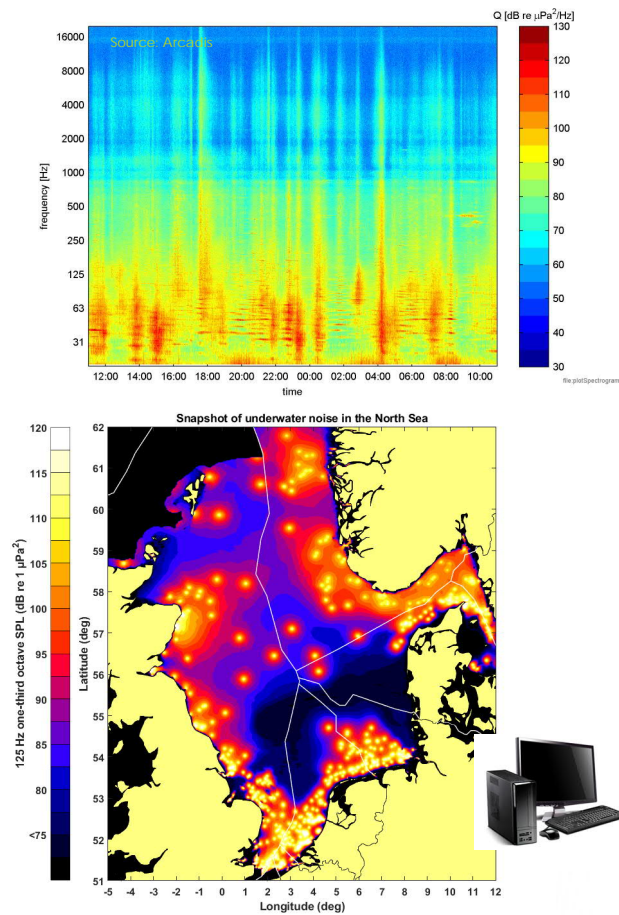


measurements

modelling

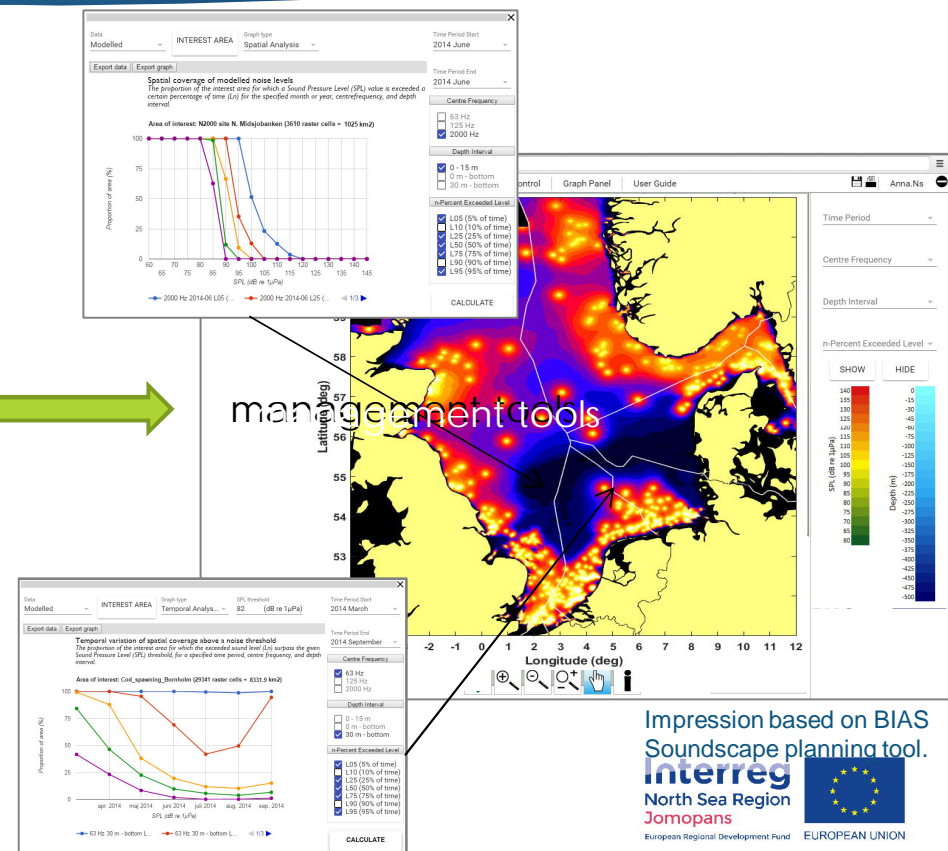


Elements of Jomopans



measurements

modelling



management tools

Impression based on BIAS
Soundscape planning tool.
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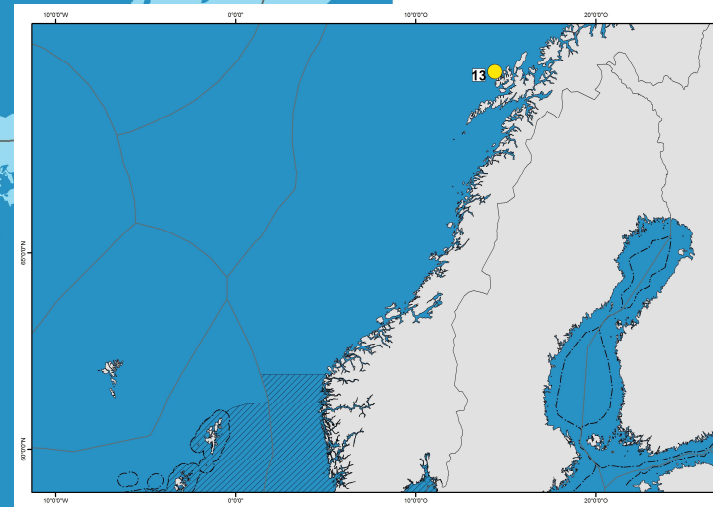


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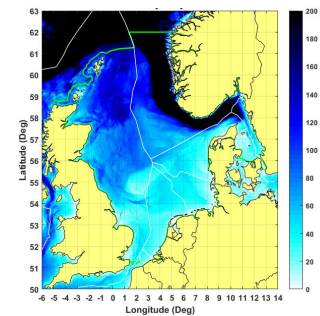


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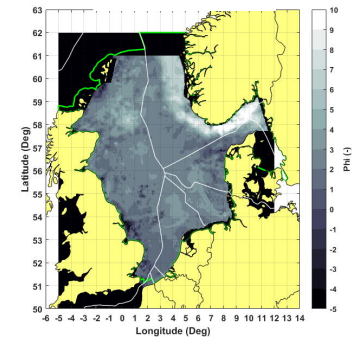
Models and data – SHIPS & WIND

- ▶ Bathymetry and geology
 - ▶ European Marine Observation and Data Network (EMODnet)
- ▶ Wind, waves and sound speed profiles
 - ▶ European Union COPERNICUS marine environment monitoring service
- ▶ Acoustic propagation models
 - ▶ Normal modes, Parabolic Equation, Rays, ...
- ▶ Shipping data (from AIS)
- ▶ Empirical ship and wind source models
- ▶ Statistics & uncertainty

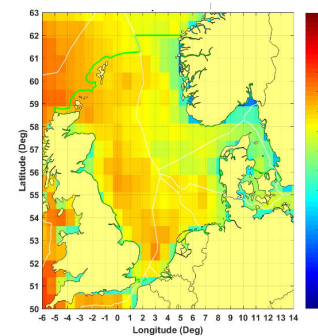
bathymetry



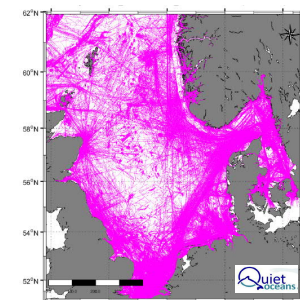
sediment



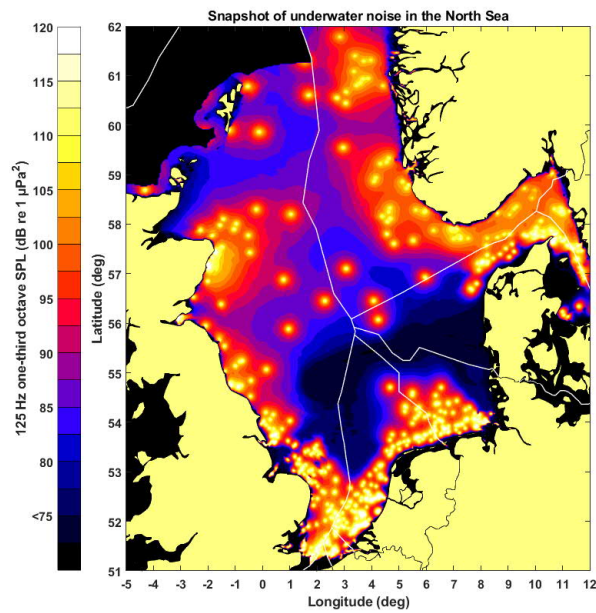
wind



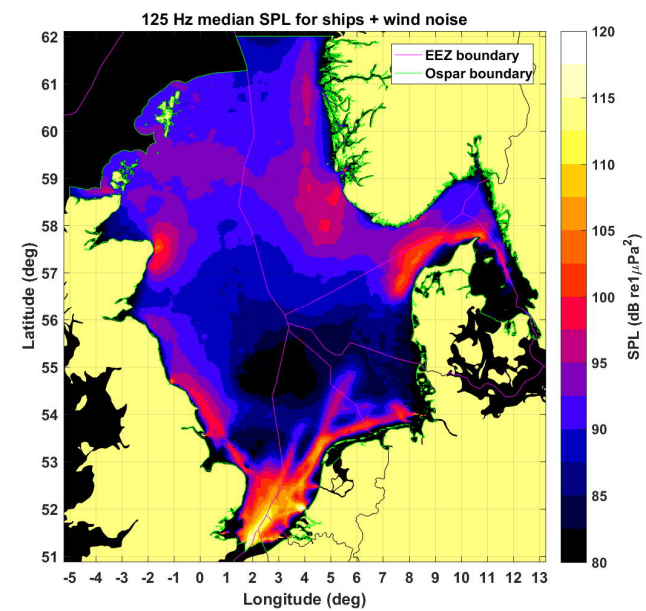
ships (AIS)



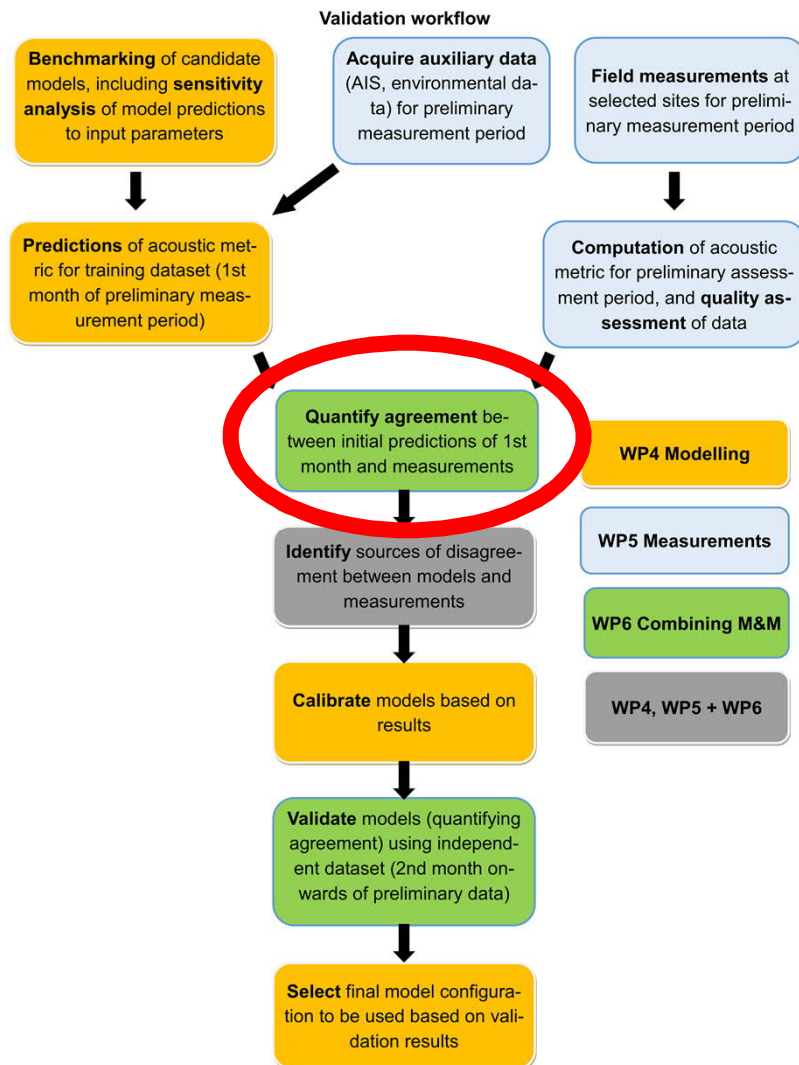
Modelled data



Snapshot 1-1-2019



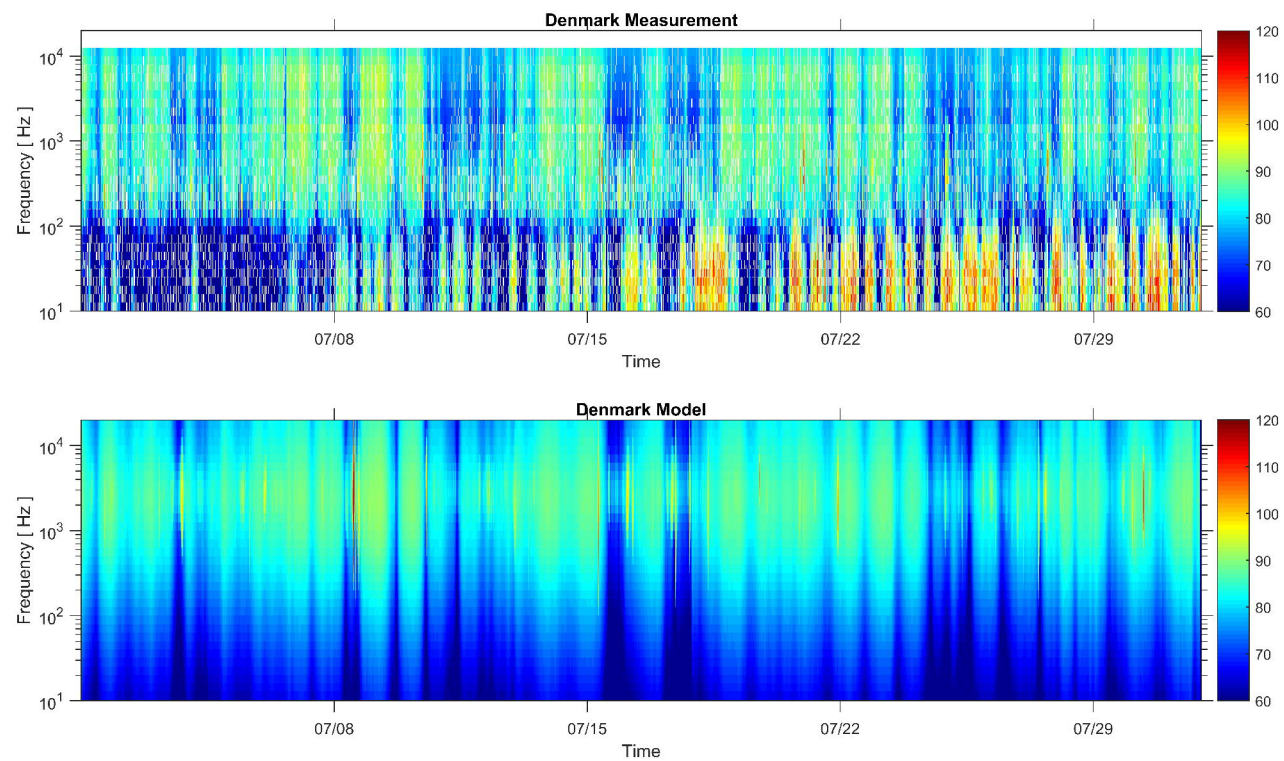
One month Jan-2019



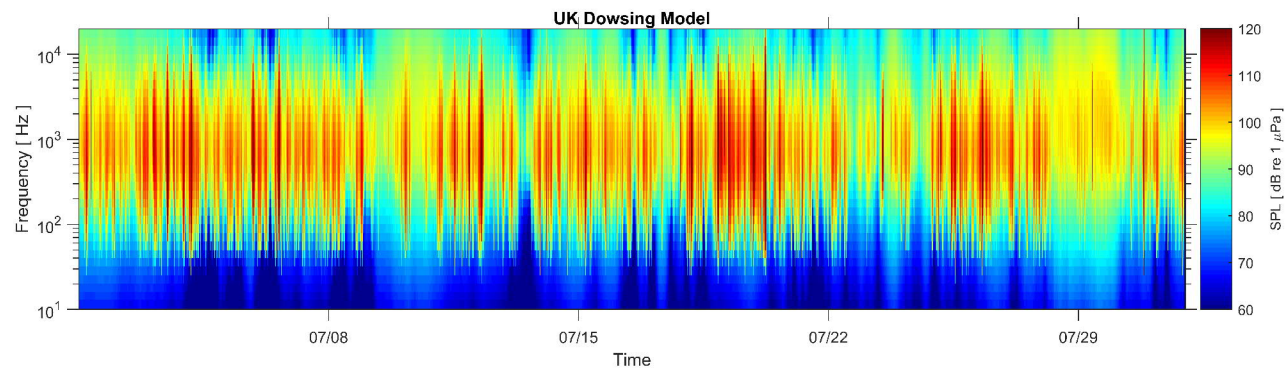
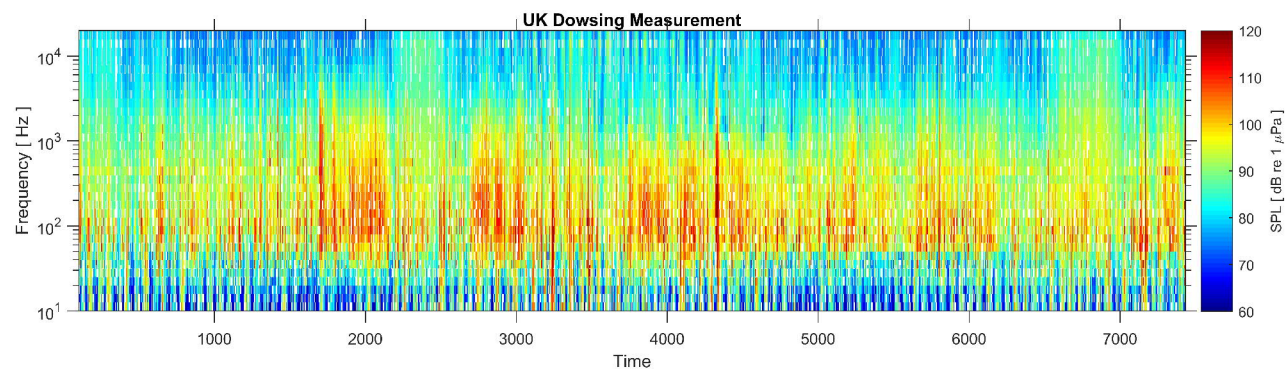
Validation workflow

- ▶ 2018 measurement data are presently available for 4 sites (on the FTP) – Sweden Vinga, Denmark, Netherlands Texel, and UK Dowsing
- ▶ We analysed the dB error (total and absolute) across the percentile range to assess goodness of fit and identify consistent errors

Denmark

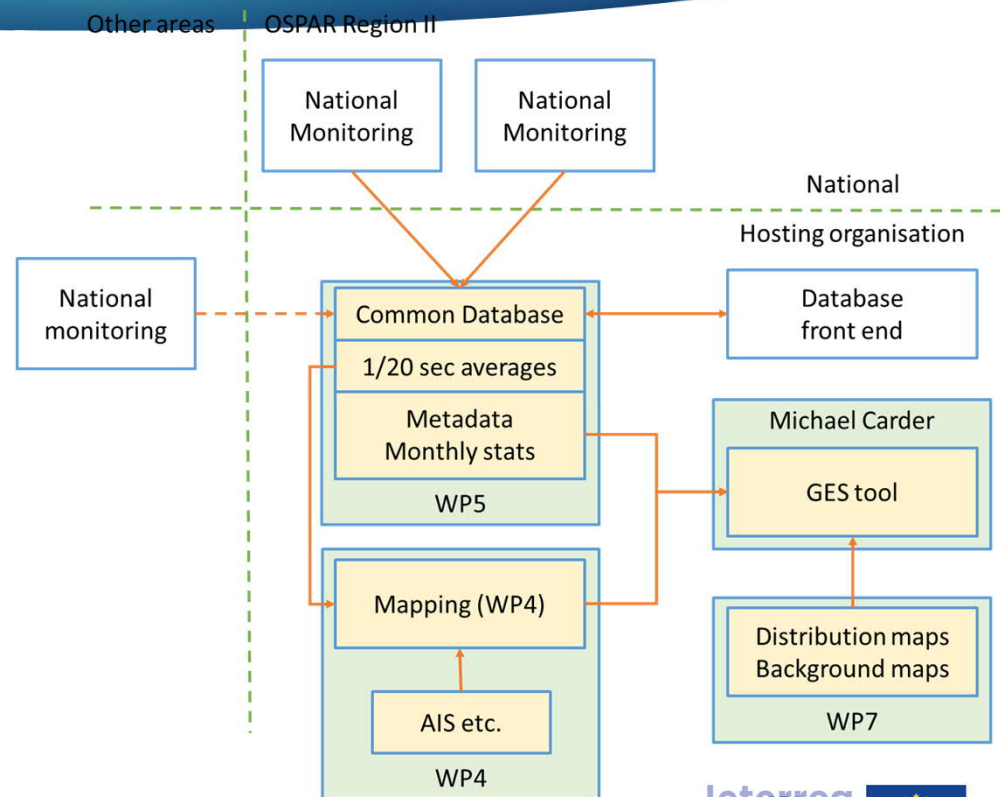


UK Dowsing



GES Tool structure and environment

- Presentation Jakob Tougaard



Policy Advisory Board

- ▶ Support letters for Jomopans
- ▶ Policy makers, marine management
- ▶ International organisations
- ▶ Advise on implementation/follow up



Workshop

Monitoring continuous underwater sound: beyond acquisition


- ▶ Objective: To discuss the requirements for data management, sharing and to find solutions for best possible harmonisation
- ▶ Participants from major several international monitoring programs
 - ▶ IMOS (Australian Integrated Marine Observing System)
 - ▶ ECHO, Atlantic Canada ESRF – Canada
 - ▶ ADEON – US
 - ▶ NOAA – US (video by Carrie Wall Bell)
 - ▶ JONAS – North East Atlantic
 - ▶ BIAS – Baltic Sea
 - ▶ Soundscape – North Adriatic Sea (ITA-CRO)




Share results

Output library, Interreg VB North Sea Region

https://northsearegion.eu/jomopans/output-library/

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Output library

This section will show selected project output.

- [Report #1: 1 Specify acoustic indicator](#)
- [Report #1: Specify acoustic indicator \(sub\)](#)
- [Report #2: 1 Scoping workshop](#)
- [Report #3: 2 Sound maps](#)
- [Report #3: 3 Data management and sharing](#)
- [Jomopans Standard Terminology v1](#)
- [Jomopans Standard Equipment performance, Calibration and Deployment v1](#)
- [Jomopans map of measurement stations 2019](#)
- [Jomopans Standards for Data Processing](#)
- [Jomopans auxiliary data exchange format description](#)

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Datamanagement



Helsinki Commission
Baltic Marine Environment Protection Commission



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Second half

- ▶ Finish one year measurements
- ▶ Data analysis
- ▶ Produce sound scape maps
- ▶ Finish GES Tool
- ▶ Continu on communication and harmonisation
- ▶ Make implementation plan

Beyond Jomopans

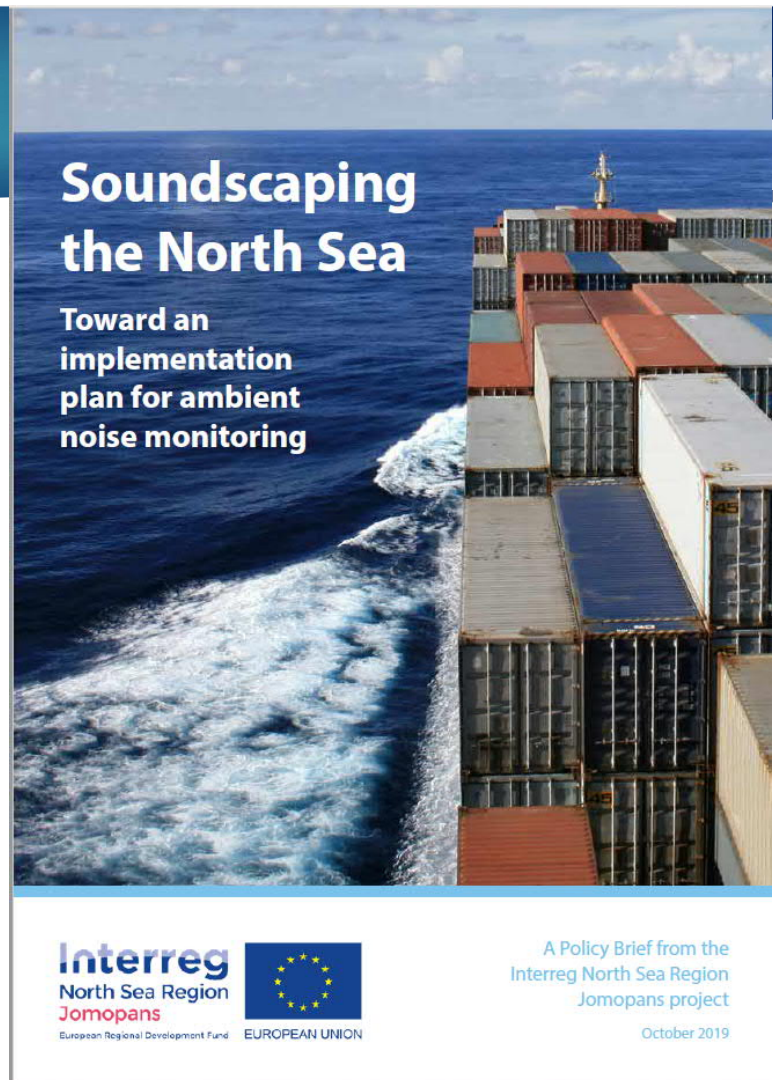
- ▶ Operational joint monitoring
- ▶ Datamanagement solution
- ▶ Knowledge gaps
 - ▶ Sources
 - ▶ Effects of sound
- ▶ EU: TG Noise
- ▶ OSPAR: ICG Noise
- ▶ UN: Sustainable Development Goal 14
 - ▶ IMO-MEPC (Marine Environment Protection Commission)



Questions?

Policy Brief

- ▶ Story on what joint monitoring means:
 - ▶ GES Tool
 - ▶ What is behind GES Tool
 - ▶ Examples (real or mock-up)
 - ▶ Why do we need both measurements and modelling





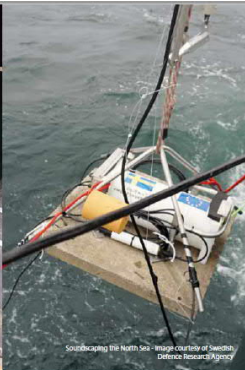
Policy Brief

► Story on what joint monitoring means:

- GES Tool
- What is behind GES Tool
- Examples (real or mock-up)
- Why do we need both measurements and modelling

► Discussion topics

- Information need
- Implementation
- Financing

 <p><small>Photo: Denise Neth, of the Scottish Association for Marine Science (COMPASS Interreg VA project)</small></p>	 <p><small>Photo: Watermark Ltd</small></p>	 <p><small>Seaflooring the North Sea - image courtesy of Swedish Defence Research Agency</small></p>
<h3>Joint monitoring</h3> <p>Jomopans primarily aims to solve technical issues and provide information to support a decision. Yet, it is important to agree on what the joint monitoring programme will be. Also the question of information needs is relevant to Jomopans. For example, one of the information needs is the obligation from the MSFD, but this is not applicable to all countries. Similarly, OSPAR obligations are not as binding as EU obligations. Relevant questions to be discussed by the PAB are:</p> <ul style="list-style-type: none"> • What is joint monitoring? • What information need should the programme support? • What are the advantages and disadvantages of joint monitoring of continuous sound? • Is the framework for monitoring continuous sound complete? Or are there elements that are missing or need to be improved? 	<h3>Implementation</h3> <p>Issues of organisation and governance can be very difficult and could cause problems if not prepared and discussed properly. The idea of joint monitoring is that tasks should be done by those parties that are best equipped to do so. At the same time, a good balance should be found in distributing the tasks among the participating countries. Finally all countries should have influence on the programme. Relevant questions to be discussed by the PAB are:</p> <ul style="list-style-type: none"> • How should the programme be organised? • What is the governance of the programme? • What could best be organised jointly and what is best done nationally? • For which shared actions do the countries volunteer? • What role can OSPAR play in the programme? 	<h3>Financing</h3> <p>Finances will be a determining factor in this project. Jomopans will deliver a monitoring programme for the best price possible. During the project we will refine the calculations as part of a full business case. Relevant questions to be discussed by the PAB are:</p> <ul style="list-style-type: none"> • What size budget is needed for the monitoring programme? • What are shared costs and what are the costs for individual countries? • How should the shared costs be divided among countries? • What is the best way to organise the financing?