Experiences from the Northeast Atlantic

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Overview

Introduction
• Management indicators and the DPSIR framework
• OSPAR and the Common Indicators
• Impulsive and continuous sources

Impulsive noise
• OSPAR 3-year assessment
• Candidate impact indicator

Continuous noise
• Ship noise maps of NE Atlantic
• Joint monitoring: JOMOPANS and JONAS

Summary
OSPAR Commission

16 Contracting Parties
Belgium  Ireland  Spain
Denmark  Luxembourg  Sweden
Finland  The Netherlands  Switzerland
France  Norway  The United Kingdom
Germany  Portugal  European Union

Observer organisations
Intergovernmental organisations and international non-governmental organisation

Underwater Noise
Intersessional Correspondence Group on Underwater Noise (ICG-NOISE) established in 2014

One Common Indicator and two Candidate Indicators for underwater noise

OSPAR Maritime Area and Regions:
Region I: Arctic Waters
Region II: Greater North Sea
Region III: Celtic Seas
Region IV: Bay of Biscay/Iberian Coast
Region V: Wider Atlantic
Explosions
Pile driving
Seismic surveys
Shipping

impulsive
impulsive
impulsive
continuous
Management indicators and the DPSIR loop

DPSIR loop

Management measures applied to drivers

Manmade Drivers → **Pressure** (noise) → Ecosystem **State** → Impact on marine life → Management **Response**

- Impulsive noise
  - Common Indicator: IA2017
- Impulsive noise
  - Candidate Indicator: Risk of impact

**Manmade Drivers**

Candidate Indicator: Risk of impact

**Management Response**
Impulsive noise: OSPAR Noise Registry

- OSPAR commissioned ICES to develop **impulsive noise registry** in 2015
- Interactive database with **time** and **location** of **impulsive noise sources** in OSPAR area
- Registry is hosted on open online portal: [http://underwaternoise.ices.dk](http://underwaternoise.ices.dk)
- HELCOM (Baltic Sea) now uses the same ICES registry
2015-2017: Total PBDs per region

[Bar chart showing total PBDs per region for the years 2015, 2016, and 2017. The regions are labeled as follows: I. Arctic, II. North Sea, III. Celtic, IV. Biscay, V. Atlantic. The chart indicates the number of PBDs for each region across the three years.]
Reported impulsive sources in NE Atlantic 2015-2017
2015-2017: PBDs by source type overall
OSPAR Impulsive noise impact indicator

• What is risk of impact on marine life?
• Impact Indicator for impulsive noise to be assessed in 2019/20
OSPAR Impact indicator methodology example

(a) Define management area (MA) for indicator species

(b) Noise pressure map as % duration of assessment period

(c) Population density as % of population within MA

(f) Exposure indicators

<table>
<thead>
<tr>
<th>Metric</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exposure Index (EI)</td>
<td>Area under exposure curve (log-transformed and scaled from 0 to 10, see Figure 3a)</td>
</tr>
<tr>
<td>Chronic Exposure Rate (CER)</td>
<td>% population exposed &gt; chronic % time</td>
</tr>
<tr>
<td>Exposure Prevalence Rate (EPR)</td>
<td>% population exposed &gt; significant % time</td>
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</table>

(e) Exposure curve

(d) Risk map

Pressure + State = Impact
OSPAR Impact indicator methodology example

(a) Aug-Sep; NNS
(b) Aug-Oct; SNS
(c) Nov-Jan; Channel/SNS
% spawning period exposed
0%
<10%
<20%
<30%
<40%
<50%
% time of spawning season
% spawning area exposed (during season)
Impulsive noise: Summary

Pressure from impulsive noise sources now regularly assessed using data in OSPAR Impulsive Noise Registry under OSPAR Common Indicator

Impact: First assessment of risk of impact expected April 2020
Continuous noise pollution

- Shipping noise expected to be dominant
- Currently an OSPAR Candidate Indicator
- Full Common Indicator expected 2020
- First assessment expected 2021
Shipping noise maps of the NE Atlantic

Median level of broadband noise, including wind

Median ship noise excess: level of ship noise above wind

• Cefas acoustic modelling based on ship-tracking data for 2017
Continuous noise: joint monitoring programmes

**North Sea**
- JOMOPANS project funded by EU INTERREG
- Started Jan 2018
- Field measurements and noise maps for 2019, plus management tools

**Atlantic Area**
- JONAS EU INTERREG project
- Large scale, open ocean habitat
- Started May 2019

**Arctic**
- No current project proposals
- OSPAR Secretariat in joint initiative with Canada under Arctic Council to address ocean noise
Summary

**Impulsive noise**
- **Pressure** from impulsive noise sources monitored since 2015 under OSPAR Common Indicator
- **Impact** indicator assessment expected April 2020

**Continuous noise**
- Currently an OSPAR **Candidate Indicator**
- Full **Common Indicator** expected 2020
- **Joint monitoring** is ongoing under EU INTERREG projects **JOMOPANS** and **JONAS**