SHEBA - Sustainable Shipping and Environment of the Baltic Sea region

Jukka-Pekka Jalkanen,
on behalf of the whole
SHEBA consortium

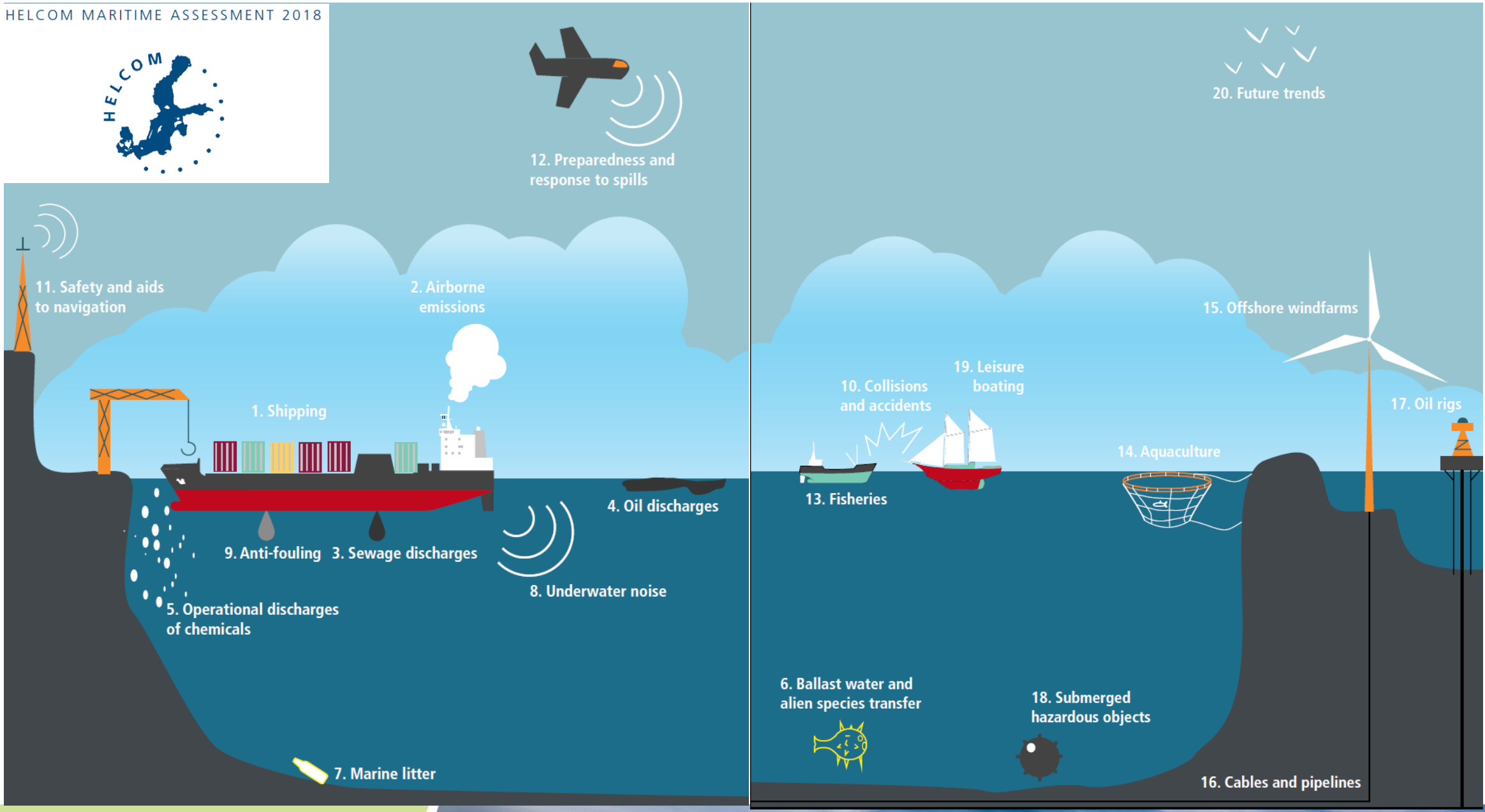
SHEBA

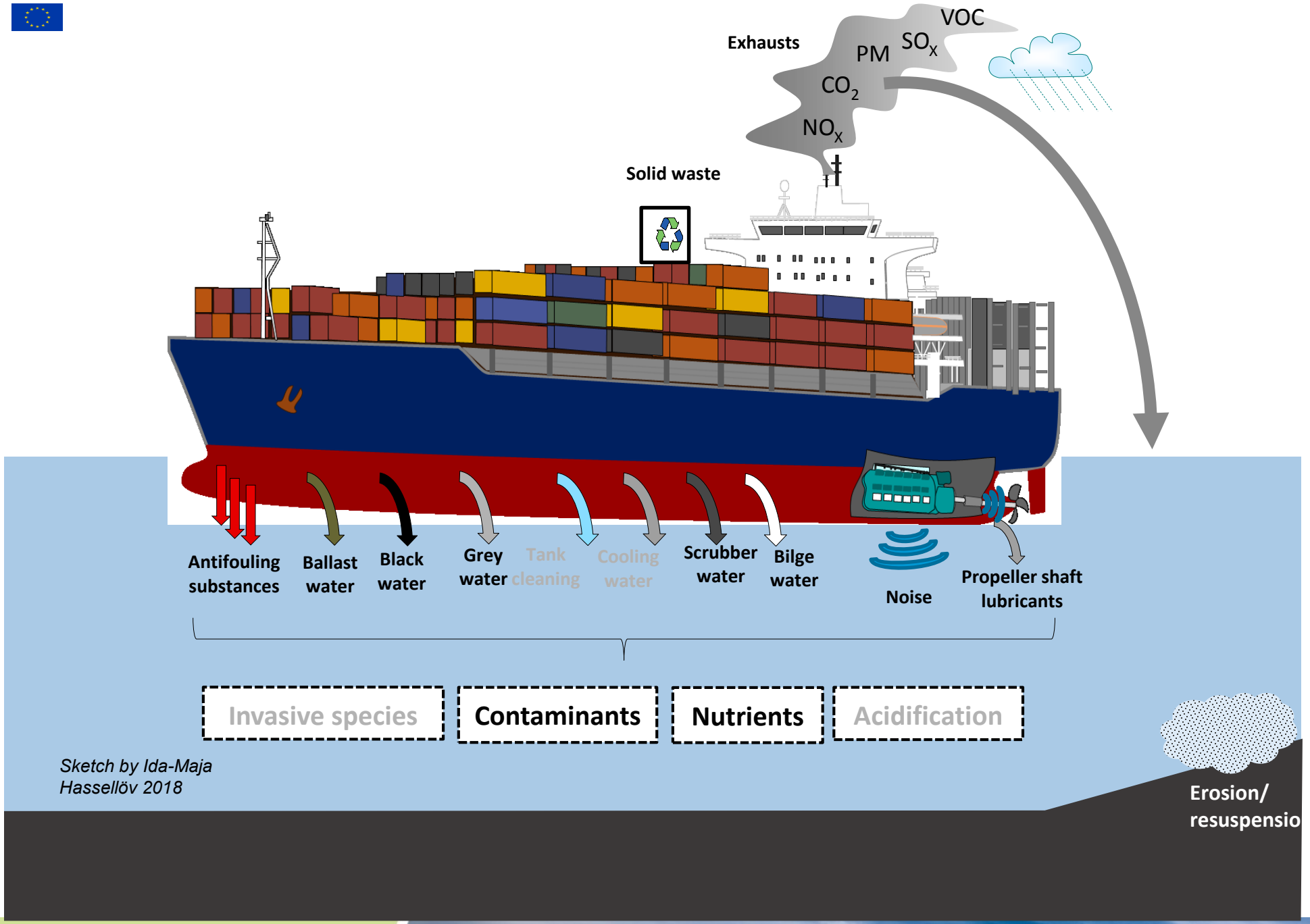
BONUS
SCIENCE FOR A BETTER FUTURE OF THE BALTIC SEA REGION

EU STRATEGY FOR THE BALTIC SEA REGION
FLAGSHIP

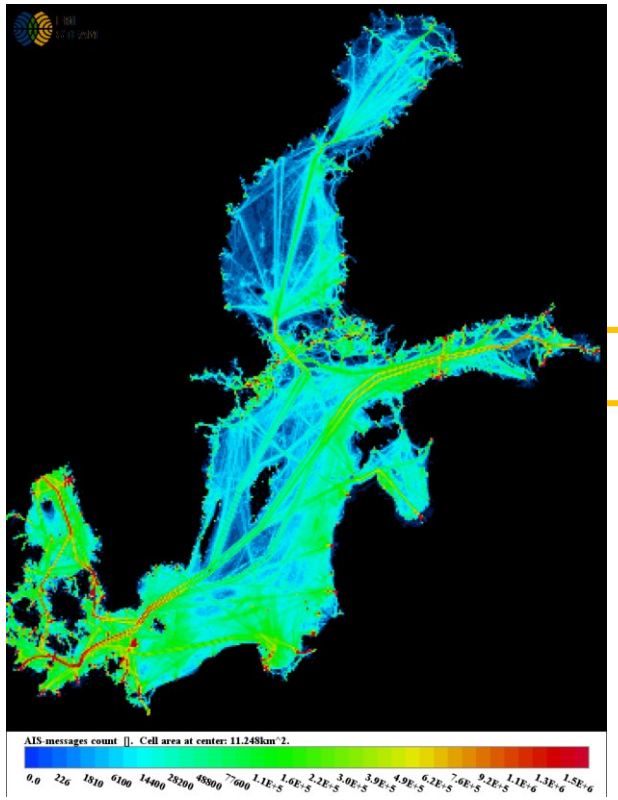
Baltic Earth

HELCOM MARITIME ASSESSMENT 2018



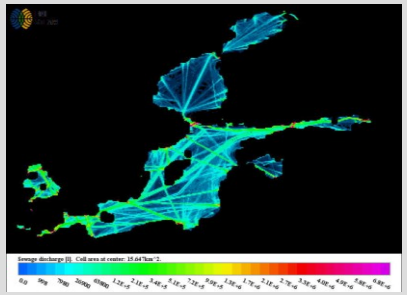


Sketch by Ida-Maja Hassellöv 2018

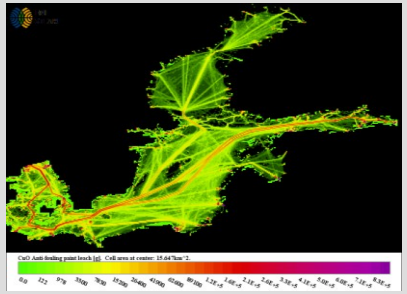


STEAM Emission model

Water discharges

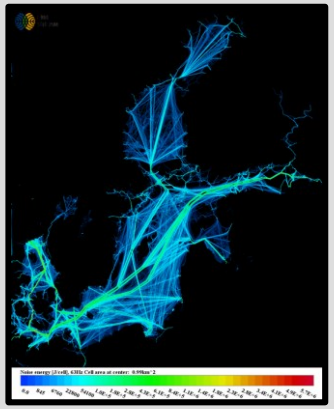


Sewage water release during year 2017 from Baltic Sea shipping

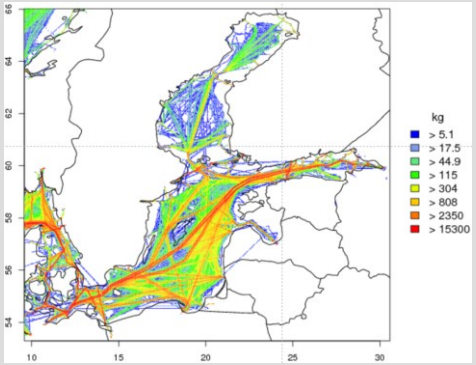


Cu(I)O from anti-fouling paints

Underwater noise

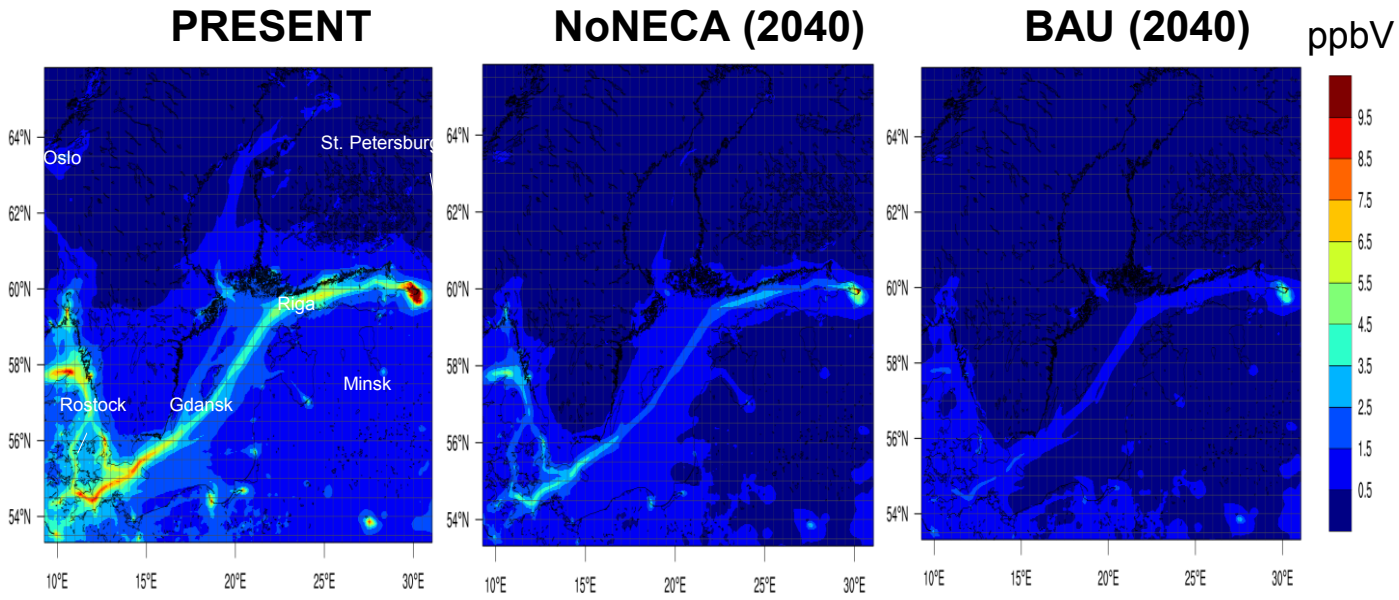


Air emissions

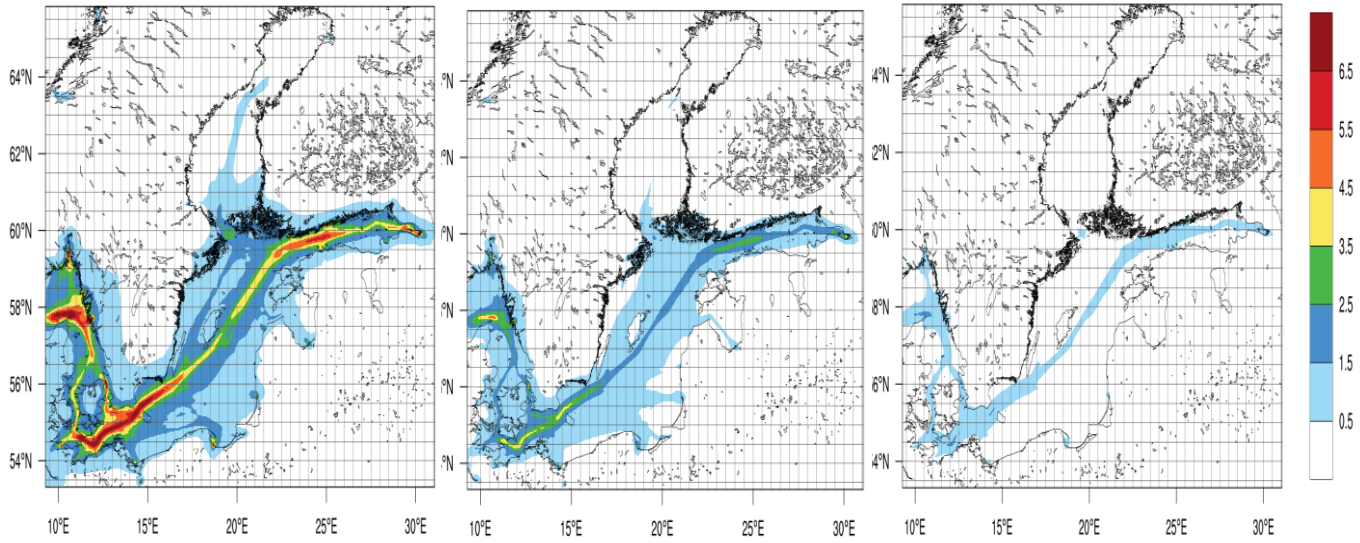


Shipping emissions to air – fate and transport

Total NOx emissions



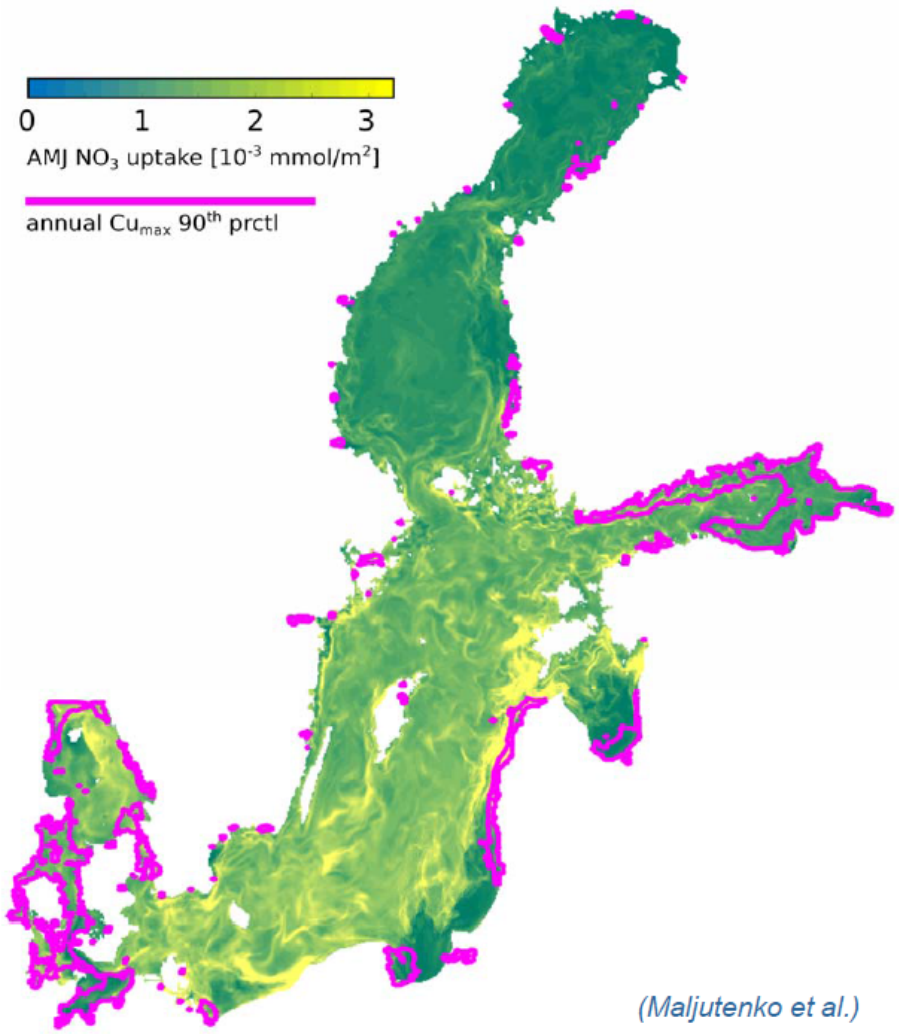
Shipping related NOx emissions



Shipping emissions to water – transport and effect

Nutrients from shipping mainly:

- **nitrogen oxides** via exhaust and N-deposition
- **phosphate** via black and grey water



(Maljutenko et al.)

Figure: Shipping related **nitrate uptake by phytoplankton** from April to June in 2012 (colour bar).

Pink contour lines **90th percentile of annual maximum copper** concentrations in 2012.

300 tons of copper emitted annually by shipping, 99 % from anti-fouling paint

A single project can answer some of the questions, but introduces new ones:

NOISE: Baseline for noise emissions from ships established, impact analysis, species habitat maps, dose-response functions, noise propagation modeling, noise monitoring, recreatonal boating...

WATER: Discharge modeling, wash/wastewater analysis, antifouling leeching rates, ecotoxicology experiments, stern tube oil leakage rates, risk analysis, eutrophication contribution...

AIR: Emission scenarios, impact analysis, Emission factors for low sulphur residual fuels + renewables, LNG vessel measurements (slip), Black Carbon, scrubber pollutant removal rates, climate impacts, remote sensing, compliance monitoring, health impacts, critical loads...

EMISSIONS: Small boats, Extension to other regions, scrubber uptake, LNG, Particle numbers, Black Carbon, Emission Control Areas, weather contributions, winter navigation, vessel noise...

POLICY: IMO, EU, HELCOM, national level; Sulphur cap, GHG reduction targets, Black Carbon, Arctic areas, noise...

IMO INTERNATIONAL MARITIME ORGANIZATION **E**

MARINE ENVIRONMENT PROTECTION COMMITTEE
70th session
Agenda item 5

MEPC 70/5/1
4 July 2016
Original: ENGLISH

AIR POLLUTION AND ENERGY EFFICIENCY

Proposal to designate the Baltic Sea as an emission control area for nitrogen oxides

Submitted by Denmark, Estonia, Finland, Germany, Latvia, Lithuania, Poland, the Russian Federation and Sweden

SUMMARY

Executive summary: This document sets forth a proposal to designate the Baltic Sea as an emission control area for nitrogen oxides (NECA) in accordance with regulation 13 and appendix III of MARPOL Annex VI to take effect from 1 January 2021.

The proposal shows that the designation of the NECA is supported by a demonstrated need to prevent, reduce and control emissions of nitrogen oxides from ships. Adoption of the proposed NECA will result in significant reductions in ambient levels of air pollution in the Baltic Sea area and in the Baltic Sea States, which will achieve substantial benefits to human health and the environment.

As larger geographic coverage of NECA would bring greater environmental and health benefits this proposal is submitted in parallel with the corresponding proposal from the North Sea States. This will also benefit equal competition for shipping in these areas.

The co-sponsors invite the Committee to consider this proposal at this session with a view toward the adoption by the Parties to MARPOL Annex VI, at MEPC 71, of amendments to regulations 13.6 of MARPOL Annex VI designating a new emission control area.

Strategic direction: 7.1 and 7.3

High-level action: 7.1.2 and 7.3.1

Output: 7.1.2.2 and 7.3.1.6

Action to be taken: Paragraph 23

Related documents: MARPOL Annex VI; MEPC 57/INF.14 and MEPC 70/INF.3

Baltic Marine Environment Protection Commission

Maritime Working Group
Hamburg, Germany, 25-27 September 2018

MARITIME 18-2018

Document title	Emissions from Baltic Sea Shipping in 2017
Code	4-3
Category	INF
Agenda Item	4 - Airborne emissions from ships and related measures
Submission date	14.09.2018
Submitted by	Finland
Reference	

Where do we stand now?

SHEBA has ended, all scientific reports are accepted, project is closing

Reporting of AIr, Water, Noise emissions done for the first time in HELCOM Maritime18 meeting, Oct 2018

Regular annual reporting of all these from 2018 onwards, CSHIPP contribution

Several scientific papers in writing, some recently published below

- Jalkanen et al., Modeling of ship as a source of underwater noise, *Ocean Science*, 14 (2018) 1373-1383
- Karl et al., Impact of a nitrogen emission control area (NECA) on the future air quality and nitrogen deposition to seawater in the Baltic Sea region, *Atmos. Chem. Phys. Discuss.*, in review

+ Dozen other papers in progress

CSHIPP project clustering started, several participants of SHEBA represented

Several shipping related project ongoing, data exchange between projects

Active dialogue between environmental authorities, industry, research (ESSF)

Research on small boat emissions/discharges will continue, has attracted interest of several groups