

# Results of the sufficiency of measures (SOM) analysis

Pressure 13-2020

Document 3-4

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# The meeting is invited to

- consider and comment on the preliminary results of the analysis of sufficiency of measures for topics of relevance to the Working Group, including hazardous substances, marine litter, eutrophication, underwater noise, and loss and disturbance to seabed (benthic habitats);
- take note of the preliminary results of the analysis of sufficiency of measures for all topics;
- take note of the validation of input data to the SOM analysis.



# Outline

- Progress and next steps for SOM analysis
- Data validation
- Results for
  - hazardous substances
  - marine litter
  - underwater noise
  - loss and disturbance to seabed (benthic habitats)
  - eutrophication



# Results are preliminary – improvements in autumn 2020

- Internal review
- Input from SOM Topic Teams, BSAP UP workshops, SOM Platform and Working Groups
- Validation of input data by HELCOM Working Groups and Expert Networks
- General, topic-specific and editorial changes => results will still change



# Validation of input data

- Pressure responsible for validating the input data for hazardous substances, marine litter, underwater noise, input of nutrients (eutrophication), and loss/disturbance to the seabed
- Deadline was 30 September 2020
- No feedback => data used as they are in the SOM analysis
- Further changes to input data cannot be made



# Outcome of data validation for Pressure topics

- Hazardous substances
  - No comments
- Marine litter
  - Comments from DK, FI and SE (changes to litter activity-pressure data)
- Underwater noise
  - Comments from DE (no changes to data)
- Loss and disturbance to seabed (benthic habitats)
  - Comments from FI and SE (no changes to data)
- Eutrophication
  - Comments from SE (no changes to data)



# Timeline for SOM analysis of existing measures

Task	Responsible	Timing (month in 2020)
<b>Validation of input data</b>	Working Groups, Expert Groups	September
<b>Providing preliminary results to Working Group meetings</b>	ACTION/Secretariat	September-October
<b>Updating results</b>	ACTION/Secretariat	October
<b>Preparing overall and topic-specific reports to support BSAP update</b>	ACTION/Secretariat	June-December
<b>SOM Platform 5-2020 meeting</b>	SOM Platform/Secretariat	30 November



# Results of SOM analysis for hazardous substances





# Topic structure

- Probability to achieve GES in the concentration of four substances
  - i. mercury
  - ii. PFOS
  - iii. TBT
  - iv. diclofenac
- Baltic Sea scale assessment



# Topic-specific issues

- Full analysis only for four substances – not representative of all hazardous substances
- Natural processes (e.g. burial and degradation) not fully accounted for
- Only expert-based data
  - Number of experts per data component: 8-12

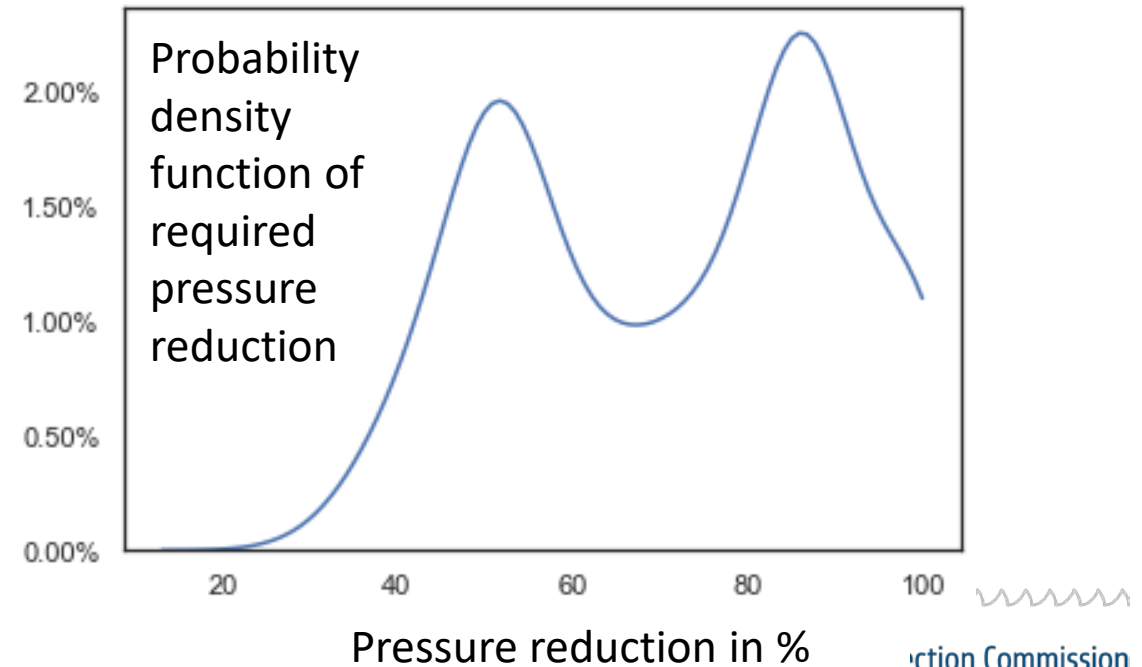


Probability to reach GES  
for mercury is...

Very low

Expected pressure reduction  
16 – 24%

Required pressure reduction  
to achieve GES: 69%  
(standard deviation: 16%)

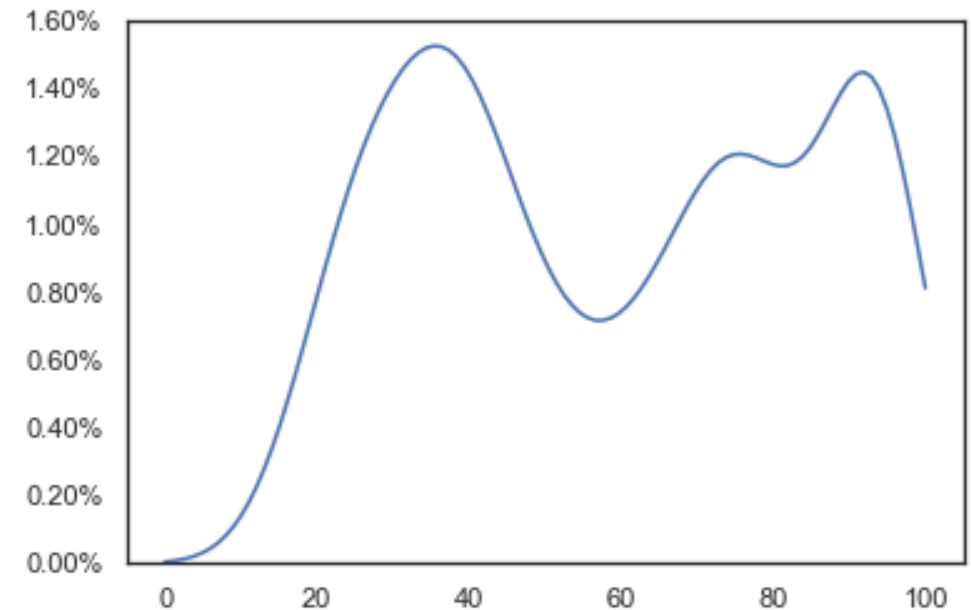


Probability to reach GES  
for TBT is...

Very low

Expected pressure reduction  
-2 – 8%

Required pressure reduction  
to achieve GES: 55%  
(standard deviation: 27%)



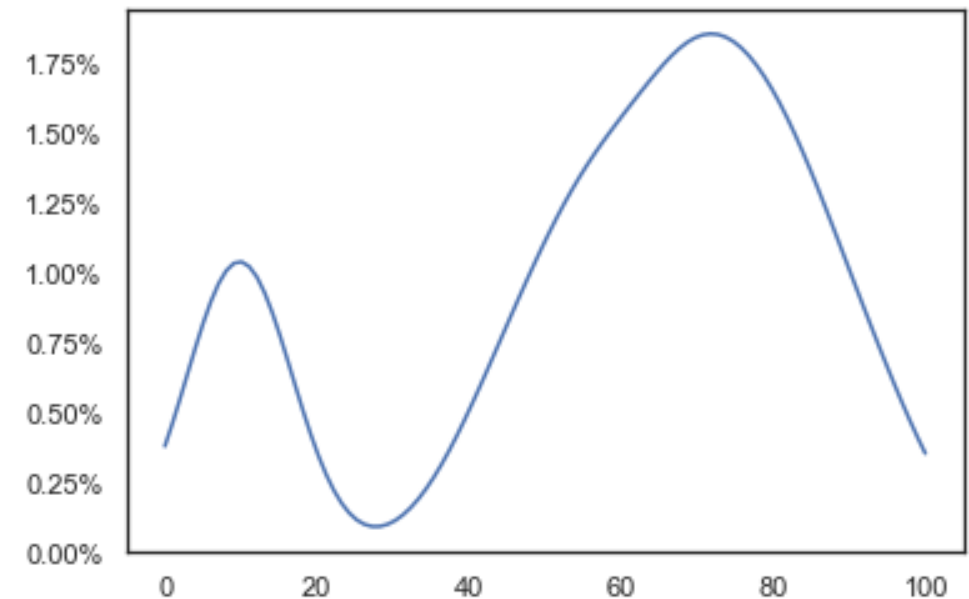
Pressure reduction in %

Probability to reach GES  
for PFOS is...

LOW

Expected pressure reduction  
6 – 20%

Required pressure reduction  
to achieve GES: 51%  
(standard deviation: 21%)



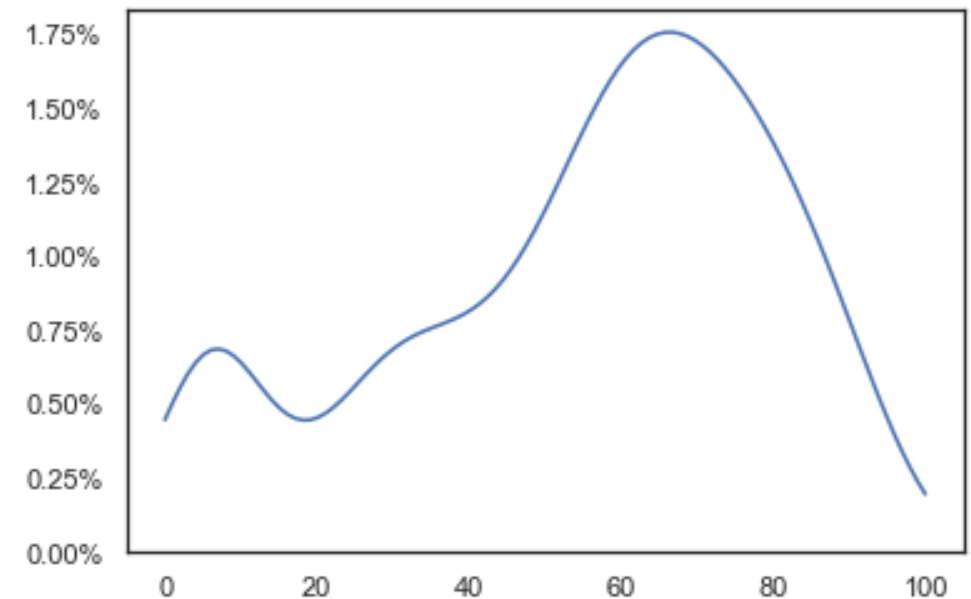
Pressure reduction in %

Probability to reach GES  
for diclofenac is...

Very low

Expected pressure reduction  
-3 – 2%

Required pressure reduction  
to achieve GES: 46%  
(standard deviation: 24%)



Pressure reduction in %

# Results of SOM analysis for marine litter



# Topic structure

- Projected total pressure reduction in the input of top 15 litter items to the beach
- Six sub-areas

No.	Litter item
1	Plastic and polystyrene pieces 0-50 cm (PLASTIC)
2	Food related items, such as containers, lolly sticks, wrappers, packets (PLASTIC)
3	Drinking related items such as cups, caps, lids, six-pack rings (PLASTIC)
4	Plastic bags of different size and colour (PLASTIC)
5	Bottles and containers (PLASTIC)
6	String and ropes of different size (PLASTIC)
7	Cigarette butts and remains
8	Glass and ceramic fragments of different sizes and other glass items (GLASS)
9	Industrial packaging, such as sheeting and strapping bands (PLASTIC)
10	Processed wood and pieces of processed wood of different sizes (WOOD)
11	Drinking related items such as bottle caps, lids, pull tabs (METAL)
12	Single-use cutlery and straws (PLASTIC)
13	Paper and cardboard items and pieces of different size (PAPER)
14	Drinking related cans (METAL)
15	Foil wrappers and pieces of metal (METAL)



# Topic-specific issues

- Full analysis for 15 top beach litter items
  - not representative of all marine litter (e.g. microlitter)
  - top 15 items comprise 67% of all items collected from beaches around the Baltic Sea
- No GES threshold for beach litter – proper SOM analysis not possible
- Mix of expert-based and monitoring data
  - Number of experts per data component: 6-14



# Projected reduction in pressure inputs

Input of top 15 litter items to the beach

High reduction  
(70-100%)

Top 15 litter items  
comprise 67% of all  
beach litter items  
around the Baltic Sea

Changes in pressure inputs result from existing measures and changes in human activities (e.g. waste waters, shipping infrastructure)



# Results of SOM analysis for underwater noise



# Topic structure

- Projected reductions in pressure inputs for three noise categories
  - i. Input of continuous noise 63/125 Hz
  - ii. Input of continuous noise 2 kHz
  - iii. Input of impulsive noise with peak energy below 10 kHz
- Results for five sub-areas



# Topic-specific issues

- Combines the distinct issues of disturbance and injury into a single pressure
- Combines the distinct issues of frequency and intensity into a single % reduction estimate
- Poor coverage of impulsive noise in the human development scenarios
- Results mainly based on expert data
  - Number of experts per data component: 7-9



# Projected reductions in pressure inputs

Input of continuous noise 63/125 Hz	Input of continuous noise 2 kHz	Input of impulsive noise with peak energy below 10 kHz
Low increase (-18 – -6 %)	Low to moderate increase (-21 – -2%)	Low to moderate reduction (12 – 20 %)*

Changes in pressure inputs result from existing measures and changes in human activities (e.g. shipping, tourism and leisure activities)

\*Development of human activities scenarios only cover 0 – 10% of activities relevant to impulsive noise input compared to >80% for continuous noise. Options currently under review to increase coverage.

# Results of SOM analysis for benthic habitats



# Topic structure

- Five habitat types
  - i. hard substrate vegetation dominated communities
  - ii. soft substrate vegetation dominated communities
  - iii. hard substrate epifauna dominated communities
  - iv. soft substrate infauna dominated communities
  - v. coarse substrate infauna dominated communities
- Results for four sub-areas





# Topic-specific issues

- Results presented here as approximate Baltic Sea averages,
- Eutrophication a major pressure on benthic habitats but the effect of its reduction not quantified in the SOM analysis
- Only expert-based data
  - Number of experts per data component: 2 -23
- Low number of participating experts for some habitat type – area combinations in the pressure-state survey
  - 2-3 experts for 9/20 habitat type – area combinations



Probability to achieve a noticeable improvement in the condition of **hard substrate vegetation dominated communities** is...

Very low -  
Low

Very low

- Kattegat
- Southern Baltic
- Eastern Baltic

Low

- Northern Baltic

Expected pressure reduction  
4 – 18%

Required pressure reduction  
to achieve state improvement:  
33 - 48%  
(standard deviation: 11 - 23%)

Probability to achieve a noticeable improvement in the condition of **soft substrate vegetation dominated communities** is...

Very low -  
Moderate

Very low

- Southern Baltic
- Eastern Baltic
- Northern Baltic

Moderate

- Kattegat

Expected pressure reduction  
7 – 21%

Required pressure reduction  
to achieve state improvement:  
15 - 43%  
(standard deviation: NA - 21%)

Probability to achieve a noticeable improvement in the condition of **hard substrate epifauna dominated communities** is...

Very low -  
Low

Very low

- Eastern Baltic
- Northern Baltic

Low

- Kattegat
- Southern Baltic

Expected pressure reduction  
3 – 21%

Required pressure reduction  
to achieve state improvement:  
27 - 42%  
(standard deviation: 16 - 19%)

Probability to achieve a noticeable improvement in the condition of **soft substrate infauna dominated communities** is...

Very low

Very low

- Kattegat
- Southern Baltic
- Eastern Baltic
- Northern Baltic

Expected pressure reduction  
2 – 14%

Required pressure reduction  
to achieve state improvement:  
31 - 54%  
(standard deviation: 14 - 24%)



Probability to achieve a noticeable improvement in the condition of **coarse substrate infauna dominated communities** is...

Very low

Very low

- Kattegat
- Southern Baltic
- Eastern Baltic
- Northern Baltic

Expected pressure reduction  
2 – 17%

Required pressure reduction to achieve state improvement:  
15 - 45%  
(standard deviation: NA - 15%)

# Results of SOM analysis for nutrients and eutrophication



# Topic structure

- Projected reductions in the
  - i. Input of nitrogen
  - ii. Input of phosphorous
- Comparison of projected reductions in the input of nutrients from existing measures in the SOM analysis with the HELCOM nutrient reduction targets





# Topic-specific issues

- No link is quantified between the input of nutrients and the effects of eutrophication
- Extensive use of data developed in HELCOM projects and processes
- National estimates of agricultural reduction provided by national modeling or expert opinion
  - No estimates from Russia – inputs assumed constant
- Data on scattered dwellings not available – inputs assumed constant
- No effectiveness of measure types estimates available



# Projected reductions in NITROGEN inputs

Area	Required reduction to meet MAI	Projected reduction by the SOM analysis
Kattegat	-	Moderate reduction (15 – 21 %)
Danish Straits	-	Moderate reduction (15 – 23%)
Baltic Proper	25%	Moderate reduction (12 – 20%)
Gulf of Riga	6%	Low reduction (5 – 9%)
Gulf of Finland	11%	Low reduction (4 – 6%)
Bothnian Sea	-	Moderate reduction (16 – 19%)
Bothnian Bay	1%	Moderate reduction (10 – 14%)

# Projected reductions in PHOSPHORUS inputs

Area	Required reduction to meet MAI	Projected reduction by the SOM analysis
Kattegat	-	Low reduction (9 – 11 %)
Danish Straits	-	Low reduction (5 – 7%)
Baltic Proper	49%	Moderate reduction (10 – 17%)
Gulf of Riga	23%	Low reduction (4 – 5%)
Gulf of Finland	36%	Moderate reduction (11 – 14%)
Bothnian Sea	-	Low reduction (2 – 13%)
Bothnian Bay	2%	Low reduction (1 – 7%)

# Most important activities to the input of nutrients

Input of nitrogen	Input of phosphorus
Diffuse input from agriculture	Diffuse input from agriculture
Background	Background
River borne transboundary	Wastewater

