

# Overview of the sufficiency of measures (SOM) analysis

HELCOM BSAP UP workshop

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# Aims

- Review the SOM approach and main results of the analysis
- Provide supporting information for discussions in the workshop

# Outline

- Background
- SOM analysis overview
- Relationship between results
- Results for hazardous substances



# Results are preliminary

Upcoming improvements during autumn 2020

- Input from SOM Topic Teams and SOM Platform
- Validation of input data by HELCOM Working and Expert Groups
- Minor changes to projected pressure reductions and state improvements
- Continued quality review
- Improved figures
- Substantial increase in results interpretation and contextualization

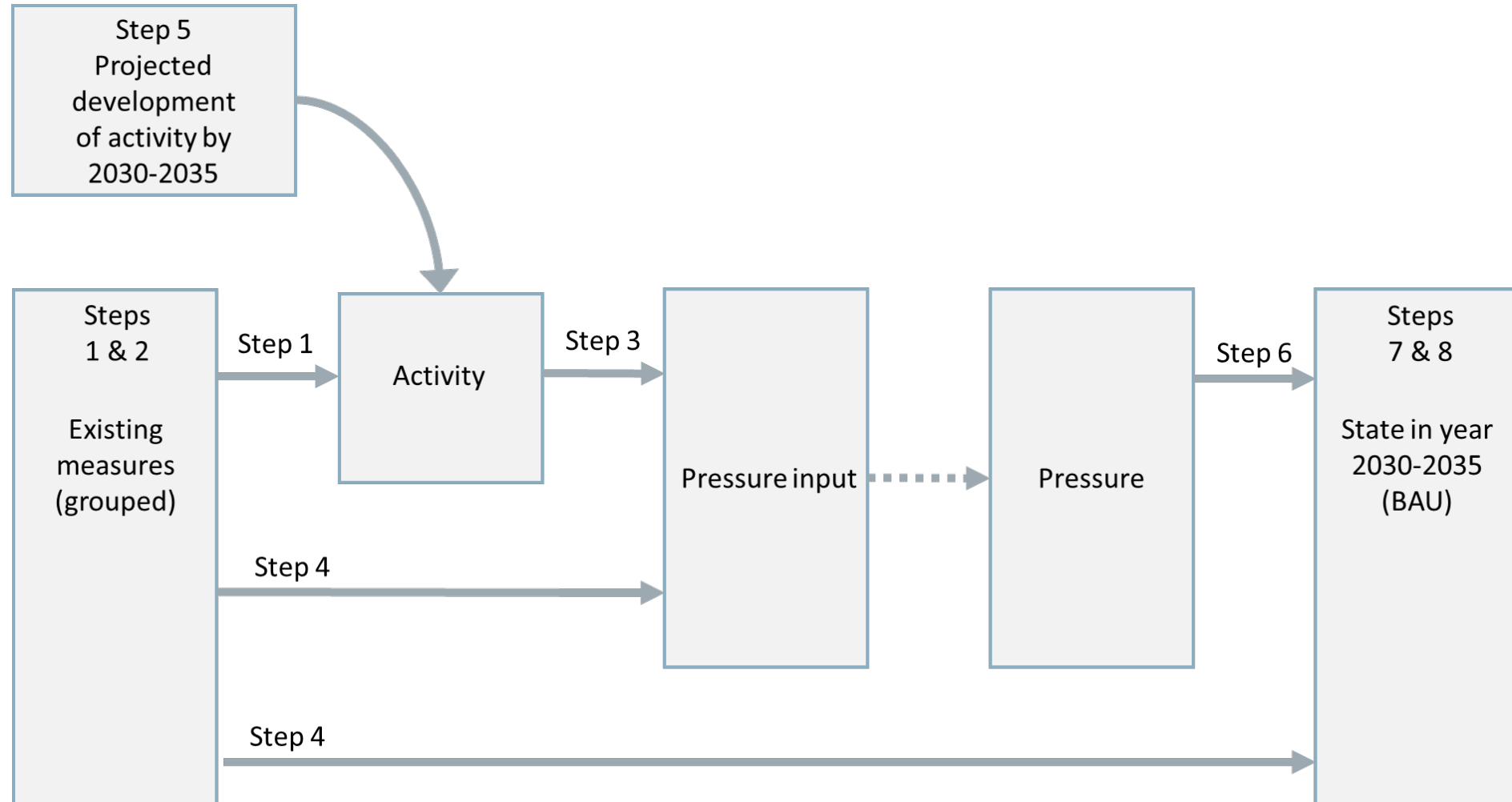


# Background

- Provides supporting information for evaluating proposed new actions
- First attempt to quantify the effects of existing measures on achieving objectives
- No final answers - should be considered in relation to other relevant results and assessments
- Literature data on effectiveness of measures not yet included



# Main components of the SOM analysis



# Relationship between pressure inputs and pressures

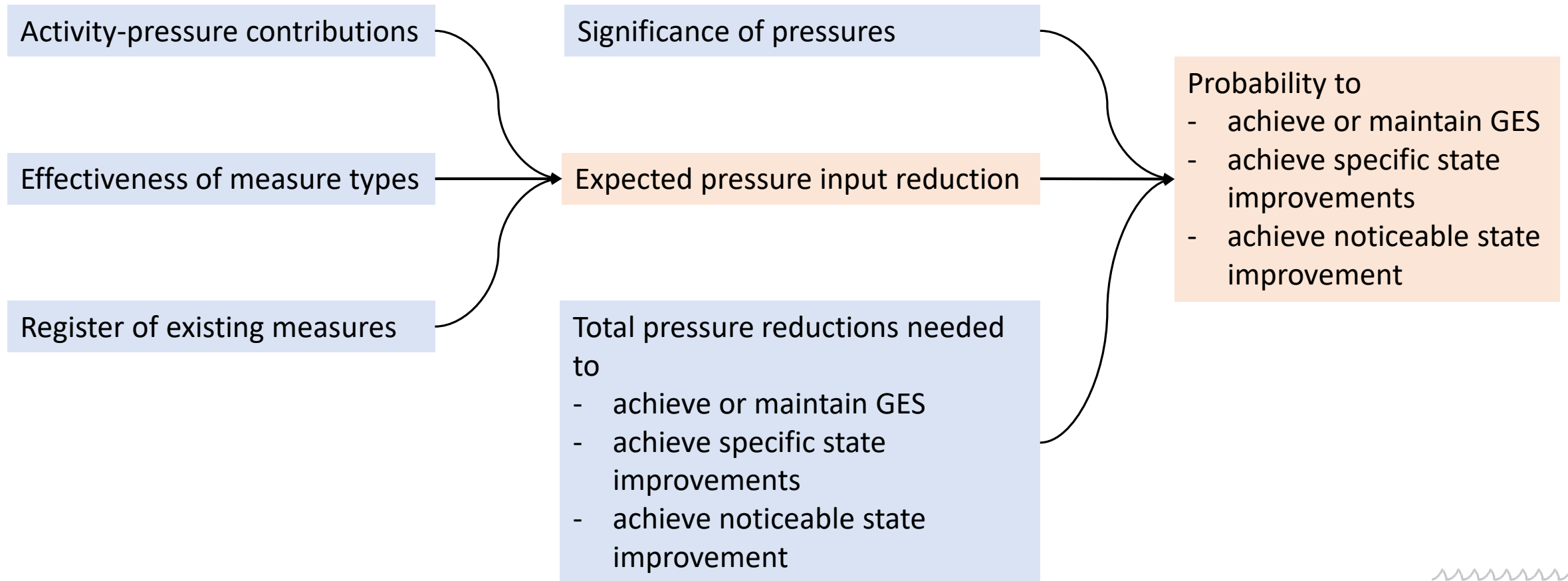
Pressure input	Relationship	Pressure
Bycatch of porpoise	Equivalent	Bycatch in fishing gears
Potential loss of seabed	Assumed equivalent	Physical loss of marine habitats
Input of continuous noise 63/125 Hz + Input of continuous noise 2 kHz	Assumed equivalent	Continuous underwater noise
Anthropogenic introductions of NIS	Link not quantified	Effects of non-indigenous species
Input of nutrients	Link not quantified	Effects of eutrophication
NA	No link	Human-induced food web imbalance
NA	No link	River, lake, or land habitat loss/degradation



Independent

Dependent on previous results

# Relationships between results



# Assumptions and features to keep in mind

- Only measures affecting pressures in 2016-2035 considered
- All existing measures assumed to be fully implemented
- Effectiveness of measure types used to approximate the effectiveness of existing measures
- When considering total pressure, all pressures are interchangeable
- Not able to account for the effect of reductions of all pressure inputs on state components (e.g. because no link between input of nutrients and effects of eutrophication)
- Data mainly from expert elicitation





# Results of SOM analysis for hazardous substances

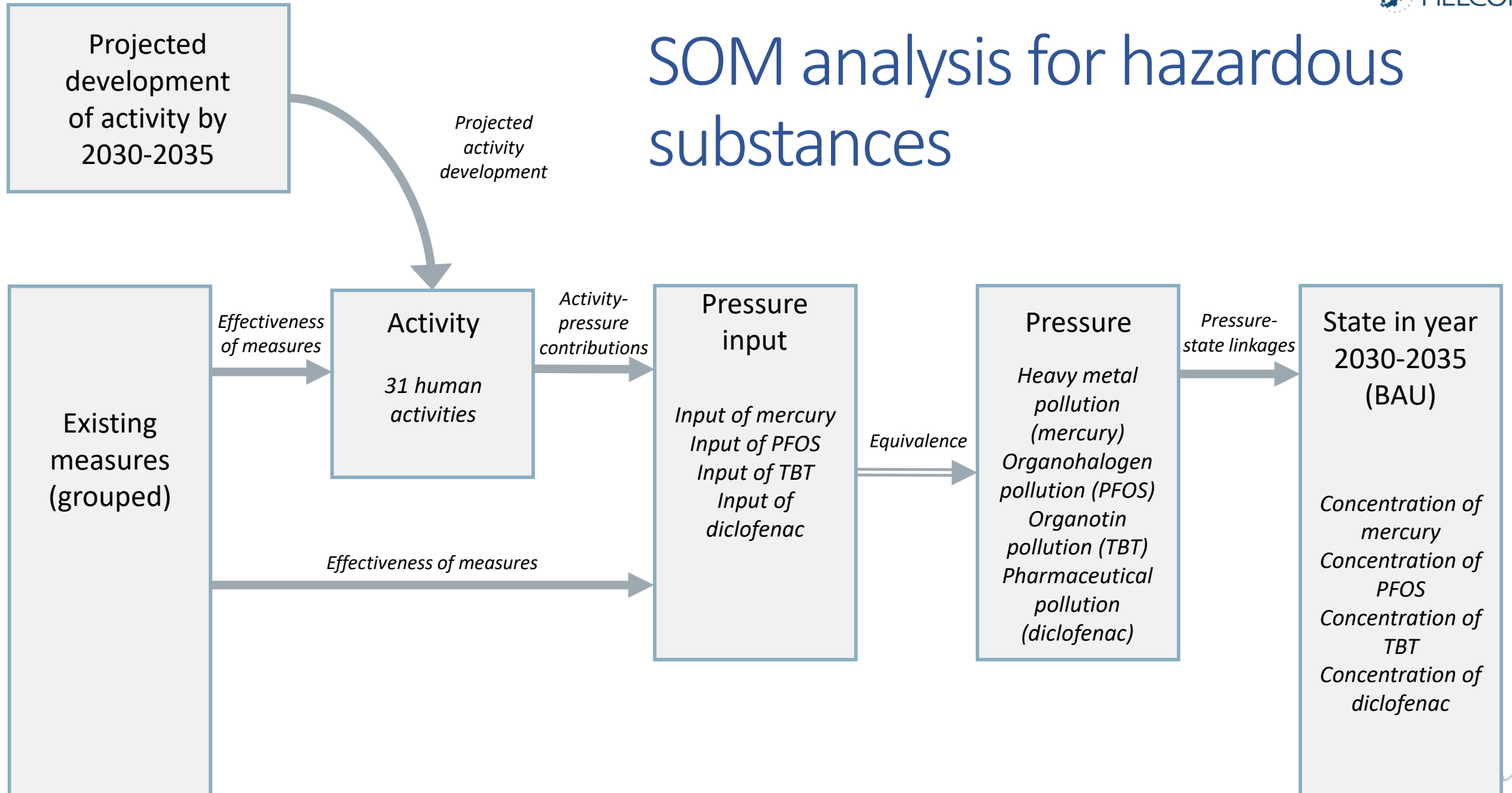
HELCOM BSAP UP workshop on hazardous substances and litter

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# SOM analysis for hazardous substances



# Data for hazardous substances

Data component	Origin of data	Spatial resolution
<b>Activity-pressure contributions</b>	Expert evaluation	Whole Baltic Sea
<b>Existing measures</b>	Literature review, Contracting Parties	17 sub-basins
<b>Effectiveness of measures</b>	Expert evaluation	Whole Baltic Sea
<b>Development of human activities</b>	Literature review, existing data and projections	Whole Baltic Sea
<b>Pressure-state links</b>	Expert evaluation	Whole Baltic Sea
<b>Time lags</b>	Expert evaluation	Whole Baltic Sea



# Focus of SOM assessment for hazardous substances

- Probability to achieve or maintain HELCOM GES threshold for
  - i. Concentration of mercury
  - ii. Concentration of PFOS
  - iii. Concentration of TBT
  - iv. Concentration of diclofenac

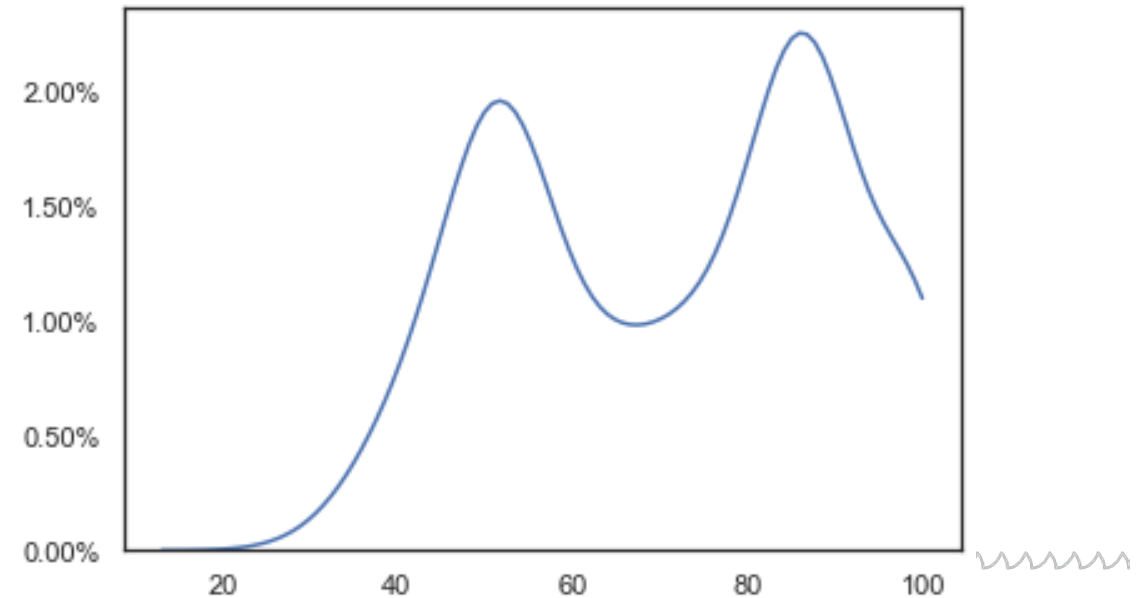


Probability to reach GES  
for mercury is...

Very low

Expected pressure reduction  
16 – 24%

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

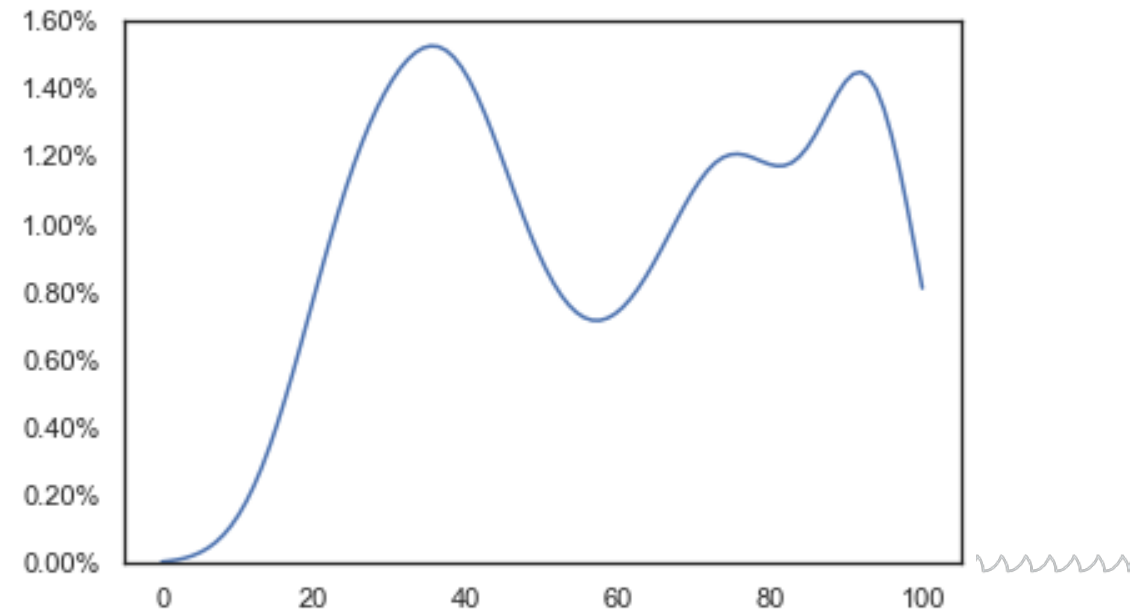


Probability to reach GES  
for TBT is...

Very low

Expected pressure reduction  
-2 – 8%

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

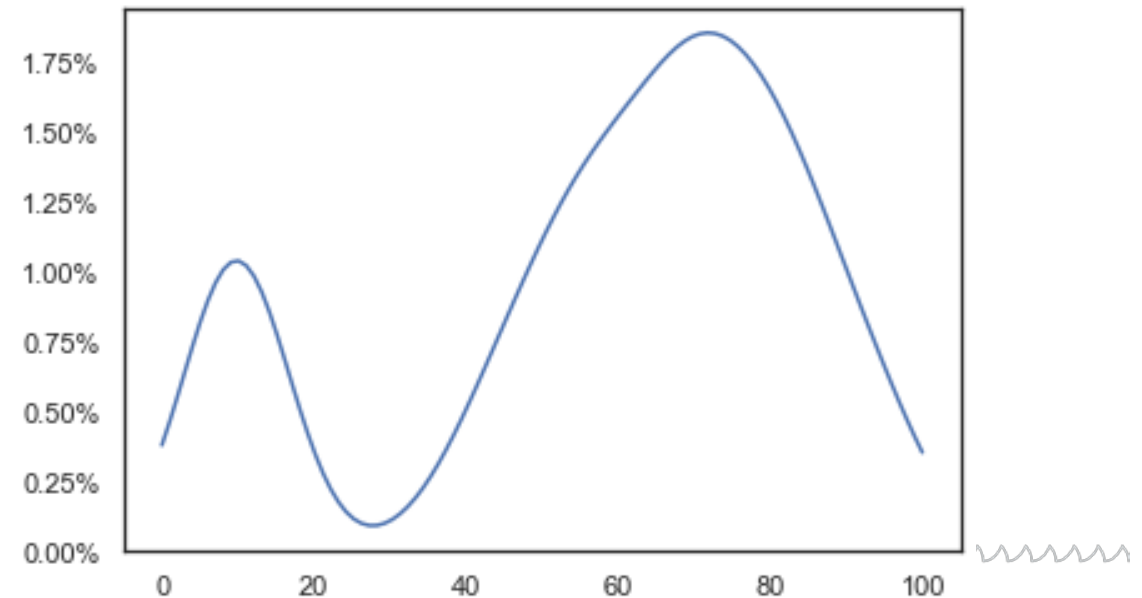


Probability to reach GES  
for PFOS is...

LOW

Expected pressure reduction  
6 – 20%

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

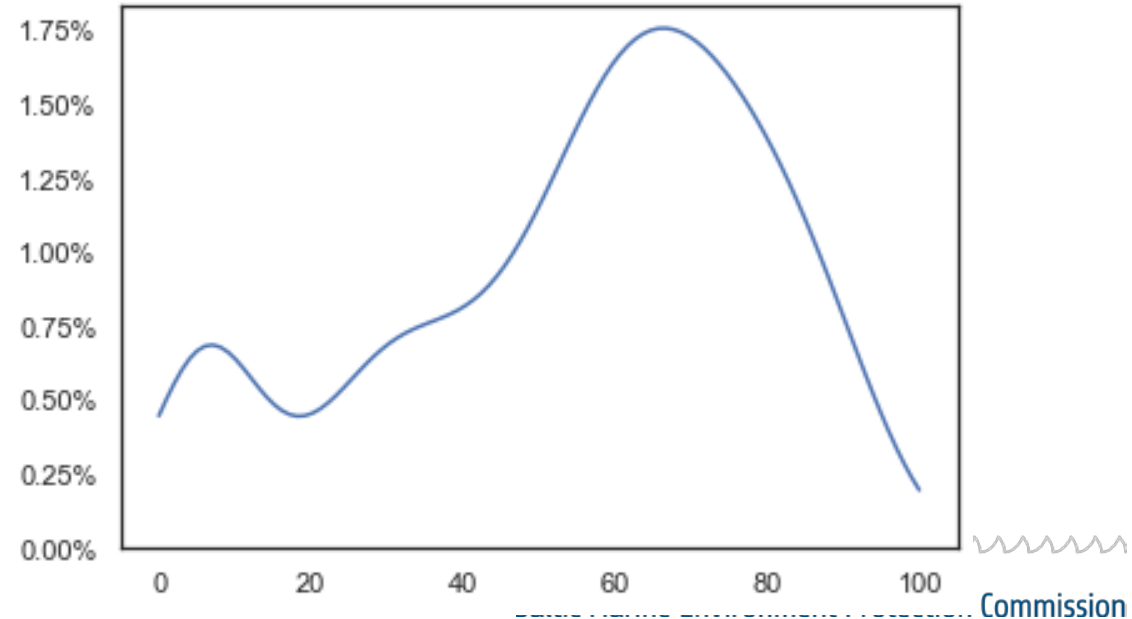


Probability to reach GES  
for diclofenac is...

Very low

Expected pressure reduction  
-3 – 2%

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





# The most significant pressures affecting the concentration of the substance

## Mercury

1. Heavy metal pollution
2. Change in hydrologic conditions
3. Physical loss of marine habitats

## TBT

1. Organotin pollution (e.g. TBT)
2. Physical disturbance of marine habitats
3. Change in hydrologic conditions

## PFOS

1. Organohalogen pollution (e.g. PFOS, PCBs, PBDEs, dioxins)
2. River, lake, or land habitat loss/degradation
3. Change in hydrologic conditions

## Diclofenac

1. Pharmaceutical pollution
2. Change in hydrologic conditions
3. Physical disturbance of marine habitats

# Projected reductions in pressure inputs

Input of mercury	Input of TBT	Input of PFOS	Input of diclofenac
Moderate reduction (20 – 40 %)	No change (-10 – 0%)	Low reduction (10 – 20 %)	No change (-10 – 0%)

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

# The most effective measure types per activity— input of mercury

Activity	Non-renewable energy generation	Transport – land, including infrastructure	Industrial uses (oil, gas, industrial plants)	Waste waters (urban and industrial)	Solid waste	Restructuring of seabed morphology (e.g. dredging)	Transport – shipping (incl. anchoring, mooring)*	Activities and sources outside the Baltic Sea Region
<b>Measure type</b>	Local /state /national targets to eliminate coal fired energy production	Increased electrification of transportation fleets	Ban on manufacturing processes where mercury is used as an electrode	EU mandatory use of dental amalgam separators retaining at least 95% of amalgam particles	Further restrictions on storage and disposal of waste/dredged material containing mercury	Reduce re-suspension from sediments, by limiting restructuring of seabed to areas with low concentrations	Treatment of scrubbing water from ships before disposal to reduce mercury	Minamata convention



# The most effective measure types per activity – input of TBT

Activity	Restructuring of seabed morphology (e.g. dredging)	Tourism and leisure activities (boating, beach use, water sports, etc.)	Transport – shipping (incl. anchoring, mooring)
<b>Measure type</b>	Reduce re-suspension from sediments, by limiting restructuring of seabed to areas with low concentrations	Boat washing restrictions	In water hull cleaning regulation



# The most effective measure types per activity – input of PFOS

Activity	Transport – air, including infrastructure*	Urban uses (land use), including storm water runoff*	Industrial uses (oil, gas, industrial plants)	Waste waters (urban and industrial)	Solid waste
<b>Measure type</b>	Stockholm convention ban on PFOS in aviation hydraulic fluid	Stockholm convention ban on PFOS fire-fighting foams	Clean-up of contaminated sites	Implement technologies to remove PFOS from wastewater (e.g. activated carbon or high-pressure membrane systems)	Clean-up of contaminated sites



# The most effective measure types per activity – input of diclofenac

Activity	Waste waters (urban and industrial)
<b>Measure type</b>	Technical upgrade of wastewater treatment plants: e.g. granular activated carbon (GAC) adsorption, ozonation, UV light, nanofiltration etc
<b>Measure type</b>	Alter prescription practices to lower consumption (drug dosage, pack size, alternative medicine, convert OTC access to prescription)



# Most important activities to pressure inputs

Input of mercury	Input of PFOS	Input of TBT	Input of diclofenac
Activities and sources outside the Baltic Sea Region	Solid waste	Restructuring of seabed morphology (e.g. dredging)	Waste waters (urban and industrial)
Non-renewable energy generation (fossil fuel and nuclear powerplants)	Waste waters (urban and industrial)	Solid waste	Solid waste
Industrial uses (oil, gas, industrial plants)	Transport – air, including infrastructure		



# 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

