2-1 Updated overall methodology to the SOM approach

HELCOM ACTION project
HELCOM Secretariat
SOM Platform 3-2020

HELCOM

The Meeting is invited to:

- take note of the updates to the SOM methodology
- agree on the methodology for using the expert-based and literature-based data in the SOM model
- agree on the (updated) SOM model structure
- agree on the methodology on joint effects.

Features of the SOM analysis

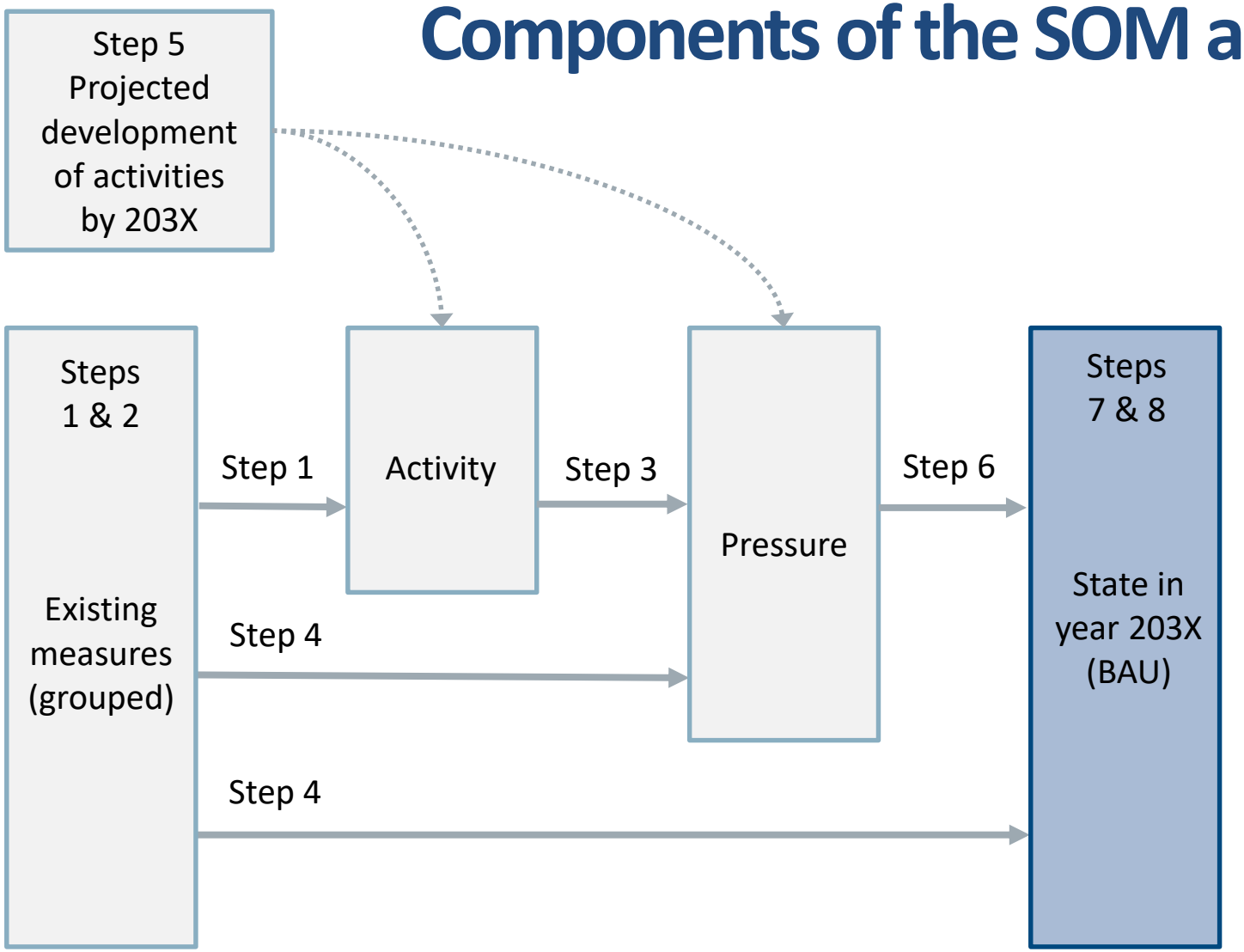
- Supports the BSAP update by
  - assessing how far we are from achieving good status (GES) with existing measures
  - providing information for identifying the need for potential new measures
- First time in this extent in the Baltic Sea region or elsewhere
- Combines natural and social sciences approaches
- Same approach across all topics to ensure comparability and coherence
- Information from scientific literature and expert elicitation for comprehensive inclusion of measures, pressures and state components

SOM methodology

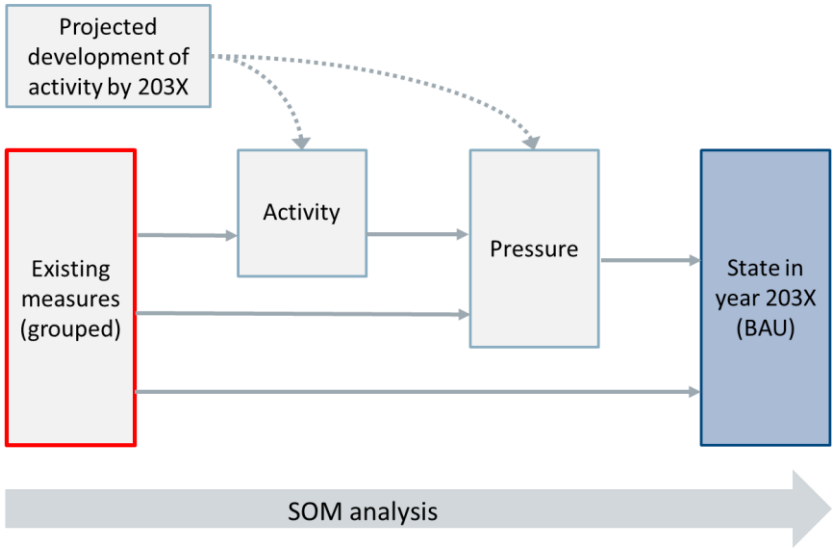
- Balance between state-of-the-art knowledge, availability of data, broad array of topics covered, and advice taken onboard from HELCOM meetings/bodies
- Region-level analysis covering many topics
  - Data requirements high
- Lessons learned and comparison to other approaches will be included in the main report and is an important project outcome

I Overall approach to SOM

Components of the SOM analysis

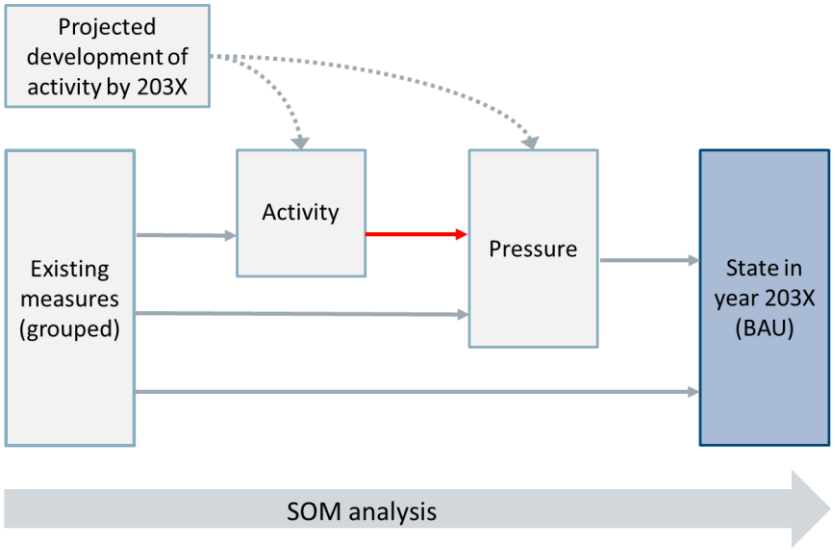


Existing measures (steps 1 and 2)



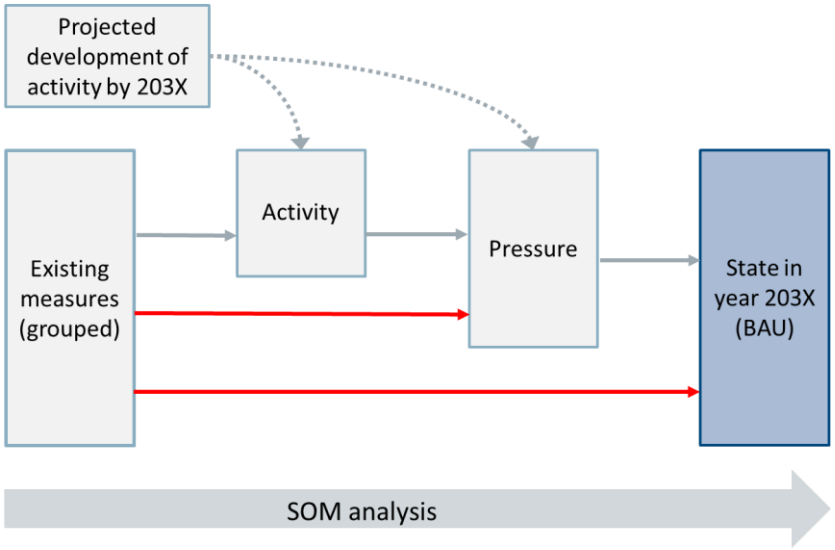
- Measures in existing relevant policies, e.g. current BSAP, MSFD
- Implemented, ongoing and planned in the time frame of BAU
- Grouped to general measure types to reduce the number of measures and improve the feasibility of the analysis

Activity – pressure link (step 3)



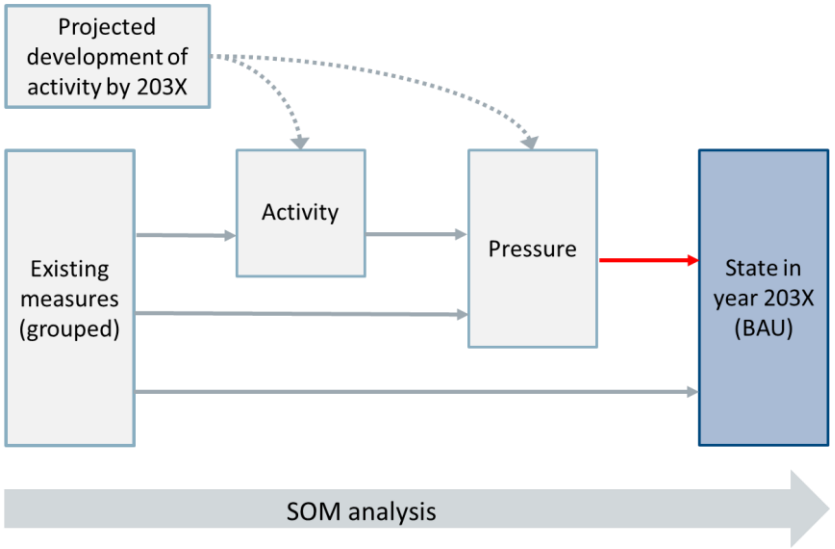
- Contribution (%) of activities to pressures
- Mainly based on expert surveys
- Loss and disturbance to the seabed
  - Approach used in HOLAS II
  - Links percent contribution of activities to the two physical disturbance pressures
- Non-indigenous species: AquaNIS database
- Input of nutrients: ACTION WP4 based on PLC-6

Effectiveness of measures (step 4)



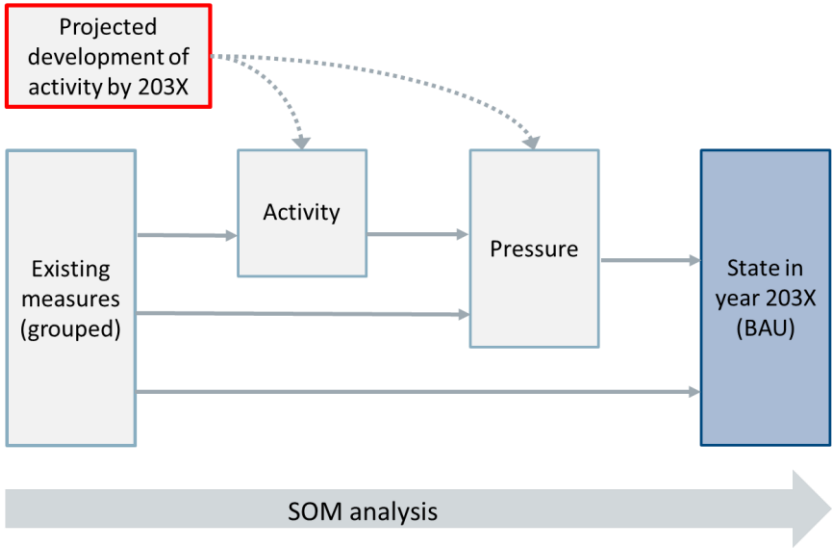
- Reduction in a specific pressure from a specific activity from implementing a generalized measure
- Assessed as a percent (%) change
- Based on expert elicitation and existing literature and models

Pressures – state link (step 6)



- Links between pressures and state components
- Depending on the existence of GES threshold:
  - Required pressure reduction (in %) to reach or maintain GES
  - Required pressure reduction (in %) to achieve a specific change in the state component
- Based on expert elicitation

Development of human activities (step 5)



- Projected change in human activities over time
- See separate document and presentation (2-2)

II Data collection and input data into the SOM model

Current status of data collection

- Data collection largely ready
  - Existing measures and measure type linkages
  - Activity-pressure data
  - Pressure-state data
- Effectiveness of measures data incomplete
  - Survey data needs to be complemented
  - Literature review ongoing for some topics

Existing measures and measure type linkages

- ~95% complete
- Redistributed to CPs through national SOM contact points, 3 week commenting period

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- Potentially important excluded measures
  - Uncertainty about the measure being taken
  - Often measures with the form:
    1. Study/consider issue X
    2. Act accordingly; may even offer list of potential actions
  - Can be quite strongly worded (i.e. high likelihood of impact)
  - Will be addressed in the final reports

Activity-pressure links (expert surveys)

Pressure	DE	DK	EE	FI	LT	LV	PL	RU	SE
Input of hazardous substances			1	4					
Input of marine litter	1	1	1	1			1		1
Disturbance/displacement by human presence - mammals	1	2							
Disturbance/displacement by human presence - birds							1		2
Input of underwater noise	1	1	1				2		2

- Other data sources for loss and disturbance to the seabed (benthic habitats), primary introduction of non-indigenous species, input of nutrients
- Remaining: no activity-pressure linkages, as either single-activity pressures or not fully analysed

Effectiveness of measures (expert surveys)

Survey	DE	DK	EE	FI	LT	LV	PL	RU	SE	Total
Benthic habitats	7	4	-	4	2	-	-	2	4	23
Birds	2	5	-	-	1	-	1	2	1	12
Fish	6	5	5	6	2	-	2	-	12	38
Hazardous substances	1	-	3	6	1	-	2	-	5	18
Litter	2	1	2	1	1	1	1	-	-	9
Mammals	2	4	2	-	4	-	-	1	-	13
NIS	5	2	1	2	-	2	1	-	3	16
Noise	3	-	2	-	1	2	-	-	3	11
Nutrients agriculture	1	1	3	1	*	1	3	-	*	10

- Input of nutrients: effectiveness of measures information by HELCOM ACTION project WP4 for wastewater treatment, atmospheric nitrogen emissions, scattered dwellings

Pressure-state links (expert surveys)

Survey	DE	DK	EE	FI	LT	LV	PL	RU	SE	Total
Benthic habitats	7	4	-	4	1	1	-	-	2	19
Birds	2	6	-	1	1	-	1	2	1	14
Coastal fish	-	4	2	2	2	-	3	-	11	24
Commercial fish	4	5	-	1	2	-	3	-	6	21
Migratory fish	6	-	3	2	1	-	2	-	9	23
Hazardous substances	1	-	3	5	1	3	1	-	5	19
Mammals	1	4	1	-	-	-	-	1	-	7

- No pressure-state surveys for litter, noise, non-indigenous species or input of nutrients
- Number of sub-topic responses can be as low as 0. See document 2-1, Table 4 for full breakdown by sub-topic

Use of expert and literature data in the SOM model

- Effectiveness of measures (step 4)
- Integration depends on the link to measure types

a) Possible to include data in the model: run the model using 1) only expert survey data and 2) both literature and expert survey data, by replacing the expert survey data points with the literature data

b) Not possible to include data in the model: literature estimates used as external points of comparison and reflected in the discussion of the model results

Certainty versus confidence

- Expert surveys allowed expressing **certainty** of knowledge
  - Effectiveness of measures: Certainty of effectiveness (uncertain – certain)
  - Activity-pressure contribution, pressure-state link: Minimum, maximum, most likely
  - Used to define distributions
- Experts evaluated their own **confidence** in the responses given
  - Effectiveness of measures, pressure-state links
  - Reported with results

Joint impacts of measure types

- **Thematic overlap:** existence on different policy levels or overlapping content
  - Assessed in 20% intervals, range from 0 to 100%

- **Chain effects of measure types in reducing pressures:** if measures take effect in a chain, a measure can only impact the pressure share that remains after preceding measures

Spatial perspective

- Regional assessment – Regional perspective
- Complements national or sub-national assessments
- Some issues considered at the Baltic Sea scale
  - All effectiveness of measures data
  - NIS
  - Hazardous substances
- Majority of state components: topic-specific smaller spatial areas
- Sub-basin results developed
- Local experiences will differ from model results and reporting will address this

Results from the SOM analysis

1. Relative contribution of activities to pressures
2. Lists of existing measures and their implementation status
3. Relative effectiveness of measures types in reducing pressures from activities
4. Effectiveness of measure types in reducing pressures (%)
5. The most significant pressures affecting state components
6. Pressure reductions required to achieve GES/status improvements
7. Pressure reductions and status improvements/from existing measures
8. Sufficiency of existing measures to achieve GES/a specific status improvement
9. Information on spatial areas and topics where measures are likely to be insufficient
10. Types of measures still needed and activities/pressures they should target
11. Time lags between measures and environmental state

Addressing criticisms: problems with collecting expert response in workshops

- Data collection moved to online surveys
- Aims of later SOM workshops revised to providing information and discussing and developing the surveys

Addressing criticism: Semi-quantitative/ qualitative approach preferred (1/2)

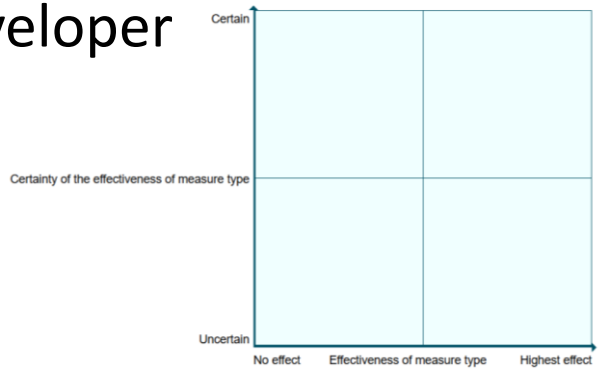
- Overall approach is numeric – based on percent changes
- Rather experts giving numbers than researchers defining them based on qualitative responses
- Enables comparability across topics and an integrated assessment
  - Issues with comparability of qualitative levels across topics (e.g. what does “low” mean for noise, input of nutrients, mammals)
- Uncertainty explicitly asked/ranges possible (minimum, maximum, most likely)

Addressing criticism: Semi-quantitative/ qualitative approach preferred (2/2)

- Approach enables all kinds of answering strategies
- Surveys request three point values (min, max, most likely) but not mandatory
- Model allows for different data precision levels
  - One point estimate: known/fixed value
  - Three point estimate: range, increased probability of most likely value, allows for asymmetric/symmetric probability
  - Two point estimate: narrow range, wide range, uniform distribution

Survey platform software bug

- Grid question on effectiveness of measures: data could be lost if a point was moved after it was placed. The bug will be fixed in an update on 27 March
  - Missing data
  - Rescaling issue
- All responses likely need to be reviewed and complemented by original respondents
- Discussions ongoing with the software developer



Next steps

- Literature review completed in April
- Additional survey data collection in April-May
- Analyses and results May-June
- Validation of data intersessionally in June-September
- BSAP update workshops in August/September