

# HELCOM pre-core indicator Cumulative impacts on benthic biotopes

## Progress and current developments

Torsten Berg & Birgit Heyden, MariLim

Presented by Kristine Brüggemann, ITAW



# Progress since S&C 9-2018

- Baltic wide assessment, based on HELCOM data and specifications used for HOLAS II
- Including physical pressures from demersal fishery, mariculture, extraction, dredging, disposal of dredged material and marine constructions
- Application of a proposed threshold value to GES (good environmental status)
- Inclusion of a cut-off method for cumulative disturbance leading to loss and the assessment of loss using CumI, optional depending on the outcome of TG SEABED
- Indicator targeting D6C3 MSFD, information on D6C1 and D6C2 and partly on D6C4 and D6C5 in addition

# Outlook and further steps

- Presentation of current developments and results planned for EN BENTHIC 3-2019
- Updated CumI report in progress for S&C 12-2020 aiming at status shift to core indicator
- Comparison of assessment results (Baltic wide, national MSFD D6C3 assessments, CumI, BSII) to determine differences and underlying causes
- Refinement of pressure and sensitivity classification to improve the resulting magnitude of pressure and the impact assessment depending on data availability
- Inclusion of and comparison with monitoring data

**Thank you!**



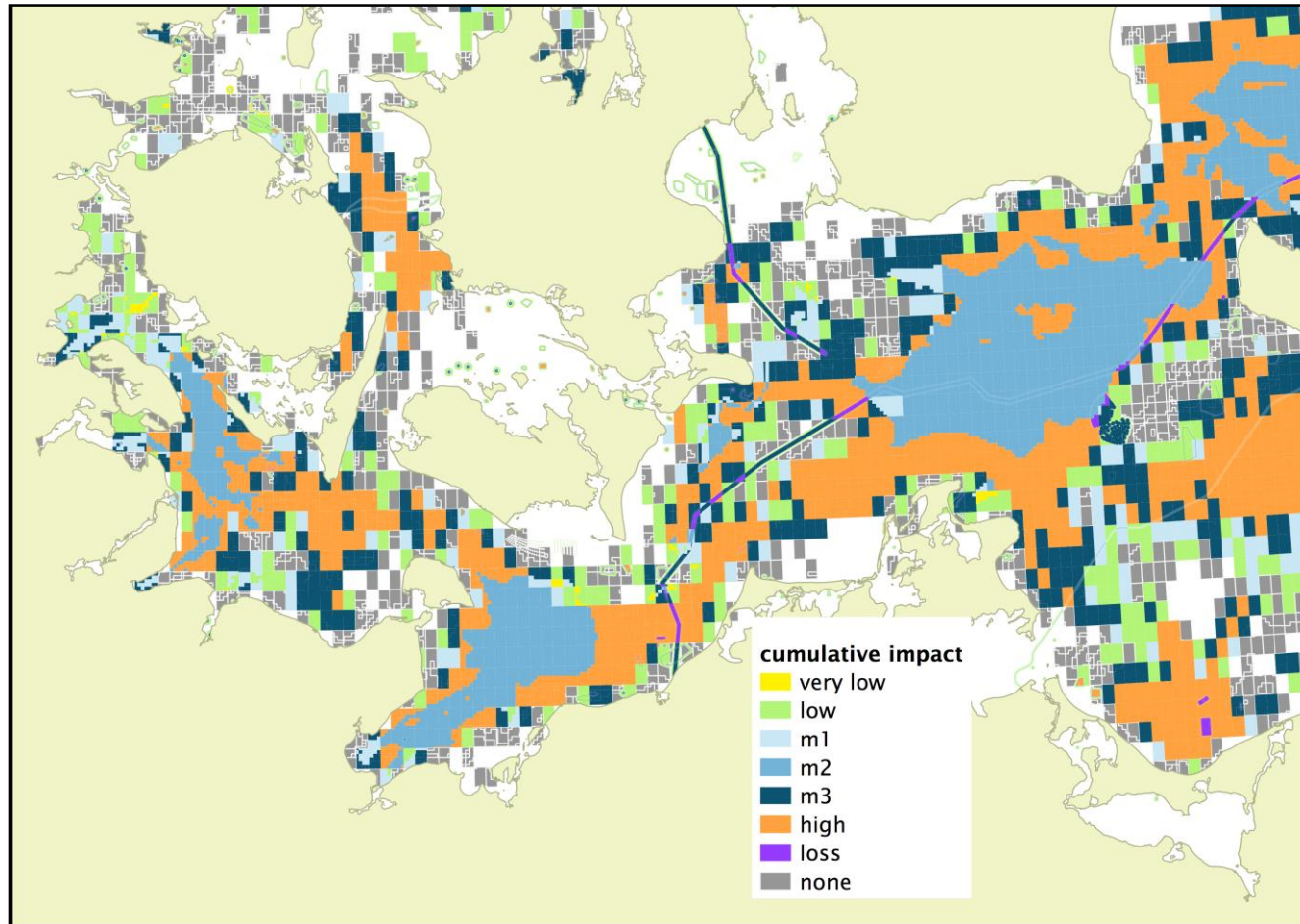
# GES threshold

- Threshold value: less than 25 % of the area of a biotope is significantly impacted **and** 10 % of the biotope area must be permanently without impact to reach GES
- Boundary between 'low' and 'moderate' cumulative impacts defined as 'significant impact' or adversely affected
- Differentiation of impact classes enlarged from 4 to 7 (5 of them for significant impacts divided in 3 moderate and 2 high classes) according to the required separation of loss and disturbance

Impact (simple)	Impact (extended)	Category
high	very high	loss
	high	disturbance
moderate	moderate 3	disturbance
	moderate 2	disturbance
	moderate 1	disturbance
low	low	disturbance
very low	very low	disturbance

← Boundary of significant impacts

# Baltic wide test assessment results – Physical disturbance



- Includes various pressures (fishing, dredging, dumping, constructions)
- Based on the HELCOM map of broad scale habitats

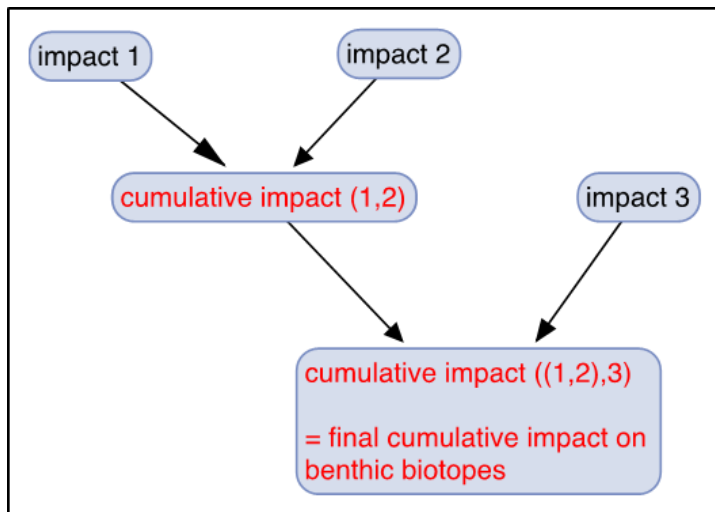
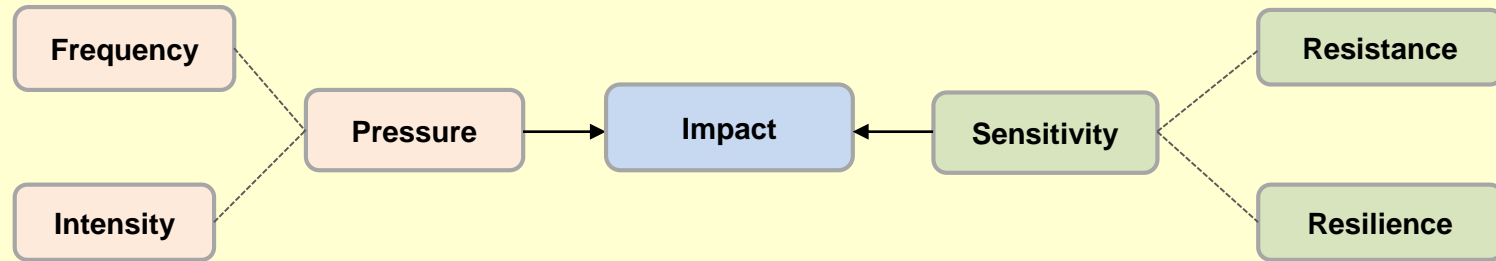
# Baltic wide test assessment results – Physical loss

Loss – direct loss (certain pressures) and loss from cumulative physical disturbance

Biotope	Direct loss (%)	Direct loss + cumulative loss (%)
Circalittoral hard	0.18	0.18
Circalittoral mix	0.06	0.11
Circalittoral mud	0.06	0.06
Circalittoral sand	0.36	0.60
Infralittoral hard	0.88	0.90
Infralittoral mix	0.92	0.93
Infralittoral mud	1.15	1.19
Infralittoral sand	1.74	1.82

- Baltic wide assessment with adapted CumI method (enlarged impact matrix, loss cut-off) providing information for different criteria under D6 assessment
- Need for harmonisation of loss definitions (HELCOM, OSPAR, ICES), probably through TG Seabed

# Method/assessment procedure



- Individual impacts derived from specific pressures combined with sensitivities
- Final cumulative impact on benthic biotopes derived by intersecting individual impacts in sequence



# Method/assessment procedure

- Biotope map as a basis (including abiotic and biotic components), broad scale habitats level 4 as minimum requirement
- Classification of pressure magnitudes and general or pressure specific sensitivities for the different biotopes used (matrix 1 and 2)

1

Magnitude of pressure intersection matrix	<i>Frequency</i>			
	persistent (more than three times per year or permanent)	frequent (two to three times per year)	regular (once per year)	occasional (less than once per year)
high (0.75–1)	High	High	Moderate	Moderate
moderate (0.5–0.75)	High	Moderate	Moderate	Low
low (0.25–0.5)	Moderate	Moderate	Low	Very low
very low (0–0.25)	Moderate	Low	Very low	Very low

2

Sensitivity intersection matrix	<i>resilience</i>			
	very low (> 10 years)	low (5–10 years)	moderate (1–5 years)	high (<1 year)
very low	High	High	Moderate	Moderate
low	High	Moderate	Moderate	Low
moderate	Moderate	Moderate	Low	Very low
high	Moderate	Low	Low	Very low

# Method/assessment procedure

- Transformation of pressures to impacts (matrix 3), differentiation of resulting impact classes to refine assessment of disturbance and separate it from loss
- Cumulation process by pairwise intersection (matrix 4)

**3**

Impact intersection matrix	<i>Magnitude of pressure</i>				
	High	Moderate	Low	Very low	
<i>Sensitivity</i>	High	High/vh	High/h	Moderate/m2	Moderate/m1
	Moderate	High/h	Moderate/m3	Moderate/m1	Low
	Low	Moderate/m2	Moderate/m1	Low	Very low
	Very low	Moderate/m1	Low	Very low	Very low

**4**

Cumulation matrix expanded	<i>Impact 2</i>					
	high	Moderate/m3	Moderate/m2	Moderate/m1	Low	Very low
<i>Impact 1</i>	high	Very high	Very high	high	high	high
	Moderate/m3	Very high	Very high	high	m3	m3
	Moderate/m2	high	high	m3	m2	m2
	Moderate/m1	high	m3	m2	m2	m1
	Low	high	m3	m2	m1	Low
	Very low	high	m3	m2	m1	Low