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Review of aggregation rules for assessment of biodiversity status

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Baltic BOOST
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Background of the review work

- European Environment Agency tasked the European Topic Center (Inland, Coastal and Marine Waters) to make a review of the available assessment tools for Europe's seas.
- The interim report was finalized in 2015.
- The task team included : SYKE (lead), Deltares, ISPRA, IWRS, UBA, JNCC and NIVA.

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Review methods

Division of the assessment tools to four groups:

BIODIVERSITY	EUTROPHICATION	CONTAMINATION	ECOSYSTEM HEALTH

Collation of marine integrated assessments:

- *Main emphasis in Europe, but also US, China, South Africa (etc)*

Review criteria:

PROOF OF CONCEPT	DEVELOPMENT HISTORY	VALIDATION	TECHNICAL DESCRIPTION	INTEGRATION RULE
DETERMINATION OF STATUS	UNCERTAINTY ASSESSMENT	COMPREHEN-SIVENESS	SUITABILITY FOR MSFD	

No scoring but descriptive evaluation!

Tools and methods to the review

BIODIVERSITY

BEAT	MARMONI	NEAT	Biological Health Index	Index of Biological Integrity	Estuarine Fish Commun-ity Index	French Estuarine Fish Index	US EPA Benthic Index

EUTROPHICATION

TRIX	ASSETS	HEAT	OSPAR COMP	WQI	EWQI	TWQI	IFREMER

CONTAMINATION

AQI	CHASE 1.0	CHASE 2.0	FTCI	PLI	SQI

ECOSYSTEM HEALTH

HOLAS	EPA Coastal Condition	Integrative Index of Coastal Waters

General conclusions

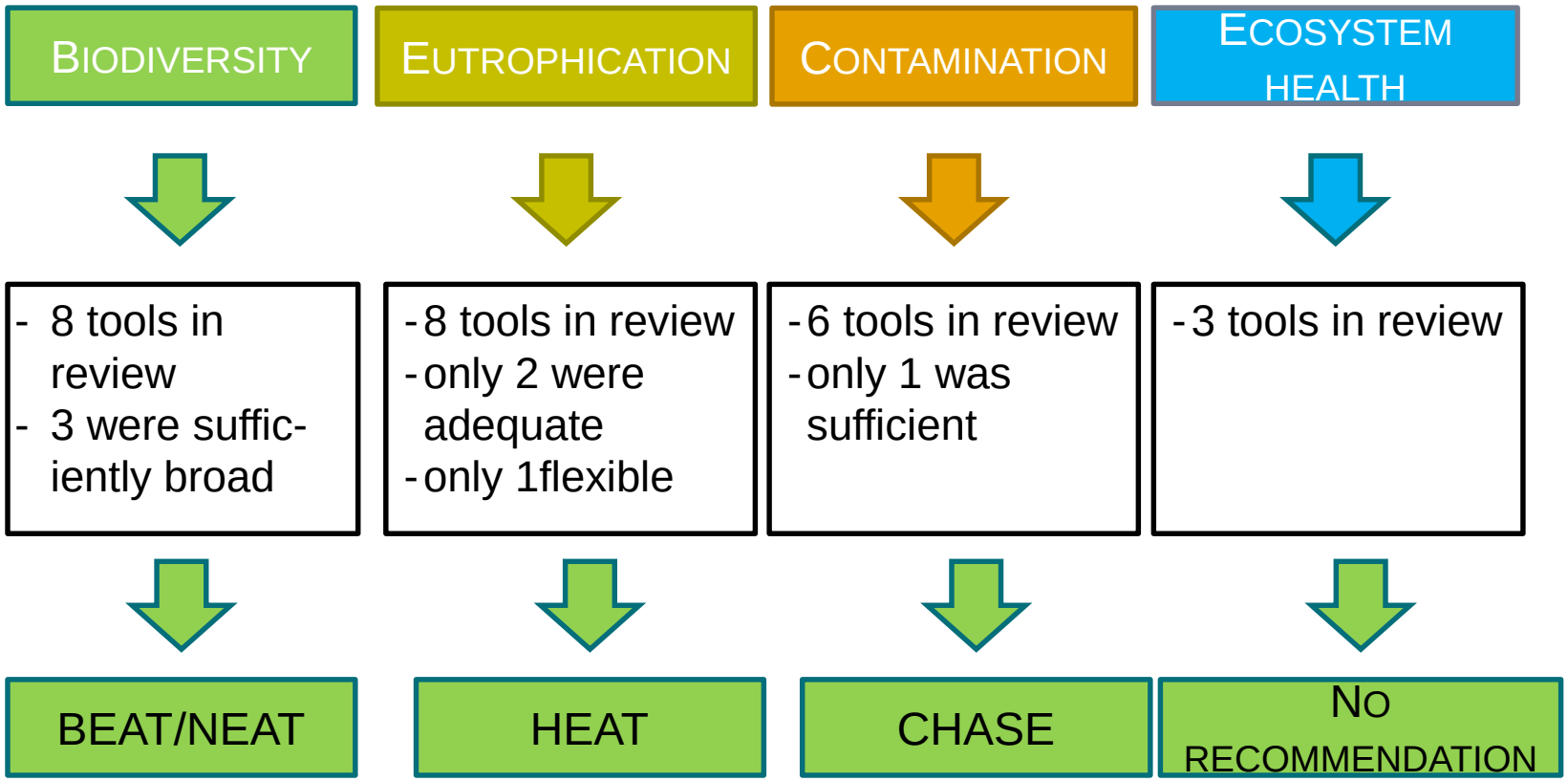
In case of international assessments, where monitoring programmes and indicator palettes differ:

- Tools that depend on summing up of indicator scores are not optimal. ← *separate GES boundary setting for each set of indicators.*
- Tools that depend on conditional rules (other than OOAO) are possible ← *would require 'rules how to deal with missing indicators'*.
- Tools that depend on (weighted) averaging are better suited to the MSFD assessment context ← *stand-alone indicators and indicator-specific GES-boundaries*.
- Tools that depend on hierarchical aggregation rules were best suited to the MSFD context ← *good evidence, good experience, allow high confidence and still precautinary approach.*
- No tool depended on OOAO → *integrated status requires multiple indicators and the risk of 'failure to reach GES' increases incredibly.*

MSFD asessment system assumes indicator-specific GES-boundaries ← *COM DEC 477/2010/EU*

MSFD indicators may require different technical solutions for GES-boundaries → *tools need to be flexible*

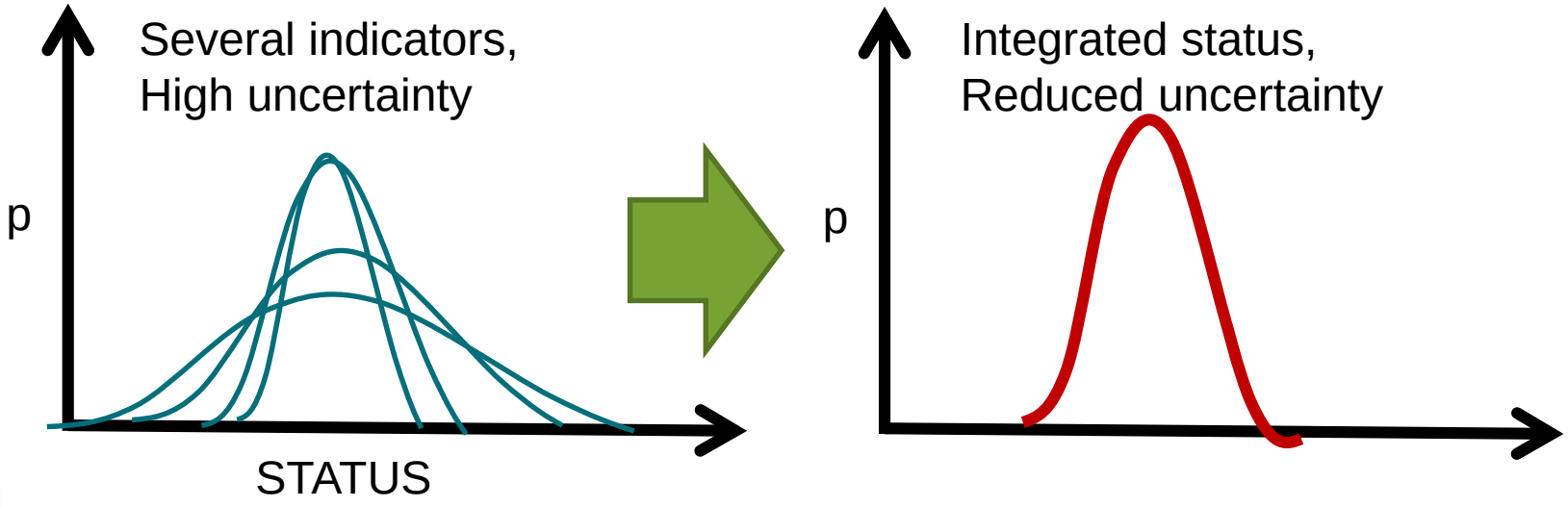
Recommended tools from the review



Biodiversity assessment:
What are the strengths of the BEAT / NEAT tools?

Confidence of the assessment:

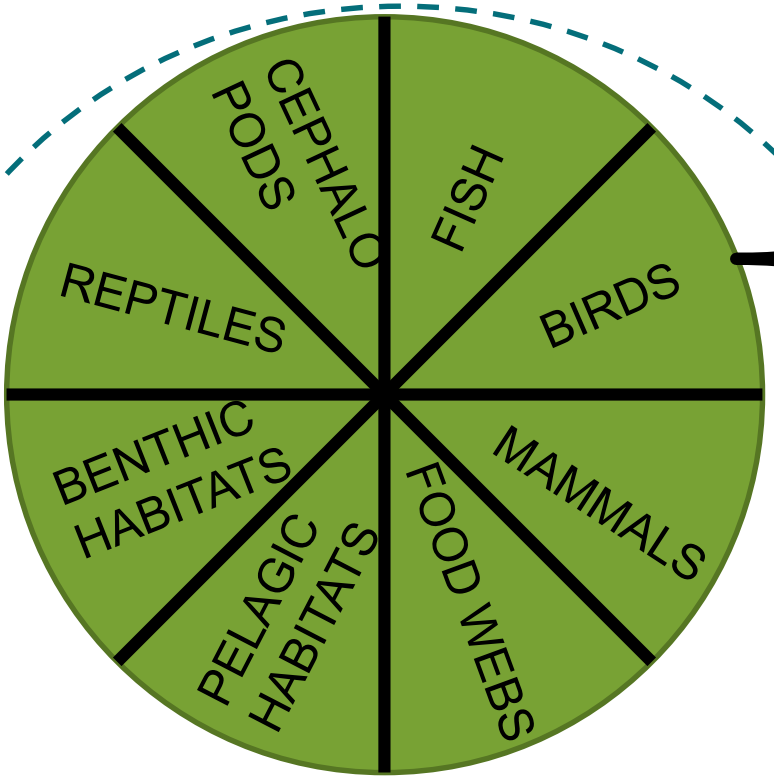
1. The more indicators are included, the more confidence the results will get ← weighted averaging per indicator group.
2. Numeric indicators and indicator-specific GES-boundaries allow probability estimates for the assessment confidence.



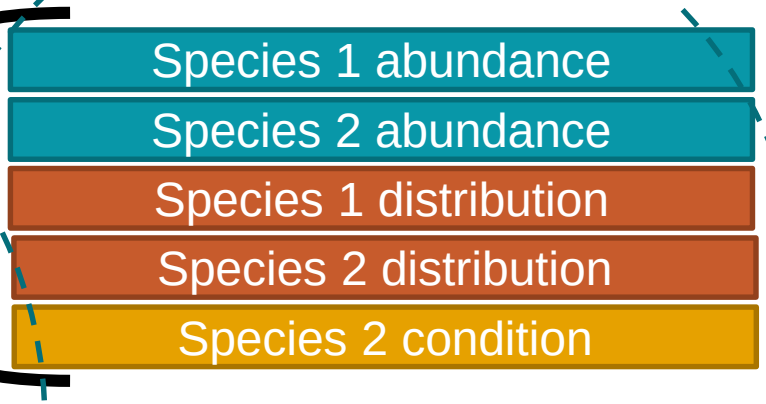
Biodiversity assessment:
What are the strengths of the BEAT / NEAT tools?

Hierarchy of the assessment structure:

1. Allows OOAO at a higher assement level → precautionary principle on a sensible level.
2. Weighted averaging allows higher confidence on the status.



OOAO among ecosystem components

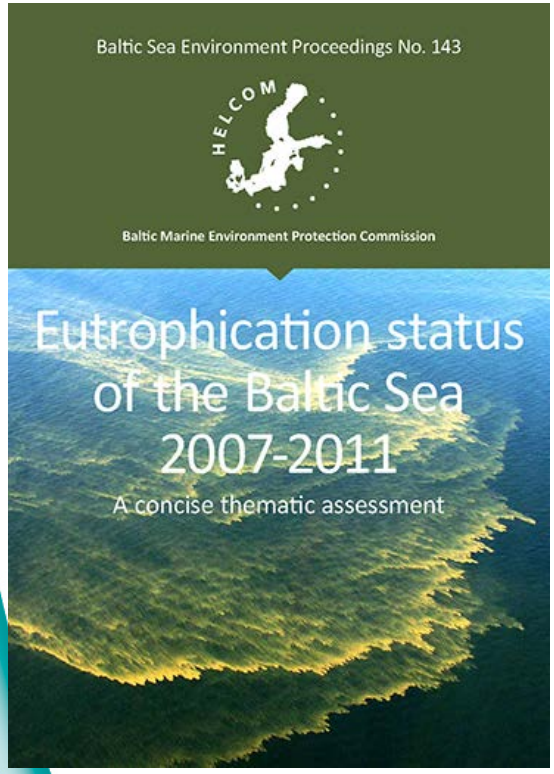


Weighted averaging in 1 or 2 steps

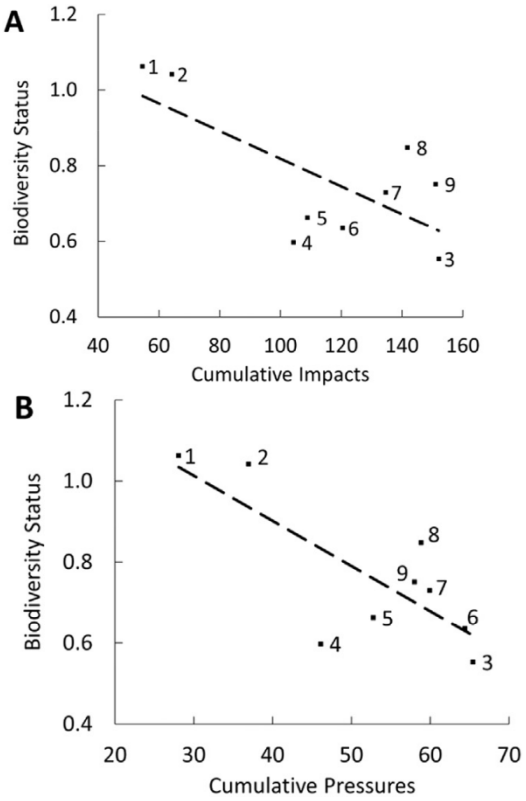
- All species-criteria combinations in a group
- OR First criteria and then species

Scientific evidence and practical experience in integrated assessment

HEAT 3.0 → almost EU-wide experience about hierarchical aggregation rules



BEAT 2.0: validation against pressures and impacts



Scientific peer-reviewed papers related to the HELCOM status assessment tools:

HEAT: 7 papers,
BEAT: 2 papers,
CHASE: 1 paper

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We are on the right track!

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Questions for the workshop

1. Any reflections on the review conclusions?

2. Do these review conclusions reflect your national considerations for the biodiversity assesment?

3. Do you agree on the difficulties with the one-out-all-out principle on ’low assesment level’?

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