SCAIRM

Cumulative Impact Assessments and the science-policy interface

"Different applications of SCAIRM to inform policy"

Gerjan Piet (WMR)

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Principles: SCAIRM

Common principles (a) terminology

Adopt common and consistent terminology and definitions in a given CIA process.

Explain terminology and methodological approach for non-expert audience.

Clearly define purpose of the CIA method.

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- Inform marine or maritime spatial planning (MSP) decision-making on a sea basin level.
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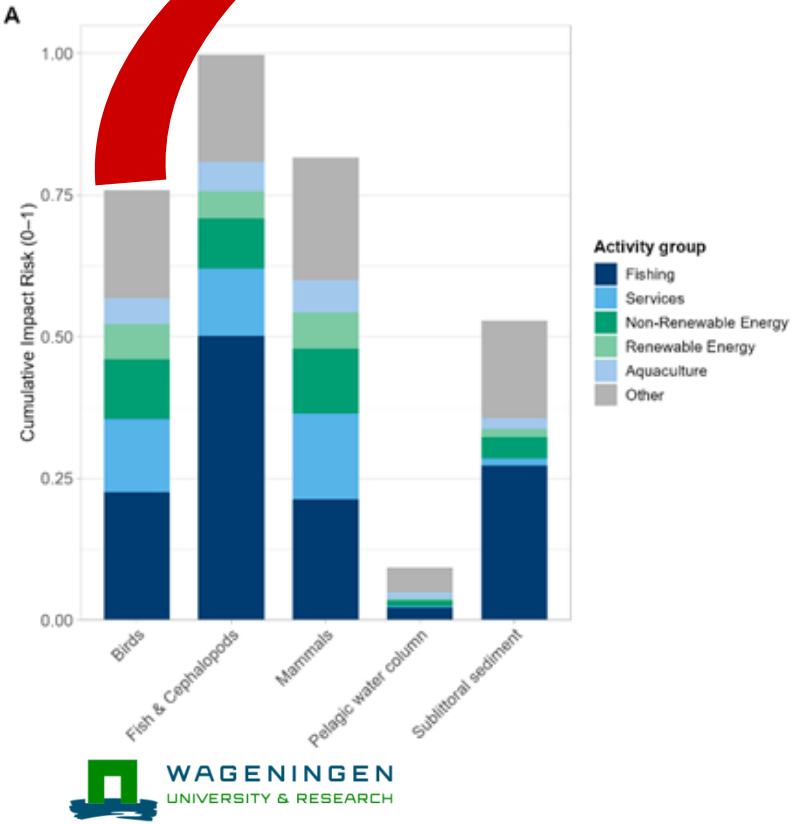
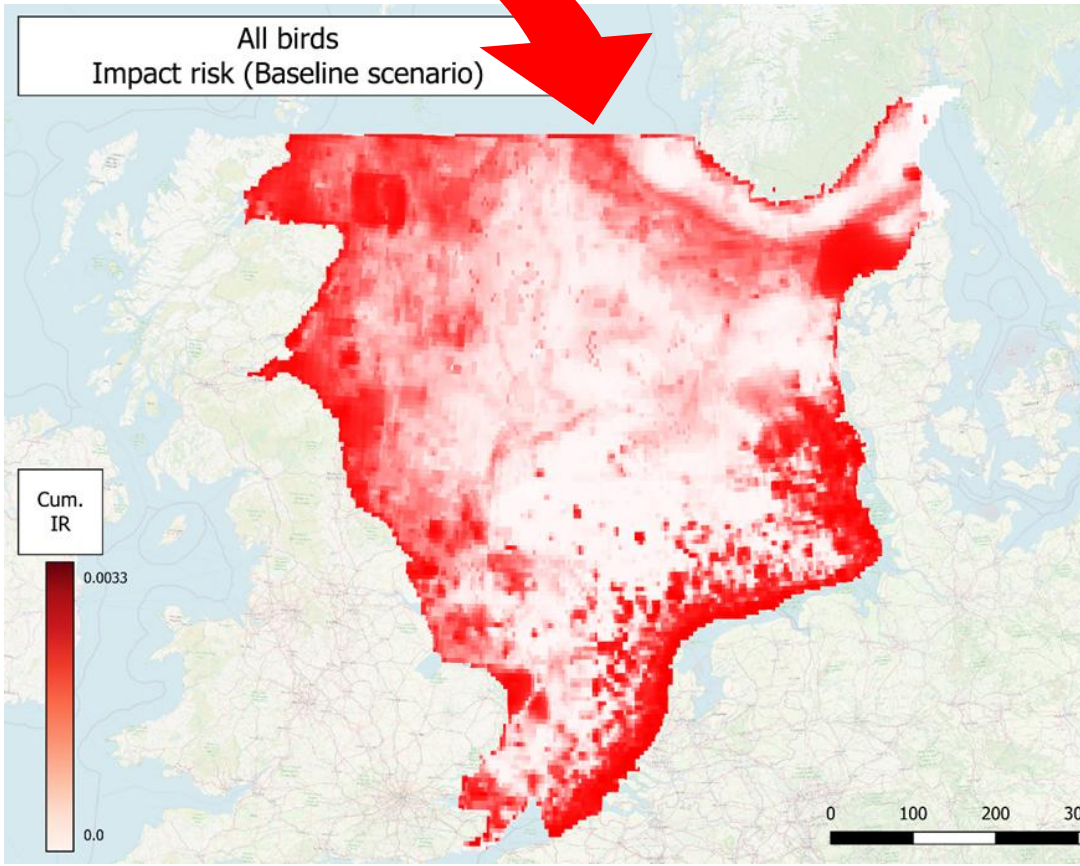
- Setting in the wider context requires compliance with other relevant frameworks/concepts e.g. IEA, EBA and/or SES:
- Functioning of the science-policy interface

Identify the main anthropogenic threats





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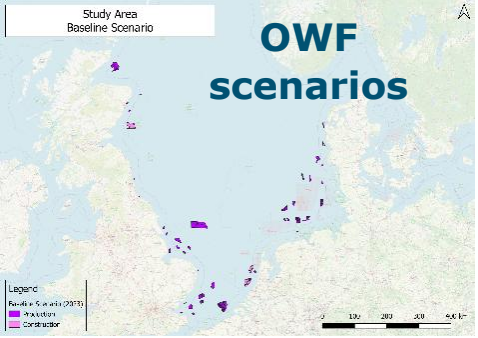
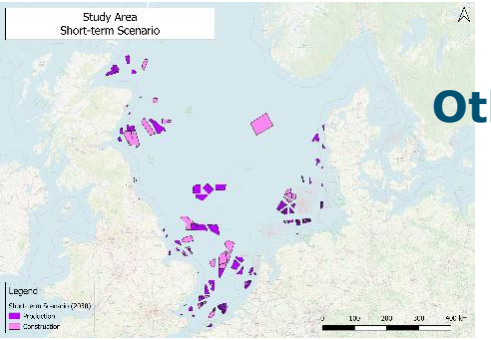
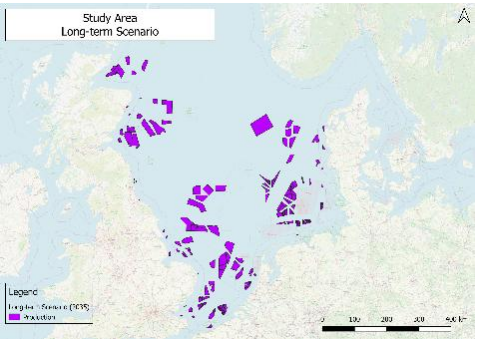
MSP scenarios
Offshore wind
&
Other human activities
on
Birds



OWF scenarios



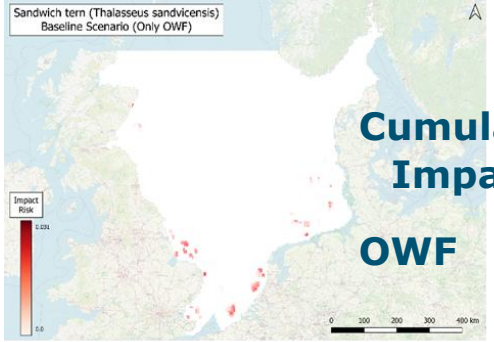


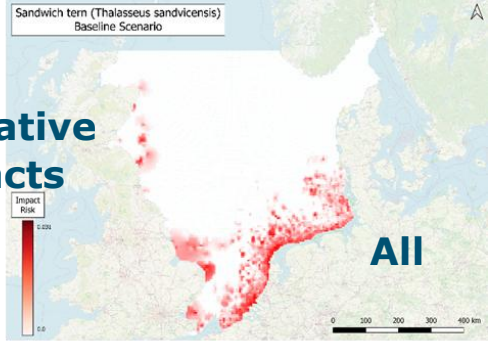
Sandwich tern

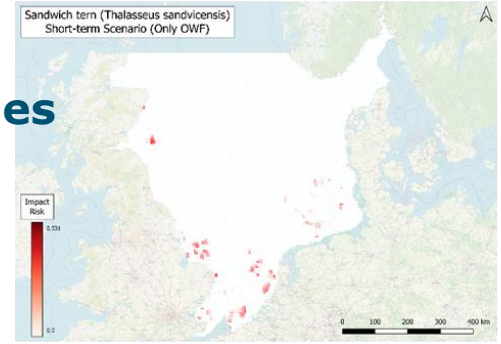
Cumulative Impacts

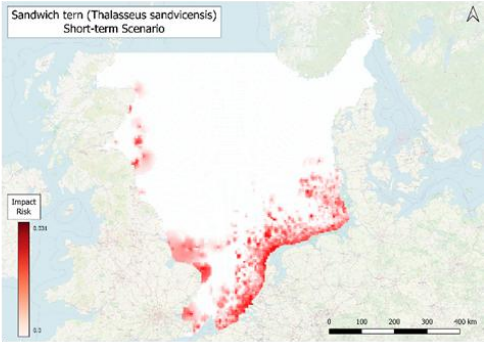
OWF

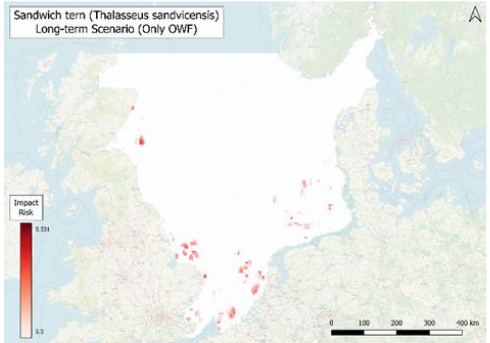
All

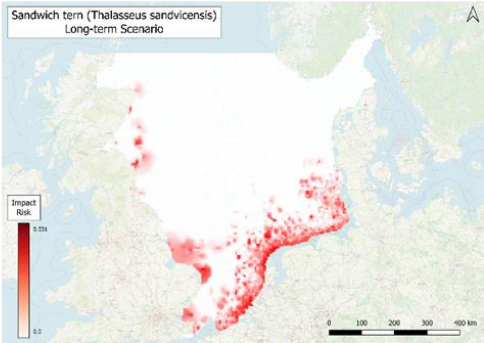












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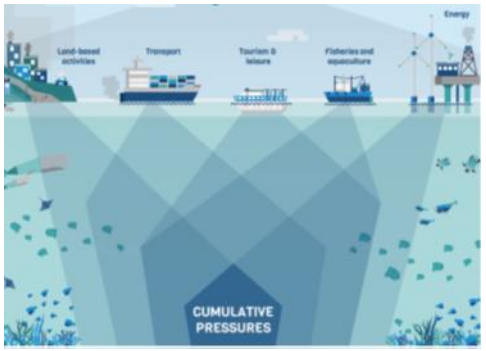

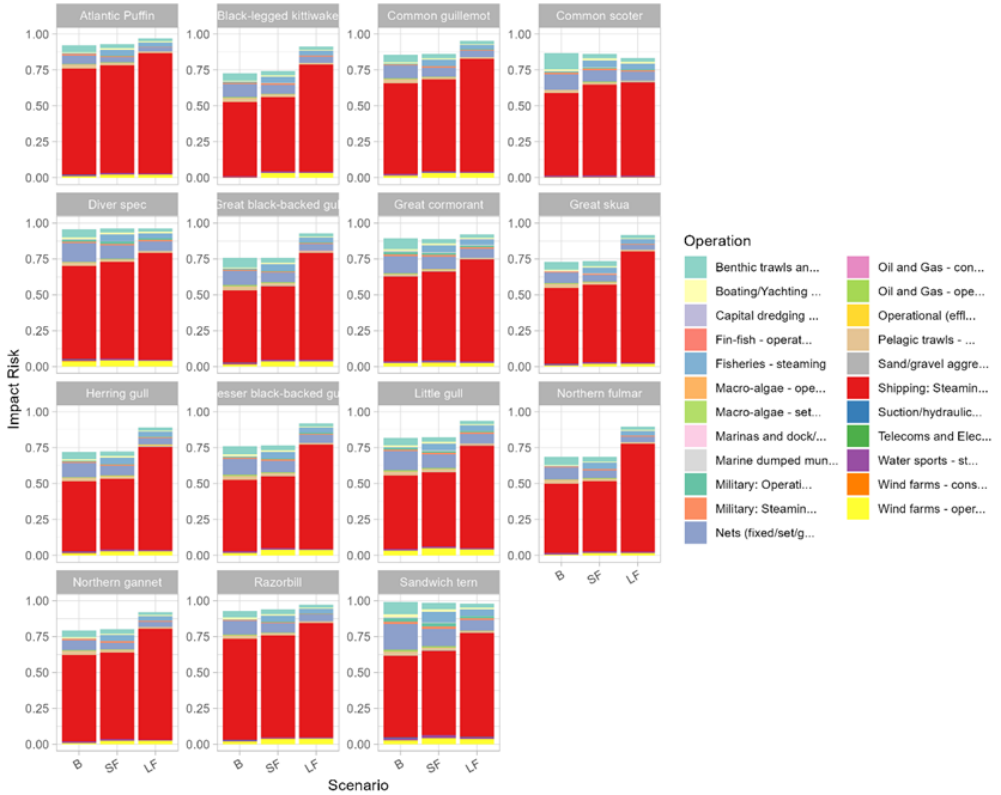

Category of spatial availability and quality	Activities	Impact Risk	% Activities	% Impact Risk	Total % Impact Risk
Cat. 1. Available and applied	32	0,37	29%	44%	44%
Cat. 2. Possibly proxies but still to do	16	0,32	15%	38%	82%
Cat. 3. Not available/unknown	61	0,15	56%	18%	100%
Total	109	0,84	100%	100%	100%

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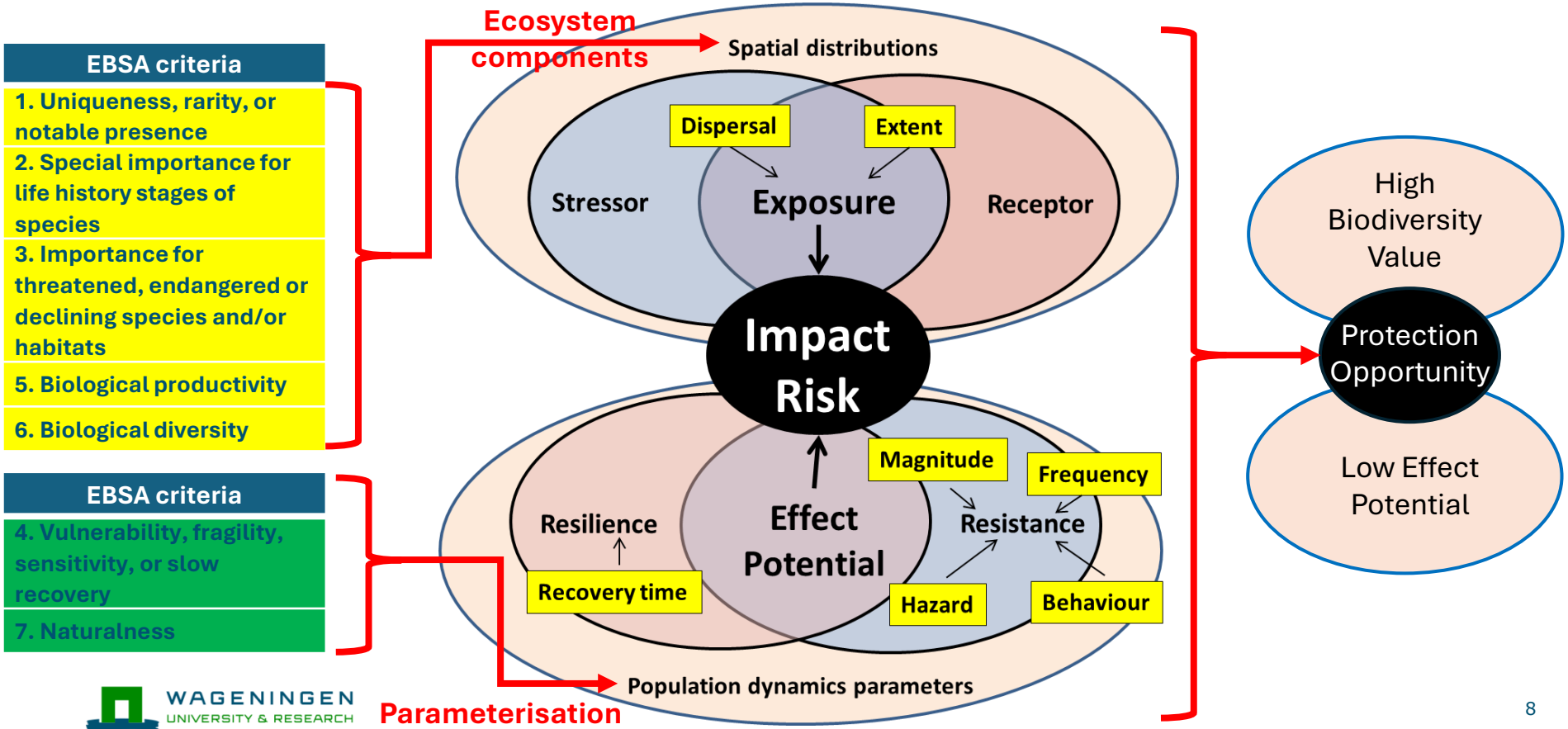
EBSA → SCAIRM → MPA



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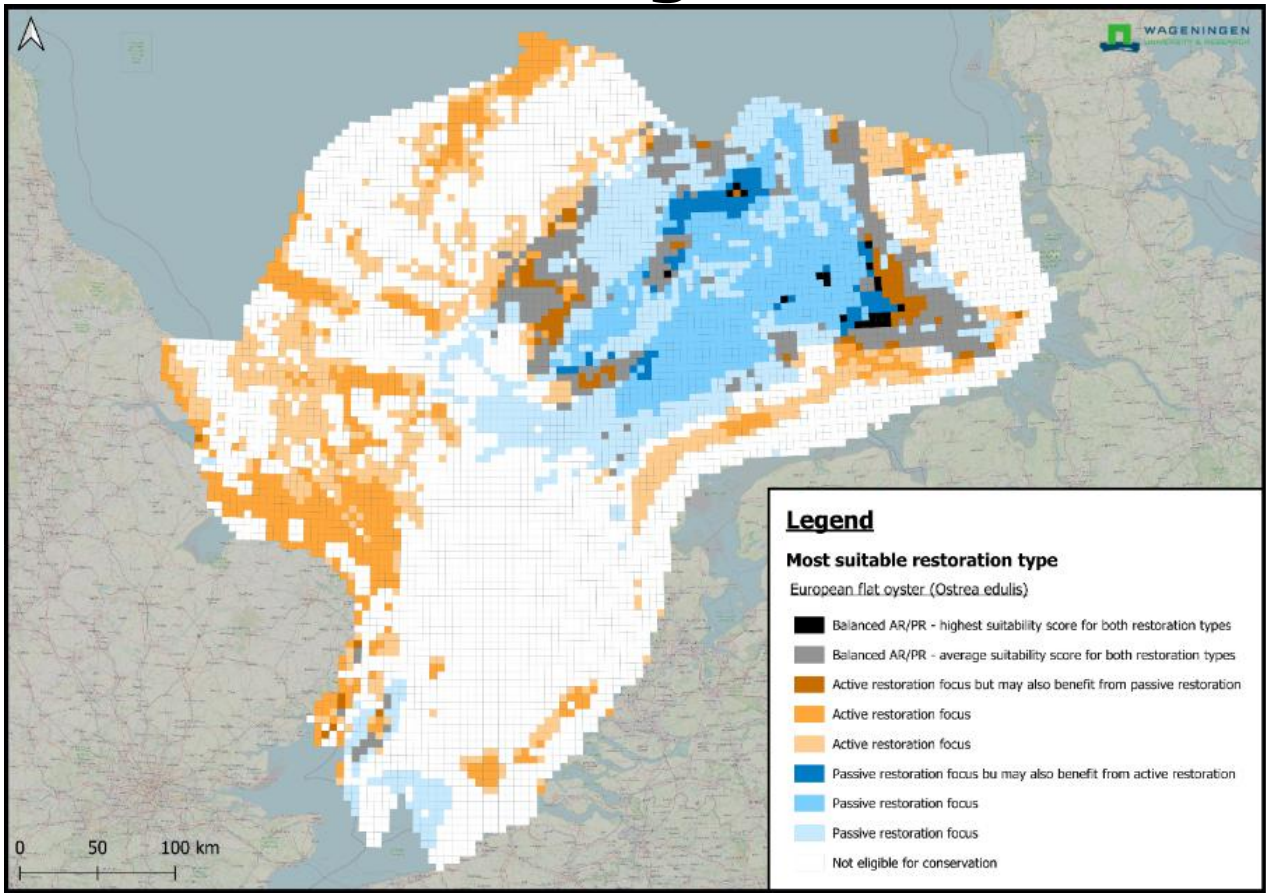
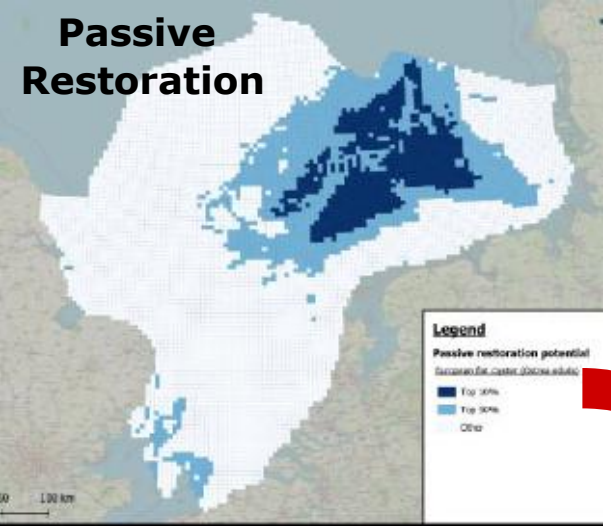
Guidance for MPAs and management





MPA guide

Level of Protection		Reduction (%) Impact Risk
10%	30%	Ostrea edulis
F	H	83%
F	L	76%
H	L	74%
H	M	53%
L	M	46%

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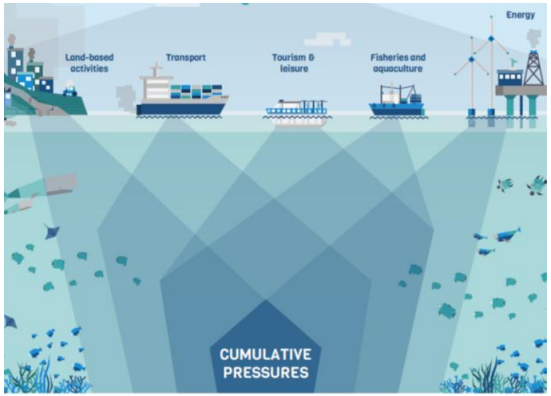
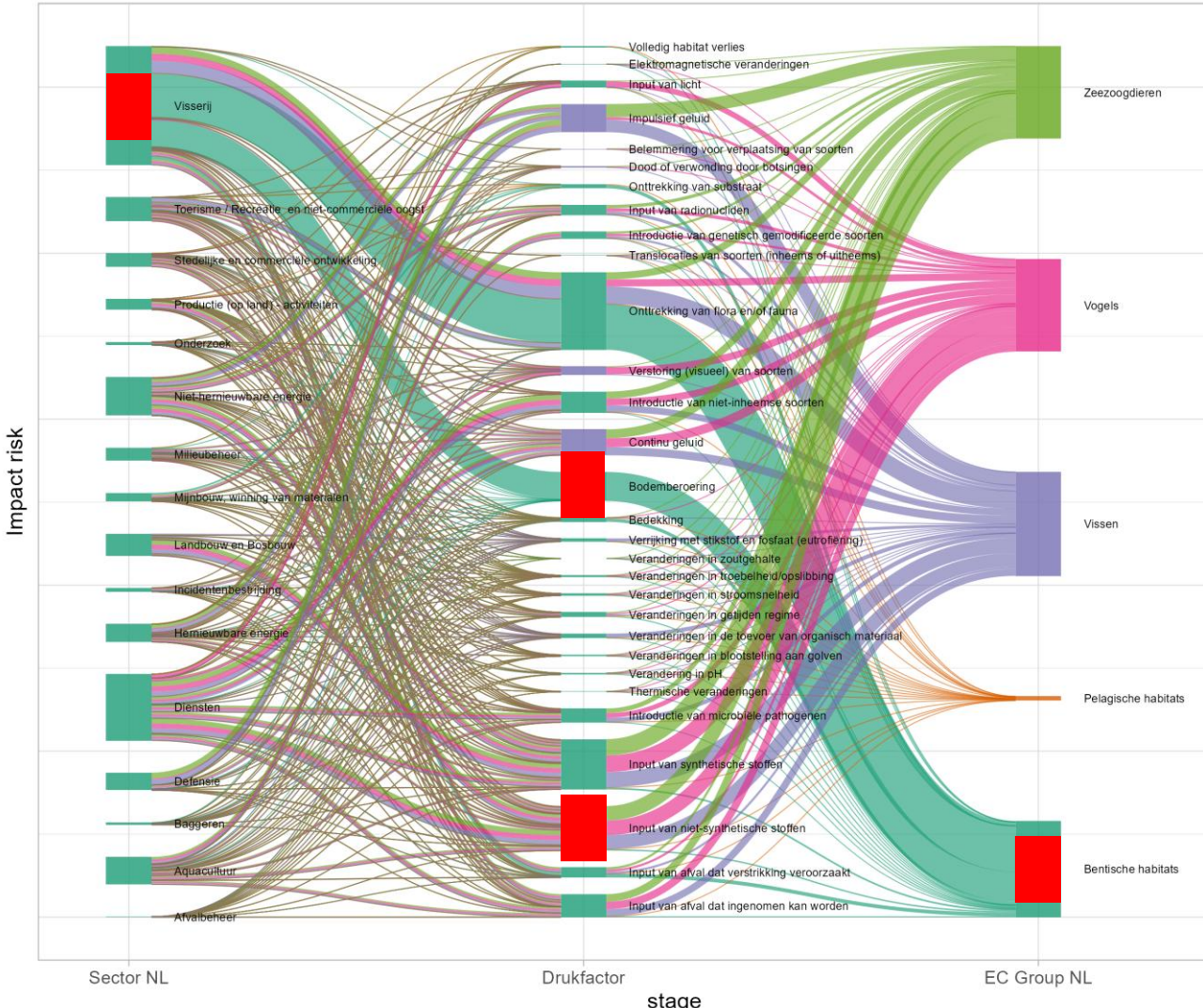
MSFD PoM: Environmental measures typology

Categories	Types		CIA				
			Interpretation	A	P	S/I	
						S	H
Prevention	Input controls	Capacity	Restricting primarily the activity (and hence all or at least a selection of associated pressures)	■	■		
		Effort					
		Technical Conservation Measures					
	Spatio-temporal distribution controls	Spatial closure/restriction (MPA)	Restricting the extent in space and time of the activity (and hence also (all) associated pressures)	■	■		
		Seasonal closure/restriction					
		Real-Time Closure					
		Marine Spatial Planning (MSP)		■	■		
Mitigation	Output controls		Prevent (all or partly) any specific pressure(s) while allowing the activity to continue		■		
	Remediation		Mitigate the effects of the pressure(s) from past activities		■		
Restoration	Species or stock restoration		Recover the original state of the ecosystem component(s)			■	
	Substrate restoration						■
	Substrate creation		Enhance beyond original state of the ecosystem component(s)				■

Spatial **C**umulative **A**ssessment of **I**mpact **R**isk for **M**anagement





Cumulative Impact Risk (IR) covered by the MSFD PoM

Ecosystem Component	IR Baseline	IR covered irt baseline	
		PoM-2015	PoM-2022
Birds	0,703	99,4	100,0
Fish	0,985	98,7	98,8
Mammals	0,764	100,0	100,0
Pelagic	0,092	97,9	97,9
Seafloor	0,467	97,9	97,9

MSFD PoM
can be considered a "Best effort obligation"

		% reduction IR PoM 2022 irt baseline		
Ecosystem Component	IR baseline	100% effective	60% effective	20% effective
Birds	0.703	100	6.3	12.1
Mammals	0.764	100		2.2
Fish	0.985	98.8		
Pelagic	0.093	97.9		
Seafloor	0.467	97.9		

Necessary to achieve GES which is a "Performance obligation"

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Science-Policy interface

- Policy relevance: Standardized output per application, e.g. graphs, text, format, layout, level of detail, etc.
- Reliability: methodology, accuracy, precision (confidence interval), peer-reviewed publications. International collaboration (EU projects, ICES WGCIAM)
- Transparency: possibility to explore "drill down" into the underlying information

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Principles: SCAIRM

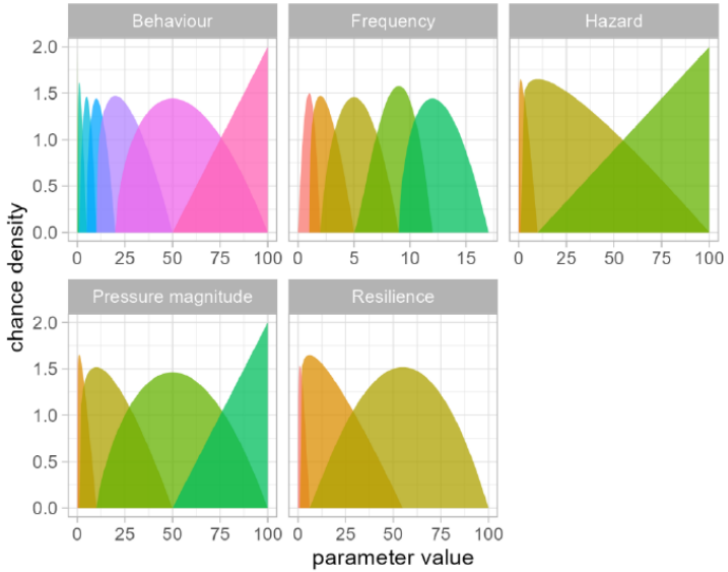
Common principles (b) uncertainty, confidence, transparency

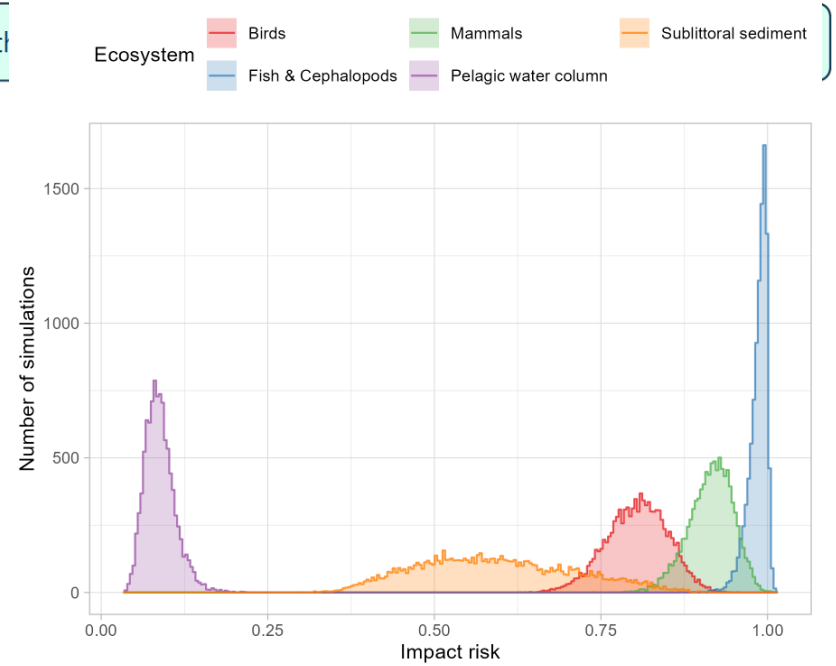
Document quality of the information/data (quantitative/qualitative and expert opinion) and methods transparently, including uncertainties and assumptions made.

Evaluate the strength of evidence and confidence in assessment outcomes; Highlight limitations in use of assessment outputs; Communicate knowledge gaps effectively.

Ensure treatment of uncertainty invcentivises, rather than discourages, collection of more data and information. Additional evidence should result in a higher confidence.

Method should allow th





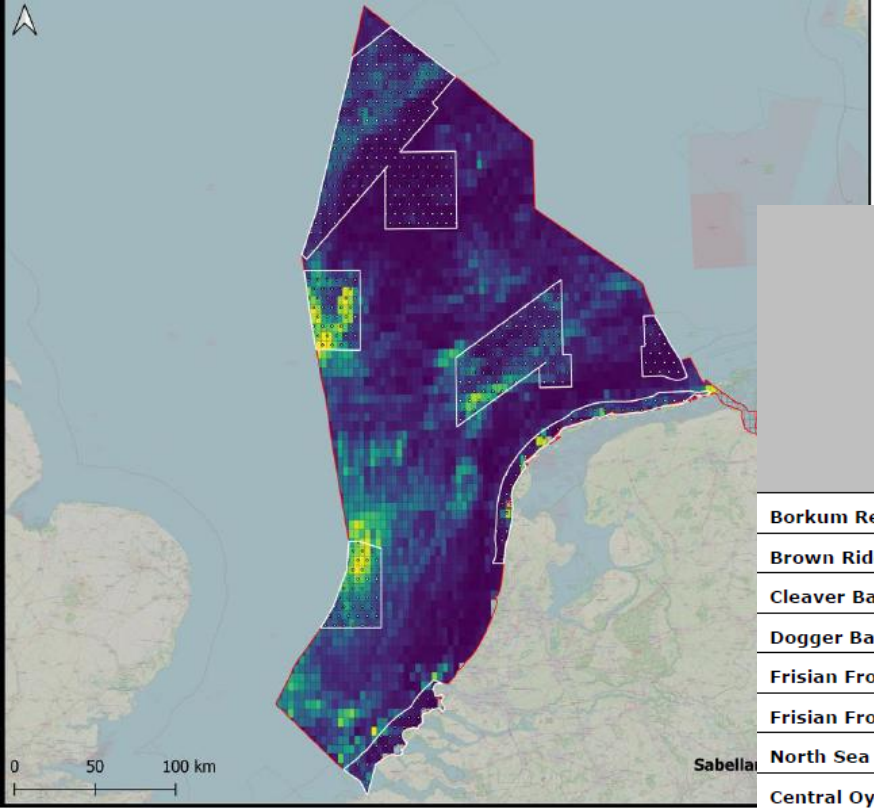
Principles: SCAIRM

Common principles (d) integration

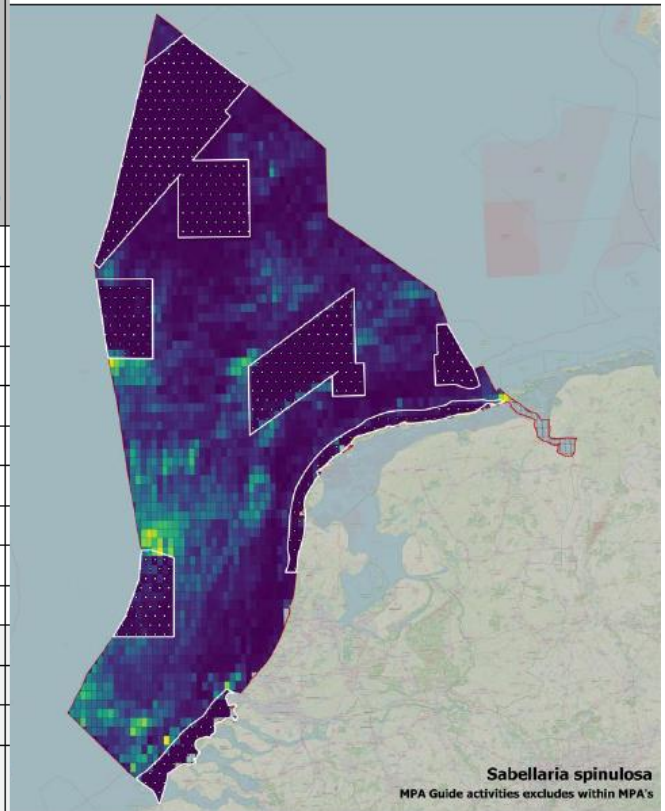
Method should inform a wide range of management interventions and support integration of policies.

Method should allow for integration of information from stakeholders.

- Evaluation MSFD Programme of Measures
- GES4SEAS – Evaluation of CIA and other tools for "Practical" EBM
- Spatial management: MPAs and MSP

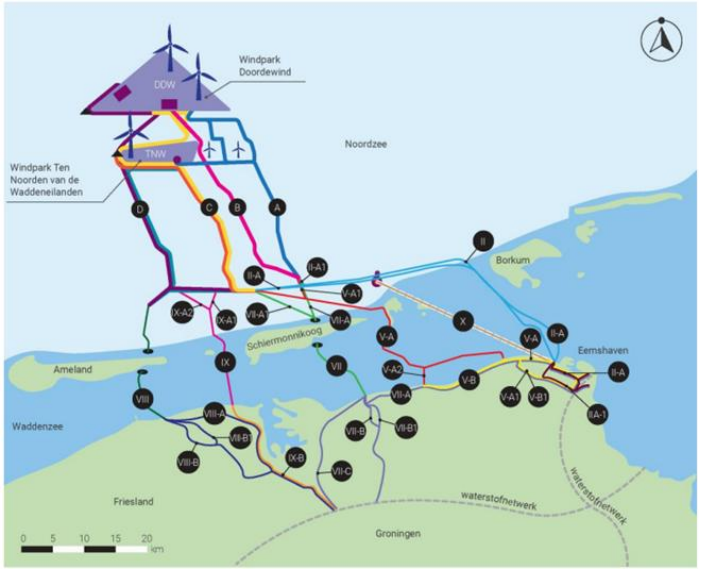


MPA	Ross worm (*Sabellaria spinulosa*)[2]
Borkum Reef Grounds	0.0
Brown Ridge	5.6
Cleaver Bank	10.0
Dogger Bank	1.9
Frisian Front subarea 1	2.6
Frisian Front subarea 2	0.1
North Sea Coastal Zone	1.6
Central Oyster Grounds	0.1
Raan Flats	0.1
Voordelta	0.2
All MPAs	22.2
Outside MPAs	20.0
Overall threat	42.2
Overall threat under full protection according to MPA-Guide	20.4



The amount of Impact Risk (%) on Sabellaria caused by all activities combined within each of the MPAs, all MPAs combined and outside the MPAs

Principles: SCAIRM



Common principles (e) implementation practice

Align method with capabilities and resources of contributors.

Align content and presentation of outputs with needs of stakeholders..

Incorporate participatory processes to engage stakeholders.

Be guided by operational objectives as/where available and appropriate.

Pressure	Hazard	Magnitude		
		Standard	Tennet	Depletion
Abrasion seafloor	100	0.1	0.1	10
Smothering	1	10	1	10->1
Contaminants	10	1	0.1	10->1
Litter	1	1	0.1	1->0.1
Light pollution	0.1		0.1	0->0.01

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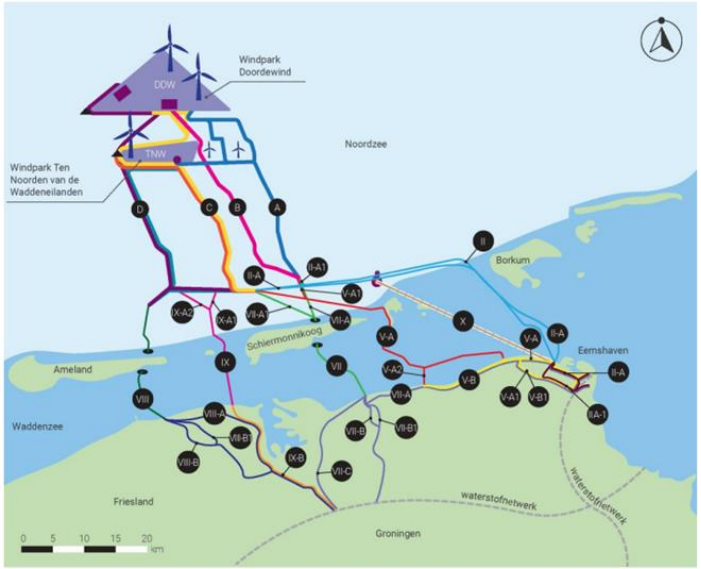
SCAIRM: Expert-judgement parameters



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Litter	1	1	0.1	1->0.1
Light pollution	0.1		0.1	0->0.01

Hazard	Score	Interpretation
Negligible	0.001	No hazard. Similar to undisturbed or pristine
Sublethal low	0.1	Potentially unsustainable at low recovery potential*
Sublethal high	1	Potentially unsustainable at moderate recovery potential*
Lethal low	10	Potentially unsustainable at high recovery potential*
Lethal high	100	Likely to be causing serious or irreversible harm

Magnitude	Score	Interpretation
Very low (VL)	0.1	Traces of the pressure with no adverse effects. Not different from pristine.
Low (L)	1	Adverse effects expected but ≤ 1% of maximum
Medium (M)	10	Adverse effects ≥ 1% but ≤ 10% of maximum
High (H)	50	Adverse effects ≥ 10% but ≤ 50% of maximum
Maximum (VH)	100	Causing highest adverse effects known for that pressure

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Evaluation criteria: **SCAIRM**

Evaluation criteria (1)

(a) Does method make effective use of all relevant data and information by allowing for qualitative and quantitative analyses?

(b) Can method be improved incrementally as new data and information become available and without compromising short-term operability?

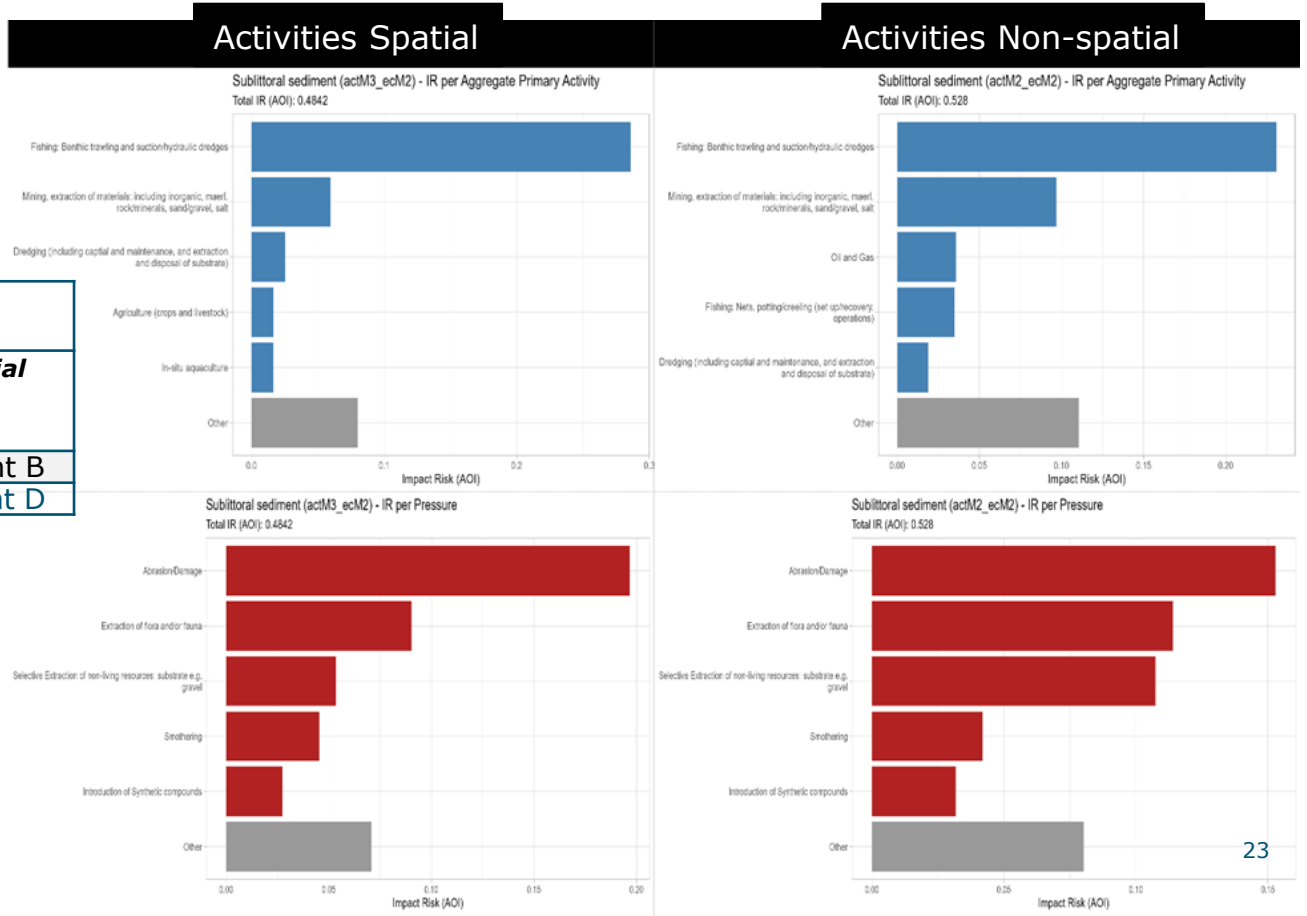
(c) Is method based on a comprehensive linkage framework allowing for inclusion of all manageable activities at appropriate scales and every pressure?

(d) Are categories in the linkage framework directly relevant for, or do they replicate, those adopted in policies and of interest to stakeholders?

- Ongoing process to incrementally improve SCAIRM by incorporating more quantitative information
- Aim is to improve applicability and confidence in the output but guided by output, i.e. what are the main threats, and sensitivity analysis

Using spatial information

Activities	Ecosystem Component	
	EC uniformly distributed	***Spatial***
Spatial	Variant A	Variant B
Non-spatial	Variant C	Variant D



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C = Comprehensive
D = Detailed categories

Purpose of the CIA - Application	Linkage Framework
Identify the main anthropogenic threats that compromise the achievement of good environmental status (GES).	C, D
Evaluate planning scenarios of offshore wind and other human activities.	D
Inform marine or maritime spatial planning (MSP) decision-making on a sea basin level.	D
Evaluate management measures, e.g. MSFD Programme of Measures (PoM):	C, D
Setting in the wider context requires compliance with other relevant frameworks/concepts:	D
Functioning of the science-policy interface	D

Evaluation criteria: **SCAIRM**

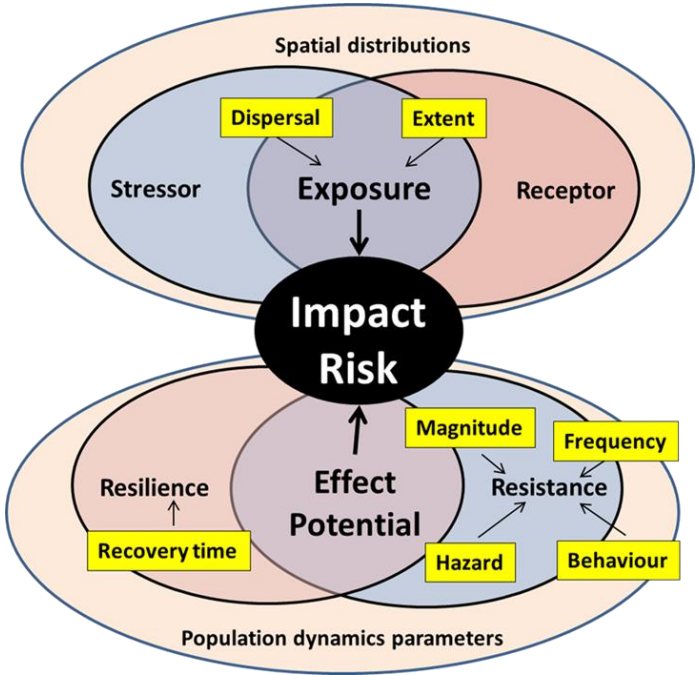
Evaluation criteria (2)

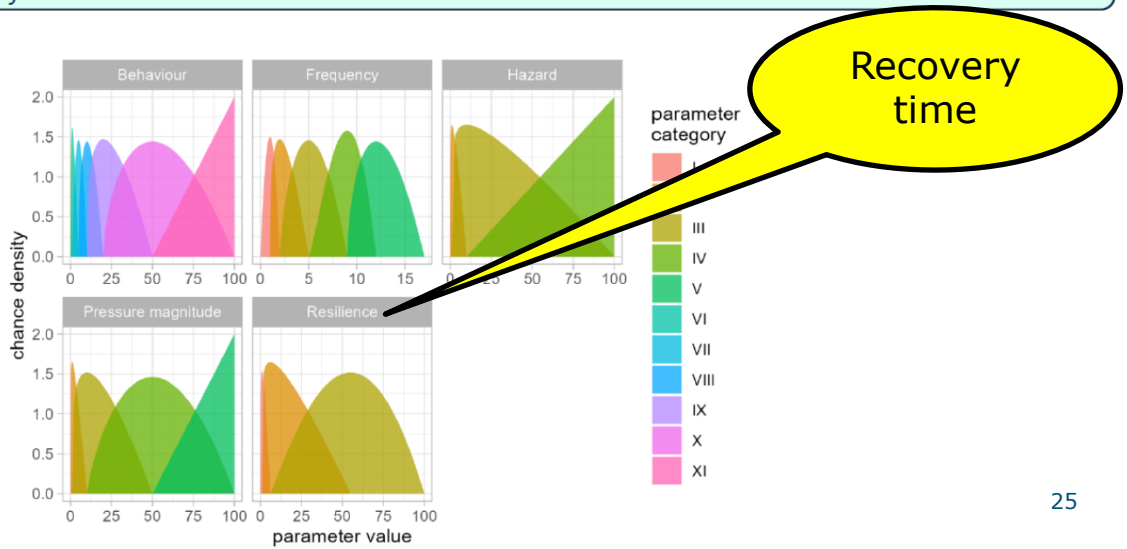
(e) Does method cover the full extent of the relevant region or ecoregion at sufficient resolution to support links to spatial assessment and marine spatial planning?

(f) Does method incorporate resistance, sensitivity, and resilience estimates based on measurements where these exist?

(g) Does method have potential to be embedded in a management framework, when other components of the framework (e.g. objectives) are in place?

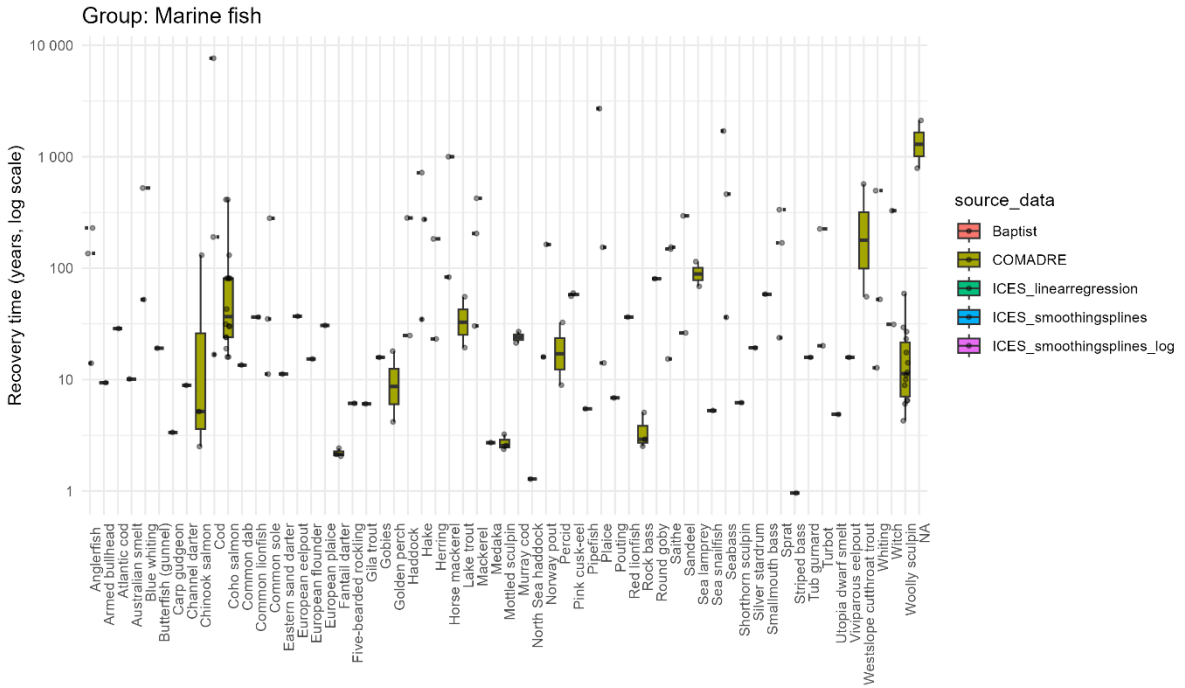
(h) Has the method been tested and applied in relevant regions or ecoregions and are many of the relevant data and information sources identified and used?





Recovery: expert-judgement to data

Ecosystem component	Recovery	Time (yr) to Recovery
Littoral rock and other hard substrata	High	1
Littoral sediment		1
Pelagic water column		1
Circalittoral rock and other hard substrata	Moderate	6
Infralittoral rock and other hard substrata		6
Sublittoral sediment		6
Birds	Low	55
Deep-sea bed		55
Fish & Cephalopods		55
Mammals		55
Reptiles		55
	None	100



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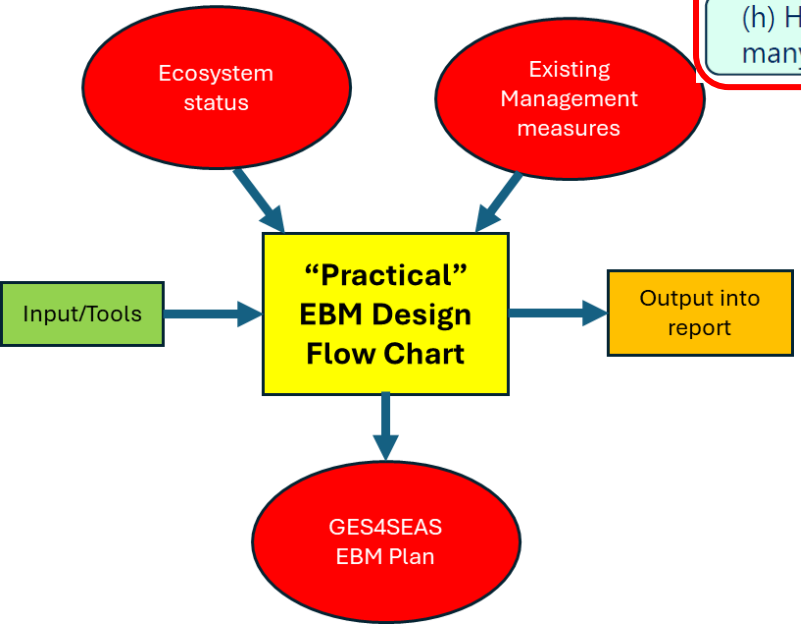

Thank you
Questions?