NEA PANACEA

North East Atlantic project on biodiversity and eutrophication assessment integration and creation of effective measures

Final Project Meeting

Notes

3-5 May 2023, The Hague, NL

Co-funded by the European Maritime and Fisheries Fund

Introduction

NEA PANACEA is an EU-funded project aiming to develop and deliver biodiversity (pelagic habitats, food web, benthic habitats and marine birds) assessments for the OSPAR Quality Status Report 2023 (QSR), and through this QSR inform the reporting for the Marine Strategy Framework Directive for EU Member States that are also OSPAR Contracting Party. In addition, the project aims to improve the coherence between assessments of biodiversity and those of the physicochemical environment, most notable eutrophication and climate change.

This document presents notes from the final project meeting. Day 1 was a hybrid meeting during which the project members presented the results of the project to each other, representatives of the European Commission (DG ENV) and project leads of so-called sister projects in the other EU sea regions that were funded under the same call. The leads of these sister projects also presented an overview of their project outcomes. Day 2 and 3 were relatively informal workshop days during which the structure of the final report was decided and the group looked to the future: science needs, organization of the biodiversity community in OSPAR and resourcing the envisioned work. This document contains brief notes describing the process and the outcomes of the discussions.

The meeting was held at the Ministry of Infrastructure and Water Management (day 1) and the ZIINN conference centre (day 2 and 3), both located in The Hague, NL. Annex 1 provides a list of participants (19 physical, 13 online) and the programme for day 1.

Day 1: hybrid meeting to present project outcomes

This day was dedicated to share the project's outcomes and deliverables amongst the NEA PANACEA team, and to reach out with this information to representatives of the EU Commission, the OSPAR convention and project leads from other EU sea regions. Every Activity was provided a presentation slot (see Annex 1 for the programme) to present for each Task the products and scientific developments that NEA PANACEA had delivered. NEA PANACEA project members were present physically in The Hague, and others were connected through a video meeting.

Later that day, representatives of sister projects from other EU sea regions funded under the same call shared the outcomes of their respective projects (ABIOMMED, CetAMBicion, HELCOM BLUES and QUIETSEAS).

Day 2 and 3: in-person workshop

During day 2 and 3 the project members held an in-person workshop at the ZZIIN conference centre in The Hague. The time was spent on deciding the structure and contents of the final project report as well as on looking forward: Overlooking the project's advancement, what are the new science needs in order to inform policy better; How do we best organize ourselves in the future in order to deliver on the OSPAR strategy, the EU MSFD and (national) marine policy frameworks; and how do we make sure that the collaboration and cross-cutting work between the eutrophication and biodiversity community continues?

Final report structure

In an open discussion and brainstorming session the structure such as can be found in the final report this meeting note is part of was established. It was decided to use the NEA PANACEA SharePoint site, kindly offered by OSPAR, as a collaboration platform.

Responsibilities for the various sections were determined and it was agreed to deliver text section at the end of June the latest so the coordinating team could collate all the work. Deadline for the project report is end of July, but the coordinator would enquire with the technical officer if this timing was opportune in relationship to his own presence during the holidays.

It was highlighted that we aim to follow the grant agreement structure for clarity, and that care needed to be taken to explicitly and clearly refer to the deliverables and their status. The main report was to focus on providing the reader with context and background, focusing on important outcomes and advances, allowing the reader to digest the more technical content of the Annexes containing the deliverables.

Future science needs / OSPAR Science Agenda (OSA)

In preparation of the upcoming ICG-COBAM meeting, where this discussion is planned to be continued and expanded with input from expert groups and indicator leads not involved in NEA PANACEA, the present indicator leads were asked to provide initial input on the future science needs. This includes development of indicators (e.g. operability or threshold value setting), expansion of geographical coverage of indicators, development of potential new indicators and work of a cross-cutting nature.

As part of this, the indicator leads were asked to update an existing working document of ICG-COBAM that lists the status (common, candidate) of each indicator in each OSPAR region. Information was to be provided according to table 1 below, which acts as a legend to the master table in the ICG-COBAM working document.

Table 1: Action categories for the indicators

NEW	Expand Common indicator to new region(s)
COM	Seek promotion of Candidate indicator to a Common indicator in specified region(s)
NNEW	Pilot assessment of a candidate in a new region(s)
NTV	Threshold value development planned in specified region.
MMD	Other method development planned in specified region

Next, the indicator leads were asked to list the future science needs identified. A brief text description was asked, as well as assigning a category based on the OSA, which are listed in table 2.

Table 2: OSPAR Science Agenda categories

OSPAR Science Agenda Categories	
Indicator development	Further development of (common and candidate) indicators to fulfill the requirements of the primary criteria of the revised EU Commission Decision 2017, and to allow increased coverage of existing common indicators, noting the lack of coverage in Regions I, IV and V
Thresholds & references	Thresholds and reference values for common indicators
Assessment areas	Ecologically meaningful assessment areas

Cumulative effects & integration	Cumulative effects and integration of indicators (not necessarily the same: ecosystem understanding vs condensed reporting)
Effectiveness of measures	Effectiveness of measures to reduce pressures
Emerging issues of HAs	Emerging issues associated with human activities

The result of both these exercises can be found in Annex 2.

Future organization of biodiversity work in the North East Atlantic

While the project members were very content with the opportunities that the EU funding for NEA PANACEA offered, and the wider OSPAR community regularly fed back appreciation for NEA PANACEA's significant contributions to the QSR, there also was a consensus amongst the project members (which was echoed by various OSPAR bodies) that the so-called "boom and bust" character of the biodiversity work in OSPAR and consequently also for the MSFD-reporting of EU member states is sub-optimal for various reasons. Boom and bust refers to the practice of those responsible for delivering the assessment becoming active 2 years before delivery (this time generally includes finding funding) to work under very high pressure to deliver and then becoming (almost) inactive for 4 years after which the cycle starts again. This is a very inefficient way of working for a number of reasons, including:

- During the 4 years downtime there is very little development of the existing or new potential indicators and assessments;
- Similarly, discussions and progress on the topics of (joint) monitoring strategies, data management and other fundamental issues such as threshold values, assessment scales and cross-cutting issues such as coherence between pressure and state assessments is not progressed sufficiently during the downtime;
- Not enough energy is spent during the 4 years downtime to ensure things are in place for the next assessment (for example data calls, experts with sufficient knowledge on the necessary work);
- During the 2 years of activity, there is so much pressure on delivering assessments timely (including hiring PostDocs, familiarizing PostDocs with the work, writing and issuing data calls, taking in and processing data, data analysis and producing assessment results) that there is relatively little time and energy for development and improvement of indicators and assessments;
- Every assessment delivery is associated with a significant brain drain, with PostDocs moving on and being replaced by uninitiated experts after 4 years;

Generally, the co-called business resilience inherent to the current mode of working of the biodiversity assessment community is extremely low. This leads to uncertainty and stress peaks amongst the expert community, stunted development of the work that we need to carry out to deliver on the JAMP, the NEAES and the MSFD, and products of a standard that could be much higher (arguably with only slightly higher resource investment).

NEA PANACEA has made a fair amount of development possible, but was also designed and executed under very high pressure. Moreover, it did not cover all the biodiversity ecosystem components: indicators and assessments not covered by NEA PANACEA had generally much lower level of development compared to IA-2017 and MSFD-MS1 (2018). The collective view in the room

was that the biodiversity community in OSPAR (specifically ICG-COBAM) is not functioning and delivering at a level that matches the ambition level of OSPAR's NEAES and the MSFD.

Solving this issue is not something that the NEA PANACEA project members or the wider expert community can do alone. It was decided, however, that we could do an exercise that offers insight to the way the experts feel the work is carried out more efficiently and effectively. The results of this exercise are to be presented at ICG-COBAM to have experts from the other expert groups add their views and the ICG agree on the output. This output can then be used to communicate to BDC and higher OSPAR bodies to support the dialogue the NEA PANACEA experts clearly feel need to be had.

In this exercise we had an open brainstorm to identify functions or "jobs" in the ICG-COBAM expert groups, tasks that belong to these functions and a rough estimate of the amount of time that is needed to fulfill those functions and tasks (See table 3). In addition, views were shared on a better work intensity-cycle (Figure 1).

Table 3: results of brainstorm on ICG-COBAM expert group members jobs and associated tasks.

Function/Role/Job	Associated tasks	Which includes…
Expert group lead	Leading expert group	Organizing EG meetings, communications, admin
	Delivering thematic assessment	
	Interaction with other groups	e.g. EU-MSFD, ICES, relevant OSPAR groups, answering policy queries
	Attending expert group meetings	
	Attending BDC, ICG-COBAM, POSH, BiTA, ICG-QSR	Preparing documents for said meetings
	Writing proposals for funding	
	Looking forward & innovation	
Indicator lead	Developing indicator assessment	Setting TVs
	Delivering indicator assessment	Data calls, data processing, data analysis, QA/QC
	Attending expert group meetings	
	Looking forward & innovation	
Expert group member	Attending expert group meetings	
	Data provision	
	Review of assessments	

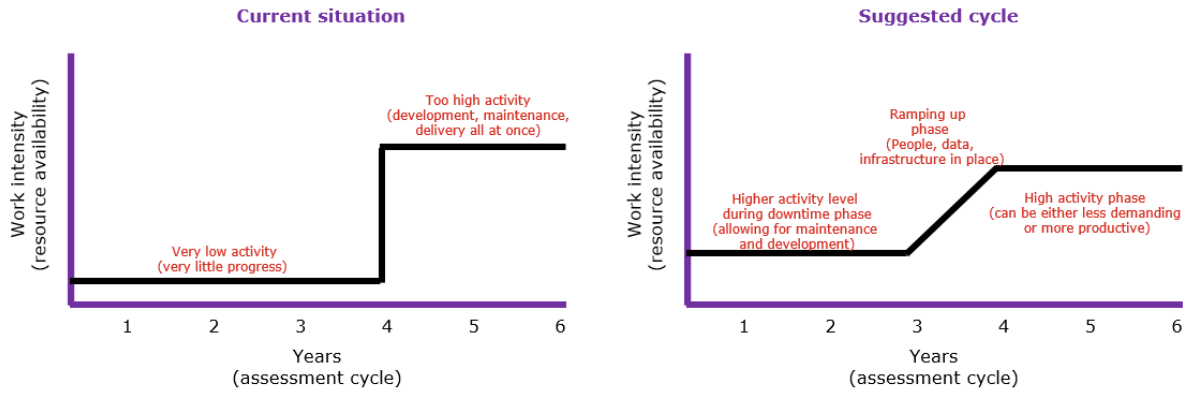


Figure 1: Current and suggested work intensity level over the assessment cycle.

Further, an estimate of the amount of time associated with the tasks described in table X was produced. Do note that some indicators are more work-intensive to deliver than others, some groups are more of a challenge to manage (e.g. due to size or policy sensitivities) and that being an expert group member of a group that delivers many assessments means that data delivery and reviewing takes more time. For expert group leads, 30 days of work per year was estimated, for indicator leads 17 days per year and for expert group members 5 days per year. This is time for attending and organizing meetings, indicator maintenance and development *et cetera*, not for delivering the assessments. It was also observed that NEA PANACEA was able to deliver 10 indicator assessments and 3 thematic assessments (which accounts for roughly half of the number of assessments delivered by ICG-COBAM) for ~1.2M Euros. Compared to large, multi-year academic projects that are often much more expensive it is a very good return for the investment with output that is directly relevant and usable in the policy realm. Table 4 presents a very rough estimate of the amount of resource needed to deliver on the suggested way of working of Figure 1.

Table 4: rough indication of costs associated with the suggested way of working in ICG-COBAM

Function	Number	Days (/6 year)	Cost estimate (800/day)
EG lead	7	1260 (7*30*6)	1.008.000
Indicator lead	20	2040 (20*17*6)	1.632.000
EG member	96	2520 (96*5*6)	2.016.000
Assessment delivery	Based on NEA PANACEA (times 2)	n/a	~2.5M Euro
Total			~7M Euro per 6 years ~100k E / CP / Year

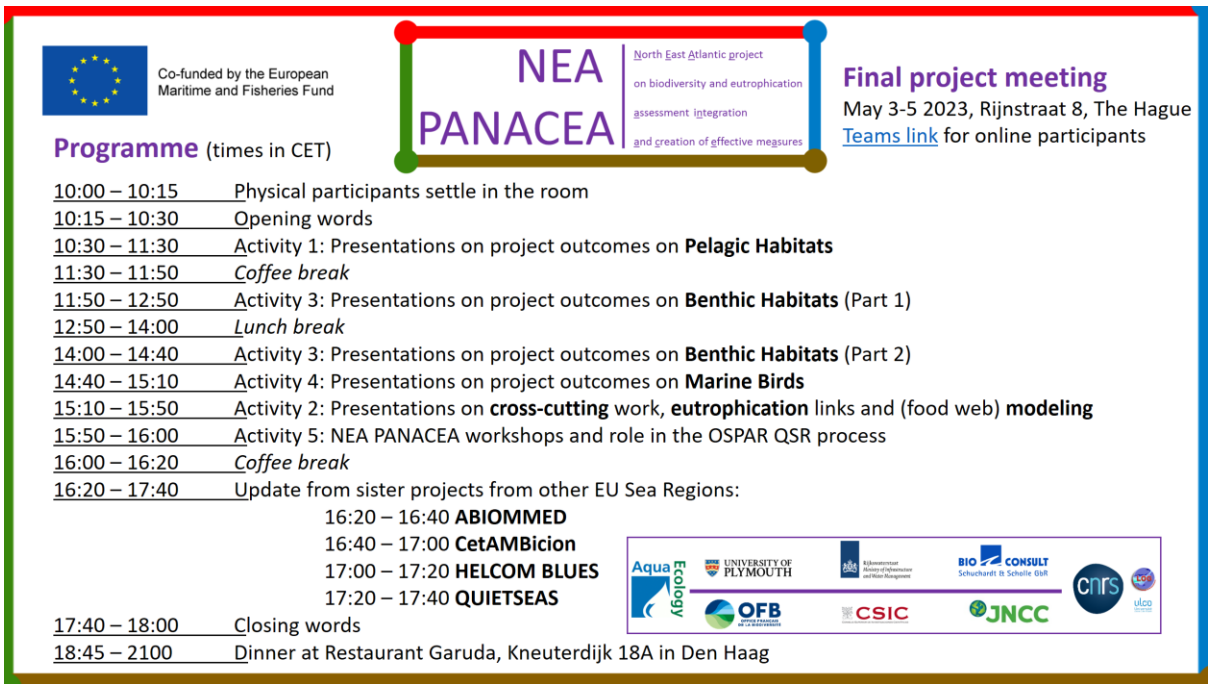
Maintaining the dialogue between eutrophication and biodiversity in OSPAR

A brief brainstorming session was held to inventory what is needed (process, action) to continue the dialogue between the eutrophication and biodiversity communities in OSPAR and to ensure that cross-cutting elements are continued to be developed. The list below suffers very much from the risks detailed in the previous session: Experts need to be resourced and available, and those experts in an ideal position to pick up some of the tasks are leaving the community with NEA PANACEA ending (brain drain).

- Make the ICES and WISE databases available / usable to the pelagics community
- Experts need to attend each other's meetings
- Communication on developments needs to be organized between the expert communities
- Future projects need to have cross-cutting elements in the work packages
- Compare the indicator outputs (BH2a, FW2/6, PH1/2/3) to the eutrophication results
- Use benthic quality indicators (e.g. BH1, BH2b, BH6) to disentangle pressures
- Add vertical component to pelagic assessments (pelagic-benthic coupling)
- Devise ways to extrapolate small scale outputs to large scales
- Align way pelagics deal with satellite data (spatiotemporal scale, data processing) to how eutrophication uses it
- Add as needed to the above, prioritize and create a roadmap

ANNEX 1: List of participants and programme (day 1)

Physical (3 days), 19	Online (only day 1), 13
Abigail McQuatters-Gollop (Activity 1)	Alice Belin (EC)
Anna Lizinska (Activity 3)	Michail Papadoyannakis (EC)
Arnaud Louchart (Activity 1)	Richard Emmerson (ICG-COBAM convener)
Birgit Heyden (Activity 2)	Lena Avellan (OSPAR secretariat)
Cristina Herbon (Activity 3)	Petra Schmitt (Activity 3)
Ian Mitchell (ICG-COBAM convener)	Noelia Ortega (QUIETSEAS)
José Manuel Gonzalez (Activity 3)	Tania Vera Santos (QUIETSEAS)
Laurent Guerin (Activity 3)	Popi Pagou (ABIOMMED)
Liam Matear (Activity 3)	Anouk Blauw (Activity 2)
Lisette Enserink (Activity 2)	Graham Pierce (CetAMBicion)
Lucy Ritchie (OSPAR secretariat)	Diego Fernandez (CetAMBicion)
Felipe Artigas (Activity 1)	Nair Vilas Arrondo (CetAMBicion)
Maider Plaza (Activity 3)	Jannica Haldin (HELCOM BLUES)
Matt Holland (Activity 1)	
Stefano Marra (Activity 4)	
Thomas Raabe (Activity 2)	
Lyke Bosma (Activity 5)	
Kay Ihle (Activity 5)	
Jos Schilder (Activity 5)	



ANNEX 2: Future science needs / OSPAR Science Agenda (OSA)

*Status of **PELAGIC BENTHIC BIRD** common and candidate indicators to QSR 2023*

	Common indicator assessment in the QSR 2023
	Candidate indicator
	Pilot assessment in the QSR 2023
	No assessment included in the QSR 2023

Please add the following to the relevant cells in the table below:

NEW	Expand Common indicator to new region (s)
COM	Seek promotion of Candidate indicator to a Common indicator in specified region(s)
NNEW	Pilot assessment of a candidate in a new region(s)
NTV	Threshold value development planned in specified region.
MMD	Other method development planned in specified region

Code	Indicator name	Lead country	Region					EU MSFD	
			I	II	III	IV	V	Descriptor	**Criterion;** Relevant **primary,** secondary, (Other)[1]
B1	Marine bird abundance	UK, DE					**NEW**	D1	**D1C2,**
	(Including At-sea abundance pilot)		**NEW**		**NEW**	**NEW**			
B2	*Breeding success of kittiwake*	*UK*						*D1*	*(D1C3)*
B3	Marine bird breeding success	UK, DE					**NEW**	D1	D1C3
B4	*Non-native/invasive mammal presence on island seabird colonies*	--						*D1*	*(D1C5)*
B5	*Marine bird bycatch*	*DE/NO*	*TV/ COM*	*TV/ COM*	*TV/ COM*	*TV/ COM*	*TV/ COM*	*D1*	***D1C1***
B6	*Distribution marine birds*	--	*MD(?)*	*MD(?)*	*MD(?)*	*MD(?)*	*MD(?)*	*D1*	*(D1C4)*
B7	Marine bird habitat quality	DE						D1	D1C5
PH1/ FW5	Changes of phytoplankton and zooplankton communities	UK	NEW MD	MD, TV	MD, TV	MD, TV	NEW MD	D1	**D1C6, D4C2,** D4C3
PH2	Plankton biomass and/or abundance	FR	NEW MD	MD, TV	MD, TV	MD, TV	NEW MD	D1	**D1C6, D4C2**
PH3	Changes in biodiversity index (s)	FR	NEW	COM	MD, TV	COM	NEW	D1	**D1C6, D4C1**

[1]See BDC 18/04/06

Code	Indicator name	Lead country	Region					EU MSFD	
			I	II	III	IV	V	Descriptor	Criterion; Relevant **primary,** secondary, (Other)[1]
			MD	MD		MD	MD		
FW2	Production of phytoplankton	FR	NEW MD	COM MD	COM, MD, TV	COM MD	NEW MD	D4	**D4C4**
FW6	Biomass, species composition and spatial distribution of zooplankton	SE/FR	NEW MD	MD	MD	MD	NEW MD	D4	**D4C2, D4C3**
BH1	Typical species composition	ES		NEW	NEW			D1& D6	**D6C3, D6C5**
BH2	Condition of benthic habitat communities: The common conceptual approach	FR						D1 & D6	**D6C3, D6C5**
BH2a	Assessment of coastal habitats exposed to nutrient and organic enrichment.	FR	NEW				NEW	D1, D5 & D6	**D6C5, D5C6, D5C7, D5C8**
BH2b	Benthic Multi-Metric Index quality assessment of the Southern North Sea	FR/NL					?	D1 & D6	**D6C3, D6C5,**
BH3a	Extent of physical disturbance to benthic habitats - fisheries assessment	UK/DE	NEW	TV, MD	TV, MD	TV	NEW	D1 & D6	partly **D6C2, D6C3, D6C5,** D2C2, D2C3
BH3b	Extent of physical disturbance to benthic habitats – aggregate extraction	UK/DE	NEW	TV, MD	TV, MD	TV, MD	NEW		
BH3c	Extent of physical disturbance to benthic habitats – offshore installations (wind)	UK/DE		MD (TBC)	MD (TBC)	MD (TBC)			
BH4	*Area of habitat loss*	*UK/DE*	*?*		*?*	*?*	*?*	*D1 & D6*	*partly **D6C1, D6C4,***
BH5	*Size-frequency distribution of bivalve or other sensitive/indicator species*	*ES*						*D1 & D6*	***D6C3, D6C5,***

SCIENCE NEEDS

OSPAR Science Agenda Categories

OSPAR Science Agenda Categories	
indicator development	Further development of (common and candidate) indicators to fulfill the requirements of the primary criteria of the revised EU Commission Decision 2017, and to allow increased coverage of existing common indicators, noting the lack of coverage in Regions I, IV and V
thresholds& references	Thresholds and reference values for common indicators
assessment areas	Ecologically meaningful assessment areas
cumulative effects & integration	Cumulative effects and integration of indicators (not necessarily the same: ecosystem understanding vs condensed reporting)
effectiveness of measures	Effectiveness of measures to reduce pressures
emerging issues of HAs	Emerging issues associated with human activities

Group	**Project**	**Category (see above)**	**Related Indicators**
BIRDS	Inclusion of data at sea: this would allow more comprehensive assessments of non-breeding seabirds. Monitoring data at sea are lacking coordination consequently there is a need to develop (a) a concept for survey efforts delivering the necessary data basis for the abundance indicator work, (b) implement this concept in the frame of national survey programmes in future years and (c) develop a methodological approach for aggregating and analysing the data. More at sea data would allow to expand the marine bird habitat quality (B7) indicator to additional species	Indicator development	B1, B7
	Potentially improve integration techniques to combine results of the B1 and B3 to assess status of breeding species. This will involve using population modelling and is dependent on the findings of the new Biodiversa+ project.	Indicator development	B1, B3
	Seek agreement on threshold for by-catch indicator and seek promotion to common. This is linked to implementation of RAP bird. Establish appropriate monitoring programmes to assess marine bird by-catch and fishing effort to address data deficency.	Indicator dev/policy	B5
	To properly assess effects of climate-change, indicators of distribution that could detect mesoscale geographical shifts would be beneficial. This reinforces the need for global distribution surveys (e.g. via	Indicator development	B6

Group	Project	Category (see above)	Related Indicators
	International Waterbird Census) to be able to detect, understand -and respond to -such shifts.		
	Quantification of some aspects of the DAPSIR process/Bowtie analyses? This would help us rank pressures/threats for birds in a more meaningful way. It could include a short review of modelling methods such as PVA or IPM as one of the tools to seek to better quantify these relationships between driver and state. It could take a policy/management/risk-based approach in light of the available scientific methods. Could involve ICG-EcoC.	Cumulative effects	B1 B3 B5 B7
PELAGIC	Test state-pressure relationships at multiple spatial and temporal scales (e.g. Bedford et al 2020). This can capture extreme events, differences in indicators between time blocks, influence of climate change and direct anthropogenic pressures, etc.		PH1/FW5, PH2, PH3, FW2
	Identify ecological mechanistic links between environmental variables and indicators.	Indicator development	PH1/FW5, PH2, PH3, FW2
	Identify consequences of change in indicators on other trophic levels (integration with foodwebs, benthic, etc)	integration	PH1/FW5, PH2, PH3, FW2, FW6
	Inclusion of pico- and nano-plankton into indicators (new lifeform(s), etc)	Indicator development	PH1/FW5, PH3
	Test indicators in Regions I and V	Indicator development	PH1/FW5, PH2, PH3, FW2, FW6
	Improve coordination with ICES for data storage and ingestion. Data can then be extracted from ICES and inserted into the PLET (only for PH1/FW5).		PH1/FW5, PH2, PH3, FW2, FW6
	Mobilisation of coastal zooplankton datasets		PH1/FW5, PH2, PH3
	PH1/FW5 indicator development: determination of additional biological traits, assess PH1/FW5 as biomass, modelling of additional pressure data such as N:P	Indicator development	PH1/FW5
	PH2 indicator development: Incorporate CPR biomass data, harmonisation with satellite and CPR, improve coherence with chlorophyll concentration eutrophication assessment	Indicator development	PH2
	PH3 indicator development:	Indicator development	PH3

Group	Project	Category (see above)	Related Indicators
	Testing of proportional role of climate change in indicator change though testing of state-pressure modelling with and without climate variables.		PH1/FW5, PH2, PH3, FW2
	Further development of threshold values and determination of GES (e.g. EQR, HASEC method, etc)	thresholds& references	PH1/FW5, PH2, PH3, FW2
	FW6 indicator development: Mobilisation of zooplankton biomass datasets	Indicator development	FW6
BENTHIC	Expand BH1 Common Indicator to new regions for its direct application. To expand BESITO index or provide analogous index with species sensitivity.	Indicator expansion	BH1
	Finalize the Integration or combination of BH1, BH2, BH3 and BH4 for better deal with all D6 criteria	Indicator integration	BH1, BH2, BH3, BH4
	To continue developing and testing methods to set condition thresholds with clear and robust ecological meanings.	Indicator improvement	BH1
	To develop trade-off analysis for establish the cost of different extent thresholds	Indicator improvement	BH1, BH3
	Test BH1 in case studies with cumulative pressures and adapt the indicator if needed to better capture the impact of several pressures on benthic habitats	Indicator improvement	BH1
	To combine benthic indicators with indicators from other thematic (e.g. food webs) for better understanding the impacts of benthic habitat status on marine ecosystems		
	In order to improve coherence in assessment outcomes and to guide management measures related to nutrient and organic enrichment: compare, combine and, where feasible, improve coherence between related indicators, ie. benthic (BH1, BH2a), pelagic (PH2), food webs (FW2) and eutrophication (chlorophyll a and oxygen depletion), with a focus on problem areas identified by each of the indicator assessment.	assessment areas Cumulative effects and integration Effectiveness of measures	BH2a, BH1, BH2b, EUT1, EUT2, PH2, FW2 Other linked? (to be completed by FW + PH + EUT experts)
	Benthic: state-pressure relationships: test and quantify various habitat types versus pressure types curves	Thresholds and reference values	BH1, BH2
	Benthic habitat thematic assessment: further develop and improve integration of benthic indicators (from	Cumulative effects and integration	BH1, BH2a+b,

Group	Project	Category (see above)	Related Indicators
	Elliott et al, 2018) and expert judgement synthetic status per assessment unit.		BH3, BH4, BH5
	Expansion of BH2a to Regions I and V: monitoring, data and assessment (with threshold) already in place. Just political acceptance needed.	Indicator expansion	BH2a
	Expansion of BH3 indicator to regions I and V	Indicator expansion	BH3a, BH3b
	Inclusion of additional pressure data (currently restricted to Denmark and the UK – data from other countries needed, inclusion of footprint data).	Indicator improvement	BH3b
	Development of BH3 indicator to account for offshore installations associated with wind/renewable infrastructure (to be discussed and confirmed through OBHEG & COBAM)	Indicator improvement – within common assessment areas (to be discussed and confirmed through OBHEG & COBAM)	BH3c (to be discussed and confirmed through OBHEG & COBAM)
	Develop and test (data in an area at relevant scales) partial to holistic habitat (including biological communities) integrated assessment (benthic, pelagic, food webs, NIS): linking or integrating each component integrated assessment, or between specific indicators	assessment areas Cumulative effects and integration Effectiveness of measures	All BH, PH, FW and NIS indicators