WORKING GROUP FOR MARINE PLANNING AND COASTAL ZONE MANAGEMENT (WGMPCZM; outputs from 2019 meeting)

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Contents

i Executive summary

The Working Group Marine Planning and Coastal Zone Management (WGMPCZM) discusses current developments around marine spatial planning (MSP) and coastal zone management (CZM) in the ICES area.

Driven both by a need to address specific spatial problems in the sea and by the EU Directive on Maritime Spatial Planning (MSP) from 2014 with approaching deadline (2021) and by a number of international R&D projects, different nations' marine planning in the exclusive economic zone (EEZ) has entered a highly prolific phase. This implies integrating knowledge of various kinds across disciplines and national borders for whole marine basins. To make planning more well-informed and consistent across marine basins, there is a need to improve the knowledge base and develop appropriate procedures and methods to collect and process new and existing data in a consistent manner to produce planning evidence. To help achieve this, the group has worked on a number of terms of reference:

Answering the term of reference (ToR) which aims to review updates from national MSP, especially in relation to cross-border issues and land-sea interactions and the role of science in marine planning, the working group has annually reviewed the developments in coastal and marine planning across member countries and relevant cross-border collaboration projects and mapped the highly varying roles of science. As a first synthesis, the group presented a discussion poster at the ICES Annual Science Conference (ASC) 2019, including a fourfold typology of interactions between science and policy making in terms of knowledge production: from highly dependent internal expertise over policy driven research and development to highly independent research, and, cutting across this, a fourth highly interactive co-production of knowledge including also societal actors. When collecting and compiling relevant data and knowledge into planning evidence it is important to be aware of both the diversity of knowledge types needed (multiple knowledge fields - both scientific and practical) and of these different processes, roles and responsibilities and dependencies. It is recognised that the breadth and depth of data and information held by ICES and the knowledge of the community can greatly enhance the implementation of MSP. Mechanisms to help this were considered, in particular the extent to which the holdings of the spatial data facility can help address the key data requirements of MSP according to a developed categorisation of data types.

In parallel to this and based on reviews in different terms of reference and the insights from a session arranged by the WG at the ASC 2018 (Session C), important knowledge and method development needs for MSP and ICZM, were identified. These current and future needs include: spatialising and linking societal and ecosystem processes and interconnections, social and economic sustainability aspects (addressing culturally significant areas and conflicts and coexistence), knowledge on land sea interactions at different scales, cumulative impacts both between uses and within ecosystems, monitoring and evaluation of plans, risks and hazards and awareness, not least in relation to climate change. Accordingly, the working group has kept and adapted its ToRs for its next term to include e.g. ocean governance, climate change, restoration of biodiversity, land-sea interactions, and analysis of impacts on coastal communities and proposed a new Working Group on Cumulative Effects Assessment Approaches in Management (WGCEAM). With a developing field of practice, there is also a need to provide professional training for MSP and join forces on this and promoting a critical, self-reflecting attitude among the increasing field of planning professionals, supported both by accompanying and by more independent research. Last but not least, the perspective needs to be kept broad, thinking beyond MSP and coastal management towards integrative ocean governance.

ii Expert group information

Expert group name	Working Group Marine Planning Coastal Zone Management (WGMPCZM)
Expert group cycle	Multiannual
Year cycle started	2017
Reporting year in cycle	3/3
Chair(s)	Matt Gubbins, Scotland, UK
	Andrea Morf, Sweden
Meeting venue(s) and dates	3-7 April 2017, Barcelona, Spain (17 participants)
	23-27 April 2018, ICES HQ, Copenhagen, Denmark (13 participants)
	8-12 April 2019, Galway, Ireland (21 participants)

1 ToR a) Country update and insights on the role of science in MSP

The present ToR a) provides the context for the activities of the Working Group on Marine Planning and Coastal Zone Management (WGMPCZM). It consists of interrelated topics identified in 2016, including the following three main lines: a) to receive updates on the issues arising in ICES countries marine plans; b) to have special focus on issues related to cross-border / transnational planning and land-sea interactions; and c) to receive assessments from country reports on the use of science (natural, social, economic) data, information and advice in the plan development process.

MSP is a field of expertise and practice under rapid development – both regionally and globally. During the last 3 years, the group has followed this development in the different countries and marine regions represented in the group and reflected on the above points b) and c) more systematically with the final goal to develop a scientific paper out of this. We come back to how we have done this at the end of this section.

The first discussion, mapping knowledge needs and types of knowledge occurred during the Barcelona meeting in 2017, resulting in lists and graphics describing types of knowledge and the types of interactions and knowledge exchange between scientists, planners, political decision makers, marine stakeholders and society at large.

The 2018 meeting in Copenhagen continued from there, deepening further into reflections on a typology of interactions, based on a paper by Cormier *et al.* 2017. As a final part of the ICES ASC 2018 session C in Hamburg, the discussion was expanded beyond the group, including the session participants into a discussion of important problems related to the development of the field of MSP and identification of method and knowledge gaps, including both a policy and a future research agenda. The group also decided to propose a session for ASC 2019 in Gothenburg with focus on MSP and ocean governance, which was, however, not accepted. Instead, to drive ahead the thinking towards a paper, an oral presentation was proposed in a more general session on tools for marine knowledge integration in ecosystem governance.

At the 2019 meeting in Galway, the presentation and paper idea was discussed further and concretised into a rough structure for an article. The conceptual figures were developed further and the typology deepened. To finally fit the requirements of the session organisers, the original oral presentation for ASC 2019 in Session I was turned into conference poster format as a discussion poster and a 1-minute pitch during the actual session.

Below, first the latest country and regional updates are presented alphabetically and regionally - based on the countries and regional seas group members' knowledge and reporting at and after the latest meeting in Galway in April 2019 (for further information, see earlier group reports from 2017 and 2018). We then discuss and draw conclusions about the development of the role of science in marine spatial planning and ICZM and the implications based on a session organised by the group at the ICES ASC 2018 in Hamburg and our discussion poster with preliminary conclusions and reflections from the ICES ASC 2019. A co-authored scientific manuscript on the subject is under preparation.

1.1 Belgium

MSP revision cycle started in the beginning of 2017, preparing a long-term vision for 2050 and a draft new MSP. From 29 June until 28 September, the Federal Ministry for Public Health, Food

Chain Safety and Environment organised a public consultation about the draft maritime spatial plan (MSP) for the Belgian part of the North Sea for the period 2020–2026 and about the environmental impact report. Cross-border consultation has taken place in which a.o. Netherlands gave its opinion. Adoption of the new Belgian MSP is foreseen for 1st half 2019. Political situation in Belgium is dictating the pace.

More info: https://www.health.belgium.be/en/public-consultation-maritime-spatial-plan-belgian-part-north-sea-2020-2026

1.2 France

The French government has since 2017 started to work on a Maritime Strategy 2030 for the four different sea basin areas they have identified (Eastern Channel/North Sea, North Atlantic - Western Channel South Atlantic and Mediterranean). An informal meeting was held by the French Authorities to inform cross-border and transboundary on preparatory work and progress on MSP in June 2018. Irish, Belgian and Dutch representatives attended the meeting for the Channel regions. Strategies for the four French sea basins and Maritime Spatial Plans are being develop in an iterative and parallel process. Documents are in consultation from March 4 until June 4 2019: documents in English can be found: http://www.geolittoral.developpement-durable.gouv.fr/documents-english-version-r549.html

Documents in French can be found through the consultation platform: www.merlittoral2030.gouv.fr

1.3 Netherlands

Dutch North Sea 2030 Strategy and a next MSP with LSI for 2021-2027

Since late 2017 the Netherlands central government is working towards a North Sea strategy for 2030. Main focus is on the tension in the triangle: offshore wind, marine environment (protection) and fisheries. A 2030 roadmap for offshore wind energy has been adopted by Dutch parliament in June 2018. Fisheries measures for Marine Protected Areas (MPAs) outside 12 nautical miles have been agreed upon, and will go to the European Commission for approval after a final consultation with the Scheveningen fisheries group. Measures are expected to become in effect later in 2019. Dutch fishermen (in particular those active in the North Sea and with a focus on bottom dwelling fish – such as plaice and sole) are impacted by the ban on pulse fishing, Brexit, displacement by offshore wind and fisheries measures in MPAs – but also face the issue of preventing by-catch. Dialogues are ongoing in a formal stakeholder consultation on the highest level possible to find a pathway to a feature livelihood and a sustainable supply of marine protein – including an environmental framework for sustainable seaweed cultivation. Possibilities to solve the current constraints for more offshore wind energy (other areas for search, preventing negative effects on certain bird species, dealing with the cumulative pressure of noise, research into the effects of the additional ship movements needed for the renewable offshore energy supply, and in particular: dealing with grid/net stability and more uptake of electricity on land. Supporting innovative blue development / blue growth – including alternatives that can contribute to the sustainable energy supply the Dutch government wants to achieve (reduction of CO2/Green House Gas Emissions of 49% by 2030). The roadmap for offshore wind 2024–2030 is expected to involve an investment between 15 and 20 billion Euros and could generate 10 000 jobs. The national government is the only competent authority outside 1 km into the North Sea.

In more general, the Netherlands Cabinet is stimulating new innovations through a mission driven program, expected to stimulate cross-disciplinary work and speeding up implementation

of innovations. The Netherlands Climate Act and the political discussions on the energy transition towards 2030 and 2050. The Netherlands ministry for Infrastructure and Water Management by November 2019 will start a revision of the current Integrated Maritime Spatial Policy and Development Plan (including the Maritime Spatial Plan (MSP) and covering Land Sea Interactions) together with the outcomes of the North Sea 2030 Strategy. Regions and municipalities are encouraged to prepare themselves for this revision of the MSP – which will be politically guided, but stakeholder driven.

Involvement of the regions and municipalities: To assist the regions and municipalities in their contribution to a new Maritime Spatial Plan for 2021–2027 dialogues are kick started. Amongst others in joint cooperation with ESPON and the Interreg project NorthSEE (contributing to coherence in MSP on shipping, energy and ecology). The Province of North-Holland is partner in that project – also on behalf of the North Sea Commission. One of the key issues (for the Netherlands) seems to be the lack of broad interest in regional and local communities and politics for the North Sea development and connections with land. One of the recommendations of a Land-Sea Interaction workshop (held in Haarlem in February 2019) therefore is: "take the regionals political agenda as a starting point to chart the interests of regions and those living there and the natural environment with developments offshore. Based on the mandate, obligations and political agenda regions might be better able to voice their interest in sustaining and developing the sea".

Monitoring and evaluation of MSP in Netherlands

An important and integral part of MSP is monitoring and evaluation. There are different types of monitoring, e.g., monitoring the state of the marine environment. This is a continuous task and feeds the assessment of the objective to have healthy ecosystems, as required by the MSFD. But also when there is uncertainty or knowledge gaps in the assessment of potential impact of an activity for which a license is applied, through monitoring the knowledge gaps can be filled or the uncertainty reduced.

This is adaptive management. In the assessment of the state of the marine environment as required by the MSFD, it became clear in 2014 that for instance more sea floor areas needed protection against bottom trawling in addition to some of the Natura 2000 areas. As part of the North Sea Strategy 2030, these new areas will be allocated after lengthy discussions with the stakeholders involved (fishermen and green NGO's). The second type is to monitor the developments within sectors and policy requirements of the government. Are outcomes consistent with what was expected when the plan was drafted? As shown, policies with regard to renewable energy changed rapidly. Each new plan had to incorporate these new and higher objectives by allocating areas for renewable energy development.

The third type is to monitor the implementation of agreed actions. Are they successful and are the results as expected? This can also include the performance of the management of policy implementation.

The frequency and intensity of the monitoring depends on the dynamic of the elements one wants to evaluate. For instance, some features show annual changes, some summer/winter changes. The latter requires more frequent monitoring. The data and information gathered through the monitoring forms input to the evaluation and adaptation process. The Netherlands North Sea Management organisation Rijkswaterstaat uses a simple but logical model: "Plan, Do, Check, Act" After the "Plan" phase, the implementation phase starts ("Do"). Regular there is the "Check" through monitoring and evaluation if the plan evolves as expected. If not, in the "Act" phase the plan is adapted. If urgencies require, this adaptation can already take place in between two full planning cycles. Monitoring data can also be acquired through the granting of a permit for a new activity with the obligation to monitor the impacts so that for later licenses of this kind

of activity, lessons can be learned and directly applied. A requirement is that these monitoring results are available to the competent authority.

As the first wind farms were built and monitoring started, it was learned that for certain aspects (especially underwater noise and its impact on fish larvae and the diameter of the disturbance area for marine mammals) the restrictions given because of the precautionary principle, could be lifted to a less strict regime. It also was the start of the development of a Framework for Ecology and Accumulation that could be applied in the planning phase as part of the Strategic Environmental Assessment of the marine plan.

Key science issues in marine planning experienced in MSP in Netherlands

- Cumulative effects assessments (CEAF)
- Under Water Noise
- Alignment of methods and cause-effect relations used in Strategic Environmental Assessments throughout the Greater North Sea Basin (SEANSE project – www.northseaportal.eu)

References

A paper on the adaptive management and MSP of the Netherlands since 2005 is in press: Leo de Vrees, Marine Policy, https://doi.org/10.1016/j.marpol.2019.01.007.

1.4 Germany

With almost 20 years of experience, Germany is the most advanced country with respect to MSP in the Baltic Sea. Germany has two different types of marine plans, a national plans for the EEZ and federal state plans covering both territorial waters and land. Over time, these plans have become increasingly aligned. Plans for the EEZ (one for the North Sea, one for the Baltic Sea EEZ) have been in force since 2009; they are currently being revised and new plans are expected to come into force in 2021/22. The competent authority (BSH) has instituted a scientific advisory board that accompanies the revision process. Topics of discussion included among others stakeholder involvement, the ecosystem approach, evaluation of the previous plan and alignment of MSP with sector planning. BSH has participated in a number of international collaboration projects in the Baltic and the North Sea developing cross-border MSP (e.g. BalticLINes, Baltic SCOPE, Pan Baltic Scope and North SEE).

The first marine spatial plan came into force in Mecklenburg-Vorpommern in 2005; an amended second plan has been in force since 2016. In Schleswig-Holstein, the first plan came into force in 2010 and the revision process began in 2018. Online consultation for the public and for institutions took place in 2019. The responses received are currently under consideration. The amended plan is expected to be completed in 2020 or 2021.

In Lower Saxony, the first plan came into force 2008 and was last revised in 2017.

1.5 Ireland

Ireland's Marine Spatial Plan is called the *National Marine Planning Framework*. The Department of Housing Planning and Local Government is the designated Competent Authority. The MSP Directive was initially transposed into national legislation through Statutory Instrument in 2016 (SI 352 of 2016). The regulations were repealed and replaced by Part 5 of the Planning and Development (Amendment) Act 2018, which provide for marine planning in primary legislation.

The legislation provides for:

- Adoption of the National Marine Planning Framework (NMPF) by both Houses of the Oireachtas;
- Review and replacement of the NMPF every 6 years;
- Obligation for marine regulatory bodies to secure the objectives of the NMPF when making policies, plans, or granting consents; and
- Enforcement powers for the Minister if the foregoing obligations are not being fulfilled.

Ireldnd's marine planning process began with the publication of 'Towards a Marine Spatial Plan for Ireland: A Roadmap for the delivery of the national Marine Spatial Plan' in 2017. The roadmap outlined the Government's proposed approach to developing MSP and formed the basis for initial stakeholder involvement. An Advisory Group was established to facilitate participation by all relevant stakeholders, from the economic, environmental and social pillars. The Advisory Group informs the work of the Inter Departmental MSP Group.

The development stage of the marine plan commenced in Q1 2018 and has been ongoing since then. It involved the analysis and identification of data and information required for MSP. The Baseline Report was published in September 2018; this documented the 'as is' situation in terms of existing sectoral development and activities in Ireland's maritime area. The Department received 173 responses to the consultation from a broad range of stakeholders, including members of the public, coastal community groups, environmental NGOs, sports bodies, stakeholder representative bodies, fisheries organisations, energy providers, Local Authorities, public sector bodies, political representatives and parties, and higher education bodies. The responses to the consultation are published online. The draft NMPF and the associated Strategic Environmental Assessment are currently being prepared and will be published of consultation in October 2019. Ireland will publish the National Marine Planning Framework at the end of Q2 2020.

The Marine Institute is providing Scientific and Technical support to the marine planning process. It is Ireland's national marine data centre and hosts Ireland's Marine Atlas which will be the principal repository of marine-related data to support both the development of the NMPF and evidence-based decision making under the NMPF framework by marine regulatory authorities. Technical MSP activities are supported by European Maritime Fisheries Fund is 2014-2020 (EMFF); the objective of Union Priority 6 is to foster the implementation of the Integrated Maritime Policy. The EMFF is funding a series of MSP projects collecting, collating and mapping accurate, up-to-date spatial and temporal information on marine ecosystems and human activities taking place within Ireland's waters.

1.6 Sweden MSP Status and important steps in Sweden

Since 2011, the Swedish Authority for Marine and Water Management (SwAM) is responsible to develop national marine plans in the outer EEZ, coordinating across sectors. Swedish municipalities have already in 1987 received the mandate for MSP in territorial waters. However, only a handful out of over 80 coastal municipalities had in 2010 an updated plan. This was similar, when in 2014 the EU MSP directive was adopted and the Swedish Environmental code amended with a paragraph to provide a base for a national planning system in the EEZ (ordinance regulating more in detail came 2015). More are under way at present, not the least triggered by national planning and partially supported (since 2017 by national funding). Note that Swedish national marine plans are of strategic character and not generally legally binding, but can include binding provisions. The state plans the EEZ until 1 NM from the base line. There is a 11 NM overlap with municipal planning in territorial waters.

Important recent steps in Swedish MSP have been a basic data mapping has been ongoing since 2012. A report on the current status report was presented for public review in (2014) with final version in 2015. Since then, Sweden has started concrete planning work. A first step was a draft of a process roadmap & delimitation of SEA, on review in 2015–16. A second step was a sector interest mapping with national authorities and cross-sector conflict & synergy analysis (spring 2016). In 2016 SwAM held a series of thematic group meetings aimed at mobilising authority stakeholders within Sweden and collecting important knowledge on trends, synergies and conflicts. Mostly national authorities were invited, including county administrative boards, plus representatives from county councils and local authorities. The meetings primarily focused on national planning issues, but also on cross-border issues when appropriate, and provided a sector perspective with the aim of showing possible conflicts and synergies between sectors with a broader perspective (6 thematic groups: energy, fisheries, environment & conservation, shipping, defence and regional development). These maps and findings were, presented to a general public in a national stakeholder meeting in May 2016. A final version of the Roadmap report was presented in October 2016. After this, for the three marine basins concrete maps have been produced with first suggestions for spatial priorities based on the overall principles from the Roadmap and national priority areas provided by the thematic work and earlier national priority areas according to the Environmental Code. In April 2017, Sweden had a first set of three draft plans on informal stakeholder dialogue: one each for the Bothnian Bay, the Baltic Sea and the Western Waters (Skagerrak/Kattegat). There was an ongoing dialogue with (mainly national) stakeholders on a 1st draft of maps (December 2016 – April 2017). Strategic environmental assessments (SEA) for each plan have been presented in early 2017. They indicate that the implementation of the plans will not improve the environment in a way that the MSFD GES will be met. This is an important challenge to continue working on, both methodologically and in planning content. The results of the 2017 review were presented in a review report. In 2018, the plan drafts were on public review during spring 2018 and received over 600 comments. After revision and complementing of the strategic environmental and sustainability assessments with partially newly developed methodology, new plans were presented for a second public review. At the time of writing the report, these are processed and a final plan versions is to be submitted to the Swedish government for adoption in December 2019. Even if they do set environmental priorities in the sea and sort out numerous other priorities all across Swedish waters with a long-term sustainability perspective in mind, the new plan versions are not necessarily leading to a considerable improvement of the environmental status of the sea either. Moreover, and ecosystem perspective would require further integration with municipal spatial planning in the territorial waters. Information in English on Swedish MSP can be found at: https://www.havochvatten.se/en/swam/eu--international/marine-spatial-planning/review.html

Transnational dialogue on plan content and planning evidence has occurred recurrently since 2013, building on the ESPOO convention requirements, but reaching beyond them in intensity and collaboration for data sharing. This occurred both through specific meetings organised by SwAM, but also through a number of transboundary EU-financed projects from PartiSEAPate onward, most recently with the EU co-financed Baltic Scope and Pan Baltic Scope projects with Sweden as lead (see Baltic Sea initiatives) developing transnational collaboration on MSP in the Baltic Sea further, also including an ecosystem and land-sea interactions perspective. Sweden has also been part in BalticLines and NorthSEE.

Role of Science for MSP in Sweden:

Science actors in general - in the form of academic institutions and individual scientists – were in 2017, at the outset of this reporting period, just starting to mobilise more broadly – with a few exceptions and regional differences: e.g. a maritime cluster in Västra Götaland in collaboration with Gothenburg university, the Swedish Institute for the Marine Environment, and the World Maritime University and a few more university departments doing research in related sector

areas (e.g. aquaculture, wind power, risk governance, recreation & tourism, shipping). The consultancy company responsible for the stakeholder mapping included researchers as an interest group and interviewed a number of researches on their interests in MSP and the sea. Early ideas of a scientific advisory group to accompany the process were never implemented. In 2016, during the review of the Roadmap document, the Swedish Institute for the Marine Environment (among other) pointed out, that there was no overall strategy to include science systematically and to its full potential to provide for the MSP process. Researchers were contacted and contracted as need arose, partially based on earlier personal contacts and contracts and institutional affiliation (e.g. SLU integrating former fisheries researchers that had been part of the precursor of SwAM) or tried to provide input as they mobilised themselves during the publication processes so far based on research interest. There have also been consultancy framework contracts with a few research institutes and consulting companies. Planned science meetings occurred during the dialogue phase on initiative of science actors (e.g. one with SIME). Thus, the role of science has been self-mobilised and on call, mainly providing basic knowledge for producing planning evidence or review and feedback on documents presented to the larger public or on request for specific issues (also MSFD implementation and SDG related). At one point, two researchers were hired to provide a feedback through a report (Profs. L. Emmelin & M. Stenseke). According to their final reports, focus has mostly been with natural sciences knowledge on the sea and to some extent on marine uses and effects between them. But the rather interesting and ambitious mobilisation and participation process as such could not be followed systematically. Within the Baltic Scope and Pan Baltic Scope projects, science organisations (Nordregio, SYKE, HELCOM) did participate in the research and development process. Social scientists from Nordregio did observations and provided feedback on the transboundary part of the process at the same time as other members facilitated the reflection process further (see lessons learned reports from both projects). Such internal review functions (facilitation of self-reflection) are further possible, entirely different functions of social sciences, so far not much employed in the planning context. Similar, due to time pressure – except for trend analyses in specific sectors – research and methods to assess future developments were not mobilised and employed to a higher degree (e.g. future research, scenario work). In terms of cumulative impacts, an interesting track of R & D under way is in connection with the Symphony tool, so far mainly focusing on environmental values and impacts in space. Here attempts are under way to develop economic and societal data layers that can be linked both on the pressure and impact side. Moreover, the sustainability assessments undertaken in parallel to the SEA have implied method development in terms of social and economic sustainability aspects (by SwAM itself for its 3 planning areas, but also for the whole of the Baltic Sea in connection with work in the Pan Baltic Scope project). Still, there is a long way to go to be able to provide spatially specific impact assessments at higher resolutions (from local to marine sub-basins) and including whole interaction chains of ecological and societal processes. Since 2017, the intensity of interaction between planning authorities and academia/research institutes to provide planning with knowledge and methods has been intensifying, but interaction with science can still provide much more, not the least complementing social and economic sustainability aspects in planning and in terms of methods for knowledge integration, future analyses and reflective learning.

Knowledge needs for MSP in Sweden:

Thus, important issues/needs for knowledge and method development for Sweden include: complementing the basic datasets on specific coastal and marine uses (e.g. tourism & recreation, residency, socio-cultural values), mapping interactions across the land-sea interface in both ways more specifically, especially spatial consequences and at higher resolution, complement the relatively well developed data sets with social and economic aspects of marine uses (drivers, needs, trends, cross-sector interactions, society-environment linkages), develop data collection and methods for monitoring and evaluation of plans and plan content, institutional systems and

planning processes, implementation and impacts, and last but not least, developing basic planning evidence for and developing the capacity of local (and partially regional) planning authorities in all the above knowledge areas.

1.7 United Kingdom

England

English waters have been split into 11 regions for the purposes of marine planning which includes the separation of inshore and offshore areas. These 11 regions are to be covered by 6 combined plans:

- East – inshore and offshore
- South – inshore and offshore
- Northeast – inshore and offshore
- Southeast – inshore
- Northwest – inshore and offshore
- Southwest – inshore and offshore

The East marine plan was published in April 2014 and had its first review in 2017. This is the only plan to have been through a full review cycle so far. A three year report on the plan was laid before Parliament in March 2017 which looked at progress made in the first three years towards achieving the objectives set out in the plans and also, in part, looked at progress made against the high level marine objectives set out in the UK Marine Policy Statement. This report noted that indicators for some of the plan objectives were consistent with progress towards those objectives, including an increase in total generating capacity of offshore wind and an increase in evidence projects and development of the marine evidence base. This report made a recommendation to not review the East marine plan at that time and noted the difficulties in assessing progress after just three years and how to draw out which results could be attributed to the plan specifically as opposed to other, non-plan factors. Since 2017 ongoing activity has included implementation work with decision-makers and annual monitoring of marine plan indicators. The second three-year report will be laid before Parliament in March 2020.

The South marine plan was published in July 2018. Ongoing activity has been focussed on external implementation work with decision-makers in the plan area through a series of training workshops delivered from September 2018 to February 2019. The first review is expected to be completed and published in 2021. An Approach to Monitoring document has been published which sets out how this review will be undertaken which, similar to the East marine plan, adopts a framework approach based upon the UK Marine Policy Statement high level marine objectives.

The remaining plans are being developed simultaneously and are all currently in the drafting phase. These developing plans are being progressed through an iterative process of stakeholder engagement. The third, and final, iteration of online engagement took place from 21 January to 29 March 2019 and was accompanied by a series of stakeholder workshops. Statutory consultation on these plans is anticipated late 2019 and submission to government in 2020 with all plans adopted by 2021. Alongside the plans, there is a monitoring approach, Sustainability Appraisal, Habitat Regulations Assessment and an online tool to ensure the most current spatial data can be used alongside marine plan policies.

The role of science in MSP

In England and Wales MSP processes the competent authorities undertook a strategic evidence review towards the start of the MSP process. This enabled a baseline understanding of current status of knowledge with a scientific/quantitative/statutory basis to be utilised to help formulate initial draft objectives and policy. It also helped highlight evidence gaps and determine where

stronger or more specific policies were likely to be accepted. Throughout the MSP process further evidence was collected towards filling evidence gaps where possible, and stakeholder engagement often highlighted new evidence that could help add local flavour to the marine plans. This latter evidence was not always of the right scale or scope to be of direct use in the MSP process, but was often useful in discussion with stakeholders or for use by other departments.

Wales

The Welsh National Marine Plan public consultation took place from 7 December 2017 to 29 March 2018 and was supported by a series of local stakeholder drop in sessions around Wales. A Summary of Responses document was published in July 2018 which recorded the key points raised in the substantive responses. This Summary of Responses identified several key themes including cross border management, evidence for planning, and monitoring, evaluation and reporting. Following the plan consultation period, a series of stakeholder workshops were held between July and September 2018 to address the key themes identified from the consultation responses received. The plan is currently being finalised with adoption anticipated in 2019. Implementation Guidance and the Monitoring and Reporting Framework are being produced alongside the marine plan.

The role of science in MSP

The Welsh Government published the Wales Marine Evidence Report in 2015 presenting the best currently available evidence of the state of the Welsh marine environment. The Welsh Government has also committed to publishing updates to this evidence report periodically with an update report currently in preparation and due to be published in 2019. The online Wales Marine Planning Portal is also updated regularly with relevant marine spatial data and maps. Neighbouring planning jurisdictions also maintain public access evidence databases, and these are signposted within the Welsh National Marine Plan and Implementation Guidance for proposals with cross border considerations. Natural Resources Wales, a statutory nature conservation body within Wales, also regularly publishes relevant material and reports including the State of Natural Resources Report and Indicative Feature Condition Assessments for European Marine Sites.

Scotland

Following the establishment of the national marine plan (NMP) in March 2015, Scotland has been rolling out the development of Regional Marine planning and has completed the first NMP review cycle 3 years after implementation in 2018.

The National Marine Plan sets the framework for all marine decision making in Scotland's Seas out to 200 nautical miles and provides a framework for more detailed regional marine planning. Eleven Scottish Marine Regions were formed around Scotland's coasts out to 12 nautical miles, requiring the formation of governing bodies (Regional Marine planning partnerships) to be created and establish Regional Marine Plans, subject to the requirements and objectives of the NMP. Under the Marine (Scotland) Act 2010, A review of the NMP was required within 3 years of implementation (in 2018).

To prepare for this review, Marine Scotland is assessed the level of uptake of the NMP in marine licensing and planning, monitored progress against the NMP policies and objectives as well as internally reviewing the NMP against ecosystem services frameworks and the ICES Quality Management System (CRR 327, adopting it as the structure for an informal evaluation framework).

The NMP review was published in 2018. Two key strands of work were carried out to assess implementation and effectiveness of the Plan: 1) internal application within Marine Scotland Licensing Operations Team (MSLOT); and 2) broader consultation with key regulatory and deci-

sion making organisations in Scotland - through online questionnaire, a multi-stakeholder workshop hosted by the Scottish Coastal Forum (SCF) and bilateral meetings. These processes looked to determine the success of Plan policies and identify policies for revision, barriers to successful implementation and Plan areas where change could be beneficial. Following review Scottish Ministers concluded that timing was not right in 2018 to amend or replace the plan. This was because of imminent changes in the policy and marine strategy landscapes as a result of EU exit, an Energy strategy and Climate Change Plan.

Regional marine planning has started with the formation of the first regional Marine Planning Partnerships (MPPs) in the Clyde and Shetland. These (very different) marine regions received Direction from Scottish Ministers in 2016 and 2017 and have completed (within the statutory 3 years) initial assessments of the state of their marine regions (environmental, physical, ecological, social, economic) with the aim of identifying issues and knowledge gaps.

These MPPs are in the process of producing Regional Marine Plans (RMPs) for review and approval by Scottish Ministers. Clyde region published a pre-consultation draft and accompanying Strategic Environmental Assessment of their RMP in 2019. The Shetland Isles have operated a marine plan for local marine decision making for a number of years (the first in the UK). More recently however, moves have been taken to create a formal RMP and a MPP has been formed, an initial assessment published and in 2019 consultation on a draft regional plan was undertaken. A further 9 marine regions will be rolled out with the creation of MPPs and develop RMPs in the coming years.

The role of Science in MSP

Science (data, evidence, knowledge, advice and research) have been extensively used throughout the Scottish marine planning process. The NMP was based on the evidence base presented in Scotland's Marine Atlas and made available on NMP interactive (NMPi), Scotland marine planning portal where several hundred spatial data layers are available for download and use. Much of these data were drawn upon in the development of regional marine plan assessments for Shetland and Clyde Scottish Marine Regions. There is on ongoing need for evidence collection, particularly in the areas of identifying environmental sensitivities, understanding usage of space by inshore fisheries (small boats) and identifying constraints to development. More fundamental research has been conducted collaboratively in international projects, including the H2020 and INTERREG projects: MUSES, SIMCELT, NorthSEE, AQUASPACE and ATLAS.

1.8 The www.NorthSEE.EU project (co-funded by EU-Interreg program North Sea)

This MSP project started in 2016, after preparatory work in 2015. The project includes work on coherence in cross border topics like Shipping, Energy and Environment. Breda University of Applied Science is in the lead for developing the MSP Challenge simulation platform for the NorthSEE. The Netherlands government has sponsored the development of the Ecopath with Ecosim foodweb model which is connected (see ToR C for more information), based on work on the ecosystem model overseen by ICES for the North Sea. The NorthSEE projects' extended steering committee conveyed during the Connecting Seas conference on MSP (organised jointly with the BalticLIneS MSP project) in February 2019 in Hamburg. There interim findings, conclusions and ways forward were discussed and adopted.

The main elements of these interim NorthSEE findings with relevance to the work of the ICES WGMSPCM are:

- *Note* the different roles of OSPAR[1], IMO, European Union and European Commission in various aspects of ecosystem based management of functions, marine ecosystems and use of space in the North Sea.

    a) *Recall* that North Sea countries co-operate in OSPAR to guide the transboundary implementation of the EU Marine Strategy Framework Directive objectives, and such cooperation is a crucial instrument to achieve the targets set under the Convention of Biological Diversity;
    b) *Note* that all states in the Greater North Sea area have established a national legal base for MSP (in line with UNCLOS). *Recall* that OSPAR's mandate is limited to the environmental aspects of MSP;
    c) *Recall* that EU obligations on Natura2000 and renewable energy are country-by-country targets, and *Stress* that MSP cannot guarantee cross-border plans for such.

- *Conclude* that the current use and spatial management in the North Sea marine region display a high level of cross-border [and transboundary] coherence for shipping, energy and ecology; *Acknowledging* that, especially for [these] sea-basin wide issues, a consistent transnational approach [be it formal, institutionalized, informal, for specific time frames/topics] may lead to even greater coordination, alignment and complementarity between plans.

- *Recall* pertinent issues necessitating cooperation such as:

    a) safety of navigation, IMO route measures, *Highlight* the progressive work on safety distances between shipping lanes and offshore wind farms by NorthSEE[2]. *Acknowledge* the need to address the spatial, environmental, safety and economic aspects of increased maritime traffic supporting the growing energy production at sea and the predicted increase in short sea shipping[3];
    b) environmental protection, and in particular achieving a clean, healthy, biodiverse and productive state of the marine environment (good environmental status) and the consideration of cumulative impacts of existing and future activities [in a changing environment].

- *Recall* that contracting parties to OSPAR have designed a coherent network of Marine Protected Areas; *Welcome* the further work in OSPAR to evaluate and strengthen this coherence for the Greater North Sea basin in terms of AICHI target 11 to be achieved by 2020 (in terms of connectivity, representation, resilience and effective management), and in this regard *Highlight* the NorthSEE study[4] on connectivity between marine protected areas.

[1] Oslo-Paris Agreement: the regional sea basin convention for the North-East Atlantic region www.ospars.org

[2] https://northsearegion.eu/media/5056/northsee_safetydistances_and_finalposter5.pdf

[3] https://northsearegion.eu/media/4836/northsee_finalshippingreport.pdf

[4] https://northsearegion.eu/northsee/news/environmental-connectivity-study-published/ initiated and financed through NorthSEE and carried out by the Norwegian Institute for Marine Research.

- *Recall* and *Welcome* the Political Initiative of the 10 North Seas countries to cooperate on offshore renewable (wind) energy[5]; in particular on MSP and creating greater coherence in dealing with cumulative ecological impacts in the sub working group; *Welcome* the studies and cooperation on SEA methodology in the EU financed SEANSE project[6]; *Welcome* further cooperation on energy transition challenges under political guidance. *Reiterate* the good cooperation on cross border infrastructures such as the recent interconnecting COBRA cable.
- *Underline* that data and information for MSP on the various sectors and the North Sea countries is not easily accessible, accurate or well integrated, in particular for the cross border and transboundary use. *Stress* the unforeseen efforts on data and information sourcing needed to achieve NorthSEE results so far.

    a) *Conclude* the need to improve data quality, data availability and sharing among the North Sea countries, as well as the need to advance the use and effectiveness of data and information in MSP processes. *Stress* the need for planners and stakeholders to have an up-to-date access to locations and public available information on existing wind farm sites, those under development, in planning and indicated as search areas. *Urge* for this information to be available as a baseline by mid-2019 for uptake in MSP processes around the North Sea.
    b) *Conclude* that the MSPChallenge NorthSEE simulation platform[7] has proven to be supportive in the stakeholder workshops organised, contributing to collaborative working, better communication and understanding of spatial and environmental challenges in the North Sea amongst academia/students, policy officers and stakeholders.
    c) *Consider* the economic and societal benefits that could be gained from further innovations in MSP support systems based on "digitally interactive technology" (such as Big Data handling techniques, geo data sourced with satellites, simulation and game technology, Virtual Reality / Augmented Reality, and Artificial Intelligence). *Consider* that the MSPChallenge simulation software and Infoquarium could provide inspiration and a prototype for furthering the creation of a joint tool assisting in MSP.
- *Agree* to promote:

    a) closing data and information loops and gaps; in particular *Calls for* the complete update of the OSPAR database on MPAs, and availability of vessel tracking data (AIS) files and maps;
    b) sharing and use of all available data by MSP authorities and stakeholders, such as data and information on migratory species in the North Sea, and the production of information products which are useful for MSP officers and in particular assist in transparency and communication with stakeholders;
    c) accurate and up-to-date available data and information provided by North Sea countries, and a cooperation mechanism to share available data on MSP.
    d) exploring benefits that could be derived from a possibility to source relevant MSP data and information (on shipping, energy and environment) from one database and (further) integration, alignment and interoperability of decision support models for ecosystem based MSP.

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[5] http://www.benelux.int/files/9014/6519/7677/Political_Declaration_on_Energy_Cooperation_between_the_North_Seas_Countries.pdf

[6] www.northseaportal.eu

[7] http://www.mspchallenge.info/northsea-and-balticlines-copenhagen-14-jun-16.html

1.9 Baltic Sea Area: Research and Development

Status of planning – including the countries not reported about earlier

In the Baltic Sea area, , the activity has been and still is high in the Baltic Sea area, both in terms of actual MSP and of knowledge production and cross-border collaboration on this. The Baltic Sea developments include a considerable number of different types of projects, to a large extent building on each other, but also becoming increasingly concrete and policy focused, as national-level MSP is being institutionalised and concretised. Today, except for Russia, all countries around the Baltic Sea have adopted a legislation for national level MSP and an appointed authority. Different countries have appointed different authorities as responsible to conduct planning (both ministries and national authorities or even regional governments (Åland), also with varying focus responsibility: environmental, maritime, finance, and more.). Germany is already into a second round of MSP with Federal State plans in the territorial waters (Bundesländer) and nationally in the EEZ, the 2nd round has started, where Finland and the region of Åland have recently started but are catching up rapidly with the approaching EU MSP directive deadline in March 2021. Moreover, there is in some countries (such as Sweden) and overlap between national and lower level governments with regard to the responsibilities for MSP. MSP has differing meanings and implications in different countries (is not binding everywhere), legislation also specifies more or less what needs to be included in a marine spatial plan. These differences are important to know, but not necessarily a insurmountable obstacle to transboundary collaboration and coordination – as the Baltic Scope project proves.

With regard to the interaction between science and policy and the role of science in the policy making process around MSP, there has been a trend from basic research to understand what is happening in the Baltic Sea (BACC) to research and development projects based on policy-defined needs of knowledge and method development (BaltSpace, Go4Blue, BASMATI, BaltCoast, financed by the BONUS research initiative) and further beyond to development projects supported by research organisations (Baltic LInes, Baltic SCOPE, Pan Baltic Scope). Earlier, INTERREG-financed projects provided early analyses and syntheses of intstitutional systems and knowledge needs and tests for method development and test planning with an increasing involvement of responsible authorities (from BaltCoast to BaltSEaPlan to PartiSEAPate (to promote knowledge generation and transnational collaboration) and finally Baltic SCOPE – financed by DG mare to actually implement policy and promote transboundary collaboration to produce better aligned national marine spatial plans)., financed by different INTERREG regional funds (Central Baltic, Southern Baltic, etc.), there are also a number of relevant recent and on-going Interreg projects promoting cross-border collaborations from different perspectives (blue growth, cultural heritage, capacity development): Plan4Blue, BaltPlanSpace, Capacity4Blue and still more might be coming.

Below, some projects are described, including a specification of the role of science.

Thus, projects have been important for the development of MSP in the Baltic Sea area, but now the more permanent institutional system and its actors are increasingly in the driving seat – and science/scientists are invited to participate to varying degrees.

An important forum for interaction are not only projects, but also an existing forum for transboundary collaboration, that might receive more tasks and play an increasingly important role as integrative forum (if the recommendations of the Baltic Scope project are implemented): the HELCOM-VASAB working group on MSP and its data subgroup.

Cross-border collaboration of authorities for MSP in the Baltic Sea area: Baltic Scope and Pan Baltic Scope

The PanBaltic SCOPE project (www.panbalticscope.eu) is co-funded by the European Union (through EASME) and after Baltic SCOPE (www.balticscope.eu) the 2nd project in a row to promote the implementation of the EU MSP Directive by supporting cross-border MSP of Baltic Sea countries involving the MSP responsible authorities. It builds on the existing collaboration of planners from authorities in Denmark, Estonia, Germany, Latvia, Poland, and Sweden, complemented by relevant regional collaboration organisations such as HELCOM and VASAB and research institutes of the Finnish Environmental Institute (SYKE) and Nordregio. Freshly onboard have also been Finland and the independent region of Åland, which most recently initiated their MSP.

The first work package WP 1.1 focuses on cross border interaction and learning for MSP among planning experts, also reviewing existing cross-border collaboration principles and features. The second Work package 1.2 focuses on the development of analytical and mapping tools and approaches to promote an ecosystem based approach in MSP including a broadersocial and economic sustainability perspective. The third work package, 1.3 addresses the EU MSP Directives' request to integrate Land Sea Interactions into MSP, focusing among other on how it could be conceptualised and made practically applicable in coastal and MSP practice both within countries and across borders (with special focus on cases in the Bothnian Gulf and the Riga Bay with special coastlines and institutional settings).

The project is about to be concluded and will present its results in the 3rd Baltic MSP Forum in Riga (http://www.panbalticscope.eu/mspforum/agenda/), in collaboration with the EU and the IOC UNESCO global MSP initiative. Over the years, this collaboration has provided a possibility for mutual learning of national planners about each others' planning systems, mutual collaboration on combining data and developing methods and concrete planning problem solving (e.g. planning wind power and shipping in the Middle bank area, developing first common basic maps and conflicts and synergies mapping, checklists how to apply an ecosystem based approach to MSP and triggering the resolving of undefined borders in the Economic zone between Denmark, Germany and Poland, mapping the development of trust and mobilising stakeholders' views and values of marine areas through online tools. One important conclusion of Pan Baltic Scope is that beyond further systematisation of data for common maps there is also a need to have a continued expert forum for discussion and concrete problem solving (a planning forum), as a complement to the already existing formally appointed HELCOM-VASAB MSP expert group and its data group. Another is that there is a great need to continue working on comparable and sharable in-data to promote cross-border planning, even if it is difficult and also across the land-sea interface. The work on implementing an ecosystem-based approach has taken another twist in concretisation. A number of interesting reports will now be available on the project website, and more products are expected during early 2020.

BONUS-financed MSP research

Under the BONUS programme, the EU, in collaboration with national research funders, has provided funding for policy relevant research (https://www.bonusportal.org/), also with calls including MSP and ICZM. BONUS has been a collaboration between the EU and national research funding organisations with focus on improving governance of the sensitive marine environment of the Baltic Sea. Consortiums from independent research organisations from at least 3 different countries have been working on knowledge gaps identified by policy makers and with the aim to understand them and develop solutions to identified problems – in interaction with potential end users of the project. 2-3 MSP and ICZM related projects appear of most interest for the group (BaltSpace, BASMATI, BaltCoast), shortly reviewed below. The BONUS initiative is just about to be concluded through a number of synthesis projects – one on integrative ecosystem governance

aspects. From 2021, the BANOS programme will support integrated North Atlantic and Baltic Sea marine environmental governance research.

Balt Space: Towards sustainable governance of marine space

https://www.baltspace.eu/baltspace-research)

BaltSpace has been an inter/transdisciplinary 3-year project (spring 2015–18,– a typical example of a research and development project (or mode 2).

BALTSPACE has been the first transnational, interdisciplinary MSP research project in the Baltic Sea Region. Eight independent research organisations partnered a consortium covering five Baltic Sea countries (DE, DK, LT, PL, SE) and analysed four different key challenges and enablers to integrate in MSP (partially in parallel to the perspective used in one WP in Baltic SCOPE), namely policy/sector, transboundary (land, vertical, international), stakeholder, and knowledge integration. These had been (among other issues) defined as important knowledge gaps by the policy world and included in the BONUS call. Integration is commonly understood as a key mechanism in Maritime Spatial Planning (MSP) but the precise meaning of integration has rarely been elaborated, nor have its implications for different MSP processes been fully explored. Achieving integration in MSP across all these various dimensions is no easy feat. This is not helped by the fact that there is little information on the constraints and benefits of successful integration. Using mainly social sciences methods (interviews, document analysis, observation) the project explored them in a first step (analysing passed and on-going planning processes in different countries of the southern Baltic) and extracting important challenges and enablers for different situations, countries.

- Work package 1 developed analytical and evaluation frameworks (see reports D 1.X). The research shows that these challenges are indeed relevant and make a good point of departure to analyse MSP initiatives – also from an evaluation perspective. Here, not just ecological, economic and social sustainability but also governance sustainability appear to be important to evaluate.
- In Work Package 2, through five different case studies at different scales to analyse challenges and enablers in MSP practice were analysed (the overall Baltic, the Sound between Denmark and Sweden, German territorial and EEZ planning, integration of the fisheries sector into Polish MSP and MSP of Latvia and Lithuania). A comprehensive list of challenges and several reports and papers has resulted from this (see movie, policy briefs, and D 2.X reports.
- Work package 3 has focused on analysing 7 tools and approaches in relation to their potential to integrate in MSP. Here, all tools analysed are potentially useful for MSP practitioners, many of them need to be fine-tuned to the context of application (see D 3.X deliverables).
- In WP 4 interactive ways of anchoring project focus and results with end users (marine stakeholders and planners) have been tested by dialogue forums.

Several organisations involved in BaltSpace are also represented in the WG (HZG, SIME, MIG) and have provided continuous contact. The WG has been an important forum for scientific communication.

The results of BaltSpace have become available on the website and as scientific publications. An interactive movie was developed, where one can explore the four different dimensions of integration and challenges and enablers: https://www.baltspace.eu/

Reports and all other products can be downloaded here: https://www.baltspace.eu/published-reports. The reports most relevant for the WG ToRs include (WP 1 Evaluation framework, WP 2 final theme reports on integration challenges from case studies (complementary to the national

authority perspective of Baltic Scope) and WP3 with tool testing (Bow Tie analysis, spatial cost benefit analysis, Open Standards for the Practice of Conservation, etc.) and within WP 4 communication the development of Dialogue Forums and communication tools.

A number of scientific articles have become available in 2019, in connection with a special issue of Ocean and Coastal Management and in the open access recent book by Zaucha and Gee *Maritime Spatial Planning – Past, present and future*. https://link.springer.com/book/10.1007%2F978-3-319-98696-8
Many publications are co-authored by WG members.

BONUS BASMATI - Baltic Sea Maritime Spatial Planning for Sustainable Ecosystem Services

Homepage: https://bonusbasmati.eu/

BONUS BASMATI (2017–20) aims to develop an innovative decision support system for MSP in the Baltic Sea region. Its main objectives are to: 1) develop integrated and innovative solutions for MSP related to marine and coastal ecosystem services and marine protected areas, 2) develop and apply spatial decision support systems including data discovery and exchange facilities, 3) develop means for interactive multi-level, multi-stakeholder and cross-sector governance. Besides a handbook on stakeholder interaction tools, two different frameworks to work with the ecosystem approach, one further concrete product will be a digital discussion and decision support system. The Baltic Explore is aimed to support planner, expert and stakeholder interaction in MSP at all stages of a planning process: from basic data discovery and sharing to integrative analyses with a special focus on ecosystem approach based perspectives. This is complemented by an analysis of governance frameworks, stakeholder involvement tools and framework development to work with the ecosystem-approach more concretely. Work is still under way, the final results will become available in spring 2020.

BaltCoast: A Systems Approach Framework for Coastal Research and Management in the Baltic

Homepage: https://www.baltcoast.net/

BaltCoast, also works with developing a tool and runs also from 2017–2020 with more of an ICZM focus. The project aims to address the lack of a holistic approach integrating human activities with ecosystems capacity and environmental forcing in coastal areas. The project has the goal to develop a coherent and systematic management approach encompassing multiple impacts in a heterogeneous spatial context. The tool developed is called Systems Approach Framework (SAF), tested on case studies reflecting specific regional sector management challenges in Denmark, Estonia, Latvia, Lithuania, Germany, Poland. The aim is to develop a more generic tool for integrated system assessments. Also in this project, final results will become available in spring 2020.

1.10 MSPglobal2030

MSPglobal2030 is part of the broader roadmap on Marine/Maritime Spatial Planning from IOC-UNESCO and DG Mare (European Commission) working on international guidelines on cross-border MSP, as set out in the "Joint Roadmap to accelerate Maritime/Marine Spatial Planning processes worldwide" adopted during the 2nd International Conference on Maritime Spatial Planning, in March 2017 in Paris.

An International Forum for Maritime Spatial Planning has been created with 8 foreseen sessions, of which the output are crucial for the drafting of international guidelines. Two sessions have

been held in Brussels (May 2018) and La Réunion (March 2019), in which members of the ICES WGMPCZM have participated.

The two sessions held so far reveal that cross-border and transboundary ecosystem based MSP cannot be separated by national MSP activities and frameworks, but in turn national approaches cannot be carried through without international cooperation (in particular on the scale of the functional larger marine ecosystem). Stakeholder involvement and a view to the economic and other transitions needed to achieve the UN Sustainability Goals (in particular number 14, Life Below Water) play an important role. ICES member countries representatives are encouraged to take part in the MSPglobal Forum and other project initiatives.

More information can be found on: https://en.unesco.org/mspglobal

In February 2019, there was a Call for expression of interest to join the Group of Experts to assist the Intergovernmental Oceanographic Commission of UNESCO with the preparation of internationally accepted guidance on Marine Spatial Planning/MSPglobal (2019–2021). To the extent possible, the group of experts will be made up of established and recognised experts of high scientific standing in one or more key areas of expertise relevant to marine spatial planning from all regions of the world (Europe, North America, Latin America and Caribbean, Africa, Asia and Oceania). As far as possible, the members of the Group will represent the diverse expertise relevant to marine spatial planning and sustainable blue economy. Gender balance will be an important consideration in the selection of the experts. The Group of Experts will be facilitated by the Project Coordinator of MSPglobal, acting as focal point, and moderator of its meetings. A representative from each of the two pilot projects (Western Mediterranean and Southeast Pacific) will attend the group's meetings. Depending on their background, experience and willingness, experts may be invited to join other specific activities of the project.

The WGMPCZM members present at the 2nd Forum in La Réunion have suggested to the IOC-UNESCO Project Coordinator to have the scientific expert group engage in a policy-science interface dialogue throughout the duration of the project, similar as how the ICES WGMPCZM is composed/functions.

1.11 Session report ICES ASC 2018 Session Theme Session C - Assessing and analysing marine spatial planning - knowledge - indicators - visions

Session: Tuesday, 25 September 2018, 10:30–17:30

Andrea Morf, Kira Gee, Riku Varjopuro

Background

Presently, in the area of marine/maritime spatial planning (MSP), there is a fast institutional development process under way, at least in the European countries, driven both by needs and by the EU MSP directive (2014). MSP has to deal with boundary crossing problems (ecosystem, administration, knowledge types) of complex character (complex, changing systems, uncertainties, knowledge gaps). Managing marine uses in space implies a process that has to deal with many stakeholders with different interests, values and knowledge in highly varying ecological, societal and institutional contexts. Ideally, this requires integrative, participatory, and iterative forms of planning with focus on process and not just outcomes.

The development is supported by research and development projects facilitating national processes, as well as cross-border and transdisciplinary learning and sharing. Insights so far indicate

that there is a high diversity in settings but also many common problems. These include differences in institutional systems, cross-border understanding and coordination, lack of resources and continuity, a need for mobilisation and education of authorities and stakeholders at different levels, a high need for method development (digital and process-related) and problems with data availability and harmonisation across borders. A fast development of a professional field of expertise is under way as well, requiring education and training. For this, complex collaborations across marine basins and fields of science and practice are needed, which presently suffer from a lack of continuity in financing and commitment.

The session call and its aims

Supported by EU policy (i.e. the MSP and Marine Strategy Framework Directives), MSP has become the tool of choice for many countries in implementing sustainable maritime development and promoting ecosystem-based management. With many countries already applying MSP and others well on track with national MSP programmes, this is a good time to take stock of MSP developments and question its current ambitions and successes. Questions must be asked regarding its ultimate objectives, for example how it is linked to an ecosystem approach to management, how it might facilitate blue growth and promote ecological sustainability, and how it contributes to more inclusive and participatory maritime governance. There are a number of recently concluded and on-going projects and initiatives in MSP, both in the Baltic and the North Sea, the Mediterranean, the Atlantic and beyond the European seas.

The session intended to collect active and interested researchers and practitioners and discuss the state-of-the art and ways beyond. It was arranged jointly by the ICES Working Group for Marine Planning and Coastal Zone Management (WGMPCZM, http://www.ices.dk/community/groups/Pages/WGMPCZM.aspx) and the MSP Research Network (https://www.msprn.net/home). The session consisted of three sections (1. Developments in MSP and comprehensive approaches; 2. Evaluation and assessment; and 3. Tools and approaches to link specific sectors into MSP) with 13 oral presentations and 4 posters also presented shortly in the last part of the oral session. The final discussion consisted of interactive group work in 6 groups and the plenary, discussing the important take home messages in relation to challenges and solutions for MSP and a research agenda. Below an extraction of important messages from both individual presentations and overall discussion.

Questions posed by the session:

The session aimed to open up perspectives on both marine spatial planning (MSP) and integrated coastal management (ICM) from a critical systems perspective, assessing the state-of-the-art and recent developments, asking the following:

- MSP developments: What are current ambitions and successes?
- How is MSP conceived? (visions) – e.g. with respect to sustainable development (or in relation to recent developments such as EBM, ICZM etc.)
- What knowledge does it draw on? (inclusiveness)
- How can progress and success be measured? (indicators and evaluation)

The session brought to the fore different visions of MSP:

- The use of MSP to consciously respond to climate change. Climate change is likely to affect the distribution of ecosystem services, leading to changes in the intensity and distribution of resources and uses. “Climate smart” ocean planning incorporates evidence related to climate vulnerability and risk assessment and strengthens its adaptive capacity by ensuring that climate-related aspects are more strongly reflected in MSP policy and plans.

- MSP as a tool to facilitate sustainable development, taking a holistic, strategic development-oriented perspective from the start rather than responding to the (recent) development of a single (new) sector, for example.
- The role of MSP in addressing various relevant marine topics and concerns was discussed. The field is rapidly evolving as more and more countries have introduced MSP. The systems differ and the challenges are multiple, leading to the necessity to address policy integration and separation of duties between policy sectors, levels and countries sharing marine basins. It is important to identify the roles that MSP can have and in which it is effective and what other policies can deliver towards the common goal of sustainable seas.
- An ecosystem (based) approach to MSP to support management of human activities, including cultural heritage and more of a non-economic values perspective.
- MSP as part of a holistic *integrative coastal and ocean governance*: with oceans as linked ecosystems and human societies steered by multiple policies and instruments, it is necessary to think even broader in terms of ocean governance both in terms of extending towards marine areas beyond national jurisdiction (the EEZ and territorial waters) but also widening thinking beyond planning as spatial management tool and connecting MSP and ICM and what is happening on land and affects the sea (understanding and managing land-sea interactions).
- MSP (including its legislation and institutionalisation) as a forum for power struggles between interests of nations, authorities and users, rather than being an objective instrument and a neutral process.

Lessons in relation to knowledge:

- Interpretation of data is now key, which implies negotiations rather than "hard" facts.
- Still, there are remaining knowledge gaps and uncertainties and there is also a lot to do to ensure availability of data in formats suitable for MSP. Several options and new methods were presented.
- When cultural heritage comes into play, qualitative statements and knowledge are added to the process, which is different to the "precise delineations" e.g. of MPAs or other zones.
- Knowledge is needed with respect to risks, such as a cumulative risk profile based on the distribution of natural values and cumulative human pressure. Risk is understood as a likelihood rather than a hard and fast impact.
- Vulnerability is related to scale, and the question of what is at stake where.
- An important question in the context of power relations is how power could be measured and expressed – in terms of the resources available? In terms of transparency on this?

Lessons in relation to evaluation, indicators and development of MSP practice:

- There is at the same time an urge to become concrete and provide tools and indicators for MSP, at the same time as there are considerable differences in terminology used both in research and practice. This is normal for a field in development, but needs attention and harmonisation.
- To promote coherence and cross-border learning, monitoring and evaluation needs to occur both internally within a country and externally across borders. This requires further method development and harmonisation.
- Indicators are needed that allow different parameters to be weighted, ideally together with stakeholders to determine the suitability of marine areas for certain activities or combinations.
- In terms of serious gaming, a key question is how "real" they need to be, e.g. with respect to assessing cumulative impacts of sea use. Here, the main issue is whether such games are understood as educational in purpose, or as actual decision-making tools.

- There are two broad "branches" of evaluation of MSP: One is to evaluate or compare national approaches of MSP against general indicators. The other is to focus on one (often national) MSP process and evaluate how the objectives specific to that process are met.
- There are numerous principles at various institutional levels that could be used for setting up goals and design evaluation systems. But these need to be concretised in relation to a specific context (several promising methods and approaches were presented).
- Internationally, there is an increasing amount of practice experiences and guidelines available for MSP, they become increasingly concrete – see e.g. MSP platform and the IOC website for a repository of relevant information.

As results in relation to Term of Reference ToR a) on the agenda of the WGMPCZM exploring the role of science in MSP we extract:

Natural and social scientists play a role in MSP as knowledge bearers and advisors, but can also take other roles (critical observers, lifting certain sector and stakeholders' views: e.g. fisheries, conservation, recreation, cultural heritage). In some areas (e.g. Mediterranean, Black Sea), science is a main driver of MSP/ICM in collaboration with marine sectors (see e.g. AdriPlan, parts of MUSES) and authorities are less committed and active, while in other marine basins MSP is driven by authority collaboration and science plays more an exploring, supporting and accompanying role (e.g. in the Baltic and the North Sea: Baltic SCOPE, Baltic LINes, North SEE) or observes MSP development (BaltSpace and many more!).

Scientific work on various aspects of MSP/ICM is under way:

- Development of basic knowledge/data (issues: availability, quality, harmonisation). For examples, see the posters: on fisheries data, aquaculture allocation, habitat modelling)
- Development and testing of tools, methodology (posters and presentations on methods for project planning and management, evaluation and indicators of various kinds, input to the European MSP platform as open library)
- Accompanying, facilitating research on process and evaluation thereof (Baltic SCOPE)
- Institutional and policy analysis and evaluation (presentations comparing MSP in Germany, Australia, Power in Denmark,
- Development of curricula for education and training (mentioned, but less discussed)
- Meta reflection on MSP work and research and the further development of the field (the final discussion in groups)

Ways forward – A research and action agenda for MSP research and ICES work:

- Research and ICES should think more broadly in terms of ocean governance, as many of the instruments and approaches are complementary and both ecosystems and resources and marine uses should not be seen and managed in isolation. This also applies to monitoring and evaluation (of plans, their implementation and the effects on users and environment), which needs to be both place specific but possible to connect to the surroundings. WGMPCZM has already proposed 2 sessions for ASC 2019 in this spirit.
- MSP and ICM need to be country and context specific but able to communicate across borders within a marine basin. Advice in relation to this needs to be so too. Here, there is still need for further comparative research (across borders and marine basins and institutional and cultural contexts).
- MSP could learn from insights of land-based planning and ICZM and from other thematic fields of management and evaluation research (in order to neither re-invent the wheel nor make similar mistakes). Various concrete suggestions were collected.
- There is a need to develop the *critical perspective* in MSP research, but also use it to promote *self-reflection in action* among planning practitioners. For this purpose, science-policy

interaction need to be developed further, including interaction with training and education. This is presently difficult, as research is transdisciplinary, international and also geographically relatively dispersed and financing not continuous.

- Linking science and policy making within ICES and beyond:
  There is a need to work further with developing a transdisciplinary dialogue on integrative and sustainable ocean governance
  a) within sciences (e.g. across ICES working groups – among and beyond social sciences groups – e.g. links to session R and others)
  b) between activities and actors within SCICOM and ACOM and
  c) across the science-policy interface (towards advice, but also by making ICES and its working groups and more known internationally in the different countries).

For a more complete summary and overview over the input from the group discussions, please contact the session leaders (andrea.morf@havsmiljoinstitutet.se, kira.gee@hzg.de, riku.varjopuro@ymparisto.fi).

The session experiences and summary also show that it is important to have regular forums for a continued development of both the scientific discussion and for sharing of practical insights and experiences across marine basins.

1.12 Synthesis and ways forward

Summing up the manifold developments in different countries and reflecting on the role of science in MSP the ICES Working Group Marine Planning Coastal Zone Management (WGMPCZM) has synthesised its reflections on the role of science in Marine Spatial Planning (MSP) in ICES member countries so far in a poster at the ASC 2019 in Gothenburg (Morf *et al.* 2019). This is under development towards a scientific paper. Below, the most important points and the conclusions the group draws for future work, combined with a list of important thematic areas, based on group discussions and the results from the session at the ICES ASC 2018.

A broad need for knowledge integration for MSP & ICZM

Overall, MSP (and ICZM) implies a need for different knowledge and processes of knowledge integration in a complex field that combines practical demands – such as developing spatial policy for intensively and dynamically used sea areas, conducting planning processes including politics, business and society and implementing plans across sectors and boundaries. Different types of knowledge, methods & skills from natural and social sciences and inter- and trans-disciplinarity are required. These include both basic data, assimilated knowledge, systems understanding, problems and solutions, gaps and trends but also the skills to translate and communicate about knowledge and synthesise it all. Pulling it all together requires a process of interaction to identify important problems and questions to address and learn or even co-create knowledge (between science, enterprise, decision makers (experts and politicians), and society at large. However – based on the working groups' and different MSP projects' combined experiences – especially in transboundary planning situations (across borders/land/sea interface), there are numerous knowledge gaps, resolution, harmonisation and quality problems, combined with conceptual differences and last but not least confusion about the roles of different types of knowledge and knowledge bearers. Sharing and integrating knowledge across borders is crucial to plan for whole marine basins (not the least with an ecosystem perspective in mind) but tends to be even more complicated, as the many projects show.

Observations from practice and group discussions

Scientific work on various aspects of MSP ICZM is under way:

- Development of basic knowledge/data (issues: availability, quality, harmonisation) resulting in publications and data in different data repositories
- Development and testing of tools, methodology (resulting in publications, new tools, data repositories, meta data sheets)
- Accompanying, facilitating research on process (resulting in publications, recommendations, direct learning)
- Institutional and policy analysis and evaluation (resulting in publications and policy advice)
- Meta reflection (at scientific conferences/in academic papers)
- Development of curricula for education and training

This can result in different types of outcomes and products: publishing research results and reformulating them into policy recommendations, or even further facilitation of training and development of practice.

The role of science in relation to the development of MSP/ICZM can differ geographically. In some areas (e.g. Mediterranean, Black Sea), science and scientific institutions makes a crucial driver of MSP/ICM, while in other areas MSP is driven by authority collaboration (Baltic) and science plays more an exploring, supporting and accompanying role. In the North Sea area, many countries have appointed specialised institutes providing data to decision making.

Scientists can be both important for planning authorities as knowledge producers and advisors, but they can also be stakeholders or lift specific stakeholders' viewpoints. Both natural and social scientists play a natural role in MSP as knowledge bearers. At the same time, they have stakes in the sea and can also almost take roles of stakeholders, lifting forward specific sectors and their interests based on deep knowledge of the sector or because they seem to be unempowered groups (observed regarding e.g.: ecology, recreation, aquaculture, coastal fisheries, local residents, indigenous populations). For evaluation purposes, besides sites for environmental monitoring, scientists can also have an interest in more/less/not exploited reference areas for comparative evaluation.

Typology to understand the roles of science in MSP

We see that varying types of science are needed for different stages of MSP and that there is a need to reflect on the roles of science (skills, methods, knowledge) and its production. We have tried to structure this in a typology with focus on the role of science in relation to policy makers (partially based on Cormier *et al.* 2017) with four main types. The interaction between scientists and policymakers takes the forms of: a) independent research projects, b) collaboration projects between science-policy, c) consultancy & advice on demand, and a process of d) co-creation of knowledge - often in a recurrent interaction process. They differ with regard to who is involved and how much, who steers the focus and formulation of questions, who owns the results, and who receives what remuneration and acknowledgement for it. Using the typology, one can examine roles of specific actors at the science-policy/spatial management interface. Some of these types can be differentiated even further.

To make the best of science-policy interaction, scientists and policy makers need to be aware of their respective roles and related possibilities and limitations in specific situations. In the developing field of ICZM and MSP, a degree of co-creation of knowledge might be necessary, rather than transferring results after the fact. Concepts such as responsible research and innovation could also come into play here (EU statement on Horizon 2020, ec.europa.eu/programmes/horizon2020/en/). However, based on our experiences with work of the group and tools in MSP, we identify fuzzy "grey zones", where confusion is likely both on the side of the scientists and the

planners – especially in collaborations of type b) and the co-creative processes (type d). The types might apply to other policy fields under development as well.

An R&D Agenda for MSP/ICZM: knowledge and method gaps to work on

Besides clarifying the roles of science in MSP, there are still numerous knowledge gaps to address. Based on ICES ASC 2018 discussions and further observation of practice and research in the group and beyond, the following observations can be made:

- We should think more broadly in terms of ocean governance. Many instruments and approaches are complementary and both ecosystems and resources and marine uses should not be seen and managed in isolation. This also applies to monitoring and evaluation (of plans, their implementation and the effects on users and environment), which needs to be both place specific but possible to connect to the surroundings.
- MSP and ICM need to be country and context specific but able to communicate across borders within a marine basin. Advice in relation to this needs to be so too. There is a need for further comparative research across borders and marine basins and institutional and cultural contexts.
- MSP as a field needs to consolidate its terminology and could learn from insights of land-based planning and ICZM and from other thematic fields of management and evaluation research in order to neither re-invent the wheel nor make similar mistakes.
- There is a need to develop the *critical perspective* in MSP research, but also to use the same perspective to promote *self-reflection in action* among planning practitioners. Here, science-policy interaction needs to be developed further, including interaction with training and education. This is challenging, as research is transdisciplinary, international and also geographically relatively dispersed and financing not continuous.
- Linking science in ICES with policy making and beyond:
  There is a need to work further with developing a transdisciplinary dialogue on integrative and sustainable ocean governance
  a) within sciences (e.g. across ICES working groups – among and beyond social sciences groups)
  b) between activities and actors within SCICOM and ACOM and
  c) across the science-policy interface (towards advice, but also by making ICES and its working groups and more known internationally in the different countries).
- To further provide MSP and ICZM with a better knowledge base for the plans, a number of themes and topics require further mapping and research and development of planning evidence, and tools and methods to deal with them. There is a need to be aware that both spatial and temporal scales matter, as conditions for and importance of specific issues may differ across scales:
    - Knowledge for plan implementation, evaluation and revision (adaptive management),
    - Land-sea interactions in both directions and at different scales.
    - Spatialising and linking societal and ecosystem processes and interconnections,
    - The content and quality of social and economic sustainability aspects and their linkages to ecological processes,
    - Risks, hazards and risk awareness, preparedness and management.
    - Cumulative impacts both between uses and on ecosystems.
    - Working with the future of the sea: sector trends, scenarios, methods.
    - Implications of climate change-related processes on MSP/ICZM.
- How to move towards common standards for data content, data collection and data exchange across marine basins and the land-sea interface, even if it may not be easy with

all the different systems. And how to use and adapt existing data collection methods, assembled knowledge and databases for planning purposes.

Continuity for collaboration, discussion and mutual learning

Last but not least, it is important to have regular forums for a continued development of both the scientific discussion and for sharing of practical insights and experiences across marine basins – on the one hand with the continued work in the group, but also with possibilities to share and discuss beyond the group, such as scientific conference sessions (ICES ASC, MARE and other) and sessions and workshops at more policy related forums (e.g. international MSP forums, but also national events). Continuity is also still a problem in terms of data collection and research and education.

Next steps – continued work

- A discussion paper to submit developing the typology further and applying it to discuss the implications for MSP research and science-policy interaction.
- Research agenda: important topics to continue working with (see above and ASC 2018 session report for details)
- Submission of suggestions for conference sessions (see appendix)

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2 ToR b) Develop cumulative impact assessment techniques for pressures resulting from human activities on the marine environment in the context of marine planning

Workshops and publications

A series of workshops was undertaken to examine the use of risk management approaches to cumulative effects assessments (CEA); (Figure 2.1). The initial workshop (WKRAM, 2014) examined the use of the Bow-tie analysis to analyse the management measures used to reduce cumulative effects. Next steps recommendations initiated two streams of work along the lines of demonstrating the integration ecological models and probabilistic techniques in a Bow-tie analysis to provide a quantitative analysis and a qualitative integration of EU legislation in the Bow-tie analysis of the management measures. WKPASM (2015) and WKBNCS (2016) applied Bayesian Belief Network to predict the residual pressures of management measures generated by different activities as an indicator of the effectiveness of the management measures. This approach was tested through a case study of economic activities pressures on the integrity of the sea-floors' integrity in the German EEZ of the North Sea and the eutrophication in the Great Lakes in Canada (Cormier *et al.* 2018a). Using the MSFD as a case study, EU legislation and regulation were analysed through a Bow-tie analysis of the MSFD programme of measures (Cormier *et al.* 2018b).

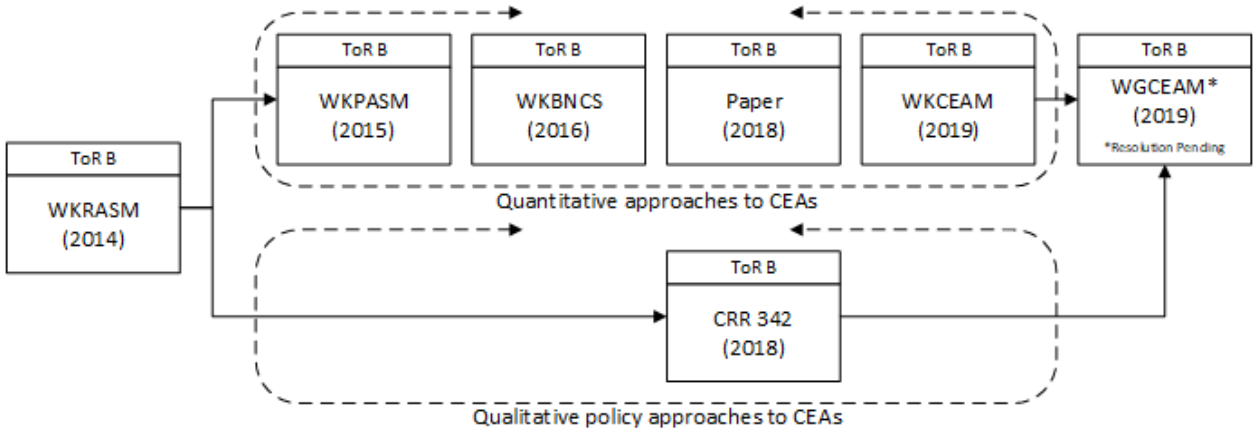

Figure 2.1. History of workshops conducted in relation to risk management approaches to cumulative effects assessments.

Based on the insight gained from this work, it was apparent that CEAs need to link the effects observed to the causal pressures in order for regulators to improve management measures that are used in specific sectors. Thus, WKCEAM (2019) was held in February 2019 to discuss the differences that should be considered when conducting CEAs to inform environmental policies, marine spatial planning and regulatory processes (Figure 2.2). In contrast to ecosystem overview reports, CEAs should inform marine planning regarding the effects being observed in the planning while identifying the pressures that are causing the effects to inform regulators as the management measures that need to be improved. The CEA should identify what are the effects that need to be addressed by the plan and while identifying the pressures to figure how best to reduce the pressures (Figure 2.3).

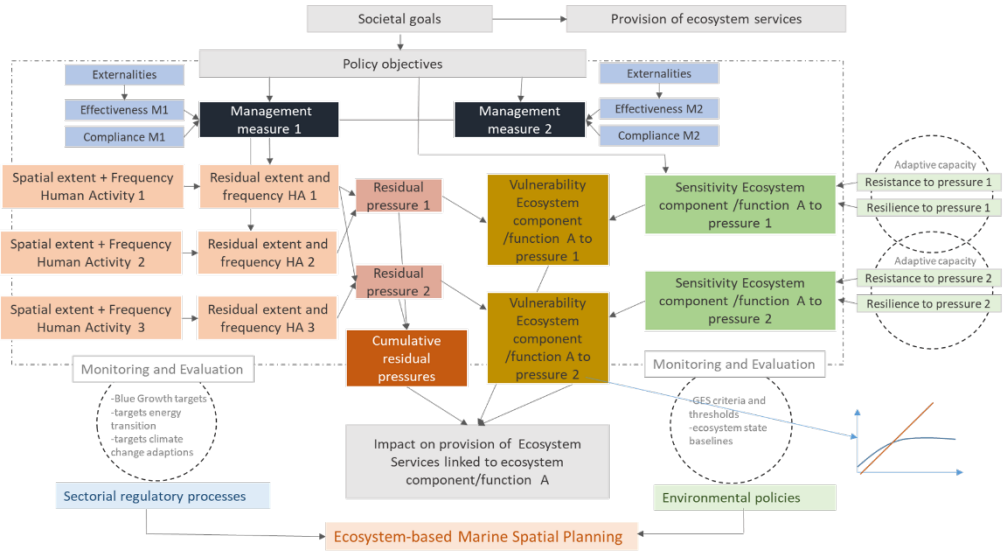

Figure 2.2. Information elements of a CEA in an operational context (WKCEAM, 2019).

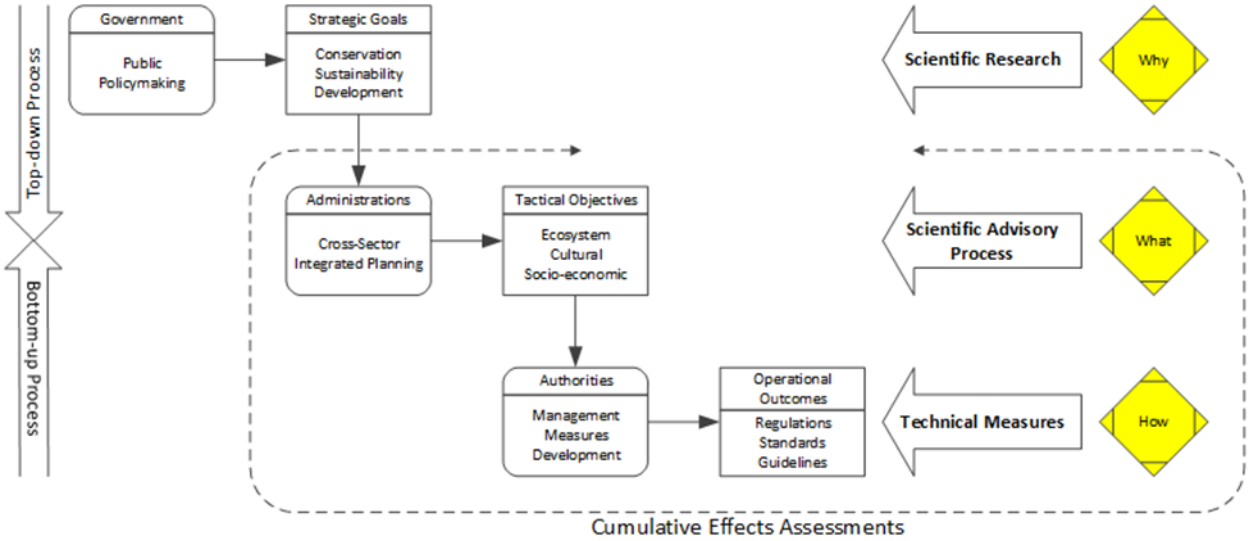

Figure 2.3. Science input inputs to operationalize an ecosystem-based approach (adapted from Cormier *et al.*, 2017, ICES, 2019).

This workshop also proposed the need for an expert group for CEAs in management. The group would develop a CEA framework to guide the development of management measures through regional case studies including guidance regarding qualitative and quantitative approaches that accommodates uncertainty as well as identifying information gaps. The group would do this work by liaising with ICES expert groups and other forums.

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United Nations Economic Commission for Europe – Risk-based approach to SDG 14

The United Nations Economic Commission for Europe (UNECE) is currently pursuing an initiative to examine the use of risk management approaches to regulatory frameworks to assist member countries achieve the UN Sustainable Development Goals (SDG). The UNECE Group of Experts on Risk Management in Regulatory Systems (GRM) selected Goal 14 "Life below Water" as a case study to examine how such an approach could be applied as an approach for all SDGs given the focus on improving the management of hazards that can affect the quality of products and services, and/or cause harm or damage to people, the environment, property and immaterial assets.

An initial workshop was held in February 2017 (UNECE, 2017) to discuss the use of risk management tools in regulatory frameworks in the context of the implementation of the Sustainable Development Goals (SDGs) using SDG 14 as the case study. Some the findings included:

Risk management in marine management:

- Elements of risk management approaches are found in current fisheries and oceans management.
- Risk management approaches used in other sectors can also be adapted to regulatory frameworks relevant ocean management and SDG 14.
- SDG targets should be analysed within national and international legislative contexts to identify clear objectives and develop a sound implementation strategy from a regulatory perspective.
- Key performance indicators (KPIs) coupled with Key Risk Indicators (KRIs) and Key Control Indicators (KCIs) would provide the basis for monitoring of impacts coupled with the effectiveness of the management and operational controls.

Implementation of the SDG targets:

- Implementation of the SDG requires mature governance approaches coupled with adequate stakeholder engagement and institutional capacity.
- National competent authorities should implement structured risk-based regulatory approaches to ensure that these are effective at achieving the targets and can be efficiently implemented within the operational activities of a given sector as well as enforced.
- Promoting the use of standards by policy-makers and business would not only help integrate standards into regulatory systems, but also enhance the design of regulatory systems while providing clarity for institutions in the development of their programs.

Risk identification and assessment in regulatory frameworks:

- Tolerance criteria must be established to evaluate the risks of regulatory options within the national policy context.

- Risk management and assessment activities including key indicators should be underpinned by current scientific knowledge through formalized and independent advisory processes.
- National competent authorities will need structured risk-based regulatory approaches to ensure that these are effective at achieving the targets and can be efficiently implemented within the operational activities of a given sector as well as enforced.

Regulation development:

- Regulations, standards and guidelines should be developed from the premise that "people want to comply".
- The mechanisms of implementation (e.g., regulations, standards and guidelines) must be efficiently integrated within the operations of a given sector to be effective at reaching a given objective, including through the adoption of guidelines and relevant enforcing jurisdiction.
- Enforcement is a necessary component of any regulatory system. Sufficient resources should be allocated to its planning and its execution.
- Conduct risk management approaches can enhance the traditional regulatory risk management prescriptive approach to changing behaviour.

A subsequent joint ICES/UNECE meeting was held in October 2018 (UNECE, 2018) to discuss how to assess and manage risks related to SDG 14 and apply lessons learned from risk-based policy making and regulatory frameworks to support SDG 14. Among the findings of the report, the most notable included:

Implementation of the SDG 14 targets:

- Attendees underscored that the risk of not achieving SDG 14 targets may be linked to the fact that Member States do not have suitable legislation or policies in place that can be conducive to the accomplishment of the Goal itself.
- SDG 14 are to be implemented through national legislation under the guidance of the United Nations.
- EU Marine Strategic Framework Directive is a comprehensive framework that could be used in any national context to assess the current status of the SDG 14 targets and analyse current legislation and regulatory frameworks.
- The implementation of risk management practices through regulatory regimes, standards and guidelines remains a challenge given the divergent use of definitions, methods, and jargon in such processes.

Recommendations for next steps:

- Creation a Group of Experts that would be mandated to assist in the implementation of regulatory risk management in the context of SDG 14 in close cooperate with the Group of Experts on Risk Management in Regulatory Systems and ECE Team of Specialists on Sustainable Fisheries and relevant International Council for the Exploration of the Sea working groups.
- Build regulatory frameworks in support of SDG 14 and that would be used by regulatory agencies and policymakers. It was noted that in doing so, the potential expert group should further analyse the Directive targets and their relevance to SDG 14 (Annex I), the ecosystem indicators developed by the International Council for the Exploration of the Sea and apply the expertise of UN/CEFACT and specifically its "FLUX" standard for the achievement of SDG 14.
- Attendees also recommended that further scientific research is carried out to support the implementation of SDG 14 at international and regional level.

As key considerations regarding the impediments for implementing SDG 14 targets is that these as aspirational and are not specific enough for implementation (Cormier and Elliott, 2017) while the MSFD could provide a comprehensive strategic framework that could be applied anywhere in the world in the development of regulatory strategies to achieve the targets. The UN indicators used to evaluate the performance of the regulatory frameworks to achieve the targets are not as comprehensive as the indicators used by ICES and other organization such as OSPAR and HELCOM. Achieving SDG 14 targets in area beyond national jurisdictional depends on the port of call or flag of convenience of the economic operator given that the United Nations does not have regulatory authority over individuals and enforcement requires agreement from the signatories of a convention to take action. Finally, the current situation in the high seas is greatly due to the variety of regulatory approaches to managing human activities through national jurisdictions.

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3 ToR c) Training

MSP Challenge serious game application for training and education

The MSP Challenge experience since 2011 reveals the value of developing a range of tools and tailoring these to different audiences and contexts. The ICES WGMPCZM has been acting as a "steering group" since the first idea of the MSP Challenge was proposed as part of the joint ICES/HELCOM-VASAB/OSPAR workshop held in Lisbon, November 2011.

During the WGMPCZM meeting in 2019 (Galway) a session with the #MSPglobal edition was organized by the Irish Marine Institute in cooperation with the Galway Atlataquaria and NUI Galway (SeaShoreNUIG). Students and working group members have actively engaged with one another and done a further outreach and promoting ecosystem based MSP.

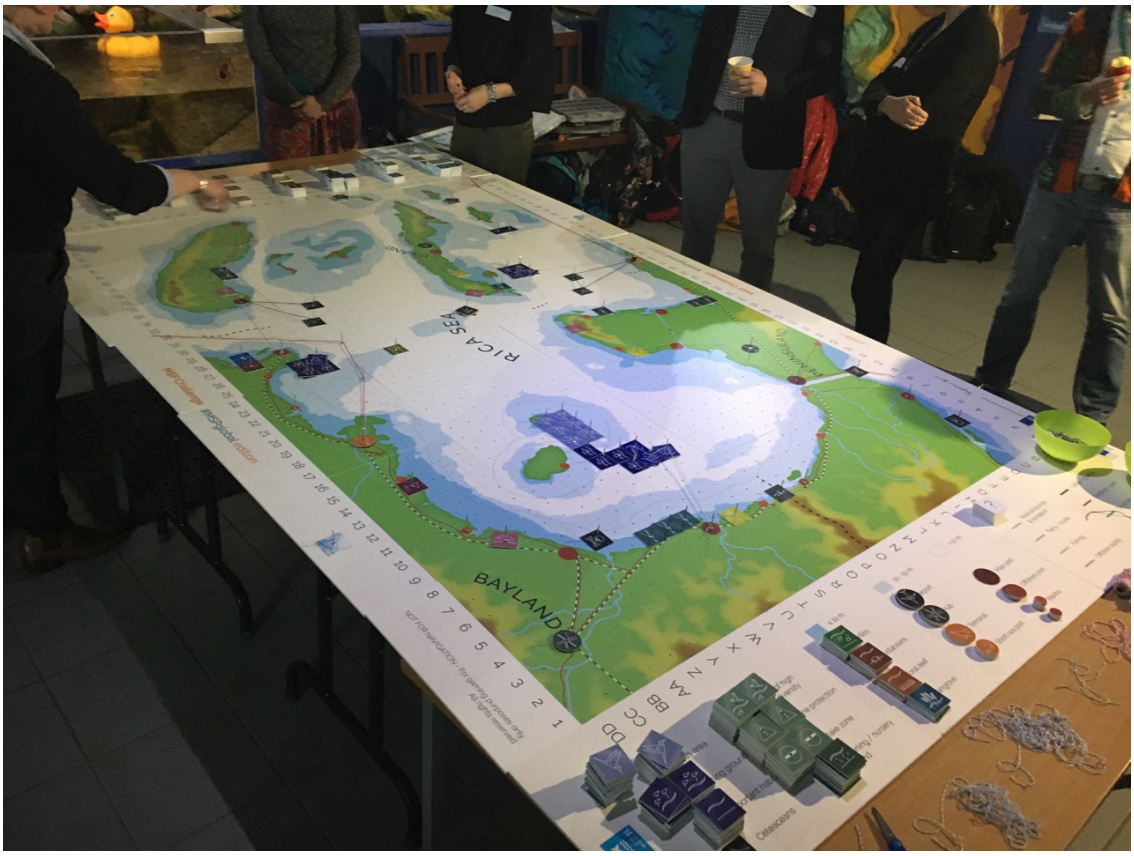

Figure 3.1. Game table as used in Galway.

By now over 100 sessions have been organized with different versions/edition of the MSP Challenge, totalling over 3000 participants. A board game format of which several editions exist, provides a valuable entry-level activity suitable for use with a wide audience. The computer based format featuring a food-web model and MSP tool is more appropriate for professionals and others more closely involved in delivering MSP, be it for government, industry or other stakeholders. Both versions have proved to be lively teaching aids for both undergraduate and Masters' students. They have also proven to be functional in increased knowledge and understanding for the moderators and teachers. Taken together in a workshop the board and digital versions of the MSP Challenge offer players an increasing logical and complementary progression in 'understanding by doing'. A communication paper was written and published by members of the

WGMPZCM building on the experiences, including the ICES training courses organized as part of this ToR and in close cooperation with the ICES training center.

Following an earlier training course on MSP in 2014 (TCMSP2014), a new course was set up from 18 to 22 February 2019 at the ICES headquarter in Copenhagen (TCMSP2019) and lectured by Roland Cormier and Andreas Kannen. 15 participants from North America and Europe and composed of administrators, scientists and consultants attended the course. The course focused on planning processes as well as the management of such processes informed by stakeholder consultations and scientific advisory processes. It introduced the participants to the different spatial and temporal considerations when planning from an ecological, cultural, social and economic perspective based on the ICES Cooperative Research Report No. 327 on marine spatial planning quality management system. The course was delivered through lectures supported by reading material and discussions. The board game edition of the MSP Challenge was used throughout the course along different planning steps to allow the participants to put into practice the concepts and approaches from the lectures through role playing. Used primarily during second half of the day, the board game was used to apply the concepts from morning lectures and generate discussions. It is important to note that the course focus and scope always need to be adapted and tailored to the backgrounds and interests of the participants attending the course even though the training material, MSP Challenge board game and leaning objectives are the same for each training session.

Though the Board game proves highly successful in attracting interest and instrumental in community based learning and training of MSP, there are plenty of critical questions to be asked and answered: Who is invited to play these games and who is not? By whom and for what reasons? What happens if the 'wrong' message about MSP is passed on through these games? What if MSP authorities or participant-players skew the point the simulation games are trying to make? What if the players take the simulation game 'too literally' and cannot distinguish fact from fiction? What if the simulation games are not real enough and are only perceived as an enjoyable exercise after which everyone continues to think and do as before? These questions are relevant to those who want to use the MSP Challenge approach in the future. They illustrate the need to have a well thought-through idea of the learning objectives for target audiences from the beginning, and importantly, not to mistake the MSP Challenge as a method for implementing MSP, but use it as a welcome support mechanism in discovering and understanding the benefits and potential of MSP.

These kind of questions are relevant to the proposed new ToR E on Education & Training for the WG MPZCM 2020–2022. Relevant to note for that further work is the achievement of marrying a food-web model and MSP tool via a game engine (Unity). Together they allow for MSP actors to get an understanding of (cumulative) impacts of potential uses of a sea-basin well into the future and understand cause and effect relations.

Simulation Platform MSP Challenge North Sea with Ecosystem model (NorthSEE edition) [awaits publication]

A report is written describing the building and parameterisation of an Ecopath with Ecosim (EwE) model of the North Sea, specifically developed for the purpose of interacting with the Maritime Spatial Planning (MSP) Platform Edition serious game for the North Sea. This effort was supported by the NorthSEE project in order to provide a tool for stakeholder engagement and learning.

The model described (named "NorthSea 1991–2013 Key run - simplified MSP", hereafter shortened to "simplified") is a simplified version of an existing Ecopath with Ecosim model (ICES, 2015; Mackinson and Daskalov, 2007). The latest version of this model was published as the "EwE North Sea model 2015 Key run (1991–2013)", used and described in the WGSAM 2015

report (ICES, 2015). Unless otherwise specified, the simplified model for the North Sea MSP Challenge is based on the 2015 model. The Ecospace component of the simplified model is based on the Ecospace model used in Romagnoni *et al.* (2015), in turn based on Mackinson and Daskalov (2007).

All these models were built with 1991 as starting- and reference year, the year that a large effort for stomach content analysis was undertaken for assessing diet relationships in the North Sea (named "the year of the stomach"). For the purpose of MSP simulation, the base year was maintained because 1991 diet data are still the most important, up to date, and comprehensive. Moreover, constructing the model in the past allowed for using relatively long time series (1991–2013) to fit and calibrate the model to changes observed in the system in this time period.

Please note that the notation "simplified model" does not suggest in any way that the model is simple. An ecosystem model is always highly complex even if "simplified". The building and parameterisation ex novo or the process of simplification of an existing model require in-depth knowledge of the modelling framework and the system under study, methodical assessment and sound scientific approach including EwE "best practices" (Heymans *et al.*, 2016).

The MSP Challenge North Sea simulation with the EwE software was launched in a stakeholder workshop in March 2018, Texel Netherlands used in four different workshops in 2018/2019, further improvements (with an elaborated EwE model and pressures – or other models) connecting with other models such as are under review both on content, application and financing. Publications on the work and first results are under way. A simulation for the Clyde Region in Scotland and the Baltic Area have also been made and are in use: more information please see www.msp-challenge.info

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4 ToR d) Review approaches to plan evaluation and monitoring

Throughout the last decade, marine spatial planning (MSP) processes are globally initiated and implemented often following the step-wise guidance provided by Ehler and Douvere (2009). Thus good practice in adaptive management such as MSP builds on monitoring, evaluation, reporting. The fundamental principles for monitoring include identifying the objectives, monitoring options, scale, costs and benefits. While the fundamental requirement on defining operational planning objectives has been acknowledged (Stelzenmüller *et al.* 2013) actual planning practices often diverge from this idealized planning step-wise approach (Buhl-Mortensen *et al.* 2017). This poses an actual challenge on the monitoring and evaluation of spatial plans. Under Tor D the group has defined a typology for monitoring and evaluation in MSP differentiating 1) evaluation of planning outcomes and the achievement of planning objectives; 2) evaluation of the performance of the planning process; and 3) evaluation of the implementation of policies (see Figure 4.1).

With a help of case studies and a comprehensive literature the group is currently working on recommendations for good practice in monitoring and evaluation considering the defined typology. During the meeting time was spent in revising the assessment criteria and the rational of selecting show cases.

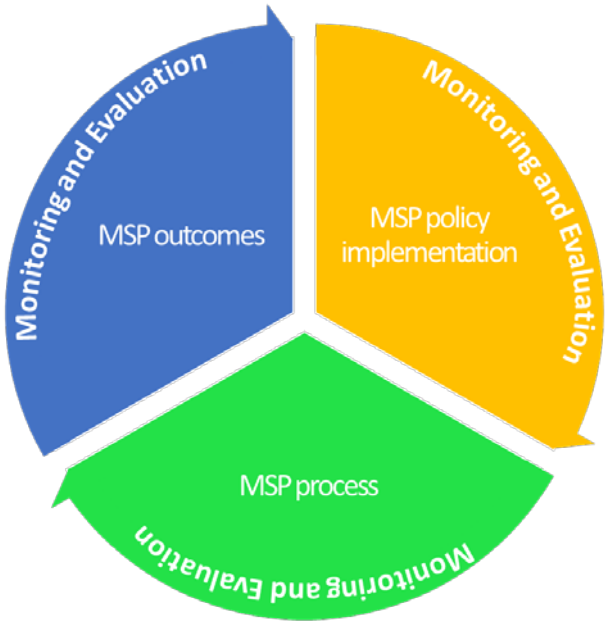

Figure 4.1. Typology of monitoring and evaluation in marine spatial planning.

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5 ToR e) Develop approaches to account for culturally significant areas in marine planning

Over the last reporting periods a substantial body of work has been carried out on this ToR. The original WKCES workshop (2013) formulated the concept of Culturally Significant Areas (CSAs) as a method for identifying places of cultural importance on the coast and in the sea. The CSA approach establishes what is valued by people, where these values are located, when in time they are relevant and to whom, and which places, features or areas are particularly significant compared to others. The approach is modelled on the concept of Ecologically and Biologically Significant Areas (EBSAs), which seeks to delineate "geographically or oceanographically discrete areas that provide important services to one or more species/populations of an ecosystem or to the ecosystem as a whole, compared to other surrounding areas or areas of similar ecological characteristics". The main purpose of EBSAs is to inform marine management decisions, including marine spatial planning, both within and beyond national jurisdiction – exactly the purpose of CSAs.

Establishing CSAs is an evaluative task that makes use of different dimensions of significance. Significance in this context is no absolute measure, but intimately linked to the cultural connection of a community to a given area, place or activity. What might be highly significant to one community may not be significant to another, and what might be significant at a national level may not be significant to local residents and vice versa.

Although the specific qualities of areas, places or activities may therefore vary, significance for a feature or place under the CSA approach is established by meeting one of the following criteria:

- Cultural uniqueness
- Broad cultural/community reliance
- Importance of the feature to the resilience of the social-ecological system
- Degree of tradition
- Dramatic cultural change

Table 5.1. Criteria for determining significance for Cultural Features for a Risk Assessment Process.

	Definition	**Examples**
Cultural Feature	Significance of a particular cultural service/value in a particular area to a community or group of users (scale dependent)	Area (sacred place, historical site, landscape), activity (ceremony, bird watching, hiking), ecosystem property (migration of species, connectedness of landscape), object of importance (monument, heritage site), species (salmon, redwoods)
Cultural Uniqueness *(Do we have many or few?)*	Extent to which the feature/place/ activity is unique within the region or to which the same or similar features exist in the same region	1) Each instance of it is irreplaceable and distinct (e.g. burial ground, sacred site, historical or archeological site); 2) It belongs to a culture that is distinct/cultural diversity (unique historical sub-cultures, indigenous cultures in most places);

			3) It is unique in a global context though abundant locally (e.g., special type of landscape), or unique in a local context though abundant globally (e.g. a city park or recreation area)
Broad Cultural Reliance *(How many people or groups rely on it? How many functions does it fulfill?)*	a) an area, activity or feature which is important to many different communities or to a very large community/large number of people; b) an area or feature which is essential to sustaining many other important activities; c) an area of feature which holds importance for a given group for many different reasons, or supports many aspects of their culture or traditions.		1) Proportion of the total population using the feature/place, 2) Number of human communities using it (e.g. sport anglers and bird watchers), 3) Type (e.g. indigenous groups, ethnic minorities) of human communities using it.
Importance to Resilience *(How essential is it to cultural integrity or to the group of users? What would happen if it was lost, changed or degraded?)*	a) impact of losing one service on other services, b) impact of losing one service on user groups (e.g. user group can no longer perform this and / or other activities in the region), c) consequences of loss for the local community / region d) role in adaptive capacity		1) Loss of this feature will affect the benefits from many other features (e.g., salmon fishing which has material, activity, recreation, spiritual, heritage/traditional, artistic, ceremonial benefits); 2) The feature is essential to the cultural integrity of a community or user group and plays a central role in the groups' identity, function or performance of essential activities (e.g., an important ceremonial site); 3) Loss of the feature would have irreversible consequences (e.g. losing a type of fisheries can increase unemployment because no alternatives exist and people move out of the region); 4) The feature allows the community to better adapt to changes (e.g., a place people go to recuperate from stress, a prayer site for difficult times, an alternative species that

		has similar cultural functions to an endangered one)
Degree of Tradition *(How long has the culture valued the feature?)*	The feature has a long or deep tradition of importance to the culture	1) The feature has a long history of importance (many generations of a ceremony or activity); 2) The feature has a strong commitment from the user group or very high participation rates
Dramatic Cultural Change *(Does the unique context of the culture that values the feature give it special importance?)*	The feature has importance in consideration of agents of Change or the historical context of change; loss of essential ecosystem function; invasion or conquest; severe changes on the culture, outside of normal cultural change	Many indigenous groups around the world have been subjected to attempts at cultural extermination through not only colonialism, but also the policies and actions that followed (such as forced removal of children and their "education" in Western norms, language and religion). This situation may justify special consideration of features associated with these cultures. Other unique cultures also face extreme pressures from internal and external forces (e.g. collapse of a fishery).

Legislation and policies are now in place in some countries (e.g. Canada) that require cultural impact assessments to be conducted for development projects. Risk assessment is a valuable element of such broader cultural impact assessments.

In 2018, a workshop was undertaken to examine vulnerabilities and risks to culturally significant areas (WKVCSA, Geesthacht, Germany, 6–9 February 2018). The purpose was to examine the key qualities that are needed to sustain each CSA and the risks that various developments might pose to these essential qualities and features.

One of the key outcomes of this work is the realisation that CSAs are complex entities. Drawing on heritage literature and related policy, a more detailed description of the object of value was provided, consisting of tangible resources (e.g. physical landscape, resources), intangible resources (e.g. local knowledge), enactment (engaging in a practice), transmission and safeguards (e.g. governance). All of these take place or are located within the area that has been defined as the CSA according to the community, individuals, groups and organisations involved.

Each of the attributes identified above – enactment, tangible, intangible – can be threatened by various activities, changes, pressures etc., and may require different approaches to management. Since most intangibles do have some connection to a tangible resource, a useful principle is to manage the tangibles in order to safeguard the intangibles. "Viability" is a helpful concept to describe the state of the element in question, as this can apply to objects, materials and places as well as social practices, knowledge or skills. Rather than merely safeguarding an object, it is therefore important to focus on the viability of a cultural object or practice that is taking place in a CSA, implying stronger focus on the relationships between people and places/objects than has commonly been applied in the past.

Risk assessment needs to identify and analyse both the threats that could change the object of value and the socio-cultural repercussions this could have. This requires a structured approach

to risk assessment, ideally building on existing methods, and including the community that values the object at risk. Formal risk management processes such as ISO 31000 are helpful in identifying what risks are being perceived and what values are at risk, in order to then find ways of addressing the risk. Bowtie diagrams emerged as a helpful tool for structuring the first step of the CSA risk assessment, which is to identify impacts on the object of value and the consequences this would have. An example of a Bow-tie analysis would include a broad range of threats to the object of value such as the continued enactment of traditional activities and the transmission of those values to subsequent generations. As part of the assessment function, the Bow-tie analysis would also identify the consequence of changes or loss of a culturally significant area in terms of the impacts or effects to those from the community of interest, as well as at broader scales of society and secondary impacts to local economies.

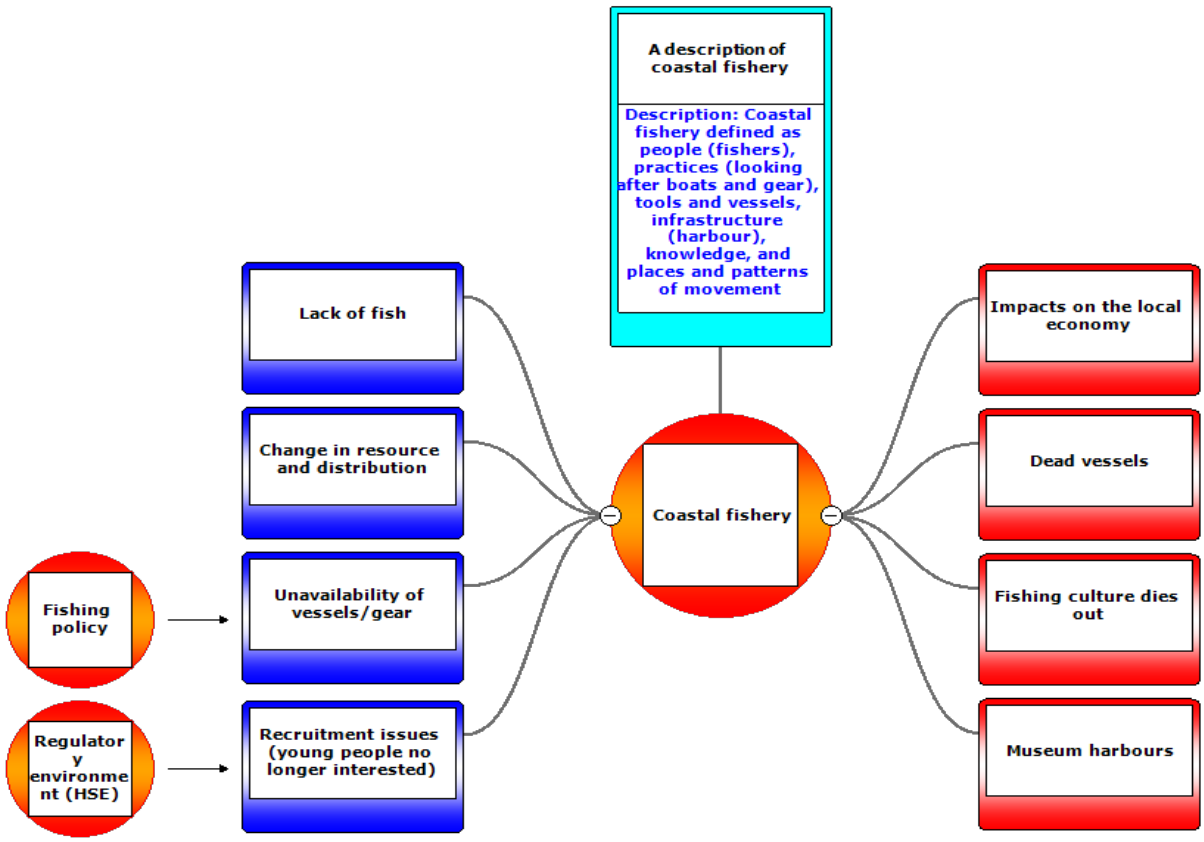

Figure 5.1. Identifying impacts on the object of value (coastal fishery) and the socio-cultural and socio-economic consequences this could have.

The next step is to define risk in terms of likelihood and acceptability, which makes use of risk criteria for cultural objects of value (describing the severity of impacts) and risk matrices (combining the consequences of an event with the likelihood of it occurring).

Table 5.1 is an example of cultural values risk assessment criteria. The table sets out the severity of risk and the impact each level of risk would have on the object of value and the people that value the object. The table also lists impacts on the management process (such as MSP) and the integrity of the community that is affected by the risk. This table is generic and could be adapted to various scales and circumstances.

Table 5.1. Cultural values risk assessment criteria

Severity	Impact on object of value	Impact on those that value object	Impact on process/relationship and managment	Impacts on the cultural integrity of the community
Extreme	Complete destruction	Total loss of tangible resource, intangible values, transmission, enactment, safeguards	The result of which would create long term loss of trust accompanied by a significant unwillingness to cooperate on marine planning issues.	Destroyed
Very High	Permanent alteration	Severe and permanent loss of tangible resource, intangible values, transmission, enactment, safeguards	The result of which would create significant loss of trust and strong resistance to collaborate. Agreements would not be achievable and negative impacts on other marine planning activities.	Undermined
Medium	Temporary alteration	Severe but reversible loss of tangible resource, intangible values, transmission, enactment, safeguards	The result of which would create some loss of trust and resistance to collaborate in the marine planning activity. Agreement would not be achievable.	Strongly affected

The aim of ToR e) was to develop approaches to account for culturally significant areas in marine planning. The CSA approach is a way of alerting marine planners to diverse cultural values, their location within a planning area and perceived significance. The vulnerability assessment adds another tool that planners could use to develop appropriate management measures for CSAs. It should be acknowledged that MSP can only address some of the threats that culturally significant areas may be exposed to, as intangible values such as enactment or traditions are likely to be outside the scope of MSP process. Nevertheless, the method can identify a broad range of threats and consequences to CSAs and their constituent parts. Any subsequent decisions (e.g. what measures are to be chosen to avoid or mitigate impacts on CSAs) would probably form part of a separate process that may also involve the political arena.

In terms of future work, the role of coastal and marine cultural values in maintaining and enhancing community well-being is becoming obvious. It will be helpful to examine the links between socio-cultural values and well-being of people in more detail to enable MSP to make conscious choices when developing spatial policies.

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6 ToR f) Coexistence and synergies in MSP: Develop approaches for evaluating benefits

A substantial body of work has been carried out on this theme over the last two work programs for WGMPCZM. Two workshops have taken place:

- A workshop on conflicts and coexistence in MSP (WKCCMSP 2016, Geesthacht, 8–12 February 2016)
- A workshop on coexistence and synergies in MSP, organised jointly with the H2020 MUSES project and Marine Scotland (WKCSMSP 2018, Edinburgh, 4–6 April 2018)

The work carried out over the last three years builds on a ToR from the 2014–2016 work program that was concerned with the development of a typology of conflicts in MSP, ICZM and EBM, as well as suitable instruments for addressing these. It was based on recognition that not addressing conflicts properly can lead to blockages of the MSP process, add costly work and hamper implementation. Understanding different types of conflict, their causes and constructive ways of dealing with them – and differentiating between those that can be resolved by MSP and those that cannot - is thus an essential part of Quality Assurance in MSP, linking this ToR to the work done on Quality Assurance in MSP. Working for coexistence and synergies can be understood as a way of constructively dealing with conflicts. Considering conflicts and synergies in MSP was therefore understood as two sides of the same coin, with the interrelationship between the two warranting further exploration. True synergy may not always be achievable, and also be context-dependent for individual MSPs.

The first step in 2015 was to develop an outline typology of conflicts. A conflict is understood to occur when a disagreement cannot be resolved through established mechanisms, or when parties fail to accept the solution that has been developed through the established mechanisms. Conflicts can also be defined as a disagreement which ends in behaviour requiring management, or a situation in need of active management. It was re-emphasised that due to the many dimensions involved, developing a comprehensive typology of conflicts is a complex task. Previous work had structured dimensions of conflicts along the lines of a bowtie, showing the sources and causes of conflict on the one side and the risks to avoid on the other. The MSP process is regarded here as a means of de-escalation or prevention. The group noted that the bowtie could give the (false) impression of linear causalities which do not exist in reality, and that the term "conflict" in itself may appear judgemental and better be replaced by "disagreement " in some instances.

The 2016 workshop WKCCMSP (ICES 2016) built on this, noting that conflicts occur at individual, group, and organisational/institutional levels and are composed of various elements that can be difficult to negotiate. Conflicts between individuals/groups/organisations can escalate and de-escalate according to certain patterns which can also be used in managing conflicts. Dimensions of conflicts include:

- **The conflict issue(s):** What is the conflict about – substance (e.g. access to resources) or process (e.g. power, knowledge, inclusiveness)?
- **Sources and causes of conflict:** What is the driving force of the conflict and what has triggered it?
- **Actors:** Who is involved in the conflict? What characterises the actors involved, what is their formal role, resources and knowledge? What of the legitimacy, power and urgency of the actors and their claim?
- **The institutional framework:** What aspects of the institutional set-up are important for understanding and managing the conflict?

- **Status of knowledge/uncertainty**: Is there a dispute over knowledge, or a lack of knowledge/certainty?
- **Impacts of conflict**: How does the conflict affect the MSP process/actors/institutions/timescales?
- **Tools**: Which tools can pro-actively address which conflicts?

WKCCMSP noted that assessing the severity, magnitude and sensitivity of a conflict helps to determine its significance for the MSP process, offering links to risk management. It was also noted that conflicts are not necessarily negative and can be turned into a constructive force. Places, people, problems, and perceptions change over time, as do conflicts. MSP-related conflicts may not be resolved once and for all in the MSP process but only managed more or less well.

Conflict resolution as part of the MSP process depends on contextual possibilities and constraints. These include the ecosystem and the prevailing socio-economic/cultural contexts, knowledge, technology and physical structures and the institutional context. Strategies for addressing spatial conflicts include:

- Understanding patterns of cooperation between uses;
- Coexistence in three dimensions: timing, depth, width;
- How activities can be synergies to others;
- Temporal/spatial management for non-permanent activities;
- Compensation for displaced activities;
- Knowledge as a solution for spatial conflicts;
- Process leadership and dedicated skills are essential for managing MSP-based conflicts.

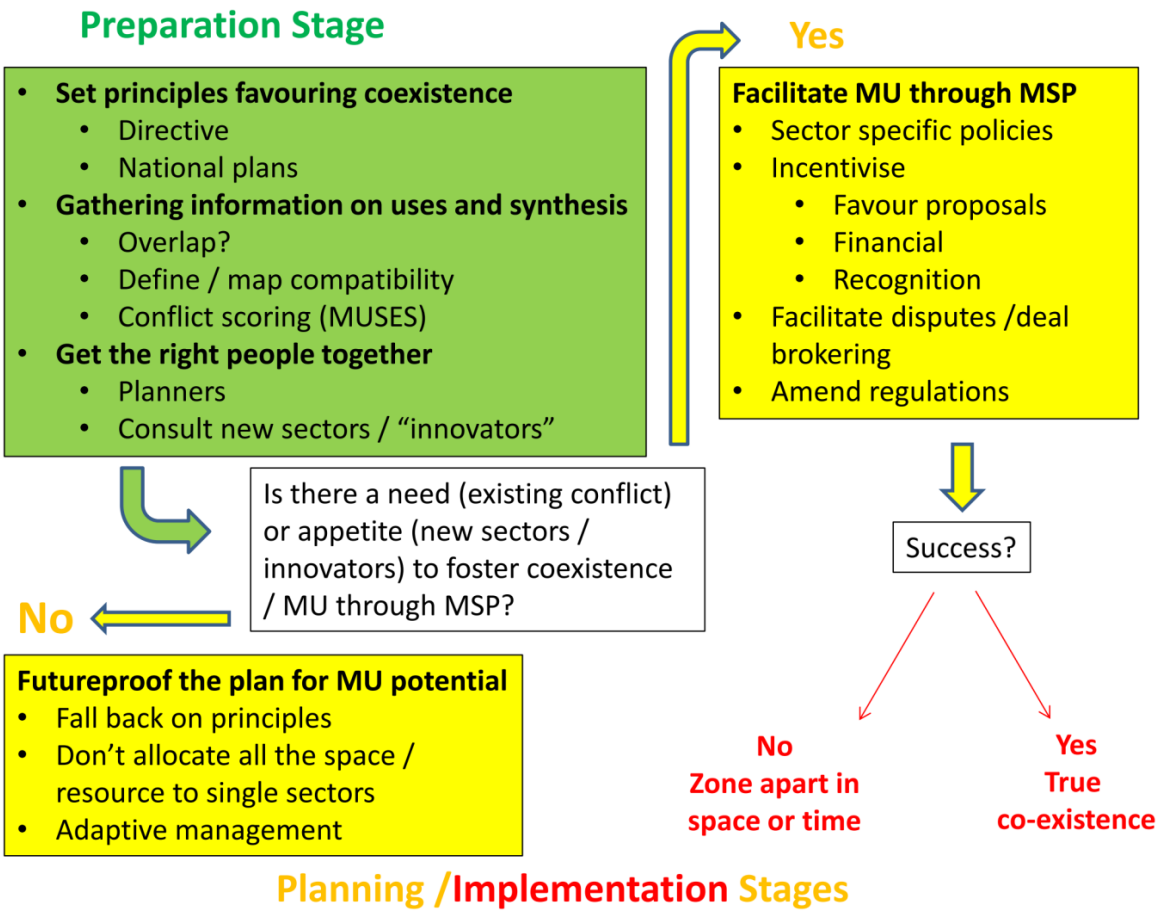
The 2018 workshop (WKCSMSP (ICES 2018)) picked up where the 2016 workshop left off, following up with a more detailed consideration of coexistence and synergies in MSP. Its specific objectives were to improve on ways to classify and understand coexistence and synergies in marine use, and to provide advice on how coexistence and synergies can be furthered in an MSP process. Collaboration with the H2020 MUSES project was actively sought as the MUSES project also sought to identify and overcome common barriers to multi-use in the ocean. Specifically, MUSES sought to investigate environmental, spatial, economic and societal benefits of multiuse, identify various barriers to multiuse (e.g. regulatory, operational, environmental, health and safety, societal and legal), and propose solutions and actions that could be taken in different contexts and for different multiuse combinations. Of particular interest for the ToR is a typology developed by MUSES, which defines different types of multiuse along with various examples. It is presented below (from Schupp *et al.* 2019).

TABLE 1 | Typology of ocean multi-use with descriptions and examples given for each identified type.

Type	Dimensions				Description	Examples
	Spatial	Temporal	Provisioning	Functional		
Type 1: Multi-purpose/multi-functional	✓	✓	✓	✓	Takes place in the same area, at the same time, with shared services and core infrastructure	Marine renewable energy sources and desalination (Maniopoulou et al., 2017), Scottish Floating Power Plant Design (FPP) (Kafas, 2017)
Type 2: Symbiotic use	✓	✓	✓		Takes place in the same area, at the same time, and peripheral infrastructure or services on sea or land are shared	Proposed aquaculture in OWF in Germany (Buck et al., 2017), combination of Wave Energy generation and aquaculture (Onyango and Papaioannou, 2017)
Type 3: Co-existence/co-location	✓	✓			Takes place in the same place and at the same time	Fisheries in OWF proposed in the United Kingdom (Kafas, 2017) and Germany (Schupp and Buck, 2017)
Type 4: Subsequent use/repurposing	✓				Takes place in the same ocean space but subsequently	Repurposing of offshore structures for new uses like recreational fishing, tourism, aquaculture, or environmental conservation (e.g., Italy) (Ponti et al., 2002; Depellegrin et al., 2019)

Types are ordered by decreasing degree of connectivity between uses and users. Connectivity in any given dimension is symbolized by "✓" in the respective field for each type.

The 2018 workshop WKCSMSP began by providing an overview of different types of coexistence and synergy and built on MUSES results (e.g. Schultz-Zehden *et al.* 2018) to classify them according to a range of descriptive parameters. It then considered the various driving forces that would lead maritime sectors to seek out or at least consider coexistence and synergy with other sectors. Questions were addressed with respect to the level of coexistence and synergy desired, as well as practical barriers. The workshop also considered the role of MSP in facilitating coexistence and synergy, noting that the role of MSP may change depending on the stage of the planning cycle and that although MSP may well act as a platform to promote coexistence and synergies and to highlight barriers, the barriers cannot always be addressed by MSP (e.g. licensing, financing, wider policy). Lastly, the workshop also considered MSP tools and skills and requirements for promoting coexistence and synergy. The diagram below summarises ways of promoting multi-use as part of MSP, taking into account the different stages of MSP from early preparatory stages to the implementation/licensing stage. It was developed during the 2018 workshop.



Open questions that were not fully answered relate to the transferability and scalability of solutions, and the question of whether synergy is always achievable. With regard to conflict resolution, an open question relates to definitions of success, which may be whether the solution achieved is to the satisfaction or acceptance of the stakeholders involved and whether further escalation has been avoided. This points to the crucial role of stakeholder involvement in conflict resolution and development of synergies, as well as acceptance of the available knowledge base and levels of uncertainty.

Progress with this ToR is on track. A combined Collaborative Research Report (CRR) is in preparation, encompassing the results of both workshops. The CRR will also be able to draw on additional project results, such as the recent MSP Platform study on Conflicts in MSP which focuses on cross-sectoral spatial conflicts. The study encompasses some of the earlier results of WKCCMSP from 2016.

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7 ToR g) Data

7.1 Introduction

Data from the marine environment are a valuable asset. Rapid access to reliable and accurate information is vital in addressing threats to the marine environment, in the development of policies and legislation to protect vulnerable areas of our coasts and oceans, in understanding trends and in forecasting future changes. Likewise, better quality and more easily accessible marine data is a prerequisite for further sustainable economic development and to support the implementation of MSP.

The ICES community has produced and offers access to over 300 million measurements and series of spatial layers that can be used as part of the MSP process. Over the years, significant efforts by ICES have resulted in establishing a well-developed Data Centre, which manages dataset collections related to the marine environment. Traditionally, ICES addressed fisheries-related and mainly scientific audiences. However, the community of MSP practitioners comprises marine ecologists, social scientist, geographers, urban/land planners and others, who might not be directly familiar with ICES data terminology, groupings, etc. Therefore, a translational challenge was identified by the ICES Working Group on Marine Planning and Coastal Zone Management (WGMPCZM). The group offered its collective expertise to review ICES data holdings and identify the best way to facilitate access to ICES data by the MSP community.

Activities addressing the translational challenge will improve access to "best available information" and reduce uncertainty in our knowledge and ability to forecast the behaviour of the sea; will enable effective and efficient marine spatial planning and legislation for environment and marine industries by MSP practitioners; will improve offshore operators' efficiency and costs in gathering and processing marine data for operational and planning purposes; and eventually will lead to a greater uptake of ICES data holdings.

7.2 Overview of WGMPCZM activities

During 2014 and 2015 meetings, WGMPCZM reviewed the spatial data requirements for marine planning and integrated coastal zone management (MSP/ICZM). The review resulted in a table categorisation of spatial data types relevant to the MSP/ICZM process (see Annex 4 in ICES WGMPCZM Interim Report 2014, ICES CM 2014/ SSGHIE:06).

At the 2016 meeting and after reviewing the ICES data holdings, WGMPCZM developed recommendations to the ICES data centre team to improve the accessibility and utility of existing data holdings to support MSP/ ICZM process in ICES countries and meet international data requirements for MSP/ ICZM. The resultant proposed programme of work included a compilation of existing external data sources hosting data for marine planning as potential sources of data feeds; a prioritised list of data gaps for MSP with particular reference to international / transboundary data; and the development of an ICES "marine planning" application (story map) presenting all the above, as part of the ICES spatial facility. The proposed programme was planned to be implemented in the following years by MPCZM, in conjunction with ICES data centre.

However, later in 2017, following informal discussions with the ICES data centre (which highlighted the IT resources requirements to develop such an application) and after taking stock of international MSP developments, WPMPCZM decided that the proposed programme of work was superseded and needed to be revised. More specifically, bespoke information gateways capturing knowledge and resources drawn from all European and international MSP processes and

projects (the EU MSP Platform and the IOC-UNESCO MSP Programme) had been established. In addition, a technical study on "Data and Information needs for MSP" identified main data, information and knowledge issues at different stages (and scale) of MSP implementation, as well as provided a comprehensive overview of information and data held in existing databases, including products and marine information services that support MSP decision making process. In essence, the majority of the work planned has already been undertaken by a dedicated resource.

In response to recent developments, in 2018, the programme of work was revised further and the focus for WGMPCZM shifted from any activity linked to external data feeds, to an exclusive focus on and presentation of ICES-held datasets. The group focused on specifying the requirements for an interface that will showcase and improve access to ICES data holdings for an MSP audience. Is also focused on identifying activities that would link a said interface to ongoing international MSP activities. Activities during 2019, finalised the specifications for such am interface.

It is acknowledged that the current proposal and specifications can only be materialised by the ICES spatial facility or a contracted party that can have familiarity and direct access to the data holdings and IT facilities. Therefore, additional resource might be required.

7.3 MSP-related landscape of portals

7.3.1 EU MSP Platform

The "MSP Assistance Mechanism" is a service to Member States by the European Commission to support the implementation of MSP throughout Europe. Originally announced in 2014, the mechanism manifested in the form of the EU MSP platform. The platform is an interactive information gateway to a diverse array of knowledge and resources drawn from existing MSP processes and projects. Over its first period (2015–2018), it allowed the European MSP community to share resources and practical information to enable MSP implementation, promote transfer of MSP knowledge and experience, make good use of various MSP funding opportunities and work done on MSP, and increase knowledge base through dedicated studies on specific topics as identified by Member States. The contract is currently being re-tendered by the Commission for another 3 years (2019–2021) up to the implementation date of the MSP directive 2014/89/EU.

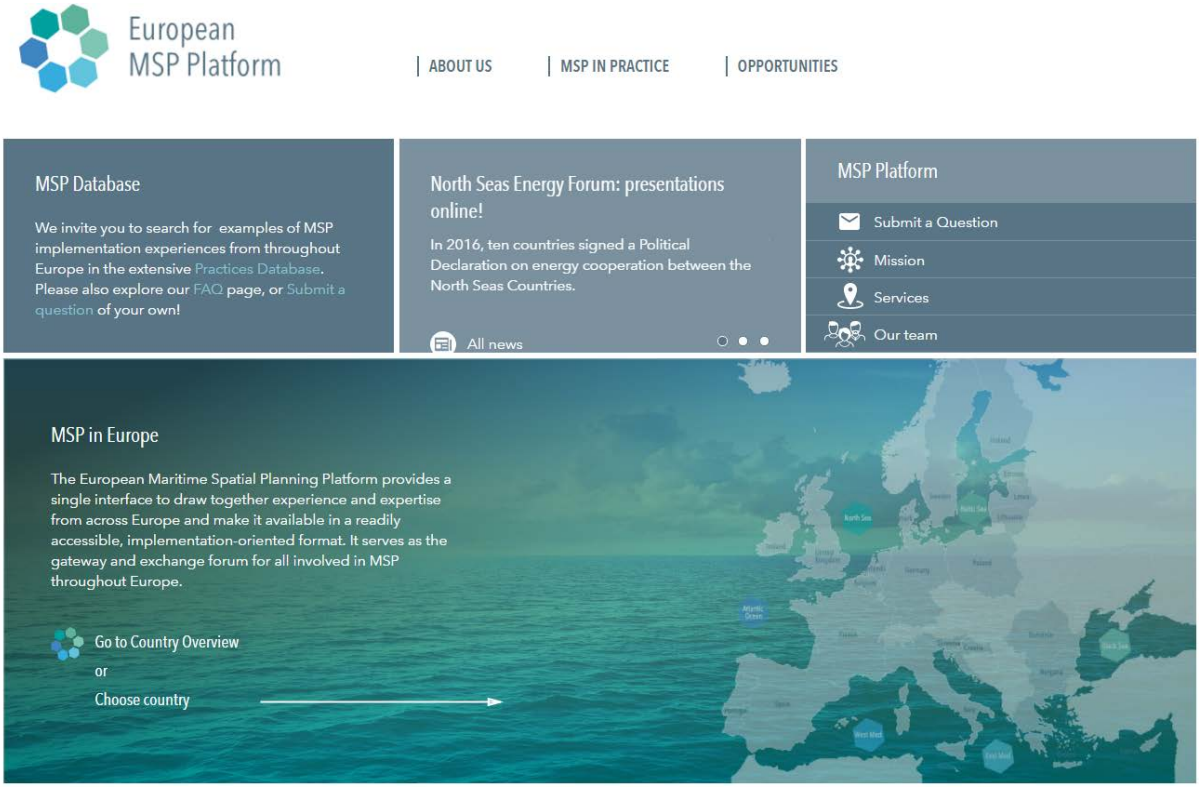

Figure 7.1. Landing page of the EU MSP platform.

7.3.2 European Marine Observation and Data Network (EMODnet) Human activities

The European Marine Observation and Data Network (EMODnet) is a network of organisations supported by the EU's integrated maritime policy. These organisations work together to observe the sea, process the data according to international standards and make that information freely available as interoperable data layers and data products. EMODnet provides access to European marine data across seven discipline-based themes (organised in portals): bathymetry, geology, seabed habitats, chemistry, biology, physics, and human activities. For each of these themes, EMODnet has created a gateway to a range of data archives managed by local, national, regional and international organisations. Through these gateways, users have access to standardized observations, data quality indicators and processed data products, such as basin-scale maps. These data products are free to access and use.

EMODnet is a long term marine data initiative. It has been developed through a step-wise approach and is currently in its third and final development phase. Currently, available data are being used to create multi-resolution maps of all Europe's seas and oceans, spanning all seven disciplinary themes - these are expected to be complete in 2020.

EMODnet Human Activities aims to facilitate access to existing marine data on activities carried out in EU waters, by building a single entry point for geographic information on 14 different themes. The portal makes available information such as geographical position, spatial extent of a series of activities related to the sea, their temporal variation, time when data was provided, and attributes to indicate the intensity of each activity. The data are aggregated and presented so as to preserve personal privacy and commercially-sensitive information. The data also include a time interval so that historic as well as current activities can be included.

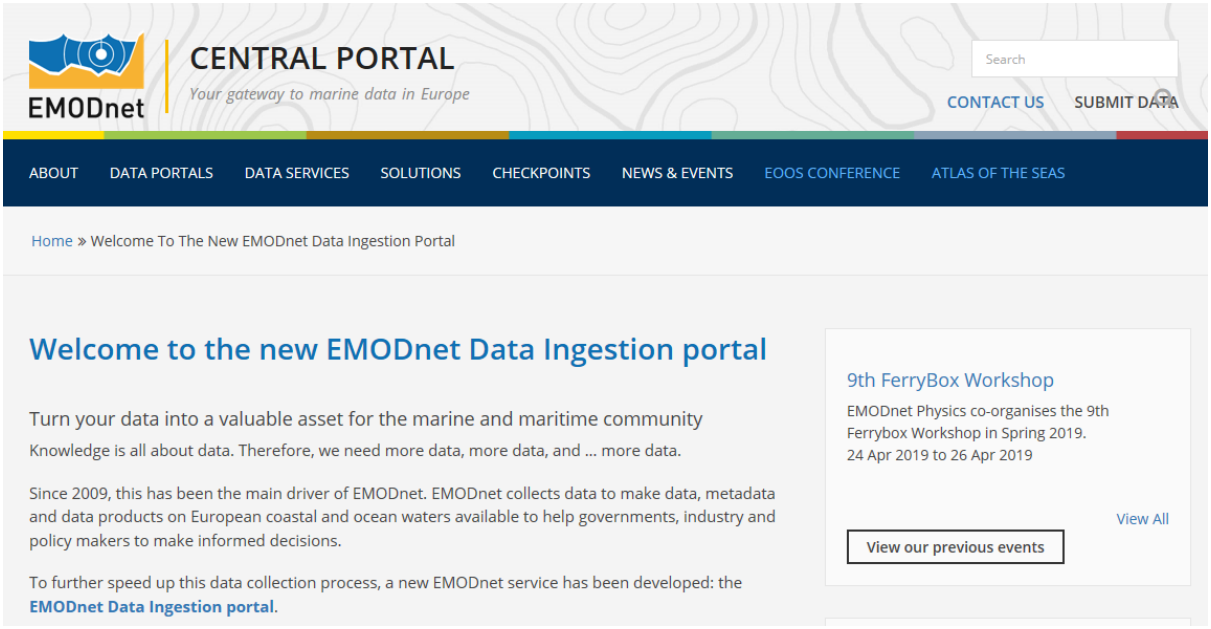

Figure 7.2. Landing page of the EMODnet data ingestion portal.

7.3.3 IOC-UNESCO MSP Programme

The Marine Spatial Planning Programme of IOC-UNESCO helps countries implement ecosystem-based management by finding space for biodiversity, conservation and sustainable economic development in marine areas.

Amongst various activities, the MSP Programme makes this possible by documenting marine spatial planning initiatives around the world and tracking progress against seven stages (pre-planning, analysis for planning, plan development, plan completion, plan approval, plan implementation, plan revision). About 70 countries now have MSP initiatives, ranging from early stages (new authority, new funding arrangements) to plan revisions and adaptation (Belgium, Netherlands, Norway, China, and Australia).

Figure 7.3. Landing page of theIOC-UNESCO MSP Programme.

7.3.4 OSPAR Data and Information Management System

OSPAR's Environmental Impacts of Human Activities Committee (EIHA) cover areas of offshore renewables, marine litter, underwater noise, fisheries and mariculture, shipping and ballast water, dredging and dumping, dumped chemical and conventional munitions, and other human activities.

ODIMS gives access to more than 200 layers of information. Many of them are related to pressures on the environment and to human activities like fishing or marine renewable energies. ODIMS portal is based on Geonode software, and provides access to INSPIRE metadata as well as data web services.

https://odims.ospar.org/

Figure 7.4. Landing page of the OSPAR's Data and Information Management System.

7.4 Next steps – an interface to showcase ICES data holdings

High quality maritime spatial data and information is a key element for implementing MSP. The associated tools are also critical to enable access to data and information as a basis for dialogue with the public and all interested parties, as well as providing support for decision making.

Specifications

This section describes a series of considerations for the development of an interface that will improve accessibility to ICES data holdings for an MSP audience:

1. To make the most of datasets and considering the familiarity of an MSP audience with certain terminology, ICES data products can be grouped and presented based on five themes (Figure 7.5): Administrative boundary; Maritime activities/uses; Physical/chemical/biological information; Spatial policy; Socio-economic data. These will address help

address the needs of multitude of MSP stakeholders (policy makers, researchers, students, spatial planners, etc.).

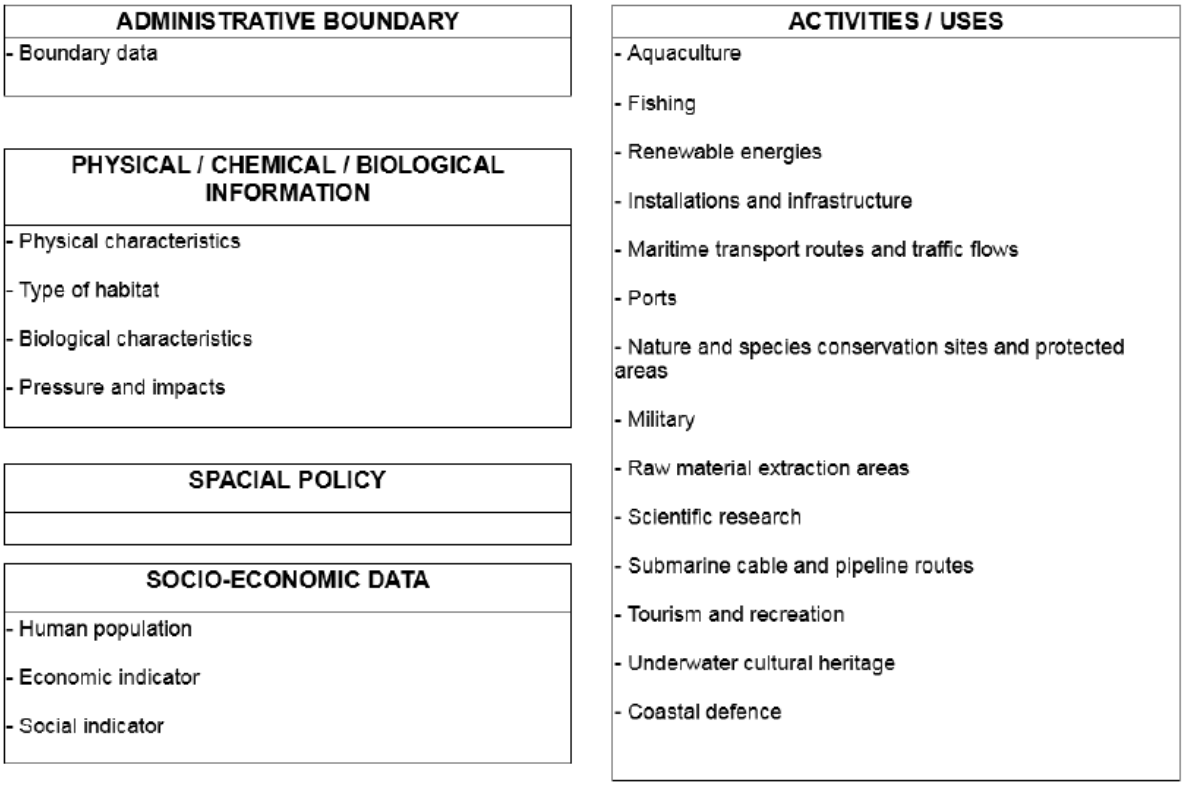

Figure 7.5. Data classification from MSP Data Study.

2. Access to derived layers for direct consumption in MSP activities (rather than access to raw data) should be prioritised. As far as possible each data layer should be covered by a single source that can provide harmonised data across sea basins. Table 7.1 provides examples of derived layers from ICES datasets that can address key spatial issues in MSP, as identified by WGMPCZM.

Table 7.1. Examples of derived layers and respective data issues in relation to MSP applications.

Data type	Issue identified
Modelled current predictions	Needed at high resolution for many issues, very few broadscale modelled outputs available.
Species and habitat distributions	Generally very weak area. High uncertainty, limited spatial extent of datasets, spatially limited habitat maps, limited interpretation of data e.g. sensitivity, spawning and nursery function etc.
Fisheries activity	Consistency of datasets between regions, inshore/offshore, member states. Weaknesses in interpretation of VMS data eg interpreted fishing when navigating tides / obstructions; VMS blindspot

3. Data tags should be used as various indexes that will allow the user to integrate the database through the interface from a variety of entry points. Example data tags can be based on an ecosystem services framework (e.g. Common International Classification of

Ecosystem Services CICES), national policies and objectives (accessed via the EU MSP platform), or DPSIR framework (drivers, pressures, state, impact and response model of intervention).

4. Data and information should be freely available as interoperable data layers and allow downloading and use in the form of non-proprietary datasets.
5. Data should be accompanied by a metadata record, which provides the baseline information each item, such as producer, provider, area, metadata data type, lineage, access protocol and URL, date of data generation, licence type, and usage restrictions. INSPIRE metadata must be provided in ISO19139 standard, and made available through CSW protocol.
6. Data should be accessible through OGC – INSPIRE compliant web services and diffusion protocols (CSW, WMS, WFS, WCS). Getting access to data through WMS / WFS / WCS brings several benefits to minimise multiple copies of the same dataset and ensure the most recent published version of a dataset is used by third party platforms.
7. The interface can link to data archives to improve links between systems.
8. The interface should allow the end user to filter and download data spatially by planning units of interest. Available units should be based on geographical and administrative maritime boundaries (such as the limits of the EEZ, country and county boundaries or depth contours), as well as national and sub-national/regional level planning areas. All planning areas can be accessed via the EU MSP platform.
9. Besides ICES datasets, links to external data sources (e.g. links to national data portals) should be returned in filtered results.

Similar activities are currently undertaken by the HELCOM-VASAB MSP Data Working Group (see output here) and it is recommended that liaison between the ICES data centre and HELCOM-VASAB should be made prior to developments taking place. WGMPCZM can facilitate these discussions.

7.5 Links to the MSP community and ongoing initiatives

MSP-focused activities by ICES should take advantage of this evolving situation, as a considerable amount of datasets has been published, either with European projects (e.g. EMODnet) or national MSDI (e.g. Marine Scotland NMPi).

- Article on EU MSP Platform
- Feed derived datasets directly to national MSDIs
- EMODnet Data Ingestion portal - https://www.emodnet-ingestion.eu/

Annex 1: List of participants

Galway, Ireland, 2019

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ICES HQ, Copenhagen, Denmark, 2018

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Annex 2: WGMPCZM Resolutions

The **Working Group on Marine Planning and Coastal Zone Management (WGMPCZM)**, chaired by Matthew Gubbins, UK, and Andrea Morf, Sweden, will work on ToRs and generate deliverables as listed in the Table below.

	Meeting dates	Venue	Reporting details	Comments (change in Chair, etc.)
Year 2017	3–7 April	Barcelona, Spain	Interim report by 20 May	
Year 2018	23–27 April	ICES HQ, Copenhagen, Denmark	Interim report by 1 June	
Year 2019	8–12 April	Galway, Irealnd	Final report by 20 May to SCICOM	

ToR descriptors

ToR	Description	Background	Science Plan codes	Duration	Expected Deliverables
a	Assess key issues arising in the development of marine plans across the ICES area and make recommendations on the role of science to address these	a) Receive updates on the issues arising in ICES countries marine plans b) Special emphasis on issues related to cross-border / trans-national planning and land-sea interactions (LSI) c) Receive assessments from country reports on the use of science (natural, social, economic) data, information and advice in the plan development process d) This term of reference provides the context for the whole work of the WG	2.1; 6.2; 6.3	Years 1, 2, 3	Y2: Manuscript on the role of science in MSP, based on the experiences of member countries. Y3: A review of key issues as a chapter of the Final WG report.
b	Develop cumulative impact assessment techniques for pressures resulting human activities on the marine environment in the context of marine planning	a) Continued need for Cumulative Effect Assessment in marine planning OSPAR b) Bayesian Network meta-model for cumulative pressures c) Futher develop management measures assessment techniques d) Linkages with the UNECE standards initiative related to Goals 14 of the UN Sustainable Development Goals	2.2; 4.3; 6.1	Years 1, 2, 3	Y1: Follow up from WKPASM activities. Y2: Workshops to identify data needs and approaches to cumulative impact assessments of new sectors/pressures and marine vulnerabilities in marine planning Y3: A handbook on Bayesian network and bow tie analysis tools for cumulative effects analysis Y3: Manuscript on the meta-models of pressure and their management

					measures.
c	Address marine planning skills and capacity shortages by working with the ICES secretariat to develop and deliver training materials / course as required. Act as scientific steering group for the MSP Challenge serious game.	a) Builds on the ICES training course developed in 2014 b) Steers the direction of development of role play / serious gaming, accounting for the above assessments of training needs.	6.3; 6.4; 7.4	Years 1 , 2, 3	Y1: A revised MSP training course outline made available to the secretariat. Y3: A review of the experiences gained through the application of the MSP Challenge serious game and related products, probably as a chapter in the Final WG report.
d	Review approaches to plan evaluation and monitoring	a) Builds on inputs collated under ToR a , CRR 327 and existing international frameworks b) Assesses these for commonality and identify gaps	6.2; 6.3; 6.4	Years 1, 2, 3	Y3: Manuscript on approaches to plan evaluation and monitoring
e	Develop approaches to account for culturally significant areas in marine planning	a) Builds on work by WGMP-CZM to develop an ap-proach to identify culturally significant areas in the sea b) Takes a vulnerability and risk assessment approach, thus building on work under ToR b c) Takes examples from member countries provided under ToR a d) Makes recommendations on approaches to be adopted	3.6; 7.3; 7.7	Years 1, 2	Y1: Workshop to develop a vulnerability and risk assessment approach for culturally significant areas Y2: Manual (CRR, already approved in 2015) for applying the vulnerability and risk assessment approach in marine planning
f	Coexistence and synergies in MSP: Develop approaches for evaluating benefits.	a) Builds on the workshop "Conflicts and Coexistence in MSP", expanding this approach towards a more specific consideration of synergies b) Develops approaches for analysis and evaluation of benefits c) Using case studies from member countries provided under ToR a d)	2.7; 7.4	Years 2, 3	Y2: Workshop to develop a classification system for coexistence and synergies in MSP and develop approaches for evaluating the benefits of synergies in MSP Y3: Manuscript on synergies in marine planning and evaluation of their benefits.
g	Work with the ICES data centre to develop, for the purposes of marine planning, aspects of the spatial data facility to improve functionality and content	a) Builds on work to define data needs of MSP and review of ICES data holdings b) Recommends functionality to improve the accessibility and utility of existing data holdings for marine planning c) Provides guidance on new data types and sources to	2.1; 4.2	Years 1, 2, 3	Y1: Specification of a "marine planning" Application (story map) in the ICES spatial facility. Y2: A compilation of existing external data sources hosting data for marine planning as

	enhance existing catalogue	potential sources of data feeds (year 1) A prioritised list of data gaps for MSP with particular reference to international / transboundary data. Y3: The development of an ICES "marine planning" Application in the ICES spatial facility.

Summary of the Work Plan

Year 1	• Follow up on activities from WKPASM (reporting, workshop and model development) ToR b • A revised MSP training course outline made available to the ICES secretariat ToR C • Workshop to develop a vulnerability and risk assessment approach for culturally significant areas • Specification of "marine planning" thematic data portal ToR E • A compilation of existing external data sources hosting data for marine planning was potential sources of data feeds ToR G
Year 2	• Produce a paper on the role of science in MSP based on experiences of member countries ToR A • Run a workshop to identify data needs and approaches to cumulative impact assessments of new sectors/pressures and marine vulnerabilities in marine planning ToR B • Produce a manual for applying the vulnerability and risk assessment approach in marine planning ToR B • Run a workshop to develop a classification system for coexistence and synergies in MSP and develop approaches for evaluating the benefits of synergies in MSP ToR F • A prioritised list of data gaps for MSP with particular reference to international / transboundary data ToR G
Year 3	• Produce a review of key issues in marine planning experienced by ICES member countries and lessons learned ToR A • Prepare a handbook on Bayesian network and bow tie analysis tools for cumulative effects analysis ToR B • Produce a primary paper on meta-models of pressures and their management measures ToR B • A review of the experiences gained through the application of the MSP Challenge serious game and related products ToR C • Produce a review paper on approaches to plan evaluation and monitoring ToR D • A review paper on synergies in marine planning and evaluation of their benefits. ToR F • The development of an ICES "marine planning" thematic portal ToR G

Supporting information

Priority	All ICES member countries are currently responding to drivers for the indroduction of marine planning and many are facing common challenges to succesful implementation. The groups terms of reference address some of these key challenges and will provide an overview of status, tools, manuals, training products, analysis of processes and data sources to assist with implementation.
Resource requirements	Group members have undertaken to complete the planned work programme from their own institute's resourcing. No additional resources are expected to be required, other than the current level of secretariat support to WG meetings and workshops.
Participants	The Group is normally attended by some 10-20 members and guests.
Secretariat facilities	Web conferencing, publications assistance (CRRs), attendence of data centre staff to some meetings as required. Requirement under ToR G for staff of the Data Centre to assist in creation of a new "marine planning" application (story map) by year 3.
Financial	No financial implications.
Linkages to ACOM ar groups under ACOM	There are no obvious direct linkages.
Linkages to oth committees or groups	Group members are well connected across a variety of ACOM and SCICOM working groups. Links to SIHD, interaction with WGINOSE, ICES Data Centre.
Linkages to oth organizations	EU MSP Expert Group, OSPAR ICG MSP, HELCOM-VASAB (common members and sharing ToRs for coordination purposes, past joint workshops / training events).

WGMPCZM ASC 2020 Theme session proposals

SESSION Proposal 1	**Making transboundary ocean and coastal governance work – state of the art, problems and enablers**
Select ASC session type:	Theme session: research and development results presentation and discussion – with interactive elements
Short Title: <90char	**Making transboundary ocean and coastal governance work – state of the art, problems and enablers**
Session convener 1	Andrea Morf, co-chair of ICES WGMPCZM Scientific coordinator & analyst at Swedish Institute for the Marine Environment, Gothenburg and senior research fellow at Nordregio, Stockholm
Session convener 1 Institute Name, Institute Address, Country	Swedish Institute for the Marine Environment, University of Gothenburg, Box 260, SE- 405 30 Gothenburg, Sweden & Nordregio, PO Box 1658, SE-111 86 Stockholm, Sweden
Session convener 1 email:	andrea.morf@havsmiljoinstitutet.se
Session convener 1- telephone:	+46 768 672 699
Session convener 2 -	Jan v Tatenhove, professor (Wageningen university NL, Aalborg University DK, Queen's University, Belfast, Northern Ireland).
Session convener 2 - Email:	tatenhove@ifm.aau.dk
Session convener 3	Dr. Kira Gee, WGMPCZM member, Senior researcher at HZG, freelancing in MSP for MSP Platform and many more. Human Dimensions of Coastal Areas Helmholtz Zentrum Geesthacht Max-Planck-Str. 1 D-21502 Geesthacht, Germany
Session convener 3 - Email:	kira.gee@hzg.de
Session convener 4	Further interested co-convenors from earlier: Riku Varjopuro riku.varjopuro@ymparisto.fi, Stella Kyvelou, skyvelou@gmail.com, Ibukun

SESSION Proposal 1	**Making transboundary ocean and coastal governance work – state of the art, problems and enablers**
	Adewumi ibukun_adewumi@yahoo.com, Andrea Barbanti andrea.barbanti@ve.ismar.cnr.it, David Goldsborough david.goldsborough@hvhl.nl , Roland Cormier roland.cormier@ecoriskmgmt.com
Description: 300 Words	Humanity faces increasingly complex socio-environmental problems in the ocean, reaching across multiple administrative, geographical and time-scales, e.g. global resource decline, pollution, climate change, and biodiversity loss. The changing open systems character of the oceans makes it difficult to address this through established institutional frameworks aligned with administrative borders. The established concepts and boundaries of ecosystems and societies may need to be developed further, so governance can adopt a broader systems perspective, enabling different transboundary approaches. Over the last decades, various boundary transcending approaches have been developed, such as integrative coastal and ocean management, ecosystem-based management and marine spatial planning. These can be seen as attempts of a more "integrative ocean and coastal governance", encompassing strategic planning and operational management and addressing both conservation and use of marine areas (blue economy). Transboundary governance in the above sense implies a complex endeavour with multiple actors working at various geographical and time scales, across jurisdictions with differing mandates. National and international institutions are also trying to adapt to calls for a more "reflexive governance", implying inclusiveness and learning. Experience so far indicates numerous conceptual and practical challenges to transboundary science and management. However, there are also examples of successful transboundary ocean governance at various scales. Cross-border and sector interaction and collaboration based on shared principles and objectives and mutual trust appear to be crucial. This session aims to provide a forum for critical discussion of the concept, practice and outcomes of integrative ocean governance in transboundary contexts. The session aims to draw out key enablers and benefits, as well as challenges and needs in transboundary ocean governance and how these could be addressed. We invite theoretical and empirical communications on the following main topics: • Addressing the lack of conceptual clarity, the institutional barriers and the resulting problems when implementing transboundary ocean governance from an analytical and theoretical perspective. • Dealing with the complexities of the land-sea-air interface, in terms of understanding and describing the system and developing workable institutional frameworks. • Making transboundary ocean governance work in practice: What are important obstacles and enablers for cross-border coordination and collaboration for a more coherent and sustainable governance of coastal and offshore areas.
Session teaser: <75 words	Transboundary ocean governance is a complex endeavour involving multiple actors, institutions, epistemologies and spatial and temporal scales. There are various conceptions of ocean governance, as well as a growing range of practical experiences, both of what is and what is not working. This session combines topical

SESSION Proposal 1	**Making transboundary ocean and coastal governance work – state of the art, problems and enablers**
	conceptual research with practical cases, seeking to draw out key challenges and enablers for successful transboundary ocean governance.
Tweet text: …#ICESASC [link will be added by ICES] <280char	Transboundary ocean and coastal governance – how to make it work? Join the discussion@ #**ICESASC**
Suggested theme session format: <100 words	The session implies a sequence of topically grouped presentations, intermitted by facilitated group discussions and interactions by post-it walls and a concluding synthesis discussion. Multiple media can be used: projector, white board, flipchart etc. Besides participating in the poster session, poster authors get an occasion to shortly pitch their posters in the oral session. This procedure works well to both present own results but also creatively interact with colleagues from other disciplines and places to develop common lessons and new ideas in a developing field of knowledge and links the posters with the oral presentations.
Expected participation: <100 words	This proposal bases on discussions ICES Working Group Marine Planning Coastal Zone Management (WGMPCZM) and international scientist networks. The primary target group are scientists and experts from around the Globe and members of ICES working groups with interest in ocean governance, coastal and marine planning, resource and land management, and ecosystem based management. We especially encourage members and representatives of international projects and initiatives focusing on cross-border collaboration and development of coastal and ocean governance to share their experiences (e.g. ICZM and MSP projects in different marine basins and the global ocean governance initiatives).
Links to the seven ICES science priority areas as proposed by the Science Committee (see link to codes above):	Conservation and management science (can only select one), other Impacts of human activities, observation and exploration (e.g. evaluation), seafood production (only in terms of marine uses), sea and society
Links to ICES Steering Groups and/or Advisory Committees	SCICOM, ACOM, SIHD

Session Proposal 2: Network Session: ICES to meet you……

Proposed by several Working Group chairs together[8]

	Network Session
Short Title:	ICES to meet you……
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Session convener 3 (optional) - Name:	Andrea Morf
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Artwork by Claire Moore

Description:

Do you want to know what ICES actually does? No, like REALLY does? What goes on in those expert groups? Why are there so many? And what are they doing? Are you a member of the ICES community that wants to know more about what is going on in the network? If yes, then

[8] Andrea is co-chair of WGMPCZM, Claire is chair of WGMIXFISH, Debbi is co-chair of WGEA-WESS. WGSOCIAL/WGMARS colleagues may also be interested, so if we need to spread the participation one of us can step out so there aren't two MI people.

this is the network session for you. You will hear from ICES expert group chairs, who will verbally duke it out in a 60 second, dragons-den, elevator-pitch style presentation designed to win you over, and give you a flavour of their work. Powerpoint is forbidden, but props are highly encouraged. The crowd gets to vote for their favourite.

Never has cross-collaboration, interdisciplinary and transdisciplinary research, and integration been so high on the international agenda. ICES does exceptional science in all of its 150 expert groups, however, with so many groups, it is very difficult for anyone, including those inside the community, to keep up with all the research that is going on. In fact, it is hard to even know what groups we have. If we don't know what groups are out there, we cannot instigate collaboration.

Despite ICES excellent early career researcher events, it is near impossible to be able to cover the breadth of the groups in an introduction. However, stronger ties with academia, industry, and the wider community are sought. This event will bring together a large number of ICES groups, scientists, managers and stakeholders with the specific aims of opening the door to new recruits and cross-collaboration that will help us become truly integrated and strengthen our community ties.

Session teaser:

Ever wondered what ICES expert groups actually do? Interested in getting involved but don't know where to start? Are you eager to learn new skills and collaborate with your international peers? Do you want contribute to developing the best available science to underpin policy and advice? Or simply interested in learning the incredible breadth of ICES work? To have all your questions answered, and learn all about who does what where in the ICES expert groups, come along and meet the ICES expert group chairs in an elevator pitching, speed-dating extravaganza!!!!

Tweet text:

Hey you! Yes, you! How you doin? You're looking very knowledgeable today. Would you like to take that big brain out on the town? How about some ICES expert group speed-dating? Come along to our Session X @TIME to find the ICES group that can make your science dreams come true!

Suggested session format:

The session will start with a brief (10 min max) introduction to ICES expert groups, how they work, and how attendees can get involved, before an outlining the sessions activities, and some warmup/icebreaker exercises. ICES expert group chairs or representatives will then give a (strictly enforced) 60 second dragons den-style elevator pitch promoting their group – what they do, why they are great, and why people should come talk to them about their groups work. Speakers will be 'buzzed off' by a gameshow style literal loud buzzer if they are still talking when the 60 seconds is up. We expect this to be high energy organised chaos, that keeps everyone entertained. We propose we will try to seek funding for refreshments and prizes for the best/most entertaining pitches.

Depending on the numbers of expert group chairs we can get involved, we have a number of potential follow on activities. If the numbers are high, we can stick to the above, and can use mobile voting for attendees to vote for their favourites. We can further use audience interaction software, so that attendees can text in questions as the presentations are going on that we can address at the end of the session.

If we have more manageable numbers, we will have a business style 'speed-dating' event where the interested parties can line up to speak to the chairs, ask more specific questions, swap contact details – but all in 3 minutes before the buzzer sounds! When the buzzer sounds, the queue moves on, giving more people the chance to meet, learn about our groups, and opening the door

to longer conversations during the week. We suggest this is done earlier in the week, as a kind of ice-breaker.

An alternative (or perhaps complimentary), ICES groups can develop posters and either include them in the poster session (of there is room) or have a dedicated poster session instead of the speed-dating event.

All EG participants will be encouraged to produce a 'digital flyer' in the form of a QR code with more details about their groups work for interested attendees.

We believe this will give the ICES community the chance to learn about each others work in a fun and informal way, whilst also piquing the interest of new attendees at the ICES ASC and opening the door to joining our community.

Expected participation:

ICES Community scientists, academic researchers, early career scientists, industry members, NGO members, managers.

Primary link to ICES priorities (select ONE only):

ALL! Although it also links to the strategic plan, particularly in relation to Working Together!