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INTEGRATED ECOSYSTEM ASSESSMENTS STEERING GROUP

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Report of the SIHD Workshop on Balancing Economic, Social, and Institutional Objectives in Integrated Assessments (WKSIHD-BESIO)

29 November - 1 December 2017

The Hague, The Netherlands



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International Council for
the Exploration of the Sea

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Executive Summary

The ICES Strategic Initiative on the Human Dimension (SIHD) Workshop on Balancing Economic, Social, and Institutional Objectives in Integrated Assessments (WKSIIHD-BESIO) took place from 29 November to 1 December 2017 at the HQ of Wageningen Economic Research (WEcR) The Hague, Netherlands. The workshop was convened by Alan Haynie (USA), Christine Röckmann (NL) and Jörn Schmidt (DE). A total of 14 participants from 8 nations attended, 11 in person and 3 remotely.

The workshop was successful in examining social, economic and institutional (ESI) fishery management objectives and concluded:

Existing EU and national marine management policies and legislation include not only environmental objectives but also a broad range of clearly stated economic, social, and institutional (ESI) goals/objectives/priorities. ESI objectives that refer to the broader societal goals of management should frame any integrated assessment.

Based on an examination of five primary EU documents related to North Sea management, WKSIIHD-BESIO started defining the spectrum of ESI objectives and indicators.

In addition, WKSIIHD-BESIO initiated a first comparison of supranational and national ESI objectives, starting with Sweden and the Netherlands. The WKSIIHD-BESIO draft lists of ESI marine management objectives are thus (1) generic for the EU/ North Sea, and (2) specific for those two nations. Examining Sweden and the Netherlands, there are some different priorities but the generic described here framework maps well to the national objectives of both countries. For example, in the Netherlands, a large quantity of sustainable ocean energy is a central priority. In Sweden, public access to natural resources and the preservation of cultural values are core goals. It is important for Integrated Ecosystem Assessments (IEAs) to recognize that management actions and objectives are context-dependent and that different countries (or leaders in countries) may make different decisions based on how they weight competing priorities.

ICES is taking steps to better inform decision-makers, i.e. to provide more integrated applied knowledge that considers not only the biological system, but the more holistic context. A continued examination of ESI objectives is needed to allow ICES to make that approach successful. Currently, ESI objectives are often overlooked in light of pressing environmental management advice requests received by ICES; they are missing in ICES ecosystem and fisheries overviews, as these documents only include the Good Environmental Status objectives of the Marine Strategy Framework Directive. A step forward could be to add data and analyses relevant to ESI objectives to these overviews. Possible ways of how to do this could be addressed in a next step beyond this workshop.

The implications of ESI objectives in legislative texts and policies are not always clear, and interpretations are also likely to change depending on one's personal or institutional viewpoint. For example, there may be expressed trade-offs between avoiding risk to fish populations and maximizing employment, but there are no clear guidelines for making such trade-offs. The listed ESI categories of objectives and specific objectives will need to be refined (and eventually operationalized) in collaboration with policy-makers, decision makers, managers and stakeholders.

An additional important conclusion is that spatial scales and time frames matter; information about the time in setting the objective as well as a stated end date of achieving an objective need to be taken into account when evaluating trade-offs.

1 Overview

The SIHD Workshop on Balancing Economic, Social, and Institutional Objectives in Integrated Assessments (WKSIED-BESIO) aimed to address four primary goals:

- a) Bringing together all compiled fisheries management objectives in the European Union (EU) and synthesizing these into a well-arranged and convenient list, in order to take into account the increasing competition at sea with other marine/maritime activities – in particular when zooming in on the North Sea;
- b) Identifying gaps and missing objectives, where appropriate;
- c) Where possible, starting to break down high-level objectives into more explicit objectives with useful measurable indicators, and identify the related data requirements; and
- d) Describing and illustrating how different objectives relate to each other, i.e. identifying synergies or conflicts.

The workshop lasted 2½ days. The first day was devoted to aligning our thinking, examining different approaches to grouping objectives, and agreeing on an approach to evaluate and categorize objectives. After introductions, background talks and discussion sessions clarified goals of the workshop, and different options were discussed for developing and describing management goals and objectives (see Annex 2: agenda). Six talks were presented on Day 1 with facilitated discussions on focused topics (see Annex 5 for brief summaries of each presentation).

- Mark Dickey-Collas: the ICES IEA work and several other relevant ESI initiatives;
- Andy Kenny: the North Sea IEA, and the cooperation and recent developments around the WGINOSE-WGMARS framework;
- Alan Haynie: the 10 US National Standards under the US Magnuson-Stevens Act;
- Leyre Goti: ESI-based results in the SOCIOEC-MYFISH governance work – via skype;
- Robert Stephenson: the experiences of developing ESI fisheries management objectives for the Canadian Fisheries Research Network; and
- David Goldsborough: recent developments in the Dutch and Belgian parts of the North Sea around offshore wind farms, marine spatial planning, and marine renewable energy policies and objectives.

Day 2 returned to the general question of how to categorize and break down “high-level” objectives and goals into more detail. Operational objectives – gaps and conflicts; respective indicators, relevant data; link to IEA models and integration. We identified five primary documents that provide objectives for marine resource management in the EU ICES countries, with a special emphasis on those countries neighbouring the greater North Sea ecoregion¹ (i.e. Belgium, the Netherlands, Germany, Sweden, Denmark, Norway, and UK). The North Sea was chosen as a focus in part because it provided a more manageable number of national documents to consider, while the EU objectives apply throughout EU ICES countries.

¹ <http://www.ices.dk/explore-us/Action%20Areas/ESD/Pages/North-Sea-Ecoregion-description.aspx>

We examined these documents to determine the economic, social, and institutional (ESI) objectives (or – as sometimes stated in preambles of legislative texts, priorities) that are explicitly or implicitly stated therein.

- The EU Integrated Maritime Policy ([IMP](#))
- EU Common Fisheries Policy ([CFP](#)) 2013
- Blue Growth Strategy ([BG](#))
- EU Marine Strategy Framework Directive ([MSFD](#)) 2008
- Maritime Spatial Planning ([MSP](#)) directive 2014.

In addition, two national break-out groups focused on identifying the national ESI objectives/goals/priorities for Sweden and The Netherlands. For Sweden, the examination focused on 'En svensk maritim strategi' (2016) and the Swedish environmental goals no. 10 (SE ESI objectives and references in Annex 6.2). For the Netherlands, the examination focused on the "Nationaal Waterplan 2016-2021", the main policy document, which is updated every six years. The group examined the policy focus column and category and then examined higher and lower-level goals (see NL ESI objectives table, NL objectives and references in Annex 6.3).

Day 3 focused on expanding the generic EU ESI objectives table, summarizing overall workshop results, synthesizing lessons learned, drafting the workshop report, planning for its completion, and discussing future steps.

2 Key findings

It was noted that it is important to check the preambles of legislative texts in addition to the main text (articles/paragraphs), because ESI objectives are often addressed in the preamble and not necessarily in the articles themselves.

Based on the examinations and workshop discussions, WKSIIHD-BESIO developed the following key findings:

Economic, social, and institutional (ESI) objectives exist in the documents

Existing EU and national marine management policies and legislation include not only environmental objectives but also a broad range of clearly stated ESI goals/objectives/priorities.

WKSIIHD-BESIO has started a process of articulating and defining the spectrum of objectives and indicators related to the ESI aspects of marine management in the EU, based on the examination of five primary EU policy documents related to North Sea management (i.e. IMP, CFP, BG strategy, MSFD, MSP), see Annex 6.1.

WKSIIHD-BESIO also identified and listed potential indicators and relevant data that would be needed to incorporate the ESI objectives into management advice and particularly into ICES IEA work.

The identified EU ESI objectives are largely in line with already identified US and Canadian ESI objectives, demonstrating a commonality of such high-level goals across governance systems.

The generic ESI framework maps well to the national objectives of the two countries examined in the workshop

The generic EU ESI table was compared to two national approaches, based on the examination of the main national documents from the Netherlands and Sweden (see Annexes 6.2 and 6.3). There are some different priorities but the generic framework maps well to the national objectives of both countries.

For example, in the Netherlands, renewable (“sustainable”) ocean energy is of “national priority”, but has to be developed in agreement and collaboration with other use functions (see Netherlands ESI objectives, Annex 6.3). In general, the Dutch priorities focus on ecologically responsible, safe, and spatially efficient use of the North Sea.

In Sweden, public access to natural resources and the preservation of cultural values are core goals. More attention is given to these goals than maximizing the commercial economic value of marine resources.

ICES holistic vision needs ESI objectives.

ICES has been taking steps to provide more holistic ecosystem and management advice, e.g. by providing ecosystem and fishery overviews and supporting Integrated Ecosystem Assessments (IEAs). Such integrated science needs to explicitly take into account the more holistic (real world) context, as stated in the ESI objectives; it cannot focus only on the biological system. Furthermore, ESI indicators cannot be added without context, as is true for environmental indicators. All scientific (natural and social) indicators and related data collection need to be undertaken within the context of societal goals for these ecosystems, including e.g. the habitats, species, economies, communities, and infrastructure which are all critical components of these ecosystems.

Only in regional, national, and local legislative and planning documents are the official societal goals for the range of these components articulated.

Currently, ESI objectives are not expressed or analysed in ICES Ecosystem and Fisheries Overviews (EOs and FOs). At the moment, they only include the Good Environmental Status (GES) objectives from the MSFD. A first step forward for ICES could be to add ESI objectives to these overviews.

A continued examination of ESI management aspects, including categories of objectives, individual objectives, related indicators, and relevant data, is needed to allow ICES to make this approach successful.

ESI objectives need refinement to be operational.

The policy implications of ESI objectives in legislative texts and policies are not always clear, and interpretations are likely to change depending on the viewpoint of a person/institution considering the objectives. For example, there may be trade-offs and/or synergies between avoiding risk to fish populations and maximizing employment, but how these trade-offs or synergies should be made or evaluated is not clear. Objectives should be clearly traceable from the management measures that are aimed at fulfilling them. ESI objectives can be categorized, although there is a lot of flexibility and many different approaches that may vary depending on the perspective of the relevant ministry/country/government.

The produced list/table(s) of ESI objectives are works in progress and need refinement in collaboration with stakeholders, in particular policy-makers and marine resource users. They should also be sent to relevant ICES expert groups for feedback, specifically to the regional IEA groups. It is important for IEAs to recognize that management actions and objectives are context-dependent and that different countries (or leaders in countries) may make different decisions based on how they weight different ecological and ESI objectives.

ESI objectives need to be merged with lists of current (already recognized) environmental objectives to evaluate potential management actions.

The WKSIED-BESIO outputs, i.e. the identified list/table(s) of ESI objectives, need to be merged with the respective existing environmental management objectives to provide a holistic characterization of expressed North Sea (and other EU waters) management priorities.

Relevance of and future for ESI work in ICES.

ICES regional IEA expert groups can benefit from taking ESI objectives into account to broaden their current scope beyond an environmental and ecological focus and put their work into their broader regional context.

WKSIED-BESIO proposes to continue working to establish a holistic list of marine management objectives, not only for the North Sea but also for other European Seas. Through this work, ICES will invest in improving the conditions for interdisciplinary ESI work, in order to help IEA groups and make their work and ICES management advice more relevant, legitimate, and credible. WKSIED-BESIO has identified diverse ESI objectives; the next step will be to develop specific steps to concretely operationalize the integration of ESI and ecological objectives. It also means that both social and natural scientists should be at all levels of ICES administration and in the membership of the relevant groups.

ESI objectives help frame scenario and trade-off analyses.

Scenario comparisons are crucial when evaluating not only environmental but also ESI impacts of management decisions. There are very rarely universally-accepted, SINGLE best solutions in light of the range of objectives that apply to marine management. In other words, there is not one correct answer in holistic settings; managers need to discuss and explicitly choose how to balance the trade-offs and/or synergies that arise with a management decision. Hence, for holistic analyses and integrated assessments, scenarios should be developed based on known ESI and environmental objectives and the best available data and understandings from the social and natural sciences and humanities to allow scenario comparisons and evaluations (i.e. trade-offs between different management actions).

For example, the optimal balance of resource allocation between fisheries and wind and other renewable energy in the North Sea is ambiguous. There might be antagonistic objectives, e.g. wind energy objectives (due to climate change policies) which cannot go hand in hand with nature conservation goals. This does not mean that one type of objective must be chosen at the complete expense of the other, but rather that some combination of management actions be chosen that support an acceptable balance among competing objectives and, when possible, create synergies among them.

Communication around ESI work is crucial and needs to be improved.

According to its website, “ICES is committed to building a foundation of science around one key challenge: integrated ecosystem understanding of marine ecosystems”. Moreover, the IEA Steering Group is responsible for providing “guidance on meeting ecological, social and economic objectives”. If ICES leadership agrees that ESI objectives should be considered jointly with ecological objectives, it will be helpful to reiterate and emphasize to the entire ICES community that ICES mission includes humans as part of the ecosystem, both affecting the other components and being affected by them. As well as focusing on “stocks” analyses must take into account all “fisheries” related aspects, i.e. economic, social, and institutional objectives.

Work is needed to understand how to most effectively present interdisciplinary information to decision-makers. The intersessional WGINOSE-WGMARS workshop of Dec 2017 focused on two visualization and communication methods that may be useful in this respect (mental modeller and Bow tie analyses). In the US fishery management council system, analyses of fishery management plans vary greatly in format and content. Decision-makers should be involved in the planning of how to best communicate ESI analyses.

Also, ICES needs to communicate to its clients the need to revisit their requests for advice: questions to ICES should be asking for scenario comparisons of different types of trade-offs and synergies instead of for a single optimal solution. ESI objectives need to be consistently taken into account when evaluating trade-offs, such as competition for space at sea between e.g. wind energy production and fisheries.

Scale matters.

Spatial scales and time frames matter, e.g. for objectives such as “stability” of markets. Therefore, information about the time frame of the objective as well as a preferred end date (based where necessary on relevant knowledge) for achieving an objective need to be taken into account when evaluating trade-offs and synergies. A duration of a transition period in particular could be highly dependent on specific actions, e.g. the

time mandated for the recovery of stocks or achieving a target of offshore wind energy production.

Some economic and social data and analyses are currently available to better inform decision-makers about the nature of these trade-offs. Other such data must be collected, requiring both time and funding. The collection of broad quantitative survey data and certain types of qualitative data such as oral histories is often quite expensive. Availability of data also depends on the scale, e.g. business results of individual companies are usually confidential and available aggregated quantitative data may be at scales that limit its usefulness to understand the impacts on smaller communities.

3 Conclusion

Based on an initial examination of relevant EU policies and the existing scientific literature on marine management policy and governance, the experts attending WKSIED-BESIO have started a process of articulating and defining objectives and indicators related to the social, economic and institutional (ESI) aspects of marine management.

The workshop was successful in identifying ESI marine management objectives and goals, examining the relationship among them, and conducting initial scoping on potential indicators, relevant data and analyses. WKSIED-BESIO has created a summary table listing marine management objective categories, objectives, and potential indicators. These are provided both (a) generically for the EU, as well as (b) specifically for two EU Member states (Sweden and the Netherlands) that were examined as case studies. The identified ESI objectives, relating to the EU and specifically the North Sea, took inspiration from similar work carried out for the USA and Canada (e.g. by WGNARS).

WKSIED-BESIO work in this area is far from complete and thus is a research and planning area that will continue to evolve. The synergies among objectives have not yet been studied. Feedback is needed from the regional IEA groups on whether they find our work so far helpful for taking the ESI objectives into account for framing their IEAs if there is additional information needed that WKSIED-BESIO might be able to provide (See also discussion of 2018 WGMARS meeting, below). In the regional settings, IEA expert groups should collaborate with their stakeholders to further refine regional ESI objectives.

WKSIED-BESIO draws the following overall conclusions (see key findings for further elaboration):

- ESI objectives exist;
- The generic ESI framework maps well to two examined national objectives;
- ICES holistic vision needs ESI objectives;
- ESI objectives need refinement to be operationalized;
- ESI objectives need to be merged with environmental objectives to evaluate potential management actions;
- Work on ESI objectives in ICES is relevant to the future;
- ESI objectives help frame scenario and trade-off analyses;
- Communication around ESI work is crucial and needs to be improved;
- Scale matters;

The outputs (ESI tables and key findings) from WKSIED-BESIO will feed and have already fed directly into other ICES related workshops and activities:

- Intersessional WGINOSE-WGMARS workshop (6–8 December, 2017, The Hague). This meeting occurred the week following the workshop. The goal of this workshop was to agree on the scope and WGINOSE approach for developing North Sea ecosystem models, including economic, social and institutional (ESI) objectives) to support ecosystem-based management advice in the context of ICES Integrated Ecosystem Assessment (IEA) WG activities.
- WGMARS 2018 meeting (19–23 February, 2018) and WGMARS-WGINOSE stakeholder workshop (22 February, 2018, The Hague). Goals of the WGMARS meeting are, among others, to further our understanding of IEAs, discuss the benefits of inter- and trans-disciplinary work and the added value of bringing social and economic sciences to the table, and understanding the economic, social, and cultural aspects of multi-use conflicts.

The WGMARS-WGINOSE stakeholder workshop focuses specifically on identifying the key ESI objectives that drive North Sea management, and testing two different conceptual planning tools for IEA, specifically for a broader inclusion of social-economic analysis and better communication to managers and the general public.

- WGINOSE meeting (16–20 April, 2018, Copenhagen, Denmark).
- The terms of reference (ToR) for a potential future expert group WGBESIO or a similar process around BESIO are currently being discussed.
- The results from this workshop will be discussed in several sessions and meetings at the ICES ASC Hamburg 2018 and at the IIFET 2018 conference in Seattle.

Annex 1: List of participants

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Rolf Groeneveld (absent due to sickness)	Wageningen University	rolf.groeneveld@wur.nl

* participation via WebEx.

Annex 2: Agenda

Wednesday 29 November 2017

10:30-11:00 Participant introductions

11:00-12:00 Brief presentations from different projects

- Mark Dickey-Collas: ICES
- Andy Kenny: North Sea IEA, WGINOSE-WGMARS framework
- Alan Haynie: US National Standards under Magnuson-Stevens Act
- Leyre Goti: on SOCIOEC-MYFISH – via WebEx
- Robert Stephenson: Canada Fisheries Research Network Experience
- David Goldsborough: North Sea/NL marine renewable energy objectives

WebEx, with Tony Charles, Mette Mauritzen, Leyre Goti

13:30 -14:30 Discussion and decision on format/ typology to proceed

- Relationship among policy choices, objectives, scientific analyses?

14:30-16:00 Apply agreed on typology to examples (different sector objectives) in break out groups

16:00-17:00 Develop revised list of key management objectives for the North Sea

Thursday 30 November 2017

Focus day 2: break down “high level” objectives into greater detail

9:00-9:30 Recap: table with strategic goals and operational objectives, combine with SOCIOEC-MYFISH results; discuss:

- How do we categorize lower-level – operational – objectives?
- Indicators, relevant data requirements? Candidate indicators
- IEA Model integration
 - Check for manageability? SMART check?
- Management measures

9:30-10:00 Inspiration: mental modelling for IEA, ([example North Sea](#); [example US](#)) – (Andy)

10:20-12:00 Break out groups:

Breakout group discussions focused on the following topics:

- **Breakout Group 1: Overall priorities** (Participants: Rob, Andy, Jörn, Alan). This group created the structure of the overall generic table (see Annex 6)
 - The group added SOCIOEC (from Leyre Goti) and WGMARS 2017 (from Christine Röckmann) lists of objectives.
 - Table to be developed that maps the 4 pillars to global, EU, and national priorities/objectives.
- **Breakout Group 2: Sweden** (Participants: Eva-Lotta, Matilda, David L.) This group focused on **examining national ESI priorities in Sweden**. Eva-Lotta Sundblad presented a range of Swedish priorities from ‘En svensk maritim strategi’ (2016) and the Swedish environmental goals no 10.). (See Sweden ESI Objectives table, Annex 6.2).
- **Breakout Group 3: Netherlands** (Participants: Marloes, Christine, David G.). This group focused on **examining national priorities in the Netherlands**, from the main policy document “Nationaal Waterplan 2016-2021”, which is

updated every 6 years. The group examined the policy focus column and category and then examined higher and lower-level goals. Identify and discuss relevant indicators, data needs and analyses, based on the objectives listed on day 1

Determine how we best connect the different pieces

How to create advice when trade-offs among objectives are not transparently made?

Where do we find the capacity to provide advice (on the four pillars)?

What process would we envisage for creation of advice? (one group or separate expert groups?)

What should/might be the format of advice, especially as it relates to trade-offs?

12:00-12:30 Discussion of approach and preliminary results

13:30-15:00 continue break out group work

15:30-17:00 Plenary: collect input for final list: strategic goals/ higher level and lower level/ operational management objectives, indicators, data...

Friday 1 December 2017

Focus: Summarize results, synthesize lessons learned, future outlook

9:00-10:00 Recap of day 2, synthesis table with strategic goals/ high level objectives, lower level/ operational objectives, indicators...

10:00-13:00 Writing:

identified lessons from the North Sea

implications for elsewhere

Way forward (Paper, February Workshop, ICES ASC, other?)

13:00 *Lunch* and end of workshop

Annex 3: WKSIED-BESIO terms of reference

The **SIHD Workshop on Balancing Economic, Social, and Institutional Objectives in Integrated Assessments (WKSIED-BESIO)**, chaired by Christine Röckmann (The Netherlands), Alan Haynie (USA) and Jörn Schmidt (Germany), will meet in The Hague, The Netherlands, from 29 November to 1 December 2017. The workshop will be addressing four primary goals:

1. Bringing together all compiled fisheries management objectives and synthesize these into a well-arranged and convenient list; in order to take into account the increasing competition at sea with other marine/maritime activities – in particular when zooming in on the North Sea;
2. Identifying gaps and missing objectives, where appropriate;
3. Where possible, starting to breakdown generic/ high level objectives into specific or more explicit objectives with useful measurable indicators, and describe/identify/map the related data requirements; and
4. Describing and illustrating how different objectives relate to each other, e.g. identify synergies or conflicts.

WKSIED-BESIO will report by 15 January 2018 (via SSGIEA and SIHD) for the attention of SCICOM, ACOM.

Supporting Information

Priority	High. This WK is seen as a key strategic element of the Strategic Initiative on the Human Dimension in Integrated Ecosystem Assessments to expand the knowledge base for providing comprehensive integrated advice containing social, economic and institutional considerations.
Scientific justification	A lot of work has been done on trade-off analyses, social, economic and other objectives and issues; however, the knowledge basis is not available in a structured and organized way for ICES. In addition, current work in expert groups may already support the delivery of social, economic and institutional considerations as laid out in the Science and Advice Plan, but the manner in which this information can best be included needs significant clarification. The workshop will be a valuable case study that will strive to develop general methods to incorporate social and economic analysis in ICES advice.
Resource requirements	One or two meeting rooms at Wageningen Economic Research office in Den Haag, WebEx facilities, support for intersessional work
Participants	We expect the workshop will be attended by some 30–35 members and guests. IEA group chairs or members, SSGIEA chairs, SIHD chairs, WGMARS, WGINOSE, WGSEDA, WGRME, WGHIST, EU project leaders (e.g. GAP1 and GAP2, JAKFISH, MEFEPO, ODEMM, MESMA, SOCIOEC, MYFISH, AQUACROSS, CERES), ICES Secretariat
Secretariat facilities	None.
Financial	Travel support for two SIHD co-chairs and one to two invited experts.
Linkages to advisory committees	ACOM
Linkages to other committees or groups	SSGIEA, BSG, SIHD, all IEA groups, WGIMM, WGSMA, WGMARS, WGS-EDA, WGHIST, WGRME, SICCME.

Linkages to other organizations	PICES Human Dimension Group, IIFET, NOAA, IMBER, ESSAS, EU.
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Annex 4: Recommendations

Recommendation	Adressed to
1. Due to the holistic nature of IEAs, ICES IEA groups should take into account ESI objectives as a means to put their work into their relevant regional context, including important clearly stated objectives beyond the environmental/ecological focus.	IEA expert groups
2. Invest in improving the conditions for interdisciplinary ESI work in order to help IEA groups and make ICES management advice more comprehensive; support ongoing work related to WKBESIO	ICES Secretariat, IEASG
3. ICES work cannot focus anymore only on “stock” but needs to take into account all “fisheries” and broad ecosystem-related aspects, including ESI. ICES vision clearly states that humans are part of the ecosystem. However, for example in the “future science priorities” document, there were several paragraphs written from a completely biological perspective. IEAs require a conception of ecosystems that includes humans. It is important to be consistent here, when communication about ICES holistic vision of the marine ecosystem across all ICES expert groups, no matter whether they have a purely biological/oceanographic/climate focus or are more interdisciplinary already.	ICES Secretariat, SCICOM, ACOM, IEASG
4. Communicate to ICES clients (EU commission, DG MARE, DG ENV, etc.) to revisit their advice requests to compare scenarios instead of asking for one optimal solution. Single solutions are hardly possible in the real world, where ESI aspects play a role and managers must decide how to trade-off among diverse objectives.	ICES Secretariat

Annex 5: Presentation summaries

Below short summaries of the inspiring presentations on Day 1 of WKSIIHD-BESIO.

Mark Dickey-Collas: on ICES IEA work and other relevant ESI initiatives

Andy Kenny: on North Sea IEA, and the cooperation and recent developments around WGINOSE-WGMARS-WGNARS

Alan Haynie: on the 10 US National Standards under Magnuson-Stevens Act

The United States has a group of “National Standards” that Regional Fishery Management Councils (Councils) must consider when they take management actions. The National Standards require that Council consider the trade-offs among such factors as Optimal Yield, fishing communities, and bycatch reduction. Councils may place more value on one standard than another, but they must consider all of the relevant standards and justify their actions in this sense. This establishes a clear framework for science-based trade-offs that include both ESI and ecological factors.

Leyre Goti: on results on ESI based on the SOCIOEC-MYFISH governance work – via skype

Summary of social and economic objectives from the SOCIOEC project

The SOCIOEC project took place between 2012 and 2015 and had as an objective to investigate the social and economic effects of the CFP. A secondary objective was to improve the impact assessment (IA) methodology with respect to the CFP. As part of this improvement of the IA methodology and investigation of the effects of the CFP the analysis of the different steps of the IA in the project included research on objectives, so that the fisheries management measures investigated could be measured against those objectives. The work on objectives in the project was also coordinated with the parallel research project MYFISH and yielded a scientific publication (Goti *et al.* under review). The article from Goti *et al.* (under review) shows for example how there are higher level objectives included in the CFP, as food security, and other subordinate objectives as for example the reduction of discards. Subordinate objectives should therefore be seen in connection with and as a step towards higher level objectives.

One of the aspects that came across in the analysis of objectives was the necessity to take into account their manageability and acceptability. The manageability of an objective was described as whether a measure could be designed that had the capacity to meet that objective. An example was B_{MSY} , which, given the many factors that influence biomass which are not under management control (such as recruitment or trophic interactions) would be less manageable than an objective set in terms of fishing mortality, as F_{MSY} , which could be influenced by management through measures as effort or quota control. Another example of manageability refers to the objective of minimizing the economic impact of closures for seabed protection. This objective would be manageable if both data on large-scale fisheries (as VMS data) and small-scale fisheries (as data obtained from small-scale fishers or fishers associations) are available. If only VMS data are used, candidate areas for closures will appear where VMS data shows less catches and therefore less economic losses of closures, but these areas could be yielding most of the catches of the small-scale fisheries (which have no VMS data). Therefore, the economic impact on the complete fisheries, both large-scale (LSF) and small-scale (SSF)

need to be taken into account. Another desirable characteristic of objectives is their acceptability by fishers, which would contribute to the compliance with the management measures leading to the fulfilment of the objective.

The project also showed that when asked about high level objectives of the fisheries policy stakeholder can propose management measures that aim at more than one type of objective (considered as ecological, social and economic) simultaneously. One example of this synergy in management measures proposed by a stakeholder was to make the policy more advantageous for fishers that are sustainable and work for the development of the region. Making quota allocation respond to the impact of fishing and to its contribution to the local economy is contemplated under Art. 17 of the CFP.

Ref.: Goti, L., Fitzpatrick, M., Döring, R., Reid, D., Mumford, J., Rindorf, A., 2018. Over-arching sustainability objectives overcome incompatible directions in the Common Fisheries Policy. Marine Policy 91; 49-57. <https://doi.org/10.1016/j.marpol.2018.02.006>

Robert Stephenson: on the experiences of developing ESI fisheries management objectives for the Canadian Fisheries Research Network

Rob Stephenson provided an overview of the experience of the Canadian Fisheries Research Network (CFRN) in establishing candidate objectives for social, economic and institutional aspects of Canadian fisheries. An interdisciplinary team of over 40 academics, representatives of fishing fleets and government collaborated to study the emerging requirements for sustainability in Canada's fisheries. Fisheries assessment and management in Canada has focused on biological productivity with insufficient consideration of social/cultural, economic and institutional (governance) aspects. Further, there has been little discussion or formal evaluation of the effectiveness of fisheries management. The team worked to 1) identify what comprehensive set of management objectives for a sustainable fishery system would logically emerge from Canadian policy statements, 2) combine objectives into an operational framework with relevant performance indicators for use in management planning, and 3) undertake case studies which investigated some social, economic and governance aspects in greater detail. The resulting framework extends the suite of widely accepted ecological aspects (productivity and trophic structure, biodiversity, and habitat/ecosystem integrity) to include comparable economic (viability and prosperity, sustainable livelihoods, distribution of access and benefits, regional/community benefits), social/cultural (health and wellbeing, sustainable communities, ethical fisheries), and institutional (legal obligations, good governance structure, effective decision-making) aspects of sustainability. The CFRN team chose to include four 'pillars' (ecological, economic, social/cultural, and institutional/governance) based on explicit reference to that spectrum in the literature (see for example Stephenson *et al.*, 2017) and in Canadian policy documents. Each candidate objective was linked to Canadian policy statements (Stephenson *et al.* submitted A) and to international agreements (Stephenson *et al.* submitted B) as well as to candidate performance indicators. This work provides a practical framework for implementation of a comprehensive approach to sustainability and to full-spectrum scenario comparison and advice that allows demonstration/evaluation of trade-offs.

Candidate objectives for sustainable fishery

Ecological objectives

- Productivity and trophic structure
- Biodiversity
- Habitat and ecosystem integrity

Economic objectives

- Economic viability and prosperity,
- Livelihoods,
- Distribution of access and benefits,
- Regional economic benefits to community

Social objectives

- Health and wellbeing,
- Sustainable communities,
- Ethical fisheries

Institutional objectives

- Legal obligations including to indigenous peoples,
- Good governance structure,
- Effective decision-making processes



Including performance indicators
Linked explicitly to policy statements



Stephenson, Robert L., Ashleen J. Benson, Kate Brooks, Anthony Charles, Poul Degnbol, Catherine M. Dichmont, Marloes Kraan, Sean Pascoe, Stacey D. Paul, Anna Rindorf, and Melanie Wiber. 2017. Practical steps toward integrating economic, social and institutional elements in fisheries policy and management. ICES Journal of Marine Science, doi: 10.1093/icesjms/fsx057 <https://doi.org/10.1093/icesjms/fsx057>

Stephenson, Robert L., Melanie Wiber, Marc Allain, Stacey Paul, Eric Angel, Ashleen Benson, Anthony Charles, Omer Chouinard, Dan Edwards, Paul Foley, Dan Lane, Jim McIsaac, Barb Neis, Courtenay Parlee, Evelyn Pinkerton, Mark Saunders, Kevin Squires and U. Rashid Sumaila. Submitted A. Integrating diverse objectives for sustainable fisheries in Canada. In review *Can. J. Fish. Aquat. Science*

Stephenson, R.L., Stacey Paul, Melanie Wiber, Marc Allain, Eric Angel, Ashleen Benson, Anthony Charles, Omer Chouinard, Marc Clemens, Dan Edwards, Paul Foley, Lindsay Jennings, Owen Jones, Dan Lane, Jim McIsaac, Claire Mussells, Barbara Neis, Bethany Nordstrom, Courtenay Parlee, Evelyn Pinkerton, Mark Saunders, Kevin Squires and U. Rashid Sumaila. Submitted B. Evaluating and implementing social-ecological systems: a comprehensive approach to sustainable fisheries. In review *Fish and Fisheries*.

David Goldsborough: on recent developments in the Dutch and Belgium parts of the North Sea around offshore wind farms, MSP and marine renewable energy policies and objectives

David Goldsborough discussed renewable energy development in the North Sea. Marine Spatial Planning (MSP) was used as a guiding principle for the talk. A comparison between MSP in Belgium, including renewable energy development, and the Netherlands was shown. Belgium has dedicated MSP legislation and has made a full comprehensive marine spatial plan for their complete marine waters. This plan was made based on available scientific knowledge and in close collaboration with all involved stakeholders, and the plan is reviewed every six years. Who is responsible for what, that is who has what competency, is clearly defined. There is a distribution of competencies between the Federal state and the Flemish region. They have designated specific areas for wind energy development, including so called sockets at sea to 'plug in' wind farms. They will also develop two energy atoll's which will allow storing excess energy from the wind farms.

This is in stark contrast to the situation in the Netherlands. The Netherlands has no dedicated MSP legislation and all policy choices for the marine areas can be found in

the Dutch National Water Plan. This plan is updated every six years and it covers all relevant water related issues in the Netherlands including coastal defense and water security. Since 2015 there is a dedicated sectoral Wind Energy at Sea Act. In distinction to Belgium there is no full MSP plan for the Dutch marine waters. The current plan which is included in the National Water Plan is open ended and only shows search areas for specified activities such as wind energy development. Producing renewable energy is seen as an activity of national importance in the Netherlands. This became evident with the Wind Energy at Sea Act (2015) and the designation of three large wind energy development areas on the 12 nm border. Identical with Belgium all three areas will have sockets at sea for hooking up the wind farms. The responsibility for MSP and wind energy development at sea was shared between two ministries up until October 2017. A new coalition government in October of 2017 led to a reshuffling of ministries and responsibilities creating a bit of confusion on who is responsible for what in the Dutch part of the North Sea.

The Netherlands has to meet EU targets regarding renewable energy: 14% in 2020 and 16% in 2023. To achieve these objectives a National Energy Agreement was signed in 2013 between the authorities and more than 40 organizations. Given that the Netherlands has opted for 100% renewable energy by 2050 the race for space for wind energy in the Dutch part of the North Sea is on. This was illustrated by briefly discussing the plans that are being made by the North Sea Wind Power Hub-Consortium. This international consortium (NL, D, and DK) has very ambitious plans to develop large-scale renewable energy systems in the North Sea. The presentation ended with two questions: What impact will these activities have on current users of the North Sea and specifically on fisheries? Who is driving these initiatives and are the institutional objectives always clear?

Annex 6: Draft table of social, economic and institutional marine management objectives

Below are the draft objectives tables, which are an important output of WKSIRD-BESIO:

Table 1. EU – generic North Sea ESI objectives table

	DRAFT objectives categories	Objective: quotes and/or topics	Candidate indicators	Source	Scale
econ	Stability	<i>"Stable markets"</i> (CFP Preamble par 4)	Wholesale price index for seafood products, percentage of EU seafood on EU seafood consumption	CFP	EU
econ	Regional economic benefit	developing the maritime potential of the EU's outermost regions and islands ~IMP, CFP	General indicators, not relevant to North Sea	CFP, IMP	EU
econ	Employment	Blue jobs focus on: tourism, renewable energy, aquaculture, biotechnology, seabed resources ~IMP	# of jobs in maritime sectors; type of employment/contracts; salary level	CFP	EU
econ	Employment	<i>"foster direct and indirect job creation and economic development in coastal areas"</i> (CFP, reg 1380/2013 preamble para 12)	Employment in coastal areas, economic activity	CFP	
econ	Employment	<i>"economically viable and competitive fishing capture and processing industry and land-based fishing related activity"</i> CFP reg 1380/2013, Art 2)	Fish processing jobs; economic activity in fishing communities	CFP	
econ, soc	Employment; Food security	<i>"an efficient and transparent internal market for fisheries and aquaculture products "</i> CFP reg 1380/2013, Art 2	# of fish processors; measures of industry concentration (e.g. Gini coefficients and Lorenz curves)	CFP	
econ, soc	Employment; Food security	<i>"improving the competitiveness of the aquaculture industry and supporting its development and innovation"</i> CFP reg 1380/2013, Art 34	Measures of aquaculture productivity	CFP	
econ	Allocation	Access to space/ resources ~IMP	# of recreational users; measures of tourist activity	IMP	EU
econ, soc	Allocation	Relative stability ~CFP	Share of TAC per country	CFP	EU

	DRAFT objectives categories	Objective: quotes and/or topics	Candidate indicators	Source	Scale
econ, soc	Sustaining communities	encouraging coastal and maritime tourism ~IMP	# of tourists at EU coasts; # of tourists on cruise ships/ sailboats, # recreational fisher	IMP	EU
soc	Sustaining communities	<i>"thriving coastal communities"</i> (CFP, COM(2011) 417 final)	Population and economic activity in coastal areas etc.	CFP	EU
soc	Sustaining communities	developing the maritime potential of the EU's outermost regions and islands ~IMP	Measures of fishing related businesses in outermost regions	IMP	EU
Econ, soc, inst	Sustainability	<i>"enabling the sustainable use of marine goods and services by present and future generations"</i> MSFD art. 1.3	Sustainable use has many different and poorly specified ESI definitions; E.g., is catch > advised level? Or catch > MEY? Also, fishing impacts; availability of ocean resources to different user groups (e.g. recreational users).	MSFD	EU
soc	Food security	<i>"Availability of food supplies... at reasonable prices"</i> (CFP Preamble par 4)	Retail price index for seafood products	CFP	EU
soc	Food security	<i>"a diverse supply of fishery and aquaculture products"</i> CFP, reg 1380/2013 art. 35	Sales of seafood products by product category	CFP	
soc	Food security	<i>"contributing to the availability of food supplies"</i> (CFP, reg 1380/2013 art. 2.1)	seafood kg per capita produced in the EU	CFP	EU
soc	Food security	<i>"contribute to the supplying of highly nutritional food"</i> (CFP, reg 1380/2013 preamble para 12)	seafood kg per capita; measures of food safety; compliance with EU safety standards; specific consumption of more nutritious species	CFP	
soc	Food security	<i>"reducing the Union market's dependence on food imports"</i> (CFP, reg 1380/2013 preamble para 12)	Domestic seafood production and seafood imports	CFP	
soc	Quality of life/wellbeing, health	<i>"the improvement of safety and working conditions for fishing operators."</i> (CFP, reg 1380/2013 preamble para 15)	Accidents in the seafood industry	CFP	
soc	Quality of life/wellbeing, health	<i>"satisfying the real needs of informed consumers"</i> (CFP, COM(2011) 417 final)	Percentage of seafood certified under different systems; food labeling requirements	CFP	EU

	DRAFT objectives categories	Objective: quotes and/or topics	Candidate indicators	Source	Scale
soc	Quality of life/wellbeing, health	<i>"verifiable and accurate information regarding the origin of the product and its mode of production"</i> CFP, reg 1380/2013 Art 35	Percentage of seafood certified under different systems; food labeling requirements	CFP	
soc	Quality of life/wellbeing, health	<i>"human health"</i> Art. 1.2 of the MSFD	Contaminants in consumed seafood, seafood consumption	MSFD	EU
soc	Quality of life/wellbeing, health	<i>"to promote peace, its values and the well-being of its peoples"</i> Treaty of Lisbon, Art.2	Number of conflicts; measures of working conditions	Lisbon Treaty	EU
soc	Quality of life/wellbeing, health	<i>"Fair standard of living for the fisheries sector including small-scale fisheries"</i> (CFP Preamble, par 4)	Average income of fisheries households relative to average national income	CFP	EU
soc	Quality of life/wellbeing, health	<i>"a fair standard of living for those who depend on fishing activities"</i> CFP, reg 1380/2013 Art 2	Average income of fisheries households and fishing communities relative to average national income		
soc	Employment	<i>"full employment and social progress"</i> internal market in the Treaty of Lisbon art. 2.3	Unemployment rate, other employment data		EU
soc	Employment	<i>"a future for fisheries and aquaculture industry and jobs"</i> (CFP, COM(2011) 417 final)	Changing employment in fisheries and aquaculture	CFP	EU
soc; inst	Employment	maritime jobs: enhancing professional qualifications to offer better career prospects in the sector ~IMP, CFP	# specialty maritime education and training programmes		EU
soc; inst	Decision-making, governability	<i>"the coexistence of relevant activities and uses"</i> MSP, dir 2014/89/EU art 5	Measures of activity for different maritime activities; % of sea area under multiple uses		
inst	Decision-making, governability	<i>"managed in a way that is consistent with the objectives of achieving economic, social and employment benefits, and of contributing to the availability of food supplies"</i> CFP art. 2.1.	degree to which social, economic and employment objectives are articulated and being used in management plans, how often managers exceed scientific advice in TAC setting		EU

	DRAFT objectives categories	Objective: quotes and/or topics	Candidate indicators	Source	Scale
inst	Decision-making, governability	<i>"It is important for the management of the CFP to be guided by principles of good governance. Those principles include decision-making based on best available scientific advice, broad stakeholder involvement and a long-term perspective."</i> (CFP, reg 1380/2013 preamble para 14)	# of long-term plans developed together with advisory bodies; existence of institutions/legislation that facilitates effective stakeholder involvement		
inst	Decision-making, governability	<i>"the establishment of measures in accordance with the best available scientific advice"; "a long-term perspective"; "administrative cost efficiency"; "appropriate involvement of stakeholders ... at all stages"</i> CFP, reg 1380/2013 Art 3	# of long-term plans developed together with advisory bodies; existence of institutions/legislation that facilitates effective stakeholder involvement		
inst	Decision-making, governability	<i>"consistent, transparent, sustainable and evidence-based decision-making"</i> MSP, dir 2014/89/EU, preamble para 9	Existence of ESI objectives and institutions/ legislation that facilitates transparent decision-making; existence of appropriate scientific knowledge		
inst	Decision-making, governability	<i>"Dialogue with stakeholders has proven to be essential to achieving the objectives of the CFP"</i> CFP, reg 1380/2013 preamble para 65	# of long-term plans developed together with advisory bodies; existence of institutions/legislation that facilitates effective stakeholder involvement		
inst	Participatory, legitimate and transparent governance structures	Open, transparent, participatory, accountable, coherent, effective ~EU white paper on GG, Aarhus convention	Public access to documents, • # of different stakeholders/sectors included, Level of stakeholder inclusion: e.g. use of fishing/ oil/ etc. platforms for conduct of research planned by scientist; one-off requests of stakeholder knowledge/ opinions; joint research planning, conduct, and analysis.		EU
econ, soc	Employment	<i>The objective of the Blue Growth strategy was to promote smart, sustainable and inclusive growth and employment opportunities in Europe's maritime economy', Blue Growth Strategy, SWD(2017) 128 final (2017)</i>	# of jobs in ocean related sectors	BG	EU

	DRAFT objectives categories	Objective: quotes and/or topics	Candidate indicators	Source	Scale
econ	Food security, employment	<i>Fostering environmentally sustainable, resource efficient, innovative, competitive and knowledge based aquaculture'</i> EMFF objective in Blue Growth Strategy, SWD(2017) 128 final (2017)	# of jobs in aquaculture, GVA mill€	BG	EU
econ	Food security	<i>The objective is to have a competitive EU industry which can continue to grow sustainably to meet the growing demand for seafood',</i> Blue Growth Strategy, SWD(2017) 128 final (2017)	mill tonnes production	BG	EU
econ, soc	Employment	<i>Reducing precariousness and increasing the number of high value jobs are therefore the primary objectives of the Commission's 2014 strategy for coastal and marine tourism'</i> Communication of the Commission 'A European Strategy for more Growth and Jobs in Coastal and Maritime Tourism', COM(2014)086	# of jobs in coastal and marine tourism (income above minimum wages)	BG	EU

Table 2: Sweden

Pillars*	Objective	type of objective	Document
Soc, econ	Increased employment in maritime sector**		A Swedish Maritime Strategy
Env	Reduced environmental impact in maritime sectors		A Swedish Maritime Strategy
Soc, econ	Attractive coastal areas		A Swedish Maritime Strategy
Inst	Competitive, innovative and sustainable maritime sectors	instrumental	A Swedish Maritime Strategy
Env	Balanced marine environment/Safeguard the ecosystem services	instrumental	A Swedish Maritime Strategy
Soc, inst, env	Long-term predictable conditions/stable regulatory environment	instrumental	A Swedish Maritime Strategy
Soc, inst	The Right to Public access (to nature)		The Swedish constitution
Soc	High experience values	instrumental	Swedish environmental goals (<i>miljömål</i>) no. 10
Soc	High cultural values		Swedish environmental goals (<i>miljömål</i>) no. 10
Soc, econ, env	Increased sustainable aquaculture		Swedish aquaculture - a green industry in blue fields 2012-2020
Env+Ec+S	Prohibiting bottom trawling in Öresund	instrumental	The Sea - time for a new strategy (SOU 2003:72)
Soc	Leisure fishing that is available by the year 2020		Svensk fritidsfiske och fisketurism 2020
Soc, econ	Doubled fishing tourism as a base for Swedish tourism and leading to employment and considerable economic values		Svensk fritidsfiske och fisketurism 2020
Env	Sustainable leisure fishing with consideration and defence of ecosystem services		Svensk fritidsfiske och fisketurism 2020
Soc, econ	Produce more food in Sweden		A national Food Strategy for Sweden

*Social, Economic, Environmental and Institutional

** Maritime sectors include among others fishery, aquaculture, transport, tourism...

Swedish Source Document	Online source
A Swedish Maritime Strategy	http://www.government.se/information-material/2015/12/a-swedish-maritime-strategy/
The Swedish constitution	http://www.swedishepa.se/Environmental-objectives-and-cooperation/Swedish-environmental-work/Work-areas/This-is-the-Right-of-Public-Access/
Swedish environmental goals (<i>miljömål</i>) no. 10	https://www.miljomal.se/Environmental-Objectives-Portal/
Swedish aquaculture - a green industry in blue fields 2012-2020	http://www.svensktvattenbruk.se/download/18.65ea4bd915019557221948d4/1443605006808/Swedishaquacultureagreenindustry_w.pdf
The Sea - time for a new strategy (SOU 2003:72)	http://www.regeringen.se/rattsdokument/statens-offentliga-utredningar/2003/06/sou-200372/
Svensk fritidsfiske och fisketurism 2020	https://www.havochvatten.se/hav/uppdrag--kontakt/publikationer/publikationer/2013-04-05-svenskt-fritidsfiske-och-fisketurism-2020.html

Table 3. The Netherlands (Source: Beleidsnota Noordzee 2016-2023 (BNZ))

Pillar	Objective	Source
Env	ecologically responsible use	BN NZ 2.1 (p.25)
Soc, econ	safe use	BN NZ 2.1 (p.25)
Econ, inst	space efficient use	BN NZ 2.1 (p.25)
Inst	integrated policy approach	BN NZ 2.1 (p.25)
env,econ,soc	sustainable development	BN NZ 2.1 (p.25)
Inst	participatory approach	p. 7
env	conservation/restoration of the marine ecosystem	p.12
env	MPAs	p.12
env	MPAs	p.12
env	Implement MSFD measures	p.12
env, econ, inst	sustainable energy (national priority): production of renewable energy; multi-use; collaborate	p.12
env,econ	responsible fisheries, aquaculture	BNZ
env,econ	fisheries, aquaculture: new share of responsibilities between gov and SH	BNZ
env, inst	fisheries, aquaculture: contribute to implement CFP and take measures	BNZ
soc	underwater heritage	BNZ
soc, econ	tourism	BNZ
env, soc, econ	land and sea interaction	BNZ
inst, soc	international cooperation	BNZ
	sustainable energy (national priority)	BNZ
	aggregates (NL policy focus)	BNZ
	oil and gas (NL policy focus)	BNZ
	CO ₂ storage (NL policy focus)	BNZ
	cables (NL policy focus)	BNZ
	shipping (NL policy focus)	BNZ
	defense (NL policy focus)	BNZ