SCICOM Progress Report 2016

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SCICOM Progress Report 2016

An annual report to the ICES Council to describe the development and implementation of the ICES Science Plan

ICES International Council for the Exploration of the Sea

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Contents

1 Introduction (SCICOM Chair)

The SCICOM Annual Report to Council reviews the activities of the ICES science structures in their efforts to implement the Science Plan (2014–2018). The role of SCICOM is to ensure that ICES is a relevant, credible and respected marine science organization via a visionary, strong and active science agenda.

The report follows the structural mechanism that SCICOM utilizes to deliver the Science Plan, including:

- Science Steering Groups –strategically manages the Expert Group portfolio that ensures delivery of the science needed to implement the ICES Science Plan but also accounts for bottom up developments and initiatives.
- Strategic Initiatives – introduction or development of new areas including interdisciplinary and crosscutting cooperation.
- Operational Groups - develops policies and access mechanisms on data and publications to meet the scientific needs of the organization and ensures consistent data, publications and communication strategies and products. Develops a high level training programme of global interest to the marine science community
- The Annual Science Conference – provides a modern and adaptive venue for the ICES community and partners to meet and strategically discuss their science, and to bring new participants into ICES activities.

The SCICOM annual report to Council also includes the midway review on ICES Strategic Plan provided by the Coordination Group.

1.1 ICES Science Development – The ICES Science Plan (Yvonne Walther)

1.1.1 Summary of progress on the Plan Objectives and Goals

SCICOM addresses two goals under the ICES Strategic Plan:

- Develop an integrated, interdisciplinary understanding of the structure, dynamics, and the resilience and response of marine ecosystems to change;
- Understand the relationship between human activities and marine ecosystems, estimate pressures and impacts, and develop science-based, sustainable pathways.

To ensure the fulfilment of these goals SCICOM oversees a number of supporting activities which are effectuated by the mechanisms described in the introduction and reported below. In addition the crosscutting effects of the work done by Advice, Data and Information, and Secretariat have been highly benefitted from the creation of the Coordination Group. Several productive initiatives have sprung out of this cooperation including among others, the midway report on ISP and opening plenary session in ASC as a joint venture between three ICES pillars, see 2.1 below. The coordination group has created a vision document that covers the summary of progress on the ICES ISP therefore only some main points are covered in this summary of progress.

As reported below in 1.1.2 the progress of the Science Plan implementing the goals is progressing steadily. To facilitate further development some particular focal areas have been identified.

- Ensure availability of experts in ICES Science Community including aquaculture, bluewater and other oceanographers – identify and fill gaps
- Continue to build an operative platform for social sciences in support of IEA.
- Develop online training facilities.
- In cooperation with data and advice, advance the data flow from producer to end user.

1.1.2 Implementation of ICES Science Plan – Performance Measurement

The Performance measure of the implementation of the Science plan was done by an expert evaluation performed by the SSG chairs of the 31 priority areas in the Science Plan. The result of the evaluation is shown in the tables in **Annex 2.** The evaluation shows good overall progress and increased scores in 16 areas (marked in green in the table). Priority areas scoring some progress to doing well (3-5) are 22 (16 in last evaluation) and areas scoring 4–5 are 11 (4 in last evaluation).

Areas with little progress scoring 1–2 are 8 (14 in last evaluation). To stimulate progress in the last period of the Science plan (2016–2018) attention should be given to the 8 lowscoring areas and see why the score is low. Below follows a short review of the low scoring areas gives a vision on how to proceed.

Three areas (2, 12 and 14) that score 1–2 would have had higher scores if evaluated across the SSGs. More focus can be given to area 2 but in that case Expert Groups need to be encouraged to do comparative work.

2. Quantify the nature and degree of connectivity and separation between regional ecosystems

12. Develop approaches to mitigate impacts from these activities, particularly reduction of non target mortalities and enhancement/restoration of habitat and assess the effects of these mitigations on marine populations

14. Evaluate ecological, economic and social trade offs between ecosystem protection and sustainable use to advise on management of human activity in marine ecosystems

8. Define and quantify north Atlantic Ecosystem Goods and Services, model their dependence on ecosystem processes and habitat condition and their social, economic and cultural value (score 1) – an area which we should give more focus, perhaps a future action area.

7. Develop end to end modelling capability to fully integrate natural and anthropogenic forcing factors affecting ecosystem functioning (score 2, previously 1) One explanation is that this is not a focal area in the community, whereas it was found interesting to include in the Science Plan some years ago, few are working on end to end models but more moving towards adaptive modelling to address specific scientific and managerial issues.

21. Conduct pilot studies in data rich areas for alternative IEA approaches, linking quantitative and qualitative methods at appropriate spatial and temporal scales (score 2, previously 1)

23. Use IEA's to informing management about the effects of cumulative pressure and additive and non additive impacts, and which provide risk evaluations and analyses of tradeoffs between sectoral objectives. (score 2, previously 1). Progress has been made in both areas yet the key success lies in a long term effort in both cases. Area 21

will likely develop in the right direction given enough time. Area 23 is a very complex issue, highly depending on the cooperation with management, which has shown little progress and should be a strategic focus from both science and advice .

27. Identify knowledge and methodological monitoring gaps and develop strategies to fill these gaps (score 2) – several initiatives to address this issue have been taken, including approaching EFARO with an initiative to create an overarching sampling programme. Progress has been slow since this area is mainly outside the ICES mandate. It is possible to identify the knowledge and gaps but setting the strategic priorities is outside ICES scope. Success of further implementation is based on the cooperation with Member States to develop monitoring strategies.

Based on the summary above the performance evaluation is considered to be conservative in some cases where the progress is in fact more extensive, in other cases lack of progress can be identified as lack of initiatives or even depend on external factors. By identifying the major obstacles for the 8 areas that scores 1-2 there is a good indication that further progress can be made.

A more extensive mapping of the implementation started in 2015 by initiative of SCICOM. In this living document the Science Priority areas are mapped against the Terms of Reference of the Expert Groups regardless of affiliation to SSG. Therefore crosscutting effects are clearer and give a fuller picture of the implementation of the Priority Areas. The mapping is available as a background document.

1.1.3 ICES Action Areas – Aquaculture and Arctic

Aquaculture

Products from Action Area Aquaculture include advice to NASCO on the possible effects of salmonid aquaculture on wild Atlantic salmon populations, focused on the effects of sea lice, genetic interactions and the impact on wild salmon production. A special theme session on this topic took place during the NASCO annual meeting in June 2016.

Aquaculture overviews: Following the 2015 Aquaculture Dialogue Meeting the idea came up to develop a SCICOM-owned, and ACOM-approved, Aquaculture Overviews, similar to the Fisheries Overviews. SCICOM requests nominations of Aquaculture contact points for the purpose of the AORACSA aquaculture work and for the aquaculture overviews.

SCICOM had a strategic discussion at its meeting during the ICES ASC on 24 September 2016 on the WGAQUA role in the ICES system and the way forward. Despite several meetings with the leadership of WGAQUA, no consensus was reached on how the group relates to the ICES system of science and advice. It was decided at the SCICOM September meeting to close WGAQUA in its current form and initiate an internal scoping process with the aim to develop a long-term strategy on Aquaculture, including the internal setup of the working group(s) to support this strategy.

H2020 Atlantic Ocean Research Alliance (AORA-CSA): - Work on the trilateral inventory of aquaculture collaborations / projects has been finalized; - Roadmap for the Trilateral AQ WG: agreed to be a somewhat stable document reviewed every 3-5 years; For each of the 8 priority topics, a work plan will be structured around 4 objectives (Sharing information and knowledge though transatlantic workshops; Existing relevant projects; Developing new Galway related aquaculture projects/programmes with

Canada/EU/US collaborators; Initiating exchange programs for students and post-docs). To be completed by the theme leaders and AORA WP7 by January 2017.

SCICOM discussed NPAFC / NASCO International Year of the Salmon and agrees that ICES should take part in setting the science agenda.

Arctic

WGICA (Integrated Assessment for Central Arctic Ocean) has established two assessment teams to initiate work on the development of integrated assessments on a subregional basis for Amerasian Basin/Pacific gateway and Eurasian Basin/Atlantic gateway.

The ASC 2016 included a Theme session on 'Arctic Ecosystem Services: Challenges and Opportunities' (Co-sponsored by AMAP and EU-PolarNet); followed by a workshop organized by the EU-PolarNet.

The Arctic Ocean Acidification (OA) workshop: Pathways to Adaptation: OA in the Arctic, co-sponsored by NOAA, the US Department of State, AMAP, and the Natural Resources Defense Council (NRDC) with additional support from the U.S. Chairmanship of the Arctic Council as a priority initiative. It was held in October in Helsinki, Finland. The workshop served multiple purposes: an opportunity to evaluate the status of the AMAP Arctic Ocean Acidification Assessment Update which follows the 2013 AMAP Arctic OA Assessment. Finland will be taking over the Arctic Council Chairmanship in 2017. The workshop will also serve to develop a broader understanding of Arctic vulnerability to OA, including cultural and social vulnerabilities and present recommendations on an adaptation methodology or framework which might be used to develop customized and regionally specific adaptation strategies for OA in the Arctic region. ICES was represented by the incoming SSGEPD Chair.

ICES Secretariat took part in the AMAP/CAFF international conference of implementing the ecosystem approach in the Arctic (Fairbanks, Alaska). This conference highlighted the added value of working with ICES would bring to Arctic Council initiatives.

2 SCICOM Open Sessions

Monday, 19 September, Riga, Latvia

2.1 Open Plenary: Without data – no science, no advice, no ICES (Walther/Kirkegaard/Holdsworth)

The SCICOM open plenary was the first session at the ASC. Traditionally it has been a summary of the science highlights in the past. A deliberate change was made in 2014 to make the session more strategic, visionary and inclusive of the ICES community. The purpose was to engage the audience and make them think, where can I benefit from ICES work and where can I engage. For this reason the SCICOM chair had invited co-chairs for this session to highlight important science interactions in ICES.

In 2015 an important review of the connection between ICES Science and Advice was made by SCICOM and ACOM chair. This was followed up in 2016 where the focal point of the opening session was data. The name of the session "Without data - no science, no advice, no ICES" indicates that data is the foundation on which we all depend.

The session was a joint venture between the SCICOM and ACOM Chair and Head of Data and Information. It was very successful and received a lot of positive feedback. The session included the scientific standards requested to create a framework of data provision as well as the needs from Advice. ICES data work from policies, framework on monitoring and collection and repositories was presented. The audience was highly engaged and showed interest in the available databases and accessibility.

2.2 What are the implications for marine ecosystems of interactions between multiple stressors? (Ojaveer/Pierce)

The session addressed Goal 2 'Understand the relationship between human activities and marine ecosystems, estimate pressures and impacts, and develop science-based, sustainable pathways' of the ICES Strategic Plan, with specific focus on the objective 'Understand, quantify, and mitigate multiple impacts of human activity on populations and ecosystems'. The aim of the open session was to present and summarize some of the work carried out recently by ICES expert groups and discuss how to proceed with advancing our knowledge base on the interactive effects of different drivers.

The following presentations were given:

- Examples of the effects of interactive drivers from historical data (Ruth Thurstan and Emily Klein, WGHIST);
- Interactive effects of human drivers from the viewpoint of marine sediment extraction (Ad Stolk and Jan van Dalfsen, WGEXT) ;
- Determining cause-effect relationships between marine renewable energy developments and the benthic ecosystem at different scales' (Andrew Gill and Jennifer Dannheim, WGMBRED);
- How driver interactions may accelerate regimes shifts. Stefan Neuenfeldt and Christian Möllmann, WKSPATIAL) ;
- Challenges for setting management targets for ecological indicators under scenarios of climate change (Nikolaus W. Probst and Simon P.R. Greenstreet, WGBIODIV);

- SYMBIOSES: practical risk management tool to integrate fisheries and hydrocarbon activities in the Lofoten and Barents Sea, Norway (Daniel Howell, JoLynn Caroll and Frode Vikebø, WGSAM).

Some of the key conclusions include:

- Although extremely valuable, historical data suffer from several shortcomings, such as lack of data prior to commercial fishing, various data reliability issues, proxies that are influenced by additional factors, and the fact that good historical data exist for relatively few species and locations;
- Historical data offer alternative baselines to those we normaly consider; their relevance depends on how much the system has subsequently changed, also the feasibility and desirability of returning a system to a distant past state;
- The scale at which phenomena are measured is an important consideration when it comes to cross-regional comparisons (e.g for marine sediment extraction);
- New and/or emerging activities (e.g. wind farms – creating underwater artificial littoral zones) are significantly modifying banthic communities, affecting local biodiversity and food resources, and the role of benthos as a „biogeochemical reactor";
- The terminology 'regime shift' is not always very informative, and improved/good knowledge of associated mechanisms/processes is essential (as statistical models don't reveal processes). It is important to consider both commercially exploited and other species; there is also a need for much better links between theory and data;
- When construting biodiversity indicators for climate change. It is important to take into account that not all species are equal; for example different pictures emerge from using slow-growing and fast-growing fish species;
- Integrating management to consider spatially co-occurring multiple marine and maritime sectors requires much wider collaboration than we are often used to, and very often, you can't do everything you would like to do.

The presentations were followed by a general discussion as well as some directed discussion on the follow-up to this session. Important points raised included:

- How to coordinate relevant activity in ICES – through a new umbrella expert group or through an existing steering group or some other mechanism?
- In case a new EG were to be established, ToR's should be specific without any overlap of other EGs work.
- How to feed such information into advice? Advice is normally given to answer a client question, the work but can lay the ground for advice in the future (as in ecosystem overviews).
- Issue of scale, i.e. context specific nature of the effects of driver interactions.
- Coordination with regional sea conventions (essentially OSPAR) to avoid overlap of similar activities.

2.3 Open session: ICES coordinated surveys overviews, reporting, survey design, and e-infrastructure (Handegard)

The Open session: "ICES coordinated surveys: overviews, reporting, survey design, and e-infrastructure" by the ACOM/SCICOM Steering Group on Integrated Ecosystem Observation and Monitoring (SSGIEOM) and chaired by Nils Olav Handegard. The meeting was attended by 50 people, representing both survey and assessment groups.

The chair opened the session by briefly outlining some of the challenges in today's system, including how to obtain overviews of the different survey products and where they are used in ICES advise and science, what information needs to be easily accessible for the users, key considerations on designing surveys, and what infrastructure is available at the data centre to facilitate the process.

Cristina Morgado, Head of Advisory Support, ICES Secretariat, and Ingeborg de Boois, DIG chair, IMARES, Netherlands, gave a presentation on the survey overviews and the status of the stock overviews, and how this can be used to link the data providers and the data users. The stock overviews give an overview of ICES stocks, and includes information about the surveys used for the advice (ref to stock overview?).

An update from the workshop on establishing reporting guidelines from survey groups (WKSUREP) was presented by Marie Storr Paulsen, PGDATA Chair, DTU Aqua, Denmark, and Nils Olav Handegard, SSGIEOM Chair, IMR, Norway. The presentation focused on the information that needs to follow the data, including coverage issues, trawl station allocations, and sub sampling of age and length.

Several working groups have pointed to the lack of expertise in sampling survey design in the ICES system, and Jon Helge Vølstad, WKCOSTBEN Chair, IMR, Norway, presented an overview of key considerations when designing fisheries-independent sampling surveys. This included the necessary steps in designing sampling surveys. It was pointed out that the unavoidable use of multi stage cluster sampling generally is leading to a decrease in effective sample size. An example on estimating abundance-indices by age showed that number of primary sampling units, and less the number of fish measured for length and age from sub-samples, drives the precision.

The last presentation was held by Neil Holdsworth, Head of Data and Information, ICES Secretariat, focusing on the infrastructure at ICES that supports fisheries-independent surveys. ICES provides open access to both data and calculated data products from trawl surveys, (including marine litter and non-commercial species) (datras.ices.dk), eggs and larvae data (eggsandlarvae.ices.dk), and acoustic-trawl surveys (planned for 2017). The environment offers web services (https://datras.ices.dk/WebServices/Webservices.aspx), documented guidance, and an online development hub (https://github.com/ices-tools-prod) to allow use of data directly in R.

After the presentations there was a general discussion about the topics. The need for ICES to task the survey group to take a more active role in providing and calculating the data products from the surveys was emphasized, and this could be achieved by tasking the data centre to continue to build the relevant infrastructure in addition to tasking groups with strong quantitative skills to provide the content, i.e. guidance on design and associated estimators. The survey overviews could be used as a first step on adding value to the surveys, and continuing the work with the stock overviews was supported. The overviews also provide a framework for feedback between survey groups and assessment groups, which is currently missing.

Tuesday, 20 September, Riga, Latvia

2.4 ICES Science – a quest for impact

Conveners: Tammo Bult, Pierre Petitgas, Anne Christine Brusendorff, Ellen Johannesen, Cornelius Hammer

Results from the electronic survey on perceptions of ICES and ICES-Science were presented, indicating overall satisfaction with ICES:

- Respondents were familiar with ICES and its products and could easily easy distinguish between advice, science & data; ICES importance was not seen as declining.
- ICES could be more pro-active when it comes to agenda-setting, communication & dissemination products.
- ICES should broaden beyond fisheries, including topics such as socio-economics, ecosystem-approaches and industries including aquaculture and the maritime sectors.
- ICES makes an effort to be an inclusive organisation.

However, respondents were mostly part of the regular ICES-network and little external input was received. After this brief review, the session continued with a discussion on topics relevant to ICES and its position, using a "debate-style-set-up" and the following statements:

The rule of this "game" included:

1) Statements are proposed that require a YES or NO position;
2) State your position by moving to the correct side of the room;
3) Convince "the other side" of your position;
4) The person creating most "converts" wins.

Statements

1) ICES's importance will substantially increase over the coming decade
   a. Participants recognised opportunities for increased impact, but doubted ICES ability to swiftly take on opportunities.
2) In the future, routine work in working groups will be done much more by the secretariat
   a. Participants differed in their opinion if WGs are doing routine work. Taking away expert work from EG/WGs will break down the willingness to participate in ICES activities.
3) ICES must engage in "agenda setting"
   a. All participants agreed on this.
4) In the future ICES will provide advice to new NGO-clients like e.g. WWF
   a. Participants differed in their views. Some saw this as a logical next step and given that ICES Advice is based on science the origin of the request may not matter. Others saw a risk in ICES acting more like a consultancy.
5) Industry & NGO experts can partake in WGs as experts

a. Most were in favour and/or recognised that this is already the case. Discussions focussed on the need for explicit "rules of behaviour" and the role of nominating delegates.

6) Within 5 years, ICES will include more new member states

a. Most thought 5 years is too short but recognised that ICES will include more member states. Opinions differed on which states.

7) ICES must set up a management-masterclass for those with ambitions and qualities for management positions in research organisations

a. Participants questioned if ICES is able to set this up; Some recognised the need for management skills and people with those abilities, to draw from in future leading positions.

The results were further discussed in Bureau later that day and it was decided to repeat the exercise in Council as a basis for further discussion and direction.

David Miller won the debate and received the prize (a bottle of Black Balsam).

Those interested in participation of the electronic survey and its result can send an email to Ellen.Johannesen@ices.dk.

Wednesday, 21 September, Riga, Latvia

2.5 How is your science being used in assessment and advice? (Kirkegaard/Schmidt)

Approximately 50 participants attended the session. The aim of the open session was to discuss a proposal prepared by the ACOM-BSG ad-hoc subgroup to improve links between Expert Groups' and Benchmarks for a more flexible and productive environment for the Expert Groups (EGs) supporting ICES advisory work. In the session the proposal was presented and discussed. A second presentation was made by the ICES secretariat on the development of the new Transparent Assessment Framework.

The audience was quite critical with the suggested framework. The main points of criticism were:

- Complexity of the process
- Data flow and data control is missing
- Unclear role of the reviewers.
- The extend of the scoping is unclear: do we only scope for issues relevant for fish stock assessment or fish stock advice or broader ecosystem assessment or ecosystem advice?
- How can we implement integrated ecosystem models if the process it is still 'owned' by stock assessment groups
- Will the proposed process result in more work for less experts.
- The frequency of assessments need to be discussed in relation to the benchmark process as well as the use of indicator based assessment/evaluation (see tuna stocks)
- If the scoping should be on regional basis (as envisaged) it need to include the identification of management challenges and the scoping on objectives

The input from the open session was discussed in a meeting of the ACOM-BSG subgroup. Recognising the critisism expressed at the open session it was agreed that the

best way forward would be to test the use of an open scoping process to define key issues to be addressed in the advisory work within an ecoregion.

2.6 JPI/Healthy Oceans and ICES host an open session looking at micro-plastics (Gerdts/HoS)

The joint JPI Oceans-ICES open session on 'Microplastics in the Ocean' was chaired by Gunnar Gerdts from AWI (Germany). The other panel members were Annika Jahnke from UFZ (Germany), Sonja Oberbeckmann from IOW (Germany) and Andy Booth from SINTEF (Norway). Gunnar (BASEMAN project), Annika (Weather-MIC project) and Andy (PLASTOX project) gave a background and current status for 3 of the 4 JPI Oceans projects currently funded under the microplastics pilot action. Sonja presented results from a nationally funded project MikOMIK in Germany. The final part of the session was allocated to a Q&A round between the audience and the panel members. The session was in general well attended with an estimated 100-150 people in the audience. The goal of the session was to raise awareness of this research topic within the ICES community and to discuss if there is a need to establish an ICES Working Group (WG) on the topic of microplastics. The presentations generated a number of scientific questions from the audience. Furthermore, the Q&A session highlighted a number of ongoing initiatives and activities related to microplastics by ICES members and within existing WGs. In particular, the existing WGs on zooplankton and marine chemistry appear to have ongoing activity. The session concluded that there was definite interest in exploring the need for an ICES WG on microplastics and that a good starting point would be to organise a dedicated ICES workshop on the topic. All agreed that the topic of microplastics is important and should have some specific focus within ICES, but that maybe a cross-cutting group or activity would be more appropriate, with the aim of establishing a stronger link the various related activities/initiatives which are ongoing already across existing ICES WGs.

2.7 How to get your message through (Reeh/Minkkinen)

The aim of the session was to introduce effective communication methods to scientists in order to build a stronger communications capacity within the ICES community to support the organization reaching its strategic goals

The session was convened by. Line Reeh (DTU Aqua), Carl O'Brien (CEFAS), Kari Østervold Toft (IMR), and Terhi Minkkinen (ICES Secretariat). The topic for the session grew out of a communicators' networking meeting at the ASC 2015, where the need for a strategic focus on communication skills within ICES was discussed.

It is essential for the uptake of the work and knowledge of the ICES community in wider society that scientists engage effectively with stakeholders within industry, government and beyond. Yet, conveying a scientific message to a non-specialist audience can be difficult.

With ecosystem based management an effective flow of information between members of the ICES community is of growing importance. As a consequence, sharpening ones communication skills has value beyond increasing public understanding as it can help breach interdisciplinary boundaries between peers.

However, communication skills are not innate; but they can be learned and must be practiced.

The session was kicked off by examples of communication needs, which had been mentioned in other Open Session-presentations during the first three days of the ASC 16,

supplemented by examples of how being able to communicate effectively about ones work is no longer and an add-on, but a core skill, an integrated and necessary part of doing modern science/advice: From writing grant applications and reports, to giving presentations, hosting stakeholder meetings, giving interviews to the media, engaging on sociale media or working with fishermen and other stakeholders (presenter: Line Reeh, DTU Aqua).

The session went on to directly explore popular science communications methods to present research in a way that will get the message heard and understood. The topic was presented by an invited speaker Peter Hyldgaard, who is a journalist and editor at Videnskab.dk and ScienceNordic.com.

Science communications proves to be a topic that interests the ICES community. The session attracted about 70 participants, and the feedback received was overwhelmingly positive: 97% of the respondents agreed that the topic was interesting, and 89,5% would like to attend a science communications session in the future.

The most popular topic suggestions for the future included social media for scientists, speaking to the media, and writing a popular science article.

3 Reports of Science Steering Groups

3.1 SCICOM Steering Group on Ecosystem Processes and Dynamics (SSGEPD, Graham Pierce, UK)

3.1.1 Expert Groups under SSGEPD

	Expert Group name	Acronym
1	Working Group on Biodiversity Science	WGBIODIV
2	Working Group on Integrated Morphological and Molecular Taxonomy	WGIMT
3	Benthos Ecology Working Group	BEWG
4	Working Group on Small Pelagic Fishes, their Ecosystems and Climate Impact	WGSPEC
5	Working Group on Phytoplankton and Microbial Ecology	WGPME
6	Working Group on Crangon fisheries and life history	WGCRAN
7	Working Group on Zooplankton Ecology	WGZE
8	Working Group on Oceanic Hydrography	WGOH
9	Working Group on the Biology and Life History of Crabs	WGCRAB
10	Working Group on Resilience and Marine Ecosystem Services	WGRMES
11	ICES IOC Working Group on Harmful Algal Bloom Dynamics	WGHABD
12	Working Group on Cephalopod Biology and Life History	WGCEPH
13	Working Group on Recruitment Forecasting in a Variable Environment	WGRFE
14	ICES/PICES Working Group on Climate Change and Biologically-driven Ocean Carbon Sequestration	WGCCBOCS
15	Working Group on Fisheries-Induced Evolution	WGEVO
16	Working Group on Operational Oceanographic Products for Fisheries and the Environment	WGOOFE
17	Working Group on the Science Requirements to Support Conservation, Restoration and Management of Diadromous Species	WGRECORDS
18	Working Group on Effectiveness of Recovery Actions for Atlantic Salmon	WGERAAS
19	ICES/PICES Workshop on Phase 1: Modelling Effects of Climate Change on Fish and Fisheries	WKSICCME1
20	Working Group on data poor diadromous fish	WGDAM
21	Workshop on Sea Trout 2	WKTRUTTA2

As per 2015 resolutions, SSGEPD includes 18 Working Groups and 3 Workshops. These cover a wide range of ecosystem components, processes, concepts and methodology, including ocean hydrography, pelagic fish, fisheries-induced evolution, ocean carbon sequestration, biodiversity, ecosystem services and molecular taxonomy.

The work of the groups is regularly reviewed in a variety of ways, including scrutiny of terms of reference, reports and self-evaluations, mapping exercises to address coverage of the Science Plan (see Figures 1 and 2), discussions with chairs at Open Sessions, by Webex and by e-mail, and an overview written by the SSGEPD Core Group in 2015.

It is evident from these exercises that the science remit and activity of these groups extends well beyond the 9 Science Plan topics most obviously associated with EDP and indeed that these groups contribute to ICES data and advice. As such, managing communication with the Expert Groups remains the key role of SSG chairs, seeking a balance between bottom-up and top-down generated work and looking for ways to increase the visibility of the work both within and beyond ICES.

The current SSGEPD chair, Graham Pierce, will leave at the end of 2016 and the incoming Chair, Silvana Birchenough has already participated in the approval of resolutions for EG ToRs in 2017.

Science area	Science Plan priority	WGCRAN	WGCRAB	WGCEPH	BEWG	WGEVO	WGERAAS	WGPME	WGHABD	WGBIODIV	WGZE	WGPME	WGRECORDS	WGMRES	WGIMT	WGSPEC	WGOH	WGRFE	SUM
EPD	1		1		1			1	1	1	1	1	1		1	1	1		11
	2	1	1	1					1						1	1	1		7
	3		1	1					1	1	1	1		1		1	1		9
	4		1		1		1	1	1			1	1			1	1	1	10
	5				1				1	1				1		1			5
	6			1	1	1				1						1		1	6
	7													1					1
	8	1	1		1									1					4
	9	1	1	1		1				1					1	1	1		8
EPI	10	1		1	1	1	1		1	1	1	1			1	1			11
	11		1	1	1	1	1			1	1		1	1					9
	12			1		1	1						1						4
	13		1		1		1			1	1		1						6
	14	1	1		1	1			1					1					6
	15	1		1		1							1	1					5
	16	1	1						1	1				1			1		6
	17		1		1				1					1					4
IEA	18				1					1				1					3
	19				1					1	1								3
	20	1		1	1									1					4
	21				1					1				1					3
	22	1			1									1					3
	23									1				1					2
	24																		0
IEOM	25	1	1	1	1				1		1		1				1		8
	26												1	1					2
	27	1		1	1	1	1	1	1		1	1	1	1	1		1		13
	28	1			1			1	1		1		1	1	1		1		9
	29	1	1		1														3
	30	1		1	1						1								4
	31		1	1	1			1			1	1	1	1	1		1		10
	SUM	14	14	13	21	8	6	5	12	13	11	6	11	18	7	8	10	2	

Figure 1. Results from the Science Plan mapping exercise with SSGEPD EGs in 2016.

Science Plan topics are shown on the left, divided according to the steering group to which they are most relevant. An entry of 1 in the table signifies that a group covers a topic in some way. Totals are given for the number of groups working on each topic and the number of topics worked on by each group.

3.2 Reflection on issues raised by expert groups

The division between Science and Advisory Experts Groups is increasingly unhelpful; this has already been addressed for Science groups falling under those Steering Groups jointly chaired by members of SCICOM and ACOM but the remaining ACOM and SCICOM groups (e.g. those under SSGEPD) could also benefit from some form of joint

parentage. More direct input from Science EGs could provide useful support for the Advisory process while the science done by ACOM groups in support of the Science Plan should also be recognised – and scrutinised – by SCICOM.

Where science groups are making major contributions to advice to clients, they may need additional support. For example, WGZE members invested considerable time and effort organising a workshop to support the *Calanus* request and ICES financial support would have made the process easier.

The increased focus on deliverables such as peer-reviewed papers is beneficial but does not guarantee that relevant ICES work will be picked up by other relevant organisations such as OSPAR or indeed that essential science information will reach ACOM. One solution is already available within the existing system, i.e. where EG findings and products are relevant to another Steering Group, to ACOM or an external organisation this can be highlighted in a Recommendation. However, arguably, it is precisely the apparent formality of the system which apparently discourages EG chairs from simply talking to the people who should be informed of important findings. The flip side of this coin is that ICES reports are regularly cited without permission and in a few cases reproduced without permission by other organisations. Appropriate citation could be encouraged if reports had DOIs.

It is clear that some EGs struggle to attain sufficient numbers of attendees at meetings. ICES is quite effective at handing down additional Terms of Reference but perhaps less so in demonstrating its support and appreciation for the EGs. Additional ToRs imposed by ICES often require a considerable amount of intersessional work to complete, which is reliant on the good will of the membership and sometimes does not deliver what the client wanted. It would be helpful if ICES could provide more detailed guidance to EG chairs about the purpose of the additional ToRs, as well as feedback about the usefulness of the material thus generated. In addition, devolution of a small budget to SSG chairs to support EG work may facilitate help that extends beyond kind words.

SSG chairs are volunteers and may not have time to read 30 Expert Group reports in a year (never mind reports from groups outside their immediate remit) – and in any case it is not efficient use of time. The format of EG reports varies widely, a problem exacerbated by the 3-year terms of reference which can result in two years of near silence followed by a glut of information in the final report. Executive Summaries tend to be bland and uninformative. Arguably what is needed for every report is a section of Key Messages, which could be provided as bullet points in the Executive Summary – these will not necessarily be recommendations but they will highlight what the group thinks is important in its findings and to whom it should be communicated. The topics that feature in the Key Messages should not be difficult to identify (the ToRs are normally there for a reason!). This could be taken further by insisting that EGs have a Dissemination Plan. More than talking about papers and conference presentations this would focus on how, where and when to communicate outcomes to relevant end-users within and outside ICES, with guidance from ICES where such communication might be sensitive. Again this is formalising what should be common sense but it could be helpful.

3.3 SCICOM Steering Group on Ecosystem Pressures and Impacts (SSGEPI, Henn Ojaveer, Estonia)

3.3.1 Expert Groups under SSGEPI

	Expert Group name	Acronym
1	Working Group on Marine Benthal and Renewable Energy Developments	WGMBRED
2	Working Group on Marine Renewable Energy	WGMRE
3	Working Group for Marine Planning and Coastal Zone Management	WGMPCZM
4	Working Group on the Effects of Extraction of Marine Sediments on the Marine Ecosystem	WGEXT
5	Working Group on Pathology and Diseases of Marine Organisms	WGPDMO
6	Working Group on Biological Effect of Contaminants	WGBEC
7	Working Group on Aquaculture	WGAQUA
8	Marine Chemistry Working Group	MCWG
9	Working Group on Marine Sediments in Relation to Pollution	WGMS
10	ICES Working Group on Introduction and Transfers of Marine Organisms	WGITMO
11	ICES/IOC/IMO Working Group on Ballast and Other Ship Vectors	WGBOSV
12	Working Group on Risks of Maritime Activities in the Baltic Sea	WGMABS
13	Working Group on Social and Economic Dimensions of Aquaculture	WGSEDA
14	Working Group on Application of Genetics in Fisheries and Mariculture	WGAGFM
15	Stock Identification Methods Working Group	SIMWG
16	Working Group on the value of Coastal Habitats for Exploited Species	WGVHES
17	Working Group on Spatial Fisheries Data	WGSFD
18	Working Group on Marine Habitat Mapping	WGMHM
19	Working Group on Methods of Fish Stock Assessments	WGMG
20	Working Group on the History of Fish and Fisheries	WGHIST
21	Working Group on Multispecies Assessment Methods	WGSAM
22	Bayesian Belief Network Case Studies	WKBNCS
23	ICES/PICES Workshop on Economic Modelling of the Effects of Climate Change on Fish and Fisheries	WKeconSICCME
24	Workshop on Understanding the Impacts and Consequences of Ocean Acidification for Commercial Species and End-users	WKACIDUE
25	Workshop on Activity Planning of SIHD	WKAPSIHD

3.3.2 EG Performance/MA ToR Progress

The following EG's will complete the MA period in 2016: WGMPCZM, WGEXT, SIMWG and WGMRE. All of them have submitted self-evaluation reports, which have been evaluated positively. In addition, WGITMO will be switched to MA management since 2017.

One EG (WGMABS) had chairmanship problem, but the issue was solved by nominating the co-chair to the group.

WGMRE has reported, that as a new group, with members that are mostly new to the ICES community the main challenges have been in relation to establishing clear expectations of purpose, levels of ambition and objectives. Particularly in the context of resource constraints.

Some EG's (e.g. WGBEC, WGAGFM) have requested extension of science delivery of a few ToRs (within the MA-period).

3.3.3 EG participation

In general, participation seems not to be the problem at least for majority of the EG's (e.g., MCWG have reported attendance problems; attendance of WGSEDA was also moderate). However, several EG's have attendance of 20+ participants.

3.3.4 Science Highlights

All EG's under SSGEPI have several scientific outputs which deserve mentioning. Due to space limitations, a few highlights of some groups are presented here. These represent already completed or near-completion work:

- ✓ Meta-data on web-based knowledge and information of relevance to understanding the environmental impacts of marine renewable energy (WGMRE);
- ✓ Database on on marine sediment extraction, including amounts of extraction, spatial extent of licensed areas, spatial extent of extracted areas, geospatial shapefile information (WGEXT);
- ✓ R-script and guidelines for answering the ICES data call on Logbook/VMS data (WGSFD);
- ✓ A glossary of terms for consistent usage of terminology relevant to stock identification (SIMWG);
- ✓ Cormier, R., A. Kannen, M. Elliott, and P. Hall. 2015. Marine Spatial Planning Quality Management System. ICES Cooperative Research Report No. 327. 106 pp (WGMPCZM);
- ✓ Howell, D., Hansen, C., Bogstad, B., and Skern-Mauritzen M. 2016. Balanced harvesting in a variable and uncertain world – a case study from the Barents Sea. ICES Journal of Marine Science. In press (WGAGFM);
- ✓ Lehtiniemi, M., Copp, G., Normant-Saremba, M. and Ojaveer, H. 2016. EU list should add potential invasives. NATURE 533:321 (WGITMO);
- ✓ Engelhard, G. H., Thurstan, R. H., MacKenzie, B. R., Alleway, H. K., Bannister, R. C. A., Cardinale, M., Clarke, M. W., Currie, J. C., Fortibuoni, T., Holm, P., Holt, S. J., Mazzoldi, C., Pinnegar, J. K., Raicevich, S., Volckaert, F. A. M., Klein, E. S., and Lescrauwaet, A-K. ICES meets marine historical ecology: placing the history of fish and fisheries in current policy context. ICES Journal of Marine Science, doi: 10.1093/icesjms/fsv219 (WGHIST).

3.3.5 Examples of EG activities that fulfil the ICES Strategy and Science Plan

ICES SCIENCE PLAN OBJECTIVE	EXAMPLE OF THE ACTIVITY
Develop historical baselines of population and community structure and production to be used as the basis for population and system level reference points.	WGHIST ToR: Integrate historical data sources through both state-of-the-art and non-traditional methodologies, to improve our current knowledge base on long-term changes
Develop methods to quantify multiple direct and indirect impacts from fisheries as well as from mineral extraction, energy generation, aquaculture practices, and other anthropogenic activities, and estimate the vulnerability of marine ecosystems to these impacts.	ICES ASC 2016 Open Session: What are the implications for marine ecosystems of interactions between multiple stressors? WGBEC ToR: Develop methods to evaluate effects of acute spills on marine organisms MCWG: Marine litter and its role as a potential source of contaminants
Develop approaches to mitigate impacts from these activities, particularly the reduction of non-target mortalities and enhancement/restoration of habitat, and assess the effects of these mitigations on marine populations.	ICES ASC 2016 Theme Session: Making marine sediment extraction sustainable by mitigation of related processes with potential negative impacts (WGEXT)
Develop indicators of pressure on populations and ecosystems from human activities such as eutrophication, contaminant and litter release, introduction of alien species, and generation of underwater noise	WGMBRED ToR: Identifying and operationalising relevant indicators in relation to assessing ecosystem functioning and change in relation to MBRED WGSFD ToR: Develop robust methods to calculate DCF environmental indicators 5, 6 and 7 WGSEDA ToR: Appraisal of existing economic indicators for their effectiveness to capture the sustainability of aquaculture on multiple levels.
Evaluate ecological, economic, and social tradeoffs between ecosystem protection and sustainable use to advise on the management of human activity in marine ecosystems.	WGMRE ToR: Identify cross-sectoral issues involving marine renewable energy, for example opportunities for co-location, interactions with fishing, aquaculture, fisheries and Marine Conservations Zones. WGBOSV ToR: Investigate and evaluate methods/technologies to assess risks of, to minimize extent of, and to respond to vessel biofouling to inform national and/or International policies or guidelines
Quantify and map biological, ecological, and environmental values, with an aim to optimize ecosystem use and minimize environmental impacts in relation to ecosystem carrying capacity	WGMHM ToR: Using input from WGDEC and BEWG, incorporate and evaluate information on sensitivity of the benthic community of the various seafloor habitats, and provide habitat maps for sensitivity of at least one demonstration area of NW European waters (MSFD region/subregion).

Develop science in support of advisory needs in marine aquaculture systems, minimizing environmental impacts, and integrating other marine sectors.	WGAQUA ToR: Compile existing and developing methodologies for predicting and assessing the carrying capacity of the ecosystems at different geographic scales WGAQUA ToR: Provide best practices for the environmental impact assessment of aquaculture production, in line with the requirements for the allocation of permits for aquaculture businesses.

3.3.6 Contribution to advisory needs

Expert groups under SSGEPI are very strongly involved in responding to the incoming advice requests. In addition, several EG's advance science directly relevant to several ACOM groups or address high-priority subject-areas in ICES (e.g., EU Marine Strategy Framework Directive, IMO BWMC). The examples from 2016 include:

- ✓ Support OSPAR to progress a review of the environmental effects of wave and tidal energy (WGMRE);
- ✓ Delivery of the dataset on the extraction of marine sediments (the amounts and the area of extraction) in the OSPAR Area to OSPAT (WGEXT);
- ✓ SMS key runs for the Baltic and the North Sea provide M2 values critical for the stock assessments in these area (WGSAM);
- ✓ Contribution to IMO on harmful aquatic organisms in ballast water: proposal for cooperation on matters relating to the transfer of invasive aquatic species by ships (WGBOSV);
- ✓ The proportions of the fisheries represented by the VMS data using logbook data; mapping the ratio of fishing effort covered by VMS data; maps of fishing intensity by mobile bottom contacting gears for the years 2009–2015; mapping significant trends in the fishing intensity during the period 2012–2015; advice on development and application of alternative smaller grids, together with pros and cons for different solutions (all OSPAR request; WGSFD);
- ✓ Contribution to ICES advisory needs by providing expert feedback on the status of stock structure of several species. These requests came from a range of ICES working groups including WGWIDE, WGBIE, WGHANSA, and NWWG; benchmark workshops including WKPLE and WKHAD, and advice drafting groups (SIMWG).

3.3.7 Perceived needs and gaps

- Involvement of SSGEPI chair in the communication between ICES Secretariat and EG chairs under SSGEPI is vital;
- Although ICES-ICCAT WGMG ToRs were approved by ToR's, ICCAT nominated co-chair is still missing. There might be a need from the ICES Secretariat to be involved here and send a reminder to ICCAT;
- Aquaculture is one of the high-priority topics in ICES. Shutdown of WGAQUA by SCICOM, and associated nomination of SSGEPI chair to lead the strategic planning and reorganisation of Aquaculture in ICES requires quick actions and

smoothly arranged process to ensure expert input to the delivery of aquculture overviews;

- The 3-year cycle puts a pressure on organising work in some EGs and amendment of ToRs within the MA period is to be expected;
- Several EG's under SSGEPI produce valuable new knowledge which could be used in addressing MSFD. Thus, there might be a need for better coordination of such activities in ICES to assemble all the valuable science produced.

3.4 SCICOM/ACOM Steering group on Integrated Ecosystem Assessments (SSGIEA, Dave Reid, Ireland)

3.4.1 Status on SG Terms of Reference

General ToRs (for all SSGs)

a) Provide guidance to constituent EGs on ToRs and outputs to ensure relevance to the Science Plan;

- IEA Science Plan component and EG ToRs fully aligned

b) Identify gaps and overlaps in the EG base, and consolidate and form new EGs as appropriate;

Geographical coverage of IEA groups covering all European waters from the Barents Sea to the West Mediterranean, plus NW Atlantic. In 2016, a new IEA WG was proposed: -The Working Group on Integrated Ecosystem Assessment (IEA) for the Central Arctic Ocean (WGICA). This had a successful first meeting in May 2016. A dedicated EG for the provision of detailed ecosystem advice in the Baltic was identified in 2015 and a new group set up: WKDEICE – Workshop on DEveloping Integrated AdviCE for Baltic Sea ecosystem-based fisheries management. This had a successful first meeting April 2016. WGMSFdemo was set up in 205 and had a successful first meeting in February 2016. This is designed as a pilot for linking the IEA work to MSFD advice, focussed on the Celtic Sea.

We also identified the need for a forum for "integrating" the IEA groups, and this led to the setting up of WKIDEA (Workshop on Integrated Ecosystem Assessment Methods). This is programmed to meet in October 2016.

c) Review the scientific products delivered by EGs to ensure the maintenance of appropriate quality standards;

- No new products to date

d) Advise SCICOM on the form and substance of the ASC, symposia, and workshops;

- Done

e) Ensure communication among Steering Groups and their constituent EGs;

- Continued strong collaboration with SSGIEOM following the Workshop on the review of the ecosystem survey requirements (WKSUREQ). Led to inputs to joint ICES/EFARO initiative on ecosystem surveys, currently pending

f) Establish and nurture collaborations within and outside the ICES community;

- Ongoing

Overarching ToRs for SSGIEA

g) Map the EGs and their ToRs against the information and data that ICES needs to deliver the Science Plan and its advisory work, suitably prioritized.

- IEAs, EGs, and ToRs are strongly linked to the Science Plan. Priorities for Assessments, Ecosystem Descriptions, and delivery of trend information to advice have been established

h) Promote the development of the Regional Ecosystem Descriptions in standardized formats along the lines proposed by WKECOVER and WKDECOVER. Propose additions and improvements to those guidelines in collaboration with constituent EG.

- Information and inputs on the Regional Ecosystem Descriptions, and the development of these as public dissemination tools.

i) Work with ACOM/SCICOM Benchmark Steering Group (BSG), and chairs of WKBEMIA to develop benchmark guidance for developing IEA in the constituent IEA EG.

- As noted in our previous report, in general, the IEA work is not yet ready for full benchmarking. However, an approach was piloted through WKIRISH Workshop on the impact of ecosystem and environmental drivers on Irish Sea fisheries management in late 2015. The WKIDEA workshop is in collaboration with BSG, and chaired by the SSGIEA and BSG chairs.

j) Promote the development of outlined Integrated Ecosystem Assessments with the IEA EG. It is recognized that a variety of approaches to IEA exist, and different approaches will be appropriate to the different IEA EG based on skill sets and local conditions. SSGIEA will promote innovative approaches including using partial component based analyses, and use of combination quantitative and expert judgement approaches.

- Formal IEA, following arrange of approaches are under construction in all IEA EG. The basic approach is for full IEAs but with focus on particular key linkages. WGEAWESS submitted a proposal for a western waters IEA project (AtlantEA) under the recent Intereg Atlantic Area call. This has passed the first phase of evaluation, and will be submitted in full in November.

k) Maintain a watching brief over initiatives in IEAs in the wider community beyond ICES. This should include new approaches or methods for IEAs, and broadening of the IEA concept to potentially include economic and social drivers and impacts.

- Ongoing – In pursuit of this there is a theme session at the 2016 ASC: Integrated ecosystems assessment and decision support to advance ecosystem-based fisheries management – Session F.

l) Promote the development within EGs of standards and guidelines for good practice and quality assurance in the collation and use of data. This should extend to the maintenance of archived data used in the IEAs, and documentation of all the steps taken to arrive at a conclusion for a given IEA, and the possible involvement of the ICES Data Centre.

- Ongoing – and specifically addressed at WKIDEA

3.4.2 EG Performance/MA ToR Progress

All the EGs are performing well. The EG have all developed multi-annual ToRs. WGICA, WKDEICE, and WKINWA are new and had their first meetings in the last year. WGCOMED, WGEAWESS, WGIBAR, WGINOR, WGINOSE, and WGNARS

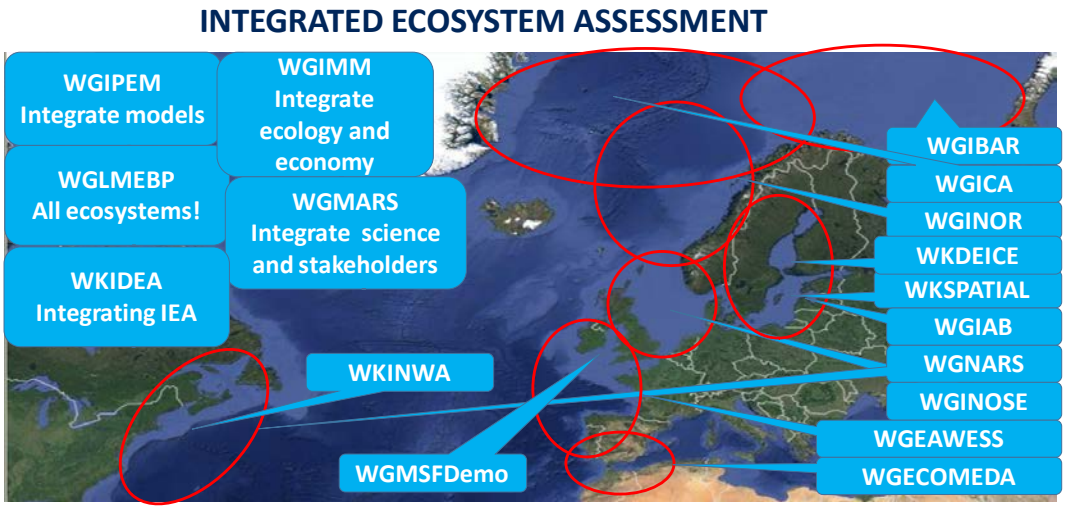
have successfully reached the end of their three year ToRs, and have completed the self-evaluation process, and submitted new 3 year ToR.

3.4.3 EG Participation

Attendance at most EG meetings held since the last report has been good. However attendance was lower at WGEAWESS and WGINOSE.

3.4.4 Structural Diagrams of the consistent EGs

The figure below shows the geographical coverage of the component groups of SSGIEA. The groups identified in the right-hand panels are the geographically specific Integrated Ecosystem Assessment groups. All aim to develop appropriate IEA methodologies, Regional Ecosystem Descriptions and start to identify operational ecosystem advice to managers. They are supported by the linked workshops (WGMSFDemo, WKDEICE, WKINWA, and WKSPATIAL). The five groups in the left panels have a more general remit and also support the work of the geographically focused groups. WGIPEM is targeted on developing the ecosystem models needed for IEA. WGMARS aims to support the integration of the wider community of stakeholders and WGIMM to link up with economists and social scientists. Finally WGLMEBP sets the ICES IEA work in the global context of the LME programme. Two further groups have been proposed. WKIDEA aims to help integrate the Integrated Ecosystem Assessment EGs.



Expert groups in SSGIEA

	Expert Group topic	Acronym	Chairs
1.	Working Group on Integrative, Physical-biological, and ecosystem modelling	WGIPEM*	Morgane Travers-Trolet, Marc Hufnagl
2	Workshop on Spatial Analysis for the Baltic Sea	WKSPATIAL	Michele Casini and Stefan Neuenfeldt
3	Working Group on Ecosystem Assessment of Western European Shelf Seas	WGEAWESS	Steven Beggs, Eider Andonegi,
4	Working Group on the Northwest Atlantic Regional Sea	WGNARS	Robin Anderson, Geret DePiper
5	Working Group on the Integrated Assessments of the Barents Sea	WGIBAR	Edda Johannesen and Yury Kovalev
6	Working Group on Integrating Ecological and Economic Models	WGIMM	Jörn Schmidt, Rasmus Nielsen and Eric Thunberg
7	Working Group on Integrated Assessments of the North Sea	WGINOSE	Andy Kenny
8	Working Group on Large Marine Ecosystem Programme Best Practices	WGLMEBP	Hein Rune Skjoldal and Rudolf Hermes
9	ICES/HELCOM Working Group on Integrated Assessments of the Baltic Sea	WGIAB	Laura Uusitalo, Lena Bergström, Martin Lindegren, Saskia Otto
10	Working Group on Comparative Analyses between European Atlantic and Mediterranean marine ecosystems to move towards an ecosystem-based approach to fisheries	WGCOMEDA	Marta Coll, Manuel Hidalgo and Hilmar Hinz
12	Working Group on the Integrated Assessments of the Norwegian Sea	WGINOR	Geir Huse and Gudmundur J. Óskarsson
13	Working Group on Maritime Systems	WGMARS	David Goldsborough
14	Working Group to Demonstrate a Celtic Seas wide approach to the application of fisheries related science to the implementation of the Marine Strategy Framework Directive	WGMSFDemo	Jean-Paul Lecomte, Eugene Nixon and Carl O'Brien
15	ICES/PAME Working Group on Integrated Ecosystem Assessment (IEA) for the Central Arctic Ocean	WGICA	John Bengtson, Hein Rune Skjoldal
16	ACOM/SCICOM Workshop on Integrated Ecosystem Assessment Methods	WKIDEA	David Reid, Jörn Schmidt
17	Workshop on IEA in the Northwest Atlantic	WKINWA	David Goldsborough
18	Workshop on DEveloping Integrated AdviCE for Baltic Sea ecosystem-based fisheries management	WKDEICE	Rudi Voss, Christian Mollmann, Maciej Tomczak

3.4.5 Science Highlights

These highlights are the personal selections of the SSG chair and in no way reflect the importance and value of any work not mentioned here. Some groups are not highlighted here, as these groups did not meet in the last year e.g.

WGCOMEDA Bilbao May 2016 3 years ToR ended. Self-evaluation completed.

Specific chapters on:

- Global patterns of stability in fish community dynamics
- From traits to life-history strategies
- Biodiversity, community and ecosystem traits changes at regional scales
- Exploring a demographic portfolio using pelagic forage species across Mediterranean and Atlantic ecosystems.
- Investigating patterns and drivers of functional diversity of benthic ecosystems.

WGIAB Helsinki April 2016

- Extended IEA beyond considering changes in abundances of a few dominant species, to accounting for community-wide changes in a number of key traits across multiple trophic levels.
- Developed a conceptual model of interrelationships between ecosystem and society.
- Evaluated the probability of occurrence and the magnitude of the effect of 15 pressures occurring in the Baltic Sea. The top five pressures identified were input of nutrients, increased temperature, decreased salinity, input of hazardous substances, and input or spread of non-indigenous species.

WGIBAR Murmansk February 2016

- Reported that since the 1980s there has been a warming trend, reduced fishing pressure, and increased biomass of several mostly boreal species. The current situation is unprecedented. The main findings were:
- Higher atmosphere and ocean temperatures, lower ice coverage
- The mean biomass of mesozooplankton was somewhat higher.
- Krill biomass remained higher than the long-term mean and Hyperiid amphipods (colder water), were at low levels.
- Capelin biomass decreased to a low level.
- Polar cod is at its lowest level since 25 years.
- New sea areas of sea are open for human activity due to ice retreat.
- The distribution area of the invasive snow crabs continued to increase.

WGINOSE Hamburg March: 2016 3 years ToR ended. Self-evaluation completed.

- Identified appropriate spatial scales (strata) to apply the Integrated Ecosystem Assessment (IEA) methods including the development of Bayesian Belief Networks (BBNs) to support ecosystem advice.

WGNARS Falmouth March 2016: 3 years ToR ended. Self-evaluation completed.

- Finalized the MSE model outputs for the Georges Bank and Gulf of Maine US ecoregions

- Developed a draft MSE model for the Canadian Grand Banks ecoregion.

WGEAWESS Belfast March 2016: 3 years ToR ended. Self-evaluation completed.

- Integrated Trend Analyses for the Irish Sea has been further developed
- Completed a review of the Ecosystem Overviews (EOs) recently published by ICES for Celtic Sea Ecoregion and the Bay of Biscay and the Iberian coast Ecoregion.
- Two new developing IEAs: one in the Gulf of Cadiz and the other one in the Bay of Biscay, both aiming at progressing towards the implementation of the Ecosystem-based Fisheries Management in these subregions.

WGICA Copenhagen May 2016

- Two assessment teams were established to initiate work on the development of integrated assessments on a subregional basis for:
    - Amerasian Basin/Pacific gateway
    - Eurasian Basin/Atlantic gateway.

WGIPEM Brest June 2015

- Focus on comparing how perturbations in mortality terms will influence the spatial and temporal dynamic of trophic cascades as represented in lower trophic level models of different complexity.
- Identified methods and possibilities to perform sensitivity analysis and parameter testing for complex ecosystem models.
- Physiological based models of foraging and growth and how to most appropriately include thermal limits such as aerobic scope as depicted in the Oxygen and Capacity Limited Thermal Tolerance (OCLTT) paradigm.

WGMSFDemo Glasgow February 2016

- Preparation work for the EFARO/ICES initiative on preparing an integrated ecosystem survey
- Significant progress made on the "clean up" of the DATRAS data for use with the OSPAR MSFD indicators
- Common stratification scheme for international surveys conducted in the Celtic Seas last year.
- Investigating a worked example for two different types of surveys in relation to the candidate foodweb indicator 'typical length' for survey suitability to deliver MSFD indicators.

3.4.6 ACOM and SCICOM Interaction

In 2014 it was agreed that SSGIEA would be represented on both ACOM and as an ex-officio member of ACOM. This was discussed and agreed by SCICOM at the ASC. The SSG chair has attended several meetings of ACOM in this capacity, and in particular the discussion focused on advice delivery and incorporation of the human dimension. As a result, and along with the BSG, WKIDEA was set up and will be run in October 2016 to help "integrate" the IEA approach. A similar process led to the setting up of WKDEICE to provide ecosystem and fisheries advice in the Baltic, which successfully met in 2016.

3.4.7 Perceived Needs and Gaps

As we stated in previous reports, an important need for SSGIEA was to bring together the IEA groups for information exchange, and methodology transfer. WKIDEA was specifically set up for this purpose and will meet in October 2016. The theme session at the 2016 ASC: Integrated ecosystems assessment and decision support to advance ecosystem-based fisheries management – Session F is designed to forge links with IEA work in the wider community – ICES and worldwide..

3.4.8 Examples of EG activities that fulfil the ICES Strategy and Science Plan

All the regional EG under SSGIEA have principally focussed on Goal 1 of the strategic plan "*Develop an integrated, interdisciplinary understanding of the structure, dynamics, and the resilience and response of marine ecosystems to change*", and on Goal 2 *"Understand the relationship between human activities and marine ecosystems, estimate pressures and impacts, and develop science-based, sustainable pathways.*

This includes the development of a range of worked IEA examples and detailed ecosystem descriptions. The approach to "integrate" the IEAs through WKIDEA takes this process forward another step.

Under Goal 3 *"Evaluate and advise on options for the sustainable use and protection of marine ecosystems"*, the groups are starting to develop the concepts of proactive advice, principally linked to fisheries advice, where ecosystem effects may be important, e.g. in the Irish and the Baltic Seas. The work of WGMSFDemo also specifically addresses this area in the context of MSFD advice using CFP data. The setting up of WKDEICE specifically addresses gaps between IEA and advice in the context of the Baltic Sea, where this problem was most obvious. The work on coupled models by WGIMM & WGIPEM also greatly enhances this understanding.

3.5 SCICOM/ACOM Steering Group on Integrated Ecosystem Observation and Monitoring (SSGIEOM; Nils Olav Handegard, Norway)

3.5.1 Status on SG Terms of Reference

Tor a-f) are common terms of reference for all SSGs and specifies the tasks on how to consolidate EG base, form new EGs, ensure the coupling to the strategic plan, and communication in general between the EG on matters. The specific ToRs for the steering groups are reported on in the following.

ToR g) Identify shortfalls in skills and knowledge needed to achieve the SG objectives, and where capacity building is needed in particular areas, so that ICES can develop training or other solutions. A process to address this was reported on in 2014, and the findings can be found in that year's report. In summary the common gaps that were reported were lack of hydrographic skills (WGIPS), socio-economics (WGRFS) and analytical skills including survey design and statistics (IBTSWG, WGIPS, WGBIFS). The impacts of the gaps are difficulty in optimizing over complex survey objectives, the use of recreational fisheries data (socio-economics) and analyses of hydrographical data.

ToR h) Map the EGs and their ToRs against the information and data that ICES needs to deliver the Science Plan and its advisory work, suitably prioritised (SP1.1).

The WKSUREQ concluded that a formalized system for mapping the information flows across the organisation is needed. DIG has initiated a process on collecting meta information about where the different data products are used. A SCICOM open session has been set up at this year's ASC to address the survey overviews including the data

products that they produce. A similar process needs to be set up from the data users (both Science and Advisory side), and there needs to be a place where the needs can be checked off relative to what is already provided.

ToR i-j) The development of methodology and adding value to fisheries independent surveys is an ongoing process and there are groups continuously addressing these aspects, mainly carried out within the technology groups (e.g. WGFAST, WGFTFB) and PGDATA, WGISUR, and WGISDAA, respectively. Developments for fishery data collection schemes are considered PGDATA and associated EGs (WGCATCH, WGBIOP, and WGRFS). In addition to this, PGDATA and WKCOSTBEN have pointed to pointed to several challenges in obtaining a cost efficient approach (see PGDATA report).

ToR m) Promote the development within EGs of standards and guidelines for good practice in data collection.

The ICES series of survey protocols (SISP) are a continuous task, and almost all survey groups have either finalized the job or have an advanced draft in place. Based on the WKSUREP work the SISP guidelines will be updated to include how to document key information for data product users. The WK has approached the survey groups, the users, including assessment groups, and input have been received from several of the groups. Some of the group report that they already have this in place, whereas others needs to look into this.

3.5.2 EG performance/MA ToR Progress

The table below list all the SSGIEOM EGs that have completed their first three-year term. All of them have submitted self-evaluation reports, which have been evaluated positively.

WGFAST	Working Group on Fisheries Acoustics, Science and Technology
WGFTFB	ICES-FAO Working Group on Fishing Technology and Fish Behaviour (WGFTFB)
WGBEAM	Working Group on Beam Trawl Surveys (2015 report not received yet)
WGISUR	Working Group on Integrating Surveys for the Ecosystem Approach
WGIDEEPS	Working Group on International Deep Pelagic Ecosystem Surveys
WGISUR	Working Group on Integrating Surveys for the Ecosystem Approach
WGTC	Working Group on target classification

3.5.3 EG participation

EG participation is a reoccurring theme, both in terms of skills and attendance. The challenges are similar to last year.

3.5.4 EGs in SSGIEOM

1) WGISUR – Working Group on Integrating Surveys for the Ecosystem Approach

2) WGFAST – Working Group on Fisheries, Acoustics, Science and Technology

3) WGFTFB – Working Group on Fishing Technology and Fish Behaviour

4) WGIDEEPS –Working Group on International Deep Pelagic Ecosystem Surveys

5) WKBIFS-ACOU – ICES Workshop on Implementation and Use in IBAS of a New Common Acoustic Database

6) WGCATCH – Working Group on Commercial Catches

7) WGRFS – Working Group on Recreational Fisheries Surveys

8) WGBEAM – Working Group on Beam Trawl Surveys

9) IBTSWG – International Bottom Trawl Survey Working Group

10) WGEGGS – Working Group on North Sea Cod and Plaice Egg Surveys in the North Sea

11) WKSUREP – Workshop to establish reporting guidelines from survey groups

12) WKARGH – ICES_NAFO Workshop on Age Reading of Greenland Halibut (Reinhardtius hippoglossoides)

13) WKARWHG– Workshop on Age reading of Whiting (Merlangius merlangus) (WKARWHG)

14) WKARA2 – Workshop on Age reading of European anchovy (Engraulis encrasicolus)

15) WKARSPRAT – Workshop on Age estimation of Sprat (Sprattus sprattus)

16) WKFICON – Workshop on Fish Condition

17) WGNEPS – Working Group on Nephrops Surveys

18) WKNEPS – Workshop on Nephrops burrow counting

19) WGBIOP – Working Group on Biological Parameters

20) PGDATA – Planning Group on Data Needs for Assessments and Advice

21) WGBIFS – Baltic International Fish Survey Working Group

22) WGMEGS – Working Group on Mackerel and Horse mackerel Egg Surveys (WGMEGS)

23) WGIPS – Working Group of International Pelagic Surveys

24) WGISDAA –Working Group on Improving use of Survey Data for Assessment and Advice

25) WGTC – Working Group on Target Classification

26) WGELECTRA – Working Group on Electrical Trawling

27) WGACEGG – Working Group on Acoustic and Egg Surveys for Sardine and Anchovy in ICES Areas VII, VIII and IX

28) WGALES – Working Group on Atlantic Fish Larvae and Eggs Surveys

29) EIMSD – EFARO/ICES meeting on Cooperation in Surveys and Data Collection

30) WKPIMP – Workshop to Plan and Integrate Monitoring Program in the North Sea in the 3rd quarter

31) WKGIC2 – Workshop on Growth-increment Chronologies in Marine Fish: climate-ecosystem interactions in the North Atlantic

32) WKCOSTBEN – Workshop on cost benefit analysis of data collection in support of stock assessment and fishery management

3.5.5 Science highlights

WGIPS has contributed substantially to the ICES acoustic database and associated postprocessing software (StoX). They have implemented the system for several of their

surveys. A paper by Gastauer et al on the distribution patterns of blue whiting has been published (Gastauer et al., 2016).

WGFAST The special issue in IJMS from the latest fishery acoustics conference are available online (Trenkel et al., 2016). The work with the ICES Acoustic metadata standard are progressing, and a new version is sent for review. This is an important input to the ICES acoustic database. Acoustic methods to assess krill distribution, investigate sound-scattering layers, pelagic habitats, and help construct a better understanding of oceanic features have been addressed. They have also focused on wideband systems and WGFAST will organize an ICES Training course on 'Principles and methods of broadband/wideband technologies: Application to fisheries acoustics" in December.

WGFTFB contributed to a two-and-half-day mini-symposium hosted by FAO in collaboration with Marista University of Merida. A synthesis of recent technological advancements in the spreading of mobile trawls have been provided, and non-extractive sampling is on the agenda. The group also address change management in the fishing industry, and suggest interaction with the SIHD.

WGBEAM has not been able to finalize their report this year.

WGISUR has developed a guidance document for all developing ecosystem monitoring (monitoring of one or more components of the ecosystem), whether from scratch or by adding tasks to current surveys. This is the main contribution from the 3 year cycle that is completed this year.

WGELECTRA has provided an update on ecosystem effects on pulse trawl with special reference to the species covered by the Natura 2000 species and habitats directive.

WGACEGG report the results from nine surveys. They are also looking into using auxiliary survey data to support anchovy mortality model, and are specifically addressing the daily egg production methods.

WGTC input pending.

WGIDEEPS input pending.

WGISDAA input pending.

WGBIFS There is work going on to move the historical data to the ICES databases and to phase in new postprocessing software for the surveys.

PGDATA has started to develop a cost benefit framework to ensure that data collection programmes are closely aligned with end-user needs, deliver data of sufficient quality to meet these needs, and make most efficient use of available human resources and funding.

WGBIOP focus on both existing biological parameters and on accuracy in derived life-history parameters which may support stock assessment; both single-stock and integrated ecosystem assessment. This is their first year, and the groups has good traction.

WGALES are concerned with standardization, calibration, data quality and data storage, and covered two science topics during their meeting, including "Current ichthyoplankton surveys in the Atlantic and Mediterranean" and "Recent developments in egg and larval mortality studies".

IBTSWG is close to implementing swept area abundance indices, based on trawl net geometry and towed distance.

WGEGGS2 has tested and proved the MIKey-M sampling and demonstrated that it can be used to sample fish eggs properly without costing extra time during the IBTS-MIK

survey. Fish eggs have been collected throughout the North Sea and with the same design as the MIK hauls.

3.5.6 Examples of EG activities that fulfil the ICES Strategy and Science Plan

See the preceding section on the SSG ToR, where each SSG ToR is linked to an item in the implementation plan. Under each ToR the EG that addresses the specific ToR is mentioned.

3.5.7 Interaction between ACOM and SCICOM

There is still a need for improved communication between data users and data providers. Several actions have been taken to improve this, but I am not confident that we have an efficient structure to accommodate this. Perhaps more strongly encourage the survey EG chairs to participate at the chairs meeting is warranted.

The comment from last year is still valid: "It is also worth noting that it is not necessary the communication between SCICOM and ACOM at a higher level that is the challenge. It is more that specialized survey groups and data users groups need to communicate on specific issues for relevant for both groups, rather than a situation where communication is established at ACOM /SCICOM level or steering group level."

3.5.8 Perceived needs and gaps

The need for a framework to evaluate and obtain an overview of the data from the survey groups and where this data flows is seen as a main gap. This should be seen as something more than simply an overview of what is presently being collected. The idea is that this could be used as a framework to include the work of WGISUR that could visualize how additional information from the survey groups could be used in, e.g., the IEA processes. The framework must contain the use and potential use of the information, including precision and bias considerations of the various data products. For any advisory process, the information that is used in the advice should be easily available. It could also serve as tool to visualize where the information from a survey flows to document how the survey effort was spent. There are processes initiated to address this, but it will need both development and maturation to fulfil its ambition.

3.5.9 References

Gastauer, S., Fässler, S. M. M., O'Donnell, C., Høines, Å., Jakobsen, J. A., Krysov, A. I., Smith, L., et al. 2016. The distribution of blue whiting west of the British Isles and Ireland. Fisheries Research, 183: 32–43.

Trenkel, V. M., Handegard, N. O., and Weber, T. C. 2016. Observing the ocean interior in support of integrated management. ICES Journal of Marine Science: Journal du Conseil: fsw132.

3.6 Benchmark Steering Group (BSG; Jörn Schmidt, Germany/Carmen Fenandez, Spain)

3.6.1 Progress on tasks

During 2016, the Benchmark Steering Group has continued to work in subgroups, focusing mostly on the 6 tasks that were presented in the report for the SCIOM and ACOM meetings in 2015. A core activity in 2016 was the work in the joint BSG-ACOM

ad-hoc subgroup to improve links between Expert Groups' and Benchmarks' work and to increase efficiency of resource utilization. A short background on this is given in 2.

List of BSG tasks:

Task 1: Identifying gaps and incremental improvements in the current benchmark processes

Task 2: Integration with the data quality assurance groups

Task 3: Integrated assessments and benchmarks

Task 4: Integrating by-catch (marine mammals) advice with fish stocks advice

Task 5: Role of WGSAM and reviewing of multispecies/ecosystem models for use in benchmarks

Task 6: Improve integration of WGISDAA (Improving the use of survey data for assessment and advice) in benchmark process

An additional task has been initiated to set up evaluation criteria for the uptake of science into assessment and advice. This is a crucial and core task.

3.6.2 BSG-ACOM subgroup

During the ACOM annual meeting in December 2015, ACOM discussed the need to develop a more flexible and productive environment for the ICES Expert Groups (EGs), particularly the assessment EGs, and for the benchmark process. An initial proposal was sketched during the ACOM meeting and a subgroup set up to work by correspondence according to Terms of Reference a-e below.

The main aims of the subgroup are to further develop the initial proposal prepared during the December 2015 annual ACOM meeting, focusing on

- Enhancing the way stock assessment EGs work, in cooperation with the ICES Secretariat (in particular, the new stock assessment posts at the Secretariat).
- Developing a more productive working environment for the stock assessment EGs, which should focus their work strategically towards improving stock assessments and benchmark preparation.
- Creating a more flexible process to structure the work leading up to benchmarks, so that the work of EGs (including stock assessment EGs) can focus on the main issues of each ecoregion and benchmarks take place when sufficient work has been developed; this should allow benchmarks to produce higher quality products. As this involves a wider range of experts and EGs in ICES, it should be considered in collaboration with the Benchmark Steering Group.
- The subgroup should prepare a proposal for discussion during the ACOM consultations in September 2016. The proposal should be detailed (not just a sketch) and include a timeline for possible implementation. Foreseeable problems should be identified and, where possible, mitigation measures proposed to facilitate the implementation
- The subgroup should propose a special session for the ASC2016 in Riga to allow feedback from a wider audience on the proposed changes.

As there is overlap with the work of the ACOM-SCICOM Benchmark Steering Group (BSG), it is considered appropriate that this should be a joint BSG-ACOM subgroup, chaired by Carmen Fernández (ACOM Vice-chair and BSG Co-chair) and Jörn Schmidt (BSG Co-chair). The following membership was agreed by ACOM: Larry Alade, Robert

Aps, Fatima Borges, Harald Gjøsæter, David Miller, Carl O'Brien, Morten Vinther, Christopher Zimmermann. Cristina Morgado and Mark Dickey-Collas will participate from the ICES Secretariat.

The ACOM chair, Eskild Kirkegaard, also took part in the subgroup's work.

The subgroup worked inter-sessionally, including 5 WebEx meetings during March-July. A document on the work of this group is available and the work will also be presented in an open session on Wednesday, 21st September 2016 during the ASC.

3.6.3 BSG ToRs for 2016

2015/2/ACOMSCICOM03 ACOM/SCICOM Benchmark Steering Group (BSG), chaired by Carmen Fernández*, ICES, and Jörn Schmidt*, Germany, will work by correspondence; hold WebEx meetings and direct meetings during the 2014–2016 ASC, and thematic workshops.

General ToRs

The main objectives of the Benchmark Steering Group are to:

a.1) Facilitate the transfer of science into advice.

a.2) Advance the benchmark process in ICES and develop the concept of regional ecosystem benchmarks.

a.3) Develop evaluation measures for the actual uptake of available science in assessment and advice.

a.4) Develop performance measures for the Benchmark SG work and the effectiveness of the benchmark process.

a.5) Form an umbrella for the entire benchmark process in ICES.

By means of:

b.1) Communicating and liaising with other Steering Groups, Expert Groups, ACOM and SCICOM, and the ICES Secretariat, to jointly carry out different aspects of the work, as appropriate.

b.2) Encouraging the dialogue between ICES scientists, managers and stakeholders, and their participation in the benchmark process.

b.3) Advising on how to attract new scientists and academics into the ICES benchmark process: advertise in international networks and develop an attractive publication scheme of benchmark results (with PUBCOM).

Overarching ToRs for Benchmark SG (2014-2016)

c) Identify advisory tasks that require benchmarking, based on science and advisory information.

d) Develop an achievable work programme for benchmarks in three main strands:

d.1) Annual benchmark programmes (most applicable to fish stocks assessments for recurrent advice). Focus on incorporation of relevant mixed fisheries, multispecies and ecosystem aspects (environmental drivers, impacts, constraints) in this process.

d.2) Evaluate the appropriateness, need and feasibility of establishing benchmarks for other environmental/ecosystem aspects of ICES recurrent advice (for example in connection with assessments of seabird population status or marine mammals).

d.3) Develop a multiyear roadmap for assessment of ecosystem components and integrated ecosystem assessments. Build on the process initiated by WKBEMIA in 2012 towards operational benchmarks of integrated ecosystem assessments (IEA) at regional scales. The roadmap should consider how a benchmark process should look at a regional scale, identifying common issues across the region (e.g. data quality, fisheries management, surveys, environmental conditions and changes); data workshops for the region may precede IEA workshops.

e) Actively seek elements of the work of the existing IEA Expert Groups and other relevant Expert Groups that could soon be integrated in advice. Facilitate the development of "demonstration" examples that could help clients and stakeholders see opportunities.

f) In collaboration with the Secretariat, develop draft ToRs for the actual benchmarks (for ACOM and/or SCICOM approval), defining aspects to be considered and advisory aspects to be delivered. This also includes identifying the scientific expertise needed and reconciling needs with availability.

Specific ToRs for 2016:

g) Develop and implement a work plan for 2016 with focus on:

g.1.) Develop performance measures for the BSG (ToR a.4)

g.2) Develop evaluation criteria for the uptake of science in assessment and advice (ToR a.3)

g.3) Develop develop an attractive publication scheme of benchmark results (ToR b.3)

g.4) Evaluate the effect of the new workflow and communication strategy on the benchmarks in 2017 (ToR d1)

g.5) Identify recurrent advice provided by ICES other than fish stock advice and evaluate the appropriateness of benchmarking the underlying assessment (see ToR d.2).

g.6) Evaluate WKBALT and WKIRISH to adjust the process for regional benchmarks (ToR d.3)

g.7) Prepare a sequel to WKRISCO together with SSGIEA

3.6.4 Interaction between ACOM and SCICOM

The activities of the BSG are targeted towards increased communication between SCICOM and ACOM expert groups (in line with BSG ToR b.1). The BSG being a joint ACOM/SCICOM Steering Group, the communication between both committees is almost automatically ensured through the co-chairs and the membership covering both committees and a series of crucial expert group chairs. BSG also reports to both committees and is represented in the joint leadership meeting.

4 Reports of SCICOM Operational Groups

4.1 Data and Information Group (DIG; Ingeborg de Boois, Netherlands)

The Data and Information Group (DIG) met in Copenhagen, 23-25 May 2016. 18 people representing 17 institutes in 10 different countries, a representative from OSPAR and ca. 10 members of the ICES Data Centre joined the meeting.

4.1.1 DIG positioning in ICES

In the light of the current SCICOM Leadership discussion, DIG discussed its position within ICES. In general, DIG is well able to be a cohesive pillar between horizontal layers (e.g. EGs, ADGs) in ICES. From some examples, it seems that the focus lays more on the data delivery and science side than on the advisory topics. However, the group agreed that this is merely a matter of visibility. Via the Data Centre DIG is at least informed about all ICES work related to data, and the responsibility for regular updates of Data Policy and Data Strategy, DIG has a generic role for the ICES community.

It was concluded that the DIG mission still applies, and reflects the scope of the group.

The current report structure and terms of reference were largely inherited from the expert group structure, and do not always effectively reflect the more strategic approach by DIG to provide an element of Data and Information Governance for the ICES community.

Short term changes

It was suggested that one of the terms of reference could be refined, by changing it from 'Review offspring groups' into 'Propose ad-hoc groups (governance, workshops, training, etc.) related to specific topics, and/or datasets, to facilitate improvements related to data issues to SCICOM, ACOM, SCICOM SSGs and/or EGs, and review the outcome of those ad-hoc groups'. The ad-hoc groups fall under DIG, and all have a limited life-time –till the task is fulfilled. In this way, DIG will have the possibility to organise follow-up on specific problems, and define the appropriate group composition for the specific issue.

Furthermore, to increase the visibility of DIG and let more people be aware of the role of DIG, the group should be actively represented at the annual ICES WGCHAIRS meeting.

Change of workflow on longer term

Proposals for change of mode of operation on longer term are still under discussion. The first ideas are presented in the DIG 2016 report.

4.1.2 ICES Data Policy

DIG updated the ICES Data Policy as part of the regular update data Policy reviewing cycle (every four years). The scope of the Data Policy was reworded and a new paragraph referring to open access data was added, related to inclusion of more restricted data sets than the current ones. The Data Policy now distinguishes between data submitted to ICES where public access might be restricted – the underlying data- and the data products that are still fully publicly available even if derived from restricted undelaying data.

The updated Data Policy will be reviewed by Council before it will be published. The most recent version of the ICES data policy is always available via the ICES website.

4.1.3 Digital Data Citation

ICES is now capable to mint persistent identifiers as DOI's (Digital Object Identifiers) for publications and datasets. The implementation in ICES is currently in a testing phase and will be available in late 2016.

The minting process connects metadata, DOI number and the URL of the publication (landing page) together. Using a DOI resolver (eg. https://dx.doi.org/) the DOI number can then direct a user to the publication or dataset via the URL linked to the DOI. The developed solution integrates with the current ICES SharePoint webpage on library publications. The DOI metadata will be available as a link on each publication thumbnail.

The use of digital citation and DOI minting is expected to widen in scope after this initial phase where the focus has been on publications. When doing digital citations on datasets there are additional issues to deal with like how to deal with non-static datasets.

4.1.4 ICES Data Guidelines

The ICES data type guidelines as currently shared at the ICES website and OceanDataPractices (since autumn 2014) are a valuable asset for the wider oceanography community. The ICES data type guidelines were originally written in the 1990's, and reviewed in in the early 2000's. The last review took place in 2006. It is important to keep the guidelines up to date. DIG agreed on the a procedure to review the guidelines and make their existence better known.

4.1.5 ICES dataset collections and portals

Tools and facilities that have been developed or improved by the ICES Data Centre:

New operational dataportals and datasets

- Portal for deep sea discoveries (Vulnerable Marine EcoSystems): The portal recently launched by ICES visualises all known vulnerable marine ecosystem (VME) data in the North Atlantic.
- Impulsive noise register system (requested and funded by OSPAR and HELCOM). Underwater noise, sound that has the potential to cause negative impacts on marine life, is one of the key descriptors of marine ecosystem health under the Marine Strategy Framework Directive (MSFD).
- The biodiversity portal, which collates data on seabirds and seals abundance and distribution, went online in May 2016. This portal assembles data supplied by contracting parties to OSPAR (North East Atlantic) as well as other data from the ICES area. This database is specifically purposed with supporting OSPAR in providing information that will feed their regional assessments of biodiversity.

Coming up (soon)

- The acoustic trawl data portal is a result of a series of workshops, and on request of the survey groups involved in acoustic fish surveys (e.g. WGIPS 2016 report). The ICES Data Centre presented the idea behind and the component of the upcoming Acoustic Trawl data portal as well as the general structure of the Acoustic Trawl data model.

The Quality Control (QC) Database is a repository for information about the checks that are applied to the incoming datasets. It now has about a thousand registered

checks. It is scheduled for the second part of 2016 to develop a web based interface for the QC Database in order for users to query it and produce downloadable reports for each dataset.

4.1.6 Data plan progress

The ICES Data Plan progress can be found in the DIG 2016 report Annex 6.

4.2 ICES Training Programme (Daniel Duplisea, Canada)

The ICES Training Programme was initiated in 2009 to help build capacity in ICES and to support the scientists involved in the advisory process. ICES offers training courses by high-profile scientists and instructors to ensure that scientists whose work is related to the advisory process, have the necessary skills. The objective of ICES training is quality assurance in the advisory process.

The ICES Training Programme has been successful in meeting its objectives of increasing the scientific capacity of the ICES community and promoting best practices in marine science. Thirty-five ICES courses and several co-sponsored courses have been offered on a wide diversity of skills, including stock assessment (introductory and advanced), ecosystem modelling, model building, management strategy evaluation, Bayesian inference, fisheries advice, trawl survey design and evaluation, integrated ecosystem assessment, analysing and visualization of Vessel Monitoring Systems, communication of science and advice, and how to lead an effective technical meeting. Each course was taught within the context of the ICES science and advisory system to demonstrate best practices as well as state-of-the-art technical skills. More than 800 students have attended ICES courses from over 30 countries. Most students have been from ICES member countries, representing all member countries but one. Many students and several instructors are from other countries and cooperating organizations.

4.2.1 Progress Report

In 2016, the ICES Training Programme has had seven training courses on offer.

- Training course in the R environment, 29 February–4 March 2016, Copenhagen, Denmark
- Social science methods for natural scientists, 26–28 May 2016, Brest, France
- Design and analysis of catch sampling programmes, 12–16 September, ICES, Copenhagen, Denmark
- Data-limited stock assessment, 12–16 September, Reykjavik, Iceland
- Management Strategy Evaluation: an introduction, Postponed to 2017
- Stock assessment (advanced), 28 November–2 December, ICES, Copenhagen, Denmark
- Principles and methods of broadband/wideband technologies: Application to fisheries acoustics, 8–14 December, Bergen, Norway

Completed course reports are available on the ICES website

The ICES Training Programme has also contributed to providing training courses for the DGMARE. This year we offered two two-day general introduction courses to stock assessment, another will be offered in December on assessment of large pelagics.

4.2.2 Training courses in 2017

Proposals for new and repeated courses are being considered. At the annual training group meeting at the ASC in September, six courses were identified to be included in

the course programme for 2017. Dates and instructor confirmations will be posted on the ICES training website, as soon as agreements and arrangements are in place.

- Abundance estimation from fisheries acoustic surveys: an introduction (John K. Horne and Paul Fernandes)
- Stock assessment introduction (TBC)
- Management strategy evaluation (Jose de Olivera and Carryn de Moore)
- Stock assessment methods (Anne Cooper and TBC)
- Bayisian Network analysis (Laura Utsitalo and TBC)
- Approaches to integrated assessment of status and trends in marine ecosystems (Christian Mollman and TBC)

4.2.3 Proposals/initiatives for new training courses

This year, only one new course proposal was received, (Abundance estimation from fisheries acoustic surveys: an introduction, John K. Horne and Paul Fernandes). This was discussed at the training course group meeting in September, and agreed that the requirements/needs for training would be brought up at the following working group chairs meeting, to identify how the needs for courses can be best expressed in future.

4.2.4 Online Training Initiatives

In response to the SCICOM encouragement to develop online training, several initiatives were undertaken. The Training Group recognizes that participation in courses has decreased, and online training could provide a cost-effective method for reaching a wider audience for meeting the programme objectives.

The Training Group, with the support of ICES staff, has been evaluating the various approaches to online training. Experience from the past few years of this evaluation, indicates that increased expertise is required for this task. Possibly a professional in this field could be contracted. It has been decided that a separate meeting to identify the needs for online training will be held. An online training plan will be produced by winter 2017.

4.3 Publications and Communications Group (Secretariat)

4.3.1 Communications (including social media, news articles and press releases, website development, and outreach)

Social media continues to play an important role for ICES, with 6353 LinkedIn members (12% increase from September 2015); 4383 Twitter followers (84% increase from September 2015); and, 3033 Facebook "likes" (51% increase from September 2015). An Instagram account was opened at the end of August.

One reason for the spiked increase in Facebook and Twitter can be explained by us using paid promotion in social media for the first time. The ACOM and SCICOM Chair job openings appeared as promoted or suggested posts on users' social media feeds for two weeks, which resulted in users not only viewing the post but also in "liking" and "following" the ICES social media accounts.

News articles that emphasize ICES strategic areas and report on ongoing and upcoming events and meetings are a focus for the Communications team. Both May symposia (zooplankton and MSEAS) were promoted by a series of articles posted throughout the week of the events. The bi-monthly e-newsletter includes in-depth feature articles,

written in co-operation with scientists in our network. By September, seven press releases had been sent out to the mailing list, including press from different ICES member countries. Write-ups of seven Editor's Choice articles from ICES Journal of Marine Science have been published on the website so far this year.

Together with the IT department and with the help from outside consultants, the Communications department has undertaken a website development project to update the website to responsive design. This means that the website view adjusts automatically, based on the device the user is using, be it PC, tablet, or a smartphone. The "groups" section is also getting an update, so that information that is entered in the Resources Coordination Tool (RCT) will be automatically updated on the website. Communications was also involved in the development of the ecosystem overview diagrams, which were published online at the end of August.

Data decks, a series of cards describing ICES data portals, were published in the spring. The cards are mostly used and distributed by our Data Centre. A set of images, which can be used in ICES communications, e.g. PPT presentations, outreach materials, infographics have also been developed.

The Communications department is responsible for outreach for the ASC, as well as organizing early career scientist events during the conference. A new addition to the ECS programme was a skills workshop, "Getting published", organized in cooperation with BONUS. A new science communications Open Session was scheduled, in addition to the networking meeting for communications professionals.

A Code of Conduct for sharing images and text from presentations during ICES ASC in social media was discussed. It was agreed that the Guidelines for ASC presenters (available on ICES website) should explicitly state that if ASC presenters do not wish their materials to be tweeted, photographed, etc. they need to self-identify this by including a disclaimer on their work. PUBCOM recommended that ICES have a clear, official position on this matter.

PUBCOM further recommended the creation of short (i.e. 30-second) videos with the authors of Editor's Choice articles talking about their work, in addition to the news articles currently produced. This could also be considered for press releases and In Other Words *blog posts.*

4.3.2 Review of Category 1 and Category 3 publications

Four category 1 resolutions for CRRs were discussed. PUBCOM had comments for two of the resolutions, as outlined below.

For the ICES Plankton Status Report 2015 (2016/1/SSGEPD01), PUBCOM suggested improving the title to reflect the information in the report (e.g. an atlas). The two external plankton websites, wgze.net and wgpme.net, are ICES products but are not hosted by ICES. They should be clearly identified as ICES products. The Plankton Status Report is based on data coming from WGZE members and hosted by different institutes. PUBCOM recommended a ToR for the groups to discuss how to centralize and save the data so these data can be preserved, as well as how to merge the external webpages with the ICES website.

For the Status Report on Harmful Algal Events in the ICES area (2016/1/SSGEPI03), PUBCOM noted that a scientific synthesis should be included within the report.

PUBCOM recommended SCICOM to accept all four category 1 resolutions.

Three SISP manuals were proposed for publication in the CRR series.

SISP is a separate publication series; therefore, PUBCOM did not support these three resolutions for publication in the CRR series.

PUBCOM noted the three category 3 (ICES symposia) publication resolutions.

4.3.3 DOI (Digital Object Identifiers) project

As reported at the midterm SCICOM meeting, a contract was signed (and paid for) in October 2015 with DTU Informatics (library). ICES is licensed to mint up to 1000 DOIs per annum under the current arrangement. The Publications and IT departments have agreed to make a provision in future annual budgets to upgrade the license to unlimited minting of DOIs, as we ramp this up.

The Data Centre has implemented the database and web service that links to the SharePoint process for assigning a DOI when publishing a new document/data product, etc.

IT continues to work towards finalizing the metadata template for publications; the full metadata for all publications will now be shown on the website (previously this has been hidden).

Since the midterm SCICOM meeting, discussions regarding the DOI metadata have continued, within ICES Secretariat and PUBCOM. We are seeking a system that will maximize the citations and recognize the publications and their authors. Current metadata fields include: Name, Publication title, Publication type, Resource type, Publication year, Publication authors, Publisher (ICES), DOI/URI, Abstract, and Keywords (optional, but recommended). Once the fields are finalized, the next step will be to begin implementing the DOIs in ICES publications, on a case-by-case basis.

4.3.3.1 Expert group reports – executive summaries

PUBCOM reviewed the recommendation to SCICOM that moving forward, expert group reports will continue to contain an executive summary, but this will no longer be registered as a separate document in the library. The importance of the executive summaries was recognized. However, in an effort to make the best use of Secretariat resources and to streamline working procedures, discontinuing the practice of providing the executive summaries as separate documents was suggested. An alternate approach could be to copy/paste the summary into the release announcement email. Establishing a maximum length for the executive summaries was also suggested.

4.3.3.2 Expert group reports – author designation

A proposal regarding how authors of expert group reports are cited in the metadata was presented and reviewed.

PUBCOM recommended that ICES remains listed as the author of EG reports, in both metadata and in citations.

4.3.4 Strengthening the profile of ICES CRRs

The conclusions and suggestions outlined in the SCICOM report, "Cooperative Research Reports (CRR) strengthened profile" were reviewed by PUBCOM. While strengthening the CRR review process from one reviewer to two was considered, PUBCOM agreed this will be a challenge, as it is often difficult to secure reviewers. The ICES Secretariat will consider ways to improve the CRR review process.

A preliminary investigation was conducted to determine if the CRRs can be added to the big databases (Web of Science, scopus). It was noted that it will be difficult for ICES

CRRs to qualify for these databases because the reports do not satisfy some key criteria, including regularity of publications, number of issues per year, international range of reviewers, etc. Authors need to be encouraged to cite the CRRs, TIMES, etc. in a standard way, with the correct authors, and as part of a series. Further exploration with Thomson Reuters is also required regarding the possibility of getting CRRs on a Web of Science index in addition to Zoological Record.

Improving the text on ICES website concerning the CRRs was discussed. ICES Secretariat will look at modifying the text, to more clearly highlight the goal of the series, and the fact that CRRs are open access and peer reviewed. ICES Secretariat will also explore ways to engage EGs/authors and their networks in promoting the CRR series.

The report further recommended that SCICOM consider if there is a need for a process for identifying expert group reports/symposia in relation to productions of CRRs that contribute to the implementation of the ICES Strategic Plan, and how to proceed with the synthesis of this information. This matter was referred to SCICOM for further discussion.

PUBCOM recommended a new, more dynamic title be considered for the ICES CRR series, and that dedicated dissemination/advertising be implemented when new CRRs are published.

4.3.5 Proposal to revise ICES citation disclaimer

A recommendation to revise the citation disclaimer in ICES publications was reviewed by the group. The following citation disclaimer was agreed in principle, with caution that the text relating to commercial use be reviewed.

"The material in this report may be reused for non-commercial purposes using the recommended citation. ICES may only grant usage rights of information, data, images, graphs, etc. of which it has ownership. For other third-party material cited in this report, you must contact the original copyright holder for permission. For citation of datasets or use of data to be included in other databases, please refer to the latest ICES data policy on the ICES website. All extracts must be acknowledged using an appropriate citation."

ICES Secretariat will revise the citation disclaimer. Once the text is finalized, it will be added to the templates for all ICES publications.

4.3.6 Feedback on ICES library search functions

Issues related to the ability to search for publications in ICES library were discussed. The Communications Officer noted specific feedback on frustrations experienced when searching for material on ICES website library. While all feedback is welcomed, not all can be addressed within the current resource framework. The Communications Officer will aim to have a meeting (focus group) with website users to identify search issues and how best to address them. Once the current website projects are completed, the Secretariat web team (Communications Officer and SharePoint Developer) will look into website search issues to determine which ones can be resolved in-house, and those that require additional resources, as well as the timeline for completing any of these updates.

4.3.7 Nomination of new PUBCOM Chair

The procedure for the nomination of the PUBCOM Chair will be decided following a review of PUBCOM ToRs and membership currently being undertaken in SCICOM.

4.4 ASC 2016, Riga, Latvia (ICES Conference Coordinator)

Participants

By 12 September, 611 participants had registered for the 2016 ASC. (620 at the same date in 2015). On the last day of the conference, the final registration count is 661 registered participants. 50 have registered on-site. We have 37 countries represented and had 34 no-show. The early registration fee closed on 1 August to encourage participants to register early.

Oral and poster presentations

In May we had received 616 abstracts, submitted to 18 theme sessions. Following the theme session convenors' selection process, we had 321 oral presentations and 114 posters in 2016. For comparison, we had 326 oral presentations and 126 posters in 2015.

Theme session A **Fisher collected acoustic data (FCAD)** Conveners: Steve Barbeaux (USA) Martin Pastoors (the Netherlands) Sascha Fässler (the Netherlands) **16 oral presentations**	**Theme session B** **Predictably Irrational – a new scientific research field for the science underpinning marine-resource management** Conveners: Sarah B. M. Kraak (Germany) Dorothy J. Dankel (Norway) **13 oral, 1 poster**
Theme session C **From individuals to ecosystems: their ecology and evolution** Conveners: Anna Kuparinen (Finland) Silva Uusi-Heikkilä (Finland) **26 oral, 14 posters**	**Theme session D** **Ecosystem changes and impacts on diadromous and marine species productivity** Conveners: Timothy Sheehan (USA) Katherine Mills (USA) Mark Payne (Denmark) **24 oral, 5 poster**
Theme session E **The emerging science of ecological multimodel inference for informing fisheries management** Conveners: Phillip Levin (USA) Stefan Neuenfeldt (Denmark) Tessa Francis (USA) **6 oral presentations**	**Theme session F** **Integrated ecosystems assessment and decision support to advance ecosystem-based fisheries management** Conveners: John Pope (UK) Lena Bergström (Sweden) Melania Borit (Norway) **24 oral, 25 poster**
Theme session G **The inshore challenge – management of recreational and commercial fisheries accounting for social benefits, economic value, and biological sustainability** Conveners: Kieran Hyder (UK) Harry Strehlow (Germany) Estanis Mugerza (Spain) Maria Spedicato (Italy) **24 oral, 12 poster**	**Theme session H** **Looking backwards to move ahead: how the wider application of new technologies to interpret scale, otolith, statolith and other biomineralised age-registering structures could improve management of natural resources** Conveners: Ewan Hunter (UK) Vladimir Laptikhovsky (UK) Philip Hollyman (UK) **29 oral, 14 posters**

Theme session I
Seasonal-to-decadal prediction of marine systems: opportunities, approaches, and applications
(Co-sponsored by PICES)
Conveners: Mark Payne (Denmark)
Desiree Tommasi (USA)
Alistair Hobday (Australia)
22 oral presentations

Theme session J
What is a good pelagic habitat?
Conveners: Mark Dickey-Collas (ICES)
Abigail McQuatters-Gollop (UK)
Verena Trenkel (France)
5 oral, 3 posters

Theme session K
Make marine sediment extraction sustainable by mitigation of related processes with potential negative impacts
Conveners: Ad Stolk (the Netherlands)
Keith Cooper (UK)
Michel Desprez (France)
15 oral, 2 posters

Theme session L
Integration challenges in maritime spatial planning – approaches, science gaps, and communication demands
Conveners: Andreas Kannen (Germany)
Michael Gilek (Sweden)
18 oral, 8 posters

Theme session M
The role of zooplankton in exploited ecosystems: top-down and bottom-up stresses on pelagic food webs
Conveners: Angus Atkinson (UK)
Webjoern Melle (Norway)
Piotr Margoński (Poland)
19 oral, 9 poster

Theme session N
Long-term phytoplankton trends in the ICES area: regional distribution, bloom dynamics and response to environmental drivers
Conveners: Alexandra Kraberg (Germany) Eileen Bresnan (UK)
Marie Johansen (Sweden)
10 oral, 1 poster

Theme session O
"When is enough, enough?" Methods for optimising, evaluating, and prioritising of marine data collection
(Co-sponsored by PICES)
Conveners: J.H. Vølstad (Norway)
Mike Armstrong (UK)
Marie Storr-Paulsen (Denmark)
Robyn Forrest (Canada)
27 oral, 10 poster

Theme session P
Arctic Ecosystem Services: Challenges and Opportunities
(Co-sponsored by AMAP and EU-PolarNet)
Conveners: Candace Nachman (USA)
Susanne Kortsch (Norway)
13 oral, 3 posters

Theme session Q
Harvest control rules: beyond FMSY for an ecosystem approach to fisheries?
Conveners: Didier Gascuel (France)
Lisa Borges (Belgium)
Dave Reid (Ireland)
12 oral, 4 posters

Theme session R
Integrating humanities and social sciences into marine ecosystem management - first steps
Conveners:
Jörn Schmidt (Germany)
Patricia M. Clay (USA)
18 oral, 3 posters

Registration

The registration fee included morning and afternoon coffee. Lunches were not included this year. This model was tested and deemed successful in 2014, and 2015 so was used again this year.

This year, the standard registration fee had been increased to 190 EUR (260 EUR after 1 August). Student registration remained at 70 EUR.

Travel funds

24 successful candidates received travel funds from ICES. Most of them were first time participants. In total funds amounting to 10,000 Euro were distributed this year.

Early Career Scientists events at the ASC 2016

This year, three separate events were organised for the Early Career Scientists: a mentor programme, a two-hour 'skills workshop', and a two-hour career chat. Each event was very popular and had full or good participation.

29 ECS signed up for the mentor programme with six mentors volunteering to meet up and guide their mentees through the ASC. The BONUS/ICES skills workshop on "*how to get published*", had 70 participants (full capacity) coming to hear three speakers (Howard Browman, Jacob Carstensen on do's and don'ts of scientific writing, and Line Reeh on how to get your work noticed after it has been published). And finally, 25 ECSs turned up for the career chat which had seven senior scientists volunteering to engage with young scientists for an informal chat during lunch.

In general, the feedback received from the ECSs is very good. According to the feedback, the mentor programme makes young scientists feel welcome at an otherwise big conference full of participants with loads of experience and knowledge of ICES. Mentors were found to be inspiring, helpful and good at guiding their mentees through the ASC. It was also deemed useful to have a pre-defined group of peers to meet up with and discuss shared research interests.

Participants found the topic of the skills workshop very interesting and felt that they gained new skills and insights. The speakers were well chosen, although some overlapping of content especially between two speakers could have been avoided. The third talk on how to get your work noticed after it has been published (Line Reeh, Communications Officer at DTU Aqua) was very popular. There is room for improvement though: the tight schedule during a 2-hour lunch break did not leave enough room for detail and discussions.

The Career Chat received good feedback as well. The ECS found the set-up (round tables, plenty of time for in-depth discussions, informal atmosphere) excellent, and the senior scientists open and very helpful.

Social arrangements

Our Latvian hosts kindly invited all conference participants to a lavish conference opening reception on the evening of Monday 19th September.

The poster session was held on Tuesday 20 September, in the Hall 1 of the conference centre. We have 114 posters on the programme, and had very few no shows. Two drinks tickets per person were distributed, and cash bar was available.

Wednesday evening also saw the launch of Games night, *Help us avoid the tragedy of the commons and win prize money doing it!*

The conference dinner was held at a traditional Latvian restaurant, with a buffet of Latvian food and entertainment from a local folk pop band, and an ICES cover of Puff the Magic Dragon! Tickets cost 40 EUR, and 166 tickets (max capacity) were sold out by Thursday noon.

Conference material

The ASC information booklet was available in the conference bags. The ASC website has been remodeled to be 100% mobile friendly, and includes the programme, theme session timetables and practical information.

Because of the mobile friendliness of the site, it was decided not to invest in an app this year.

Abstracts will be made available online, to the public, with ISBN numbers, in a few weeks.

5 Reports of Strategic Initiatives

5.1 ICES/PICES Strategic Initiative on Climate Change effects on Marine Ecosystems (SICCME; Myron Peck, Germany, John Pinnegar, UK, Anne Hollowed, USA, PICES, and Shin-ichi Ito, Japen, PICES)

A roadmap has been developed to enable researchers associated with SICCME to produce a broad range of scientific publications that can contribute to writing groups preparing the 6th Assessment Report of the IPCC. This work is proceeding in four phases: Phase 1) identification of modelling teams; phase 2) harmonizing future scenarios to be investigated; Phase 3) reporting on progress and comparing results at dedicated workshops and symposia; Phase 4) publishing results by the end of 2018.

The first two phases are underway. A dedicated workshop on modelling climate change impacts on fish and fisheries in Seattle in August 2015 identified 14 potential regions where there was sufficient data to model the effects of climate change on fish and fisheries. Stemming directly from recommendations of that workshop, the SICCME convened a socio-economic workshop in June 2016 to address the range of possible management responses. That workshop (The ICES/PICES Workshop on Economic Modelling of the Effects of Climate Change on Fish and Fisheries (WKSICCME_Econ) was chaired by Alan Haynie (USA), John Pinnegar (UK), Lisa Pfeiffer (USA), Mitsutaku Makino (JPN), Jörn Schmidt (DE), and Sophie Gourget (France) met in Brest, France and was attended by35 scientists from >9 countries. Alternative, future scenarios have been produced and are being discussed.

In parallel, funding has been procured by several groups involved in SICCME to allow regional modelling to move forward. These projects include 'CERES' (2016-2020) in Europe, COCA in the NW Atlantic and ACLIM in the NE Pacific. SICCME members are linked to a variety of other climate assessment / modelling activities. Two additional workshops were convened to provide status reports on regional modelling activities. A 1-day ICES/PICES workshop was convened directly after the 2016 ASC: Modelling Effects of Climate Change on Fish and Fisheries (WKSICCME-I), chaired by Anne Hollowed (USA), John Pinnegar (UK), Myron Peck (DE), and Mark Payne (DK). A second, sister workshop will be convened by the SICCME in association with the Annual Science Conferences of PICES (to be held in November 2016).

Contributing to this overall vision of consolidating projection modelling of fish and fisheries across the world's oceans have been i) ICES-PICES SICCME theme sessions such as Session I at the 2016 ASC in Riga co-convened by Mark Payne (Denmark) Desiree Tommasi (USA) and Alistair Hobday (Australia), ii) active involvement of SICCME members in the upcoming workshop on changes in fish distribution (WKFISHDISH) to be held in November 2016 in Copenhagen, and iii) recruitment of new SICCME members, particularly those acting as PIs ofongoing, large-scale programs making short-, medium-, and long-term climate projections.

Activities in 2017-2018

- 1-day workshops will be held in connection to the 2017 ASC of both ICES and PICES. Resolutions are under preparation for these workshops. These workshops will be a platform for comparison of projections of climate change impacts on fish and fisheries stemming from different regions.
- ICES-PICES SICCME submitted a proposal for a theme session at the 2017 ICES ASC in Ft. Lauderdale, Florida, to highlight ongoing regional modelling

projecting impacts on fish and fishery-dependent communities with emphasis on the representative fishing pathways (RFPs) needed to fully depict the range of possible mitigation scenarios that could be considered by managers. The proposed co-conveners are Jon Hare (USA), Myron Peck (Germany) and John Pinnegar (UK). An additional ICES PICES SICCME theme session is planned to be submitted for the 2017 PICES ASC.

- SICCME plans to convene a workshop in Copenhagen in late spring 2017 to discuss methodology for rapid climate vulnerability assessments for Europe. A resolution for this workshop is being developed and will be submitted soon.
- SICCME co-chairs (Anne Hollowed, Myron Peck, and John Pinnegar) form part of the Scientific Steering Committee for the 4th Effects of Climate Change on the World's Oceans Symposium co-sponsored by ICES-PICES and the IOC-UNESCO. Planning is underway for this upcoming event to be held May 2018 in Washington DC. This event and the publications stemming from it mark Phases 3 and 4 or the current roadmap developed by the ICES-PICES SICCME.

5.2 Strategic Initiative on Biodiversity Science and Advice (SIHD; Jörn Schmidt, Germany, Eva-Lotta Sundberg, Sweden, David Goldsborough, the Netherlands

SIHD had its inaugural meeting at the ASC 2015 and started to discuss on how to operate. This discussion was continued at the Workshop on Activity Planning of SIHD (WKAPSIHD) in IJmuiden, 12th and 13th January 2016 and led to concrete actions (see 3 SIHD Actions). The main questions, which drove the discussion, were:

1) Which participatory processes are available or need to be established to engage across disciplines and involve the wider civil society?

2) How could an integrated, interdisciplinary discourse in support of an effective communication between human, social and natural science look like?

3) What are key components of IEAs and how can the IEA work benefit from the involvement of the humanities and social sciences?

4) Which social, cultural and economic indicators and models are available or need to be developed and how could the use of empirical quantitative and qualitative methods to characterize the state of and changes in the human dimension of ecosystem-based management be extended?

SIHD met at the ASC on Thursday, 22 September, in Riga to update on the activities and discuss further activities.

A key conclusion is that it needs to be recognized that the social sciences have a similar breadth in disciplines as the natural sciences and the expertise needed depends on the topic addressed (and not to state: 'we need someone from the social sciences'). Interdisciplinary cooperation needs time as scientists from different disciplines need to learn and understand each other's language, concepts and way of working. The same is even truer in trans-disciplinary research, where the scientists need to understand the view of the stakeholders and the stakeholders the way science is working. Visualization and role-play might be a way of communication here, but certainly communication and the fora in which discus-sion takes place are important. Social science disciplines and also the humanities offer a lot of insight into how humans act in a given system. These insights are gained with the help of a large variety of different methods, some quantitative, but some also qualitative.

The first activity carried out was an online questionnaire on the current activities carried out by expert groups, which already integrate different disciplines from natural and social sciences and humanities and to explore where need is perceived. It further assessed perceived obstacles and support needs to integrate different disciplines within ICES expert groups. The results of the survey was presented at the 2016 ASC and a short summary report will be submitted to SCIOM, ACOM and Council.

The second activity was the development of an outreach strategy, which involves both the inward looking aspects on how to communicate within ICES and between expert groups as well as how to reach out and connect to other organizations. The latter point will be particularly worked on with respect to upcoming conferences. The activities at the ICES ASC 2016 included buttons and stickers (see layout in annex 4). The buttons were distributed to those participants, which showed an integration of natural and social sciences and humanities or engaged in innovative ways with stakeholders in their research. The stickers were used to highlight posters in the same way. Both worked very well in making the initiative and ICES visible, not only at the conference, but also via social media to the outside.

The MSEAS conference was a brilliant forum to investigate the breadth of on-going integrative work and to communicate the activities of the Strategic Initiative to a broader audience. At the conference two meetings were held, which took advantage of the presence of different organisations, programmes and projects, which are also engaged in integration of natural and social sciences and the humanities. It was concluded, that an umbrella network would help in communicating between different actors and specifically to reach out to communities, which are currently not well connected.

Contact has been established with the organizers of the MARE conference 2017. Suggestions were made to propose a couple of session, focussing on the integration of social and natural sciences and to suggest a key note speaker from the natural sciences at the MARE conference (normally a social science conference).

The concrete issue of integration in the context of Integrated Ecosystem Assessments will also be taken up in two upcoming workshops, WKIDEA (ACOM/SCICOM Workshop on Integrated Ecosystem Assessment Methods) and WKINWA (Workshop on IEA in the Northwest Atlantic).

Much of the work will be done by correspondence and inter sessional. However to ensure the possibility of physical meetings, including a broad attendance, the possibilities of further funding, e.g. through a COST action, will be explored.

5.2.1 Recommendations

RECOMMENDATION	ADRESSED TO
1. Further promote the engagement of human and social sciences in all structural layers of ICES.	ICES leadership
2. ICES leadership should establish and strengthen working relationships with communities, organizations and societies in the realm of social sciences and humanities	ICES leadership
3. develop support for increased transparency between groups, to be available for all group members. For example a web-page built on a database where the work of all	ICES secretariat

groups can be searched and an expert database, e.g. similar to www.oceanexpert.net	

5.2.2 SIHD Actions

ACTION	RESPONSIBLE
Systematically contact all ICES EGs (chairs) to explore where there is already context for SIHD. Understand current needs and demand of 'human' disciplines Understand how the integration of social scientists can happen or work How could we better link those social scientists, who already are engaged within ICES	Eva-Lotta, Jörn
Explore further opportunities for funding, e.g. COST action	Jörn, Jan Jaap, David, Andreas, Christine
Demonstrate to SCICOM/ACOM/Council/us the development of an IEA using WGNARS as a case study; use graphics, simple language to communicate efficiently with the target groups	David, Geret, Christine
Outreach to other organisations/venues/conferences: MSEAS, MARE,	Olivier and Doug, Marloes
Produce outreach material, poster, leaflet, etc.	Nathalie, Katell, Christine
ASC theme session structure, Theme session timing with other (similar) session	Jörn, Sarah
Interact with groups like STECF to understand what the issues in integrating the Human Dimension are	Sarah, David, Katell
How could advice on Human Dimension issues (or within the ecosystem approach) could look like (e.g. produce demonstration advice)	Marloes, Jan Jaap,

5.2.3 Terms of Reference for 2016

2015/2/ACOMSCICOM05 The ICES Strategic Initiative on the Human Dimension in Integrated Ecosystem Assessments (SIHD), chaired by David Goldsborough (Netherlands), Eva-Lotta Sundblad (Sweden), and Jörn Schmidt (Germany), will conduct activities over the period 2015 to 2018, coordinated by a core group to:

i) Strengthen the expertise in human and social sciences by identifying and linking activities undertaken within ICES

ii) Strengthen or develop links with existing organisations and initiatives outside ICES dealing with human and social science in the marine realm

iii) Provide a point of entry for non-natural scientist to participate in ICES IEA work

iv) Develop ways to integrate the humanities and social sciences within Inte-grated Ecosystem Assessment groups by working with social scientists to:

a. Make use of existing and further developing participatory processes to engage across disciplines and involve the wider civil society

b. Specify key components of ICES IEA and identify how this work can benefit from the involvement of the humanities and social sciences

c. Develop an integrated, interdisciplinary discourse in support of an ef-fective communication between human, social and natural science

d. Make use of existing and further developing social, cultural and eco-nomic indicators and models and extending the use of empirical quantitative and qualitative methods to characterize the state of and changes in the human dimension of ecosystem-based management

v) Identify approaches on how to enable the integration of this knowledge in ecosystem based management and how to give advice

5.3 Strategic Initiative for Stock Assessment Methods (Steve Cadrin, USA, Ciaran Kelly, Ireland)

The ICES Strategic Initiative for Stock Assessment Methods (SISAM) was designed to assure that scientists can apply the best stock assessment methods for developing management advice for fisheries. The first stage of SISAM culminated in a simulation-based workshop to evaluate performance of stock assessment methods and the World Conference on Stock Assessment Methods (WCSAM, 17-19 July 2013, Boston USA). The second stage of SISAM involves continued coordination with Regional Fishery Management Organizations and national agencies, the development of "good practice" guidelines, further evaluation of model performance, and transition to a Global Assessment Methods Expert group (GAME).

In the second phase of SISAM, progress was made in global coordination of advancement in stock assessment methods, and development of best practices guidance for stock assessment methods.

SISAM leadership organized three linked sessions for the 2016 world fisheries congress (Busan Korea). The sessions investigated the current state of the art for stock assessment, the development for new methods (including data poor, and spatial stock assessments) and the use of environmental information in fisheries management. Although no formal discussions on GAME took place, many WFC participants expressed an interest in joining GAME once it was inaugurated.

SISAM leadership submitted a proposal for an open session to summarize progress toward SISAM objectives, present a plan for transition to GAME. In an effort to attract global stock assessment experts, SISAM leadership also proposed a theme session. Other proposed theme sessions (12 - Quantifying and communicating uncertainties in stock assessment; 25 - Designing fishery stock assessments: should they be simple, complex, or include an ensemble of structural assumptions?) may also help to attract active stock assessment scientists to the ASC and the open session discussion.

SISAM leadership is involved in the Center for the Advancement of Population Assessment Methodology (CAPAM) and related Good Practices Guides on selectivity, growth modelling, and data weighting. A CAPAM workshop on "Data conflict and weighting, likelihood functions, and process error" (October 2015, La Jolla, USA) provided advice and guidance on practices for using data in fishery assessments. The 5-day meeting included an applied modeling session, keynote and research presenta-

tions, and focused discussions. Major topics included data conflict and weighting, likelihood functions, temporal variation, model misspecification, wildlife population assessment methods, data conflict and weighting in stock assessments using the Stock Synthesis modeling framework and related simulation methods/software. Scientists presented work from both ongoing research efforts and completed studies. A special issue in the journal Fisheries Research is planned for papers developed from the workshop. The next CAPAM workshop will be on "Recruitment: theory, estimation, and application in fishery stock assessment and management" (30 Oct-3 Nov 2017, Miami USA). The workshop will focus on underlying processes, the stock-recruitment relationship, temporal variation, spatial considerations, and management implications. The workshop will include a Stock Synthesis tutorial and applications on tuna stock assessments. The following topic is tentatively on natural mortality. The change in venue for CAPAM reflects a transition to a more global approach, which is entirely consistent with SISAM plans. Although the governance of CAPAM has been largely by the Inter-American Tropical Tuna Commission and the NOAA Southwest Fisheries Science Center, CAPAM workshops draw on global expertise and had global relevance. Both SISAM and CAPAM have most of the RFMOs, and we hope to merge towar a global governance.

Annex 1: 2016 List of ICES SCICOM Expert Groups that were dissolved, established, renamed or that changed committee

Type of Action	Name	Chair – Outgoing	Chair – Incoming
Change of Chairs	***SCICOM Steering/Operational Groups/Strategic Initiatives***		
ACOM	Advisory Committee	Eskild Kirkegaard, Denmark	TBD
SCICOM	Science Committee	Yvonne Walther, Sweden	TBD
SSGEPD	Steering Group on Ecosystem Processes and Dynamics (SSGEPD)	Graham Pierce, UK	Silvana Birchenough, UK
SSGIEA	SCICOM/ACOM Steering Group on Integrated Ecosystem Assessments (SSGIEA)	Dave Reid, Ireland	Mette Skern Mauritzen, Norway
SSGIEOM	Steering Group on Integrated Ecosystem Observation and Monitoring (SSGIEOM)	Nils Olav Handegard, Norway	Sven Kupschus, UK
BSG	Benchmark Steering Group (BSG)	Carmen Fernandez, Spain Jörn Schmidt, Germany	TBD
PUBCOM	Publications and Communications Group	Audrey Geffen, Norway	TBD
Established	***Expert Groups***		
SSGEPD	Working Group with the Aim to Develop Assessment Models and Establish Biological Reference Points for Sea Trout (Anadromous *Salmo trutta*) Populations (WGTRUTTA)		Johan Höjesjö*, Sweden, and Name*, Country (TBD)
SSGEPD	Working Group on Seasonal-to-Decadal Prediction of Marine Ecosystems (WGS2D) (approved intersessionally in 2016)		Mark Payne*, Denmark
SSGEPI	ICES-ICCAT Methods Working Group (MGWG)		Arni Magnusson*, Iceland (ICES), and Name*, Country (ICCAT representative, TBD)
Change of Chairs	***Expert Groups***		
SSGEPD	Working Group on Cephalopod Biology and Life History (WGCEPH)	Marina Santurtun, Spain (outgoing Co-Chair)	Graham Pierce (incoming Co-Chair)
SSGEPI	Working Group on Introduction and Transfer of Marine Organisms (WGITMO)	Henn Ojaveer, Estonia	Cynthia McKenzie*, Canada
SSGEPI	Working Group on Marine Planning and Coastal Zone Management (WGMPCZM)	Andreas Kannen, Germany	Matthew Gubbins*, UK, and Andreas Morf*, Swede
SSGEPI	Working Group on Spatial Fisheries Data (WGSFD)	Josefine Egekvist, Denmark	Niels Hintzen*, the Netherlands, and Christian von Dorrien*, Germany

Type of Action	Name	Chair – Outgoing	Chair – Incoming
SSGEPI	Working Group on Multispecies Assessment Methods (WGVHES)	Daniel Howell, Norway (outgoing Co-Chair)	Alexander Kempf*, Germany (incoming Co-Chair)
SSGIEA	Working Group on the Integrated Assessments of the Barents Sea (WGIBAR)	Edda Johannesen, Norway, Yuri Kovalev, Russia	Elena Eriksen, Norway, Anatoly Filin, Russia
SSGIEA	Working Group on North Sea Integrated Assessments (WGINOSE)		Erik Olsen, Norway (incoming co-chair)
SSGIEA	Working Group on Comparative Analyses between European Atlantic and Mediterranean marine ecosystems to move towards an Ecosystem-based Approach to Fisheries (WGCOMEDA)		Christian Möllmann, Germany (incoming co-chair)
SSGIEOM	Working Group on Integrating Surveys into ecosystem monitoring programmes (WGISUR)	Ingeborg de Boois, The Netherlands	Ralf van Hal*, The Netherlands
SSGIEOM	Working Group on Fisheries, Acoustics, Science and Technology (WGFAST)	Verena Trenkel, France	Richard O'Driscoll, New Zealand
SSGIEOM	Working Group on Fishing Technology and Fish Behaviour (WGFTFB)	Pingguo He, USA (outgoing co-chair)	Haraldur A. Einarsson*, Iceland (incoming co-chair)
SSGIEOM	Working Group on Electrical Trawling (WGELECTRA)	Bob van Marlen, The Netherlands	Adriaan Rijnsdorp*, The Netherlands
SSGIEOM	Working Group on Beam Trawl Surveys (WGBEAM)	Kelle Moreau, Belgium	Holger Haslob*, Germany
Dissolved	***Expert Groups***		
SSGEPI	Workshop on Understanding the Impacts and Consequences of Ocean Acidification for Commercial Species and End-users (WKACIDUSE) – **to be dissolved after the meeting in December 2016**		Silvana Birchenough (UK, ICES), Sam Dupont (Sweden, AMAP) and Ono-san (Japan, PICES) – **possible Change in Chairs**
SSGEPI	Bayesian Belief Network Case Studies (WKBNCS)		Roland Cormier, Canada, and Vanessa Stelzenmüller, Germany
SSGEPI	ICES/PICES Workshop on Economic Modelling of the Effects of Climate Change on Fish and Fisheries (WKeconSICCME)		Alan Haynie, USA; John Pinnegar, UK; Lisa Pfeiffer, USA; Mitsutaku Makino, Japan; Jörn Schmidt, Germany; and Sophie Gourguet, France
SSGEPI	Workshop on Activity Planning of SIHD (WKAPSIHD)		Eva-Lotta Sundblad, Sweden, David Goldsborough, the Netherlands, Jörn Schmidt, Germany
SSGEPI	Working Group on Aquaculture (WGAQUA)		
SSGEPI	(former) Working Group on Methods of Fish Stock Assessment (WGMG)		
SSGEPD	ICES/PICES Workshop on Phase 1: Modelling Effects of Climate Change on Fish and Fisheries (WKSICCME1)		Anne Hollowed, USA, John Pinnegar, UK, Myron Peck, Germany, and Mark Payne, Denmark

Type of Action	Name	Chair – Outgoing	Chair – Incoming
SSGEPD	Workshop on Sea Trout 2 (WKTRUTTA2)		Ted Potter, UK, and Johan Höjesjö, Sweden
SSGEPD	Workshop on Eel Stocking (WKSTOCKEEL)		Derek Evans, UK
SSGIEA	Workshop on developing integrated advice for Baltic Sea ecosystem-based fisheries management (WKDEICE)	Rudi Voss, Germany, Christian Möllmann, Germany, and Maciej Tomczak, Sweden	
SSGIEOM/BSG	Second workshop on the impact of ecosystem and environmental drivers on Irish Sea fisheries management (WKIrish2)	Mike Armstrong, UK,	
SSGIEOM	Workshop on cost benefit analysis of data collection in support of stock assessment and fishery management (WKCOSTBEN)	Mike Armstrong, UK and Jon Helge Vølstad, Norway	
SSGIEOM	Workshop to establish reporting guidelines from survey groups (WKSUREP) *[to be dissolved after December 2016]*	Nils Olav Handegard, Norway, and Marie Storr Paulsen, Denmark	
SSGIEOM	Workshop on Age Reading of Greenland Halibut (*Reinhardtius hippoglossoides*) (WKARGH)	Karen Dwyer, Canada & Gróa Pétursdottír, Iceland	
SSGIEOM	Workshop on Age estimation of Whiting (*Merlangius merlangus*) (WKARWHG2) *[to be dissolved after the meeting on 22–24 November 2016]*	Joanne Smith UK & Lotte Worsøe Clausen, Denmark	
SSGIEOM	Workshop on Age estimation of European anchovy (*Engraulis encrasicolus*) (WKARA2) *[to be dissolved after the meeting on 28 November – 2 December 2016]*	Andres uriarte, Spain, Begoña Villamor, Spain & Gualtiero Basilone, Italy	
SSGIEOM	Workshop on Growth-increment Chronologies in Marine Fish: climate-ecosystem interactions in the North Atlantic (WKGIC2)	Bryan Black, USA, Christoph Stransky, Germany and Beatriz Morales-Nin, Spain	
SSGIEOM	Workshop on Age estimation of Sprat (*Sprattus sprattus*) (WKARSPRAT) *[to be dissolved after the meeting on 15– November 2016]*	Julie Coad Davies, Denmark & Claire Moore, Ireland	
SSGIEOM	Workshop on Fish Condition (WKFICON) *[to be dissolved after the meeting on 17–18 November 2016]*	Josep Lloret, Spain Claire Saraux, France & Pierluigi Carbonara, Italy	

Type of Action	Name	Chair – Outgoing	Chair – Incoming
SSGIEOM	Workshop on *Nephrops* burrow counting (WKNEPS) *[to be dissolved after the meeting on 9–11 November 2016]*	Ana Leocadio, UK and Jennifer Doyle, Republic of Ireland	
SSGIEOM	Workshop to Plan and Integrate Monitoring Program in the North Sea in the 3rd quarter (WKPIMP)	Andrew Kenny, UK and Ingeborg de Boois, the Netherlands	
SSGIEOM	EFARO/ICES meeting on Cooperation in Surveys and Data Collection (EIMSD)	Tammo Bult, EFARO, and Eskild Kirkegaard, ICES	
SSGIEOM	Workshop on Age estimation of Norwegian Spring Spawning Herring between Norway, Denmark, Iceland and the Faroe Islands (WKNSSAGE)	Jane A. Godiksen, Norway	
New Workshops			
SSGEPD	Workshop on Predator-prey Interactions between Grey Seals and other marine mammals (WKPIGS)		Andrew Brownlow*, UK; Nora Hanson*, UK; Jan Haelters*, Belgium; and Abbo van Neer*, Germany
SSGEPD	Workshop on Biological Input to Eastern Baltic Cod Assessment (WKBEBCA)		Michele Casini*, Sweden, and Margit Eero*, Denmark
SSGIEA	Workshop on Spatial Analyses for the Baltic Sea 2 (WKSPATIAL2)		Michele Casini, Sweden, and Stefan Neuenfeldt, Denmark
SSGIEA	Workshop on IEA in the Northwest Atlantic (WKINWA)		David Goldsborough*, the Netherlands
SSGIEA	ACOM/SCICOM Workshop on Integrated Ecosystem Assessment Methods (WKIDEA)		David Reid (Ireland) and Jörn Schmidt (Germany)
SSGIEOM	Workshop on Technical Development to Support Fisheries Data Collection (WKSEATEC)		Dave Stokes
SSGIEOM	Workshop on Collecting Quality Underwater Acoustic Data in Inclement Weather (WKQUAD)		Matthias Schaber*, Germany, and Mike Jech*, USA
SSGIEOM	Joint Workshop of WGFTFB and WGFAST (JFTAB)		Paul Winger*, Canada, and Chris Wilson*, USA
SSGIEOM	ICES Workshop on Implementation and Use in IBAS of a New Common Acoustic Database (WKBIFS-ACOU)		Hjalte Parner*, ICES Secretariat, and Olavi Kaljuste*, Sweden
SSGIEOM	Workshop on monitoring technologies for the mesopelagic zone (WKMESO)		Benjamin Planque*, Norway + **TBD**
SSGIEOM	Workshop on North Sea Herring larvae surveys, data needs and execution (WKHERLARS)		Cindy van Damme*, The Netherlands and Richard D.M. Nash*, Norway

Type of Action	Name	Chair – Outgoing	Chair – Incoming
SSGIEOM	Workshop to develop abundance and biomass survey indices in Datras for the stocks assessed by the Bay of Biscay and Iberian waters Ecoregion (WKDABSI)		Lisa Readdy*, UK and XXXX
SSGIEOM/BSG	Stock Assessment Workshop for Irish Sea stocks (WKIrish3)		Chair Hans Gerritsen, Ireland + External chair
SSGIEA	Workshop on Developing Integrated Advice for Baltic Sea Ecosystem–Based Fisheries Management 2 (WKDEICE2)		Maciej Tomczak, Sweden, Rudi Voss, and Christian Möllmann, Germany

Annex 2: Performance evaluation of Science Implementation– "gut feeling"revisited 2016

The document includes expert evaluations of the SCICOM Steering Group Chairs:

- Graham Pierce, SSG Ecosystem Processes and Dynamics (SSGEPD)
- Henn Ojaveer, SSG Ecosystem Pressures and Impacts (SSGEPI)
- Dave Reid, SSG Integrated Assessments of Ecosystems (SSGIEA) – not available but will be filled in shortly
- Nils Olav Handegaard, SSG Integrated Monitoring and Observation (SSGIEOM)

Summary

The gut feeling exercise was introduced in 2014 to give a brief overview of the status of the implementation of the Science Priorities under the Science Implementation Plan that support ICES Strategic Plan (2014-2018)

The revisited evaluation 2016 is to show the midways status of implementation.

The scale of scoring the implementation was established as follows.

1 Not Started

2 Just Started

3 Some Progress

4 Good Progress

5 Doing Well

The result of the evaluation is shown in the table below. The expert evaluation of 31 priority areas shows increased scores in 16 areas (marked in green in the table below). Priorities areas scoring some progress to doing well (3-5) are 22 (16 in last evaluation) and areas scoring 4-5 are 11 (4 in last evaluation).

The evaluation is considered to be conservative and the progress is in fact more extensive. This is due to that the priority areas are assigned to a specific SSG. A more extensive mapping of the implementation started in 2015 by initiative of SCICOM. In this living document the crosscutting effects are clearer and give a fuller picture of the implementation of the Priority Areas. The major strategic changes occur in the Multiannual evaluation of the Expert groups including renewing of the Terms of Reference.

SSGEPD	Priority area	2014	2016	Comments
Describe and quantify the state of North Atlantic Ocean regional systems	1. Assess the physical, chemical and biological state of regional seas and investigate the predominant climatic, hydrological and biological features and processes that characterise regional ecosystems	3	4	In general I think we are making good progress, especially through groups like WGBIODIV and BEWG. Topics like climate change and indicators are well covered.
	2. Quantify the nature and degree of connectivity and separation between regional ecosystems	1	1	Arguably some relevant information is collected but I don't see anyone focusing on it
Understand and forecast the impact of climate variability and change on marine ecosystems	3. Quantify the different effects of climate change on regional ecosystems and develop species and habitat vulnerability assessments for key species	3	4	
	4. Understand the influence of climate impacts across a range of temporal and spatial scales, from local to global and from seasonal to multidecadal and identify indicators of climate driven biotic responses and forecast trajectories of change	3	4	
Resolve and quantify ecological processes in marine ecosystems, including modelling the dynamics of food webs and their responses to environmental change	5. Quantify the role of structural and functional diversity in marine ecosystems in providing stability and resilience	1	3	For some of the more basic knowledge on structure and function coverage is more patchy but arguably significant. This is also true of work on ecosystem services although only one group focuses on ES
	6. Investigate linear and nonlinear ecological responses to change, the impacts of these changes on ecosystem structure and function and their role in causing recruitment and stock variability, depletion and recovery.	3	3	

	7. Develop end to end modelling capability to fully integrate natural and anthropogenic forcing factors affecting ecosystem functioning	1	2	I am not sure anyone is doing true end-to-end models but many components are modelled
Quantify the relationship between habitat condition, ecological processes and the provision of ecosystem goods and services	8. Define and quantify north Atlantic Ecosystem Goods and Services, model their dependence on ecosystem processes and habitat condition and their social, economic and cultural value.	1	2	
	9. Identify indicators of ecosystem state and function for use in the assessment and management of ecosystem goods and services	2	3	

SSGEPI	Priority area	2014	2016	Comments
Estimate long term trends of human	10. Develop historic baseline of population and community structure and production to be used as a basis for population and system level reference points.	2	3	WGHIST has identified useful datasets. Support for storage in ICES data center is needed. Next step is baseline development. The next 3 yr of this group should be related specifically to this TOR and perhaps be named something like WG Historical baselines
Understand, quantify and mitigate	11. Develop methods to quantify multiple direct and indirect impacts from fisheries as well as from mineral extraction, energy generation, aquaculture and other anthroponegic activities and estimate the vulnerability of ecosystems to such impacts.	3	3	Strong development of modelling of impacts from fisheries. Contaminant impacts has started to developed treshholds and is progressing steady and well.
	12. Develop approaches to mitigate impacts from these activities, particularly reduction of non target mortalities and enhancement/restoration of habitat and assess the effects of these mitigations on marine populations	2	2	Development is made in ICES but not particularly in EPI groups. Work has been done in relation to discards. WGSAM investigates impacts of by-catch on other target species through F. WGVHES has worked on the role of coastal habitats on exploited populations. We may get something related to essential fish habitat from that group. Score would be higher if other activities were evaluated . Remove priority from SSGEPI?
	13. Develop indicators of pressure on populations and ecosystems from human activities such as eutrophication, contaminants and litter release, introduction of alien species and generation of underwater noise.	3	4	With the recent movement of ITMO and BOSV into EPI this work will progress faster in the steering group. Aquaculture groups are progressing in terms of that particular type of eutrophication
Provide evidence in support of sustainable management of ecosystem goods and services	14. Evaluate ecological, economic and social trade offs between ecosystem protection and sustainable use to advise on management of human activity in marine ecosystems	1	1	SGSA which looks and social dimension of aquaculture but it is in developing. WGMARS moved to IEA. Reevaluate the SSG TORs
	15. Develop tactical and strategic models to support short	5	5	Tactical fisheries models both single and multispecies are well covered. Good work associating coastal habitats

	and long term fisheries management and governance advice and increasingly incorporate spatial components in such models to allow for finer scale management of marine habitats and populations			with exploited population dynamics. Spatial aspects are well considered in SIMWG and some nations (e.g. Iceland) has strong spatial aspects to their stock assessment which can make appearances in WGSAM. Support for WGMG to make sure it continues to be important and it is key to this SSG TOR.
	17. Develop science in support of advisory needs in marine aquaculture systems, minimizing environmental impacts and integrating other marine sectors.	3	4	Primarily in WGAQUA, potential expansion but WGAQUA is actually spinning off TORS and workshops related to these areas. I do not see a strong need to change in this area, it is coming along as long as we continue to support the group.

SSGIEA	Priority area	2014	2016	Comments
Develop a scoping process to identify objectives to guide IEA's in ICES regional Seas	18. Identify objectives for IEA's that address ecosystem stability and health, taking cognizance of ecological, social and economic sustainability goals as well as multi scale issues.	4	4	All IEAs now have a series of objectives either designed in advance, or as a product of the analyses themselves highlighting the key pressures on the ecosystem. Social and economic sustainability goals form elements of the IEA in a number of regions, particularly in developing conceptual models around this aspect. In addition WGMARS with WGNARS & WGINOSE have that as a key objective vi a dedicated workshop WKINWA.
	19. Identify issue based ecosystem questions relevant to science and management needs that can be addressed by developing IEA's	2	3	This is now a component of all IEAs. WKDEICE was set up to deliver this in the Baltic, and WGMSFDemo for MSFD based advice in the Celtic Seas. Other IEAs have incorporated in their ongoing work.
	20. Provide priorities and specifications for data collection frameworks supporting IEA's.	3	3	This is a stated aim, of the IEA groups, but has not been developed further yet. Recent work in WGEAWESS has shown the potential to identify key sector – pressure – ecosystem state linkages that can be used to identify the main areas of concern and hence the data needs, or improvement to those data streams required. Further work on this will be carried out at WKIDEA.
Advance IEA methodologies and approaches in the ICES context	21. Conduct pilot studies in data rich areas for alternative IEA approaches, linking quantitative and qualitative methods at appropriate spatial and temporal scales.	1	2	We are using a range of different IEA approaches in different areas that help towards these objectives. In particular, Bayesian Belief networks (BBN)being explored in WGIAB and WGINOSE can make use of both quantitative and qualitative data. The ODEMM analyses used in WGEAWESS can now make use of both using e.g. mapped quantitative data, as well as expert judgment to evaluate critical areas.

Develop approaches that allow forecasting within an IEA and evaluation of the effectiveness of tradeoffs of different management options	22. Determine and demonstrate what modelling and analytical approaches will allow projections of ecosystem states in IEA's	3	3	Forecasting of ecosystem conditions remains a challenge. The best approach to this would be the Integrated Trend Analyses (ITA) developed in WGIAB, WGINOSE, and WGEAWESS, and being developed in others. Food web and ecosystem models used in the Baltic, Norwegian and Barents Seas also allow some projection, as do GAM based analyses within WGEAWESS and Ecopath with Ecosim modeling used in other areas. Extensive modeling in WGIAB has been able to identify trade –offs. MSE approaches are being developed by WGNARS. WGIPEM are focused on model improvement and sensitivity testing
	23. Use IEA's to informing management about the effects of cumulative pressure and additive and non additive impacts, and which provide risk evaluations and analyses of tradeoffs between sectoral objectives.	1	2	ITAs, BBN, and ODEMM style analyses all make some approach to multiple pressures, and are used across the IEA Expert Groups. This can allow identification of where more than one sector and/or pressure impacts on a given ecosystem element. However, it cannot yet identify where, and how those interact beyond simply cataloguing their occurrence. Understanding cumulative pressures will likely be a long term goal for these groups, and will require major interaction with other science EG.
	24. Compare IEA and single issue approaches regarding their efficacy in providing management and governance advice on sectoral and multi sectoral use of the oceans.	2	3	Several groups e.g. WGIBAR, WGNARS, WGINOSE and WGEAWESS have deployed different IEA approaches within their areas. In some cases these have already been used for advice on management. Essentially, different approaches have different strengths and weaknesses. A major activity for WKIDEA will be to review SWOT analyses on IEA methods from the IEA EGs, and evaluate these in this context.

SSGIEOM	Priority area	2014	2016	Comments
Identify and prioritize ICES monitoring and data collection needs	25. Identify monitoring requirements for science and advisory needsin collaboration with data product users, including a description of variable and data products, spatial and temporal resolution needs, and the desired quality of data and estimates	3	3	
	26. Develop a cost benefit framework to evaluate and optimize monitoring strategies in the context of the capabilities of, and reqests from ICES Member Countries and clients.	2	4	
Develop further the methodology for the observation and monitoring of marine ecosystems in the ICES area.	27. Identify knowledge and methodological monitoring gaps and develop strategies to fill these gaps	2	2	
	28. Promote new technologies and opportunities for observation and monitoring and assess their capabilities in the ICES context	4	4	
	29. Promote the development and testing of new fishing gear technology and methods for selective reduction of by-catch and discards and for mitigation of other environmental impacts of fishing	4	4	

Implement integrated monitoring in the ICES area	30. Allocate and coordinate observation and monitoring requests to appropriate expert groups on fishery dependent surveys and sampling and monitor the quality and delivery of data products.	3	4	
	31. Ensure the development of best practice through establishment of guidelines and quality standards for (a) surveys and other sampling and data collection systems; (b) external peer reviews of data collection programmes and © training and capacity building opportunities for monitoring activities	3	3	