

SCICOM Progress Report 2020

An annual report to the ICES Council to describe the scope, scale and impact of ICES science, implementation of ICES Science Plan and the work of ICES Science Committee



ICES
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International Council for
the Exploration of the Sea

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International Council for the Exploration of the Sea Conseil International pour l'Exploration de la Mer

H. C. Andersens Boulevard 44–46
DK-1553 Copenhagen V
Denmark
Telephone (+45) 33 38 67 00
Telefax (+45) 33 93 42 15
www.ices.dk
info@ices.dk

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1 Extended Summary

The ICES Science Committee continues to support ICES science to grow in scale, scope and impact. The general objectives of the Science Committee are to work with the ICES community and Secretariat to keep the ICES science programme dynamic, internationally relevant, and impactful; to ensure seamless links between science, data and advice; and to engage with scientists in ICES member countries and beyond by planning an annual cycle of meetings and workshops as well as the Annual Science Conference.

2020 has been and still is a challenging year for everyone. The COVID-19 pandemic has had a dominant effect on all aspects of daily life, and therefore also on how science in general, and the work of ICES expert groups has been carried out. Thanks to immense commitment and tireless work of the whole network, including all individual scientists and especially the Secretariat, the meeting activities and work continued, although in different ways than normally, and ICES was able to reach key achievements

In July, the transition between the outgoing and the incoming SCICOM chair was organised fully remotely and the new chair, Jörn Schmidt, took on his role in full on 1 August 2020.

Notable activities in 2020 included (i) the establishment of the Steering Group on Data Science and Technology (DSTSG); (ii) a stronger focus on supporting expert groups, including support for online meetings; (iii) furthering the engagement of new scientists participating in the ICES community; (iv) an increased frequency and strategic emphasis on science communication; (v) increasing the links between science and advice – a key product of which has been the recently released viewpoint on the effect of scrubber technology; and (vi) maintaining and developing international collaborations. These activities have taken place alongside the continued delivery of science outputs and publications by the expert groups.

One hundred and fifteen working groups, forty-five workshops and twenty benchmark workshops, supported by six steering groups, were active in 2020. Expert group meetings in 2020 saw a very high number of new participants, and had a higher overall attendance than in previous years. The exact reason for this cannot yet be conclusively determined, but one reason certainly was that experts haven't had to travel and thus had no travel costs. In July 2020 SCICOM approved DSTSG, which will start to work on from January 2021. DSTSG will be responsible for guiding and supporting expert groups that are developing, assessing and applying new technologies, as well as advancing data science, systems management, quality assurance, and data governance. DSTSG also reinforces the science priority emerging techniques and technologies.

Four new steering group chairs were elected in September 2020 to lead the new DSTSG and three existing steering groups: Ecosystem Observation Steering Group (EOSG), Ecosystem Processes and Dynamics Steering Group (EPDSG) and Integrated Ecosystem Assessments Steering Group (IEASG). The incoming chairs will work with the current chairs to ensure a smooth transition for 1 January 2021.

The development of the new resolution forms and a searchable resolution database has continued and is now in the technical development phase. The harmonisation of the information on all resolution types will simplify the process of drafting resolutions, especially for the different types of EGs that currently use three different forms. The database of approved resolutions will also facilitate more efficient searching and reporting of the expert groups, symposia, and publications resolutions, including filtering by region and science and advice priorities. The database will also enable the

tracking of links between groups Terms of Reference and science priorities, and facilitate the identification of expertise in the network.

One Co-operative Research Report (CRR) was published since the last SCICOM report to Council. A further seven reports are being prepared for publication in future years. Five Plankton ID Leaflet were published, one will be published soon, and seven are in preparation. Twelve Identification (ID) Leaflets for diseases in fish and shellfish are currently in preparation. Two Techniques in Marine Environmental Sciences (TIMES) were published and four are in the pipeline. There's has been overall a very strong increase in readership. For example, the average views of CRRs published in 2019 have increased substantially to 1700 views per report vs. around 200 - 400 previously. The reviewer acceptance rate is high for our in-house publications, at around 80%, indicating that these publications are considered important and relevant both within and without the ICES community. The publications website is undergoing a restructuring. The contents and the design are being updated in order to attract more visitors, and to make it more user-friendly for interested individuals from within and without the ICES community. The Science Impact and Publications Group together with the secretariat is also working on developing a new library platform for ICES. The new library will increase the findability and accessibility of ICES publications and will support the ongoing increase in outside recognition of ICES science. The group also recommended the adoption of CC-BY 4.0 licensing for all publications to allow a broad use of ICES science, while ensuring correct attribution of content to ICES.

Several training courses that were planned for this year have been cancelled or postponed to next year due to the COVID-19 pandemic. Two courses were moved online for 2020 – the Fish stock assessment and Bayesian training courses, which will take place in October and December respectively. The stock assessment course is fully booked, with candidates on the waiting list. However, despite the potential further reach of online courses, online teaching is still very work-intensive, and therefore issues regarding online teaching and online courses need to be further discussed in the near future.

The Data and Information Group (DIG) worked with the Data Centre on the Core Trust Seal (CTS) accreditation application, which was submitted in July 2020. Feedback from the CTS is expected by late September 2020. Core Trust Seal is based on requirements established by the World Data Systems (WDS) and the Data Seal of Approval (DSA), and certify core characteristics of trustworthy data repositories. DIG is also working towards a single data policy proposal that will address all aspects of how data is received, maintained and safeguarded by ICES.

Inter-institutional collaborations in 2020 have included running or setting up joint expert groups, including with PICES, IOC, IMO and PAME. At other levels, and with inputs from SCICOM, ICES has engaged in international processes linked to the Arctic, the UN Decade of Ocean Science for Sustainable Development, and science and advice in Areas Beyond National Jurisdiction. All four ICES co-sponsored international symposia in 2020 have been postponed to 2021. The Oceans Past Symposium VIII was held as a virtual meeting in 2020. With the two symposia already planned for 2021, we now have six symposia to be held in 2021.

The implementation of the ICES Science Plan will be further progressed and supported by the ongoing efforts to introduce more consistent and concise resolution forms, to improve and quality control expert group descriptions and terms of reference and to implement the resolutions database. The main priorities beyond this are detailed in the implementation plan and include efforts to

- (i) promote ICES science to a wider international constituency and to early career scientists through collaborations and training, broadening of expert groups, targeted early career and new topic events at the ASC and ICES co-sponsored symposia, increased use of science highlights and an active communications strategy, development of impact case studies, and broader ASC formats;
- (ii) continue to provide clear and accessible paths for new participants to engage with ICES;
- (iii) continue to strengthen links between science and advice;
- (iv) put in place and embed all processes for monitoring implementation of the Science Plan (especially collation and reporting of science information and statistics across all expert groups in a consistent way);
- (v) increase international scientific cooperation through targeted and concrete activities with scientific partner organisations like PICES, CIESM, IOC, FAO, AMAP; IASC, GFCM; and
- (vi) improve the link to national science activities relevant to ICES.

Beyond the implementation plan, the focus is on further developing effective work environments for expert groups meeting remotely, early career scientists, and developing formats for online and hybrid symposia and the ASC, which support the scientific exchange and networking capabilities for all scientist.

2 Introduction

This introduction defines the purpose of the SCICOM Progress Report and the role of SCICOM and associated groups. Much of the content of this Progress Report is compiled from submissions provided by ICES groups and the ICES secretariat.

2.1 Purpose of the Progress Report

The SCICOM Progress Report is an annual report to the ICES Council that summarises the scope, scale and impact of ICES science in 2020 and SCICOM plans for future science delivery. The primary purposes of the report are to update Council on the scope, scale and impact of ICES science, implementation of the ICES Science Plan and the work of SCICOM.

The report covers activities in the steering groups, expert groups, strategic initiatives, operational groups as well as the implementation of the ICES Science Plan and progress by SCICOM in relation to the SCICOM work plan. It also summarises ICES contributions to co-sponsored conferences, training courses and publications. It normally also reports on the outcomes of the Annual Science Conference (ASC). However, due to the COVID-19 pandemic, the 2020 ASC had to be postponed to 2021.

2.2 Role of the Science Committee

The Science Committee is the main scientific body in ICES and is ultimately responsible for the scope, scale and impact of ICES science. SCICOM works with the ICES community to set the direction for ICES science and to implement and monitor the ICES science plan. Through planning of the work of ICES groups, the science committee strives to ensure effective working relationships between all parties contributing to the implementation of the ICES Science Plan. SCICOM is empowered to speak on behalf of ICES on science priorities and strategies, and on the state of knowledge of topical marine

issues. The empowerment is provided by national representation from member countries. SCICOM has the authority to establish and dissolve expert groups and subordinate governance bodies (strategic initiatives, operational groups) as deemed necessary to deliver the ICES Science Plan.

The general objectives of SCICOM are:

- (1) To keep the science programme dynamic, internationally relevant, and impactful
- (2) To ensure seamless links between science, data and advice
- (3) To engage with scientists in ICES member countries and beyond by planning an annual cycle of meetings and workshops as well as the Annual Science Conference

The current priorities for SCICOM are to:

- (1) identify and promote science priorities within a science programme that is dynamic, internationally relevant and impactful, while fully taking account of national needs and providing added value to national programmes,
- (2) collate information on ICES science outputs in accessible and searchable formats, to develop and publicise metrics of impact, and to ensure expert group outputs acknowledge ICES contributions,
- (3) develop and regularly update website text relating to science, SCICOM, steering groups and personnel to increase awareness, visibility and impact of our people and work,
- (4) develop and run an engaging training programme that achieves cost recovery and enables participants to develop their careers, broaden their knowledge base, widen their professional network and add value nationally,
- (5) promote and support frequent and effective communication between expert groups, steering groups and SCICOM to increase network engagement and efficiency in all activities relevant to SCICOM,
- (6) promote science activity and collaboration within and beyond the ICES network,
- (7) ensure effective communication and seamless links between science, data collection, storage and processing, and advice.

SCICOM's previous role in leading the developments of ICES viewpoints has now been taken on by ACOM vice-chairs, with the agreement of ACOM and SCICOM.

2.3 Summary of Science Committee scientific and operational structures

Four types of groups contribute to the work of SCICOM and have roles in implementing ICES Science Plan. Other temporary groups are also formed to develop content for conferences and symposia and to address other transient actions. In addition, SCICOM is supported by the ICES secretariat Science Support.

The following descriptions of groups are also made available in the 'Guidelines for ICES groups' to help broaden community understanding of the ways in which different groups can, and do, contribute to delivery of ICES science. The Advisory Committee, the Data Centre and the ICES community also play vital roles in delivering science and implementing the Science Plan, but working in roles alongside SCICOM. Their roles are documented in the science implementation plan.

Expert groups

Expert groups (EG) are groups of scientists who collaborate during scheduled meetings, and often intersessionally, to advance understanding of marine systems by tackling fundamental and applied scientific questions and developing analyses that underpin state-of-the-art advice on meeting conservation, management, and sustainability goals. The questions they address are defined by terms of reference that are reviewed and signed off by the science and advisory committees. Expert groups publish the outputs of their work in the series “ICES Scientific Reports”.

Steering groups

Steering groups (SG) address broad and enduring areas of science and advice and “parent” a number of expert groups. They are responsible for guiding and supporting expert groups and helping to ensure their work is effectively coordinated, conducted and reported.

Operational groups

These groups develop ICES capability in areas beyond the remit of expert groups. Currently ICES has three operational groups: Data and Information Group (DIG), Science Impact and Publication Group (SIPG) and Training Group (TG).

Data and Information Group

The Data and Information Group (DIG) is an operational group reporting to the Science Committee that advises on all aspects of data management, including data policy, data strategy, data quality, technical issues, and user-oriented guidance. Their work is closely coordinated with the ICES Data Centre and helps to ensure that expert groups have access to data and the support for data handling that is essential to their work.

Science Impact and Publication Group

The Science Impact and Publication Group (SIPG) is an operational group reporting to the Science Committee that coordinates and supports the publication and dissemination of research conducted under the auspices of ICES. The group is responsible for guiding, monitoring, and sharing ICES publication output and increasing the reach and impact of ICES publications.

Training Group

The Training Group (TG) is an operational group reporting to the Science Committee that develops the structure and content of ICES training programme and then guides and supports the provision of training.

Strategic initiatives

Strategic initiatives (SI) report to the science committee and develop and co-ordinate cross-cutting science that impacts and interacts with the science of many expert groups. They also focus on building science collaborations outside ICES member countries.

The Strategic Initiative on the Human Dimension (SIHD) aims to develop strategies to support the integration of social and economic sciences into ICES work.

The Strategic Initiative on Climate Change Impacts on Marine Ecosystems (SICCME) coordinates ICES science that seeks to understand, estimate and predict the impacts of climate change on marine ecosystems.

ICES Secretariat

The ICES secretariat provides essential secretarial, administrative, logistical, scientific, and data handling support to the preceding groups and ICES community in general. This facilitates effective planning of meetings, reporting and external communication.

3 COVID-19 pandemic effects on work

The COVID-19 pandemic had severe impacts on our scientific network. It affected not only the ability to carry out expert group meetings, but also on the ability to carry out scientific work within our member countries. The impacts were not equally distributed across the community. Young families and single mothers and fathers who had to take care of their kids during the different lock-down phases were especially challenged with the variable workload. The move from normal lecturing to online lecturing and the need for increased care for students and employees increased the pressure on our experts in academia. Finally, the lack of opportunities to present work at conferences and to network is likely to impact Early Career Scientists.

The immediate effect we were able to observe, and are able to evaluate, is the shift from physical meetings to online meetings. Almost all expert groups have been actively and successfully moving to online formats and working practices. Responses to the changes were quick, with 12 expert groups that were due to meet in person before the end of March, meeting remotely. Thirty-nine expert groups moved meetings online during March and April, with 18 completing meetings in March and 21 in April. In May, 19 of the scheduled meetings moved online and one was postponed until (probably) September. One additional expert group meeting held in May was the consequence of a postponement from March. In June, all 15 scheduled expert group meetings moved online. In July and August, we had an additional 5 groups and in September another 15 with remote meetings. Groups have also treated the current situation as an opportunity to develop more effective online working practices.

The Annual Science Conference (ASC) 2020 was postponed to 2021. The decision was made by ICES leadership, based on the COVID-19 global situation and the expectation that international travel and large gatherings of people would still be under considerable pressure. The postponed meeting will take place 6–9 September 2021, at Øksnehallen, in Copenhagen, Denmark, and we are developing ideas for allowing remote participation to the conference. In addition, all ICES sponsored symposia planned for 2020 have been postponed to 2021. It is still not clear if they can be carried out as planned and some organizing committees are already planning to run the meetings as hybrid events.

A full picture on the overall effects of the COVID-19 pandemic on ICES work is presented in Council meeting document CM 2020 Del-Doc_2.2.2.

4 Science priorities, planning and delivery

4.1 Science Plan and Science Plan implementation

The ICES Science Plan “Marine ecosystem and sustainability science for the 2020s and beyond” describes the scientific priorities and goals of ICES, their rationale, and the science and other tasks to be undertaken to meet them. The Science Plan is a public document with an audience comprising the marine science community in ICES countries and beyond.

By successfully implementing the science plan ICES aims to generate ecosystem and sustainability science with a high and beneficial impact on society. The science conducted should therefore advance and shape understanding of marine ecosystems, improve assessments of the effects of human activities, improve observations of the seas

and oceans and provide evidence and solutions to support conservation and management. Supporting tasks aim to increase the visibility and impact of this science, provide a rewarding and efficient working environment, engage new scientists, increase training and networking opportunities, and strengthen collaboration with regional and global partners.

ICES science, as described in the Science Plan, is currently brigaded under seven priorities. These are used for mapping all ICES science activities to topics (e.g. expert group terms of reference, symposia, training courses) and for presenting ICES work and outputs (e.g. ICES 2018 Annual Report). The seven science priorities are:

1. Ecosystem science

Advance and shape understanding of the structure, function and dynamics of marine ecosystems — to develop and vitalize marine science and underpin its applications

2. Impacts of human activities

Measure and project the effects of human activities on ecosystems and ecosystem services — to elucidate present and future states of natural and social systems

3. Observation and exploration

Monitor and explore the seas and oceans — to track changes in the environment and ecosystems and to identify resources for sustainable use and protection

4. Emerging techniques and technologies

Develop, evaluate and harness new techniques and technologies — to advance knowledge of marine systems, inform management and increase scope and efficiency of monitoring

5. Seafood production

Generate evidence and advice for management of wild-capture fisheries and aquaculture — to help sustain safe and sufficient seafood supplies

6. Conservation and management science

Develop tools, knowledge and evidence for conservation and management — to provide more and better options to help managers set and meet objectives

7. Sea and society

Evaluate contributions of the sea to livelihoods, cultural identities and recreation — to inform ecosystem status assessments, policy development, and management

There are still some challenges to ensure all expert groups are linking terms of reference to ICES Science Plan but this is being addressed across ICES with the introduction of a new and consistent style of resolution form that provides the capability to harvest data directly (in place of the existing and heterogeneous word documents) and ultimately the resolutions database. It is encouraging to see these developments, as they are leading to more consistency in our working practices with expert groups and helping to emphasise that the ICES Science Plan is for the whole of ICES and not just for SCICOM.

A separate implementation plan describes how ICES Science Plan is being implemented, how people and groups within ICES contribute to implementation, the tasks they undertake and how progress is measured and reported. Collectively, ICES Science

Plan and implementation plan guide the conduct and delivery of science in support of the vision and mission of ICES. The intended audience for the implementation plan are the people and groups in ICES who are involved in implementing, monitoring and reporting on implementation of ICES Science Plan, principally the members of the Science Committee and associated groups and the ICES Secretariat.

The implementation plan defines objectives and actions in seven areas.

1. Catalyse, shape, facilitate and promote marine science which has a high and beneficial impact on society and addresses all priorities identified in the science plan
2. Ensure expert groups have flexibility to innovate and explore new topics and encourage and support cross-cutting science activity
3. Increase the visibility of, and access to, our science, data and advice and recognise, promote and use the science outputs from expert groups
4. Provide an efficient, collaborative, respectful and rewarding working environment for all scientists, as well as the resources and infrastructure needed by ICES groups to develop and share knowledge and expertise
5. Provide more and better networking and training opportunities and encourage engagement of a new and emerging generation of scientists with ICES and expert groups
6. Exchange knowledge and expertise with regional and global partners through collaborative projects, networks and training: to shape and advance marine science and advice and meet joint scientific goals
7. Monitor and report on progress towards meeting the goals of the science plan

Specific actions supporting these objectives are tabulated in the implementation plan and responsibility for these actions is widely distributed throughout ICES community. For actions involving ICES Secretariat, the actions have been transposed to the joint work plan. This report to Council summarises progress with implementation using metrics described in the implementation plan, although some systems still need to be put in place to report some metrics.

4.2 Science collaboration, including symposia

The Arctic Science Ministerial (ASM3) has been postponed to 8–9 May 2021 in Tokyo, Japan. ICES and PICES have jointly provided responses to the ASM3 survey on international collaboration and cooperation. Anne Christine Brusendorff, ICES General Secretary, will chair working group 3 – A Productive Ocean, as a part of the Arctic Regional Process for the UN Decade of Ocean Science for Sustainable Development 2020/2021.

Representatives of ICES and PICES have conducted regular remote meetings to discuss ongoing collaboration, including potential activities related to the UN Decade of Ocean Science, a joint ICES-PICES conference (2023, US), and the Early Career Scientists Conference (2022, CA). The group will be seeking formal status within their respective organizations, and aim to encourage broader participation from the ICES community.

ICES is currently a partner in 10 projects. The project Mission Atlantic had had a successful virtual kick-off meeting from the 30th of September to the 2nd of October 2020. Mission Atlantic is one of several HORIZON2020 projects with focus on Transatlantic cooperation through the Galway and Belem declarations.

In relation to ICES co-sponsored symposia, all symposia planned for 2020 have been postponed to 2021. This includes (i) the International Symposium on Plastics in the

Arctic and Sub-Arctic Region, which was scheduled for 21-23 April 2020 in Reykjavik, and has been postponed to 2-4 March 2021; (ii) the Marine Socio-Ecological Systems (MSEAS) Conference scheduled for 25-29 May 2020 in Yokohama, and now planned for 2021 (dates still being finalised); (iii) the World Fisheries Congress scheduled for 11-15 October 2020, and which will take place 20-24 September 2021; and (iv) the Oceans Past VIII which was held as a shorter online event (“Oceans Past IX” is now scheduled for 3-7 May 2021). For 2021 SCICOM also approved the Baltic Sea Science Congress 14-18 June and the ICES 4th Decadal Variability of the North Atlantic and its Marine Ecosystems: 2010-2019 26-28 October, and for 2022 the joint ICES/PICES/FAO International Symposium on Small Pelagic Fish: New Frontiers in Science for Sustainable Management. The review process in March 2021 will include the years 2022 and 2023 (a full list with details can be found in annex 3).

4.3 Interactions with Expert Groups

Expert groups are at the heart of ICES, engage the largest proportion of scientists in our community, and are responsible for generating the majority of our science output, including the basis of ICES advice. For these reasons, it is essential to ensure their work is valued, highlighted and accessible, and that chairs are engaged with the ICES community and effectively supported by other ICES groups. Since the specific scientific foci and activities of our expert groups are described elsewhere in this report, this section focuses on cross-cutting actions and system modifications that are being used to engage and guide chairs and to strengthen the coordination and impact of expert groups and their science. One hundred and fifteen working groups, forty-five workshops and twenty benchmark workshops were active in 2020 (see Annex 1 and Annex 2).

4.3.1 Engagement and guidance

SCICOM is continuously working to improve the engagement with Expert Groups. Measures introduced in the last years have been the WGCHAIRS forum, and the extension of the WGCHAIRS meeting. The forum is used as a means to keep EG Chairs informed in a consistent way and to provide a platform for feedback.

The WGCHAIRS meeting continues to be a valuable event to foster exchange and communication both among expert group chairs, and between the chairs and SCICOM, ACOM and the secretariat. The 2020 meeting included agenda items on the development of new resolution forms, finding the right publication channel, drafting executive summaries for “ICES Scientific Reports”, highlighting and disseminating science, updating web texts for groups, science to advise, ecosystem and fisheries overviews, the recognition of and guidance for expert group chairs, and recruiting new members of groups. The latter topics were discussed in depth in sub groups.

Guidance for groups in general is given in the Expert group guidelines. This document is continuously updated and contains a thorough and complete set of guidelines for all aspects of EG work. However, general guidance for new chairs, updates on developments, and introduction to new procedures requires specific training for EG chairs. The ACOM and SCICOM chair will work with SG chairs, ACOM leadership, and Secretariat to establish an Expert Group Chairs Training Course to be run for the first time alongside the 2021 WGCHAIRS meeting.

ICES science continues to flourish and attract new participants to our expert groups. The measures taken over the last years seem to have had an effect, although a full analysis to provide evidence will not take place until earlier next year. This year has especially seen a large increase of participation in expert groups due to the ability to more

easily join groups remotely. A larger proportion of members participated in meetings and we saw an increase in new participants.

4.3.2 Reporting and self-evaluation

The “ICES Scientific Reports” series is now in its second year. It has raised the profile of the scientific work of expert groups and increased the visibility of the experts within the groups. Considerable effort was made in 2020 to ensure that the executive summaries and reports were focused primarily on scientific content, and further attention to this will need to continue into 2021. The system of interim reports, scientific reports and business reports, which can be used depending on the output of the group, is flexible enough to cater to all needs, while harmonizing the process. In addition, the assignment of has facilitated better referencing of scientific reports in the broader scientific community.

The adoption of the e-evaluation process for fixed-term working groups has allowed the removal of a lot of process related content from the “ICES Scientific Reports” so they are focused on scientific content. The e-evaluations provide a more efficient way for the working groups to report participation, progress on their ToRs, and science highlights. These e-evaluations also provide the SG chairs, SCICOM and the Secretariat with a brief annual overview of the working groups and their plans for the following year. These documents provide sufficient information for the secretariat and steering group chairs to assess whether the working group is on track and to identify and rectify any concerns that need to be addressed. The completed e-evaluations are posted on the front page of the SCICOM SharePoint site, so they also provide a quick and straightforward way for SCICOM national and ex-officio members to evaluate the progress of the fixed-term working groups.

4.3.3 Expert Group recommendations

The new system for recommendations, which requests groups to contact recipients of recommendations before submission and to allow only five recommendations per groups, has proven to be efficient. Increasing the frequency in which recommendations are reviewed to three times a year has increased responsiveness and kept the workload for each review meeting to a reasonable amount. As the system has just been introduced, a full evaluation cannot yet be made.

4.4 Raising Awareness of ICES Science

An important aspect of the implementation of the ICES Science Plan is to raise awareness of the science conducted by ICES. Opportunities to raise awareness of science outputs have been increased by the adoption of a new report series, with an ISSN for the publication of expert group reports, the creation of a preliminary web-based and searchable ICES bibliography (<http://ices.dk/publications/library/Pages/default.aspx>), and the adoption of a science highlights process to share science highlights with the communications team. Significant web material has been developed on ICES science, science symposia, and engaging with ICES.

The restructuring of the website has increased the visibility and accessibility of the different ICES areas, and it is now easier to find information on how to engage with ICES. The next steps will be to widen dissemination and complement the existing material with examples of how ICES works, and what science is conducted within the ICES member countries. This could for example be achieved through short videos.

4.4.1 Science Highlights

ICES Science Highlights is a short, focused series, published 2–3 times per year. Generally, five or more expert groups are involved in the series. Two upcoming series, “Technology and data science” is to be launched in early 2021, while “Future of aquaculture” is postponed to 2021. Topics for other Science Highlight topics are continuously being developed by SCICOM.

Two additional publication series, “Biodiversity” and “In other words”, will be starting in 2021. A proposed ongoing series in collaboration with SCICOM is “National perspectives on international cooperation with ICES”.

4.5 Resolutions database

Over the past few years, the ICES community, including SCICOM, ACOM, and Expert Group members, have asked for a more comprehensive overview of resolutions that is fully searchable and able to support broader reporting. As such, the Secretariat has been working closely with ACOM and SCICOM to develop a streamlined process for submission and tracking of resolutions. To date, the team has drafted updates of all resolution forms (expert groups, symposium, publications, and steering groups). We are currently finalizing the text of suggested examples on how to fill out these forms, which will be a helpful aid to the ICES community to ensure better consistency and completeness across the various resolutions. The new forms also ensure that the resolutions include text that is helpful for forming the searchable database on all fields, including clear identification of ecoregions relevant to each resolution, close links to other organisations, and science and advice priorities. The technical aspects of the database and the workflow have also been formulated over the past few months, and will still need some work as the database continues to be developed. The Secretariat is now working on upgrading Microsoft Dynamics, the software that will support the resolutions database, so it can be integrated with our existing expert group meetings database. Drafts of the online and offline forms have also been created for the symposium resolution, which we anticipate will be the first resolution rolled out for use in early December with the others to follow in 2021.

4.6 Peer-reviewed publications linked to expert groups in 2019

The secretariat is collecting all peer-reviewed publications, which are products from one of the expert groups and acknowledge the group and ICES. The database is updated regularly, but the full list for the calendar year is only available at the beginning of the following year. The 2020 list will be available as a document next year.

4.7 Annual Science Conference 2020

When the COVID-19 pandemic broke out in March 2020 the preparations for ICES ASC 2020 were well underway. The decision to postpone the ASC was made in April by ICES leadership, based on the COVID-19 global situation, and the expectation that international travel and large gatherings of people would still be under considerable pressure in September 2020. Most major preparations, commitments, and bookings for the ASC were kept and the ASC was shifted to 6 – 9 September 2021. This includes the venue contract, two out of the three previously confirmed keynote speakers, all 18 theme sessions and their conveners, submitted abstracts, and networking and social events. However, it is still unclear if travel can resume fully until September 2021 and we start to see discussions on reducing air travel therefore different options for a hybrid meeting is now considered.

The missing keynote was filled at the SCICOM September meeting 2020 and Yunné-Jai Shin (France) has accepted the invitation.

The ASC 2022 has been confirmed to take place in Ireland Monday 12 – Thursday 15 September 2022. Dublin Castle Conference Centre has been confirmed as the conference venue and has been booked from Sunday, 11 to Saturday 17 September 2022.

4.8 Webinar

The postponement of the ASC resulted in a gap in the yearly schedule of ICES and the ICES Bureau approved the decision to organize an ICES Webinar. “ICES reflections: Understanding the impacts of the COVID-19 pandemic on fisheries, markets, communities, and management” was held on 16 September 2020. The topic of the Webinar should reflect a topical subject and was to be inclusive and bring together as many participants as possible from ICES community. Thus, it was decided to develop a programme that would give a broad overview of how the COVID-19 pandemic has affected marine scientists across our member countries. ICES secretariat collaborated with the Strategic Initiative on the Human Dimension (SIHD) and the SCICOM and ACOM Chairs to develop this. The speakers were Alan Haynie (USA/SIHD Chair), Doug Lipton (USA), Cristina Pita (Portugal), and Marloes Kraan (The Netherlands). The Webinar attracted many from within the ICES community, but for about half of the participants, it was the first ICES event they attended. In total 718 people registered for the webinar and 418 logged on as it was live.

Being considerate about the resource requirement, the value of such events to communicate ICES science and activities is high. In addition, the postponement of almost all conferences this year has put especially Early Career Scientist in a situation, where they cannot present their work and develop their scientific network. We need to find ways to mitigate these challenges and Webinar-type of activities could be a way forward.

5 Steering Groups

5.1 Overview

Steering Groups address broad and enduring areas of science and advice and “parent” a number of expert groups. Following decisions taken by ACOM and SCICOM in 2018 there are now six Steering Groups that are responsible for guiding and supporting the work of all expert groups in ICES and helping to ensure their work is effectively coordinated, conducted and reported. With expert groups that were traditionally seen as ‘science’ or ‘advice’ all working within the same Steering Group structure, ACOM and SCICOM are further advancing towards a ‘one ICES’ approach to guiding expert group work and further strengthening links between science and advice. Practical examples of this are the contributions of many expert groups outside FRSG to the basis of advice, and regular ACOM reporting to SCICOM on science needs to support advice and on current and forthcoming special advice requests.

The following Steering Group reports introduce the purpose of each Steering Group, their terms of reference, working practices and progress in relation to the terms of reference during 2020. The reports also highlight the science being conducted in the groups and other issues relevant to implementation of the ICES Science Plan.

In 2020, the chair of the Aquaculture Steering Group (Mike Rust) took the option to extend his term by one year to the end of 2021.

5.2 Data Science and Technology SG (Incoming Chair; Jens Rasmussen, term starts in January 2021)

The Data Science and Technology Steering Group is responsible for guiding and supporting expert groups that are developing, assessing and applying new technologies as well as advancing data science, systems management, quality assurance and data governance.

5.2.1 Introduction

Topics covered include:

- Increasing the representation, profile and application of new technologies and data science in ICES
- Ensuring the ICES community evaluates and, where relevant, adopts new methods, systems and devices
- Assessing implications of new and emerging technologies
- Supporting continued improvements in monitoring through application of innovative technologies and optimization of sampling designs
- Supporting and advancing effective data governance, data management, analytics and quality assurance methods

5.3 Aquaculture SG (Mike Rust, USA, term started in June 2017)

5.3.1 Introduction

The Aquaculture Steering Group (ASG) is responsible for guiding and supporting expert groups that are working on science and advisory topics contributing to the sustainable development of aquaculture.

Topics covered include:

- evaluating the social and economic dimensions of aquaculture operations
- types, transmission and prevalence of diseases affecting cultured species and actions that can be taken to address them
- understanding positive and negative environmental impacts of aquaculture, approaches to monitor and mitigate them and methods of aquaculture risk assessment
- carrying capacity and relative efficiencies of alternate aquaculture systems
- genetics of cultured species, and application of molecular techniques to aquaculture questions
- projecting the future development of aquaculture and its implications for the food system and food security

5.3.2 Summary of progress in relation to Terms of Reference

Terms of Reference	Progress
ToR a) Engage with and work with Chairs of EG to ensure that EG work supports and meets the science objectives and advisory needs of ICES	Worked with Chairs one on one. 2x ASG web meetings and webinar series
ToR b) Help EG formulate and prepare their draft terms of reference and resolutions	Three groups reforming this year
ToR c) Review and report on the science being undertaken within EG to SCICOM, with a focus on identifying	This report and meeting

science highlights and priorities and demonstrating the impact of their science	
ToR d) Review scientific products/deliverables of the EG and provide feedback on ways to improve the impact and influence of their work	On-going as WG meetings occur. Exploring linkages to other organizations which are in need of scientific inputs such as FAO and OIE. Increased focus on advice deliverables.
ToR e) Provide feedback to SCICOM on research priorities and implementation of ICES strategy	Seven EGs are now functional to implement ICES Strategy. Focus will be on the science to advice linkage. Trying to add additional groups as appropriate chairs are found. Groups would include: Vulnerabilities and resilience of aquaculture to climate change Aquaculture Oceanography and Modelling Operationalizing Economic and Social Trade-off Analysis Aquaculture Marine Spatial Analysis Engineering and Technical Risk in Aquaculture
ToR f) Identify shortfalls in skills and knowledge needed to achieve ICES objectives within the SGs area and work within the SG and through SCICOM and operational groups to develop capability	Conducted a survey and proposing one or more workshops to articulate process and needs for aquaculture advice products. That effort may identify gaps in ICES ASG. Also a ToR of several WGs. COVID has made this process difficult. See list above for shortfall areas.
ToR g) Identify gaps and overlaps in the work of EG, and propose consolidation, rationalization or forming of new EG to SCICOM as appropriate	See above
ToR h) Help EG Chairs to adopt practices which ensure scientific information generated by EG is receiving adequate quality control consistent with scientific norms	On-going. Encouraging publication in peer-reviewed literature.
ToR i) Facilitate active horizontal and vertical communication, collaboration and co-ordination between EG and all other relevant ICES groups and identify, in cooperation with EG Chairs, opportunities for internal and external collaboration	We have had joint EG chair calls and meetings about 2x/yr. EG chairs from different groups were co-conveners at ASC 2018 and ASC 2019 and have published together. Members from WGSEDA are also actively interacting with the WGSOCIAL and WGECON to help ensure aquaculture is a part of these groups discussions. ASG webinar series to improve communication among EGs. WGOOA and WGECCA were planning on a joint meeting in May however that has been cancelled.
ToR j) Represent the SG at SCICOM meetings and SCICOM/ACOM leadership meetings in spring and at the ASC	This meeting
ToR k) Establish a core group of ASG Expert Group Chairs who, together with the ASG Chair, will share responsibility for implementing the work of ASG	Working with existing and new chairs to develop a coordinated SG with a common vision. Process is on-going, but I need to work harder on this.
ToR l) Generate a position paper on the contribution of ASG to ICES science, data and advice	Not started. Structure and text will follow an ecosystem approach to aquaculture and likely detail the work that is already proceeding in this area

5.3.3 Expert groups

The ASG expert groups are listed in Annex 2.

5.3.4 Science to advice

The main activity during the period of this report is to continue to advance the underlying science and define specific advice products for aquaculture. This would include three areas of advice, 1) Aquaculture Overviews, 2) Viewpoints and 3) Requested Advice. To this end ASG has worked with ACOM to:

- Retain a group of national level stakeholders to advise on the content and format of aquaculture advice products. Stakeholders are primarily regulatory experts who deal with aquaculture. This group was surveyed in the Winter 2020 to provide input into aquaculture overviews. This group is available to provide input to ASG products and research directions as requested
- Developed a path to define Aquaculture Overviews
 - Surveyed the Stakeholder group to help define “Aquaculture Overviews” Results informed contents of “Aquaculture Overviews”. Results are being written up.
 - Identified the first region to develop an “Aquaculture Overview” (Norwegian Sea) and developed an outline based on an Ecosystem Approach to Aquaculture.
- Developing the first Viewpoint for an aquaculture issue
 - Working with the Chairs of the Workshop on Emerging Mollusc Pathogens (WKEMOP – Chaired by Janet Whaley and Ryan Carnegie) on the production of a Viewpoint. Background scientific document in process.
 - Working with WSGENOTOOLS on a possible second Viewpoint.
 - Other WGs have expressed interest in Viewpoints but are not as far along. These include WGSPA, WGOOA and WGEIA.
- Setting a foundation for requested advice.
 - Working Group on Environmental Interactions of Aquaculture (WGEIA) will finish its term in 2020, but most members plan on continuing as the WG Environmental Risk Assessment for Aquaculture. They will turn toward comparing risk assessment approaches used by different ICES countries to inform management of aquaculture. This will likely become a key process for ICES to respond to requested advice products in the future. There will also likely be opportunities for ICES training in risk assessment methods in a year or two.
 - Option to use the National Level Stakeholders to help define additional products such as BMPs, Synthesis documents, Models and trade-off analysis.

5.3.5 Science highlights

The **Working Group on Scenario Planning on Aquaculture (WGSPA)** has published in ICES Journal of Marine Science a paper on blue growth targets and seafood demand estimates for the ICES region. The bottom line is that blue growth targets for increased seafood production from aquaculture are well below projected demand for the region. In other words, even if all European and North American domestic targets are met, the North Atlantic will not be able to meet its own seafood needs and will continue to have to increase imports from other regions. Implications for ICES sustainable seafood goal are obvious. The citation is:

Halley E. Froehlich, Jessica Couture, Lynne Falconer, Gesche Krause, James A Morris, Montse Perez, Grant D Stentiford, Harri Vehviläinen, Benjamin S Halpern, Mind the gap between

ICES nations' future seafood consumption and aquaculture production, ICES Journal of Marine Science, fsaa066, <https://doi.org/10.1093/icesjms/fsaa066>.

The **Working Group on Social and Economic Dimensions of Aquaculture** has two publications submitted and several in preparation. These include:

Krause, G., Billing, S.L., Dennis, J., Grant, J., Fanning, L., Filgueira, R., Miller, M., Pérez Agúndez, J.A., Stybel, N., Stead, S.M., Wawrzynski, W. (2020). Visualizing the social in aquaculture: How social dimension components illustrate the effects of aquaculture across geographic scales. *Marine Policy*, 118, <https://doi.org/10.1016/j.marpol.2020.103985>. <https://authors.elsevier.com/sd/article/S0308597X19307481>

Mikkelsen, E., Fanning, L., Kreiss, C.M., Billing, S.-L., John, D., Filgueira, R., Grant, J., Krause, G., Lipton, D., Miller, M., Perez, J., Stead, S., Villasante, S. Availability and usefulness of economic data on the effects of aquaculture: A North Atlantic comparative assessment. (currently in press with "Aquaculture Reviews").

5.3.6 Communication with EG

- **Developed a plan and best practices for virtual meetings.** The upside is that the SG chair will be able to attend more WG meetings.
- **ASG meetings.** Now having 2x/yr ASG meetings. Next web meeting is planned for October to develop a path forward.
- **Established a webinar series.** ASG has one webinar per month rotating among the chairs to introduce the activities of their WG. No Web meeting during September due to the ASM, nor July, August or December due to holidays leaving 8 months open. One for each WG plus an extra per year. Hoped to start in January 2020, however that has been delayed. New start in April or May.

5.3.7 Forward look

In addition to what has already been reported, ASG will continue to structure the steering group in order to define and support an Ecosystem Approach to Aquaculture Management. This will take multiple EGs interacting. This process started at ASC 2018 and continued it at ASC 2019 and into 2020. The ASG webinar series will be continued to foster cross-group understanding and to develop a common vision. However, ASG did not make as much progress on this following the ASC 19 as hoped.

WGEIA will finish in December 2020 but will refocus as a new group called Working Group on Environmental Risk Assessment for Aquaculture. Three other groups will turn over in spring 2021.

Despite preliminary discussion with Chairs of Strategic Initiative on Climate Change Impacts on Marine Ecosystems (SICCME) has taken place around the pros and cons of a WG on Aquaculture and Climate Change, the ASG Chair has yet to draft a strawman resolution.

Other ideas for new working groups include:

- Vulnerabilities and resilience of aquaculture to climate change
- Aquaculture Oceanography and Modelling
- Operationalizing Economic and Social Trade-off Analysis
- Aquaculture Marine Spatial Analysis
- Engineering and Technical Risk in Aquaculture

5.4 Ecosystem Processes and Dynamics SG (Silvana Birchenough, term started January 2017)

The Ecosystem Processes and Dynamics Steering Group is responsible for guiding and supporting expert groups that study the state and resilience of marine ecosystems and food webs, as well as the life histories, diversity and interactions of component biota.

Topics covered include:

- oceanographic characteristics of marine systems and their influences on population, food web and ecosystem dynamics
- origins and transformations of matter in biogeochemical and production cycles.
- measuring, understanding, reporting and forecasting the dynamics of populations, food webs and ecosystems
- life histories, diversity and ecology of microbes, phytoplankton, zooplankton, benthic invertebrates, crustaceans and fish
- ecosystem services
- ecosystem resilience

As a result of COVID-19 restrictions, all EG meetings, discussions, planning and evaluation of ToRs have continued to be delivered online with some variations (e.g. meeting structure, timing, and delivery of outputs). Most of the science discussions and planning have continued to advance as agreed, with some delays.

5.4.1 Summary of progress in relation to Terms of Reference

The overall EPDSG progress is summarised below in relation to the ToRs.

Terms of Reference	Progress
ToR a) Engage with and work with Chairs of EG to ensure that EG work supports and meets the science objectives and advisory needs of ICES	On track and ongoing, depending on requests-regular e-mails correspondence with EGs chairs to discuss and support production of deliverables (e.g. deadlines and production of annual reports, Self-evaluations documents, setting new ToRs) and agreeing work priorities. Active discussions with EG chairs on outputs and meeting formatting, to ensure there is a healthy balance during meetings.
ToR b) Help EG formulate and prepare their draft terms of reference and resolutions	On track-regular e-mail discussions with EGs chairs on ToR and deliverables associated with ICES priorities. Most EGs chairs are responsive to suggestions and revised documents are shared within short timeframes.
ToR c) Review and report on the science being undertaken within EG to SCICOM, with a focus on identifying science highlights and priorities and demonstrating the impact of their science	Ongoing- regular correspondence with EGs chairs to alert, inform on the recent products and highlights. A very active link with the ICES Communication department, Tweeter, and press releases opportunities to publicity scientific outputs. EPDSG actively have also engaged on the ICES Annual Report (developed an article on bioturbation), Biodiversity Highlight series and a special feature to cover COVID-19 effects and science, taking the position of EG chairs. Actively pursuing and drafting press release articles to show-case the new papers across the network.

Terms of Reference	Progress
ToR d) Review scientific products/deliverables of the EG and provide feedback on ways to improve the impact and influence of their work	Ongoing as needed regular feedback provided on annual reports, ToRs and Self-evaluation documents to improve visibility, influence and targeted activities. EPDSG chair helps to draft features, papers, and press releases.
ToR e) Provide feedback to SCICOM on research priorities and implementation of ICES strategy	<p>SG attended the SCICOM on-line meeting in March. The EPDSG chair also submitted an EOI for the UN decade Workshop in June, now moved to October. Regular correspondence with Simon Jennings, Jörn Smith and PICES on EGs issues, ToRs and science developments. EPD chair was also involved in discussions and suggestions for ICES TECH opportunities.</p> <p>EPDSG chair also chaired the recruitment panel for the new ICES SCICOM Chair. He role was to process, review and score EOIs, CVs, running interviews and evaluations of candidates to secure the new ICES SCICOM chair (from December 2019 to May 2020).</p>
ToR f) Identify shortfalls in skills and knowledge needed to achieve ICES objectives within the SGs area and work within the SG and through SCICOM and operational groups to develop capability	Ongoing- There are clearly more opportunities for integration between EGs across ongoing initiatives (e.g. Ecosystems overview), joint open sessions, viewpoints and dedicated, helping to generate new viewpoints publications (across common topics of interest). Also assessing Technologies aspects and opportunities to integrate data and technology at ICES via sub-group discussions.
ToR g) Identify gaps and overlaps in the work of EG, and propose consolidation, rationalization or forming of new EG to SCICOM as appropriate	Ongoing- new ideas to integrate with Aquaculture SG and EPD SG, still to be discussed. Potential ideas contribute with ecosystems overview aspects on processes and functions.
ToR h) Help EG Chairs to adopt practices which ensure scientific information generated by EG is receiving adequate quality control consistent with scientific norms	As requested by EGs- EPD chair helps EGs chairs with project proposals, support letters and ideas for new workshops. EPD chair invited to participate at the 4th Symposium on the Decadal Variability of the North Atlantic and its Marine Ecosystems: 2010-2019. EPDSG will be co-chair at the theme session focused on ecosystems and human dimension. EPDSG engaged in planning, keynote ideas and structuring the session.
ToR i) Facilitate active horizontal and vertical communication, collaboration and co-ordination between EG and all other relevant ICES groups and identify, in cooperation with EG Chairs, opportunities for internal and external collaboration	Ongoing with current and new EG chairs as requested. EPDSG chair liaising with PICES and EG chairs to support integration and collaboration.
ToR j) Represent the SG at SCICOM meetings and SCICOM/ACOM leadership meetings in spring and at the ASC	Done-SG participation at the on-line March meetings in 2020. EPDSG also chaired the evaluation panel for electing the new ICES SCICOM Chair. EPDSG also been actively discussing ideas and challenges with EG chairs.
ToR k) Establish a core group of EPDSG Expert Group chairs who, together with the EPDSG Chair, will	On track-several EGs Chairs are active and engage on dedicated requests, correspondence, and feedback. A

Terms of Reference	Progress
share responsibility for implementing the work of EPDSG	good network and support in place. An EPDSG meeting is scheduled online for October 2020.
ToR 1) Generate a position paper on the contribution of EPD to ICES science, data and advice	Discussions with Sara Bailey (HAPISG chair) to develop a joint opinion document between both EPD and HAPI chairs. An online discussion to discuss topics and complementary ideas was done in May 2020. Further discussions will continue intersessionally.

5.4.2 Expert groups

The EPDSG expert groups are listed in Annex 2.

5.4.3 Science highlights

WGHABD

- GlobalHAB Manual: Best Practice Guidelines for the study of HABs and Climate Change (under review);
- The IOC GlobalHAB Status report is nearly completed and will be finished at the end of this year;
- Currently a special issue of Harmful Algae is in production containing regional summaries of HABs and HAB impacts. There are currently five manuscripts from WGHABD members in this issue;
- ICES-IOC Harmful Algal Status Report will be submitted by the end of October 2020.

WGSCALLOPS

- The ICES Workshop of Scallop Aging (WKSA) workshop was very successful;
- The first ever data call for scallop species (landings and effort) is out at present;
- The ICES team was acknowledged for supporting the call for data;
- The intention is to conduct a scallop stock assessment for the North East Irish Sea. This activity will involve multiple institutes working collaboratively and has never been done before for this species and area.

BEWG

- Birchenough, SNR and Degraer, S., (2020) [Science in support of ecologically sound decommissioning strategies for offshore man-made structures: taking stock of current knowledge and considering future challenges](https://doi.org/10.1093/icesjms/fsaa039). **ICES Journal of Marine Science**, Volume 77, Issue 3, May-June 2020, Pages 1075–1078, <https://doi.org/10.1093/icesjms/fsaa039>
- Greathead, C., Magni, P., Vanaverbeke, J., Buhl-Mortensen, L., Janas, U., Blomqvist, M., Craeymeersch, J., Dannheim, J., Darr, A., Degraer, S., Desroy, N., Donnay, A., Griffiths, Y., Guala, I., Guerin, L., Hinchin, H., Labrune, C., Reiss, H., Van Hoey, G., Birchenough, S.N.R. (2020) Exploring the use of a generic framework to illustrate the importance of benthic marine ecosystems to the effectiveness of MPAs. *Aquatic Conservation* <https://doi.org/10.1002/aqc.3401>

WGZE

- Contributed to the Ecosystem assessment documents for Bay of Biscay and Iberian Coast Ecoregion and Celtic Sea;
- Contributed to the Zooplankton Status Report
- ICES JMS Theme Set planned entitled: “Marine zooplankton time series: essential tools to understand variability in productivity-determining processes in the oceans.” The deadline for contributions is on 15th March 2021.

EUROBUS

- Uttieri, M., Aguzzi, L., Aiese Cigliano, R. et al. WGEUROBUS – Working Group “Towards a EUROpean OBServatory of the non-indigenous calanoid copepod *Pseudodiaptomus marinus*”. *Biol Invasions* 22, 885–906 (2020). <https://doi.org/10.1007/s10530-019-02174-8>

WGGRIFY

- The proposal for PICES/ICES Working Group proposal was recommended for approval by the PICES Science Board at their April 2020 meeting and forwarded to the PICES Governing Council.
- The WGGRIFY co-chairs welcomed Dr. Shin-ichi (University of Tokyo) as a PICES-affiliated co-chair.
- Membership in WGGRIFY now includes members from China, Korea, Japan, and Russia in addition to EU countries, Canada and the US.
- The first meeting of WGGRIFY will take place via WebEx from September 7-10 and will consist of four 2-hour meetings.
- The aim of the meeting will be to introduce WGGRIFY members with the view to build a common understanding of the WGGRIFY TORs, and develop implementation plans for each of the TORs that will guide activities over the next 6 months.

5.4.4 EPDSG chair communication articles

- [To remove or not remove](#)
- [Decommissioned offshore man-made installations are the focus of the latest themed set of papers in ICES Journal of Marine Science](#)
- [Bioturbation paper](#)
- [Bioturbation article ICES Annual Report](#)
- [MPAs paper](#)
- [In Memoriam –Clare Greathead](#)

5.4.5 Communication with EG (summary paragraph of activities undertaken)

Most groups are progressing as per agreed ToRs. Their work is of good quality and the EPD chair supports as request by EG chairs. Discussions are often targeted to promote a better and active EGs integration and production of outputs. The recent communication with EGs chairs has highlighted the challenges associated from COVID-19 effects and not being able to hold face-to-face meetings. Online meetings have been useful, but there has been a lack of engagement from some members and the face-to-

face interaction has been highlighted as an issue to support science discussions (e.g. papers and proposals).

5.4.6 Summary of new EG proposals and EG closing

- WGOOFE- ToRs under review, online meeting planned for October 2020. EPDSG invited to participate.
- WGONCE- ToRs being drafted and under discussions with PICES. EPDSG chair engaged and advising on content.

5.4.7 Forward look (including actions for SG and SCICOM/ ACOM)

Several activities planned for the EPDSG chair:

- Continue to support new EG chairs (e.g. **ICES/PICES Working Group on Small Pelagic Fish (WGSPF)**, **Working Group on Impacts of Warming on Growth Rates and Fisheries Yields (WGGRFY)** and our ongoing collaboration between ICES and PICES;
- Actively discuss with EGs Chairs what ICES Data have and what could be a potential additional data-driven science outputs to support the ICES research;
- Continue to liaise with ICES communication centre to ensure EGs outputs are disseminated accordingly,
- To represent ICES EPDSG at the forthcoming Regional Arctic Ocean Decade Workshops (October) - UN Decade of Ocean Science for Sustainable Development (2021-2030);
- To contribute with the developing of Biodiversity highlights as ICES Science topic (EPD EGs will contribute to this piece);
- To support and disseminate the work under ICES/IOC Harmful Algal Event Status report;
- Drafting a resolution to develop a TIMES publication to disseminate methods from benthic monitoring and applications of E-DNA. This work is developed under the project GEANS and funded under the INTERREG Programme (<https://northsearegion.eu/geans/>);
- EPDSG drafting an article in collaboration with the ICES communication team to showcase the challenges associated with COVID-19 and scientific meetings (<https://www.ices.dk/news-and-events/news-archive/news/Pages/Covid19science.aspx>);
- EPDSG participating at the "Decadal Variability of the North Atlantic and its Marine Ecosystems: 2010-20192 (October 26-28, 2021 in Bergen) as a co-chair for the theme session focused on ecosystems and human dimensions.
- EPDSG EG meeting scheduled for 26 October 2020.

5.5 Human Activities, Pressures and Impacts SG (Sarah Bailey, term started January 2019)

5.5.1 Introduction

The Human Activities, Pressures, and Impacts Steering Group is responsible for guiding and supporting Expert Groups that seek to describe the diversity of pressures affecting marine ecosystems and the impacts that follow.

Topics covered include:

- describing and projecting trends in human pressures and impacts on marine ecosystems, including analysis of historical change
- understanding and quantifying multiple impacts of human activity on populations and ecosystems, and proposing options for mitigation
- prevalence and effects of contaminants, invasive species, shipping, noise, renewable energy, fishing, climate, acidification and habitat loss
- estimating the vulnerability of marine ecosystems to pressures and impacts, including risk assessment and identification of limits and thresholds
- developing indicators of pressure and impact and testing their role in management systems
- assessing human impacts on ecosystem goods and services and developing approaches to mitigate undesirable impacts

5.5.2 Summary of progress in relation to Terms of Reference

TERM OF REFERENCE	PROGRESS
ToR a) Engage with and work with Chairs of EG, SCICOM and ACOM to enable and support EG contributions to both the science objectives and advisory needs of ICES	Routine correspondence with EG chairs and with the ICES secretariat to support production of text and deliverables (e.g. production of annual reports, self-evaluations, setting new ToRs) as needed. Attendance at ACOM leadership meeting in Jan 2020 to discuss more integration of HAPI EGs with advisory activities (e.g. adding shipping to Ecosystem Overviews, viewpoint contributions). Discussions with EG Chairs at ASC 2019, although few HAPI EG Chairs were in attendance. Co-convenor for Contributed Theme Session at ASC 2020/2021. Circulation of HAPISG Report for information and feedback.
ToR b) Review and report on the science being undertaken within EG to SCICOM and ACOM, with a focus on identifying science highlights and priorities and demonstrating the impact of their science, including how science was used in ICES advice (method development, advisory products)	Review of EG interim and final e-evaluations to identify science highlights and priorities. Addition of science highlights to e-evaluations will improve reporting. Working with ACOM vice-Chair to facilitate HAPI contributions to Viewpoints. Working with ICES Communications to facilitate HAPI contributions to 'In Other Words'. Regular reporting to SCICOM meetings in accordance with deadlines.
ToR c) Provide feedback to SCICOM and ACOM on research priorities and implementation of ICES strategy	Participation in all SCICOM meetings, with feedback provided during development of ICES science and advisory plans. Work ongoing to communicate priorities to HAPI EG Chairs and facilitate implementation of ICES Strategic Plan.
ToR d) Identify shortfalls in expert availability, skills and knowledge needed to achieve ICES objectives within the SG area and work within the	Support to WGSHIP and WGOWDF during first term (getting EGs established and developing capacity in new strategic areas). Support to merger of MCWG and WGMS to address shortfalls in expert

SG and through SCICOM, ACOM, Strategic Initiatives and operational groups to develop capacity and capability	attendance at EG meetings.
ToR e) Identify gaps and overlaps in the work of EGs, and propose consolidation, rationalization or forming of new EGs to SCICOM and ACOM as appropriate	Have successfully supported establishment of new WGs: WGSHP and WGOWDF. Support to merger of MCWG and WGMS to address shortfalls in expert attendance at EG meetings. No other gaps or overlaps identified to date.
ToR f) Facilitate active horizontal and vertical communication, collaboration and co-ordination between EG and all other parts of ICES and identify, in cooperation with EG Chairs, opportunities for internal and external collaboration	Facilitated communication across EGs and between EGs and ICES Secretariat. Convened network session on global impacts of shipping with EPD Chair at ASC 2019. Participation in PICES Annual Science Meeting 2019 as co-Chair of joint ICES/PICES session on shipping. Facilitated interactions between WGSHP and the International Maritime Organization (IMO). Ongoing discussions about coordination of activities by WGBOSV and WGSHP at IMO with ACOM Chair.
ToR g) Help EG Chairs to adopt working practices which ensure scientific information generated by EG is receiving adequate quality control consistent with scientific norms	Encouraging publication in TIMES, Viewpoints and external peer-reviewed literature, as appropriate. Review of EG reports to ensure appropriate level of scientific (vs. administrative) content.
ToR h) Review EG reports and activities and, in dialogue with the SCICOM chair and ACOM leadership, provide feedback on ways to improve the impact, communication and influence of their work	Review of EG reports to provide feedback. Encouraging submissions of relevant work to IMO. Encouraging EG Chairs to make use of press releases for wider publicity of scientific outputs.
ToR i) Encourage EGs to come forward with proposals and initiatives for longer term science development in support of ICES advice	Communication with EG Chairs (WGEXT, WGML, WGBEC, WGSHP) to encourage proposals for new Viewpoints.
ToR j) Help EG Chairs to formulate and prepare their draft ToR and Resolutions for research-oriented work	Routine review of ToRs related to EG renewals, advisory requests and WK proposals.
ToR k) For advisory ToR: to work closely with the ICES secretariat, ACOM leadership and the EG chairs in preparing the research and advisory work plans for the upcoming year to ensure the advisory ToR are allocated to EGs and addressed adequately and within the advisory request timeframe	Business as usual. Support provided as requested.
ToR l) To give Special Requests received during the year immediate and rapid attention to inform the decision about whether or not the Special Request can be accepted and addressed	WGSFD received a special request in 2020 which was successfully addressed in close cooperation with advisory staff. ACOM legacy EGs within HAPISG are dealing with special requests monitored by Advisory program on a regular basis.
ToR m) To support the ICES Secretariat and/or the ACOM leadership in liaising directly with the Chairs of relevant EG when processing Special Requests	Support provided as required.
ToR n) Represent the SG in SCICOM and ACOM meetings, SCICOM/ACOM leadership meetings, WGCHAIRS and	Attendance at 2020 WGCHAIRS, ACOM Leadership meeting (Jan 2020), spring and fall SCICOM meetings. No ASC in 2020.

at the ASC	
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5.5.3 Expert groups

The HAPISG expert groups are listed in Annex 2.

5.5.4 Science Highlights

- Dannheim, *et al.* 2019. Benthic effects of offshore renewables: identification of knowledge gaps and urgently needed research. ICES J. Mar. Sci. 77:1092-1108. <https://doi.org/10.1093/icesjms/fsz018> (WGMBRED)
- Hassellöv, *et al.* 2020. ICES Viewpoint background document: Impact from exhaust gas cleaning systems (scrubbers) on the marine environment (Under Review). (WGSHP, with input from MCWG, WGMS)
- Le Pape, *et al.* 2020. The use and performance of survey-based pre-recruit abundance indices for possible inclusion in stock assessments of coastal dependent species. ICES J. Mar. Sci. <https://doi.org/10.1093/icesjms/fsaa051> (WGVHES)
- Tamburri, *et al.* 2020. Protocol for the Verification of Ballast Water Compliance Monitoring Devices. ICES TIMES 63. <http://doi.org/10.17895/ices.pub.5465> (WGBOSV)
- WGBEC completed a review on environmental risks of offshore oil and gas activities in the Arctic
- MCWG contribution to “In Other Words”: Marine Contaminants
- WGEXT proposal for publication of ‘*Marine Aggregate Extraction and the Marine Strategy Framework Directive: A review of existing research*’ as an ICES CRR
- WGEXT annual delivery of the dataset on the extraction of marine sediments in the OSPAR area (new web app in development)
- Development of Viewpoint on impact from exhaust gas cleaning systems (scrubbers) on the marine environment, and subsequent submission to IMO
- MCWG TIMES publication on chlorophyll a analysis is nearly complete

5.5.5 Communication with EGs (summary paragraph of activities undertaken)

Routine email communication by HAPISG Chair with EG Chairs to solicit contributions to Viewpoints, Science Highlights, and ‘In Other Words’, as well as to identify/facilitate linkages between EGs under HAPI as well as those under other steering groups. The EGs under HAPI have been actively working and achieving their proposed ToRs. There are no major issues on the work identified and delivered by the EGs, although there are delays with the submission of self-evaluations and final reports by some EGs.

5.5.6 Summary of new EG proposals and EG closing

EGs closing in 2020:

- Working Group on Methods for Estimating Discard Survival (WGMEDS)
- Workshop on Fish of Conservation and Bycatch Relevance (WKCOFIBYC)
- Workshop on fisheries Emergency Measures to minimize BYCatch of short-beaked common dolphins in the Bay of Biscay and harbor porpoise in the Baltic Sea (WKEMBYC)

EGs opening in 2020:

- No resolutions at current time, though proposals for new workshops are expected

5.5.7 Forward look

- WGSHP participation at PAME II-2020 Shipping Experts Group (SEG) Pre-Meeting (17-18 September 2020) to develop linkages with the Arctic Council and PAME's shipping and other related work
- WGSHP, WGCEAM, WGOWDF to participate in IEASG meeting October 13-14, 2020
- HAPISG Virtual Meeting October 19, 2020
- WGSFDGOV to move from HAPISG to new Data Science and Technology Steering Group MCWG and WGMS propose to merge into new expert group after 2021
- WGML is supporting the International Symposium on Plastics in the Arctic and the sub-Arctic region (March 2021)
- Joint Theme Session at 2021 ASC on *The impacts of marine shipping and their effects on coastal communities and ecosystems* (WGBOSV and WGSHP)
- Theme Session at IUCN World Congress 2021, *Stopping the Tide: Best practices and solutions to tackle marine invasive alien species*, supported by WGBOSV and WGITMO
- WGOWDF planning ICES workshop to increase external engagement in order to improve understanding of the implications of offshore wind for fishing behaviour and fishing communities
- WGITMO and WGBOSV planning workshop on molecular tools for detection and monitoring of nonindigenous and harmful algal species (side event at International Conference for Marine Bioinvasions – postponed to 2022)

5.6 Integrated Ecosystem Assessments SG (Mette Skern-Mauritzen, term started January 2017)

This Steering Group is responsible for guiding and supporting Expert Groups that develop ecosystem modelling and assessment methods, contribute to state of the environment reporting and underpin guidance on meeting ecological, social and economic objectives.

Topics covered include:

- Development of integrated ecosystem assessments for the Arctic, Baltic, Barents, Celtic, North, northwest Atlantic and Norwegian seas, Greenland Sea and Northern Bering and Chukchi Seas
- Comparative analyses of marine ecosystems
- Ecosystem modelling
- Methods and application of ecosystem-based management and risk assessment
- Linking ecological, economic and social models and analyses to understand interactions and trade-offs between management objectives
- Defining data needs to support integrated ecosystem assessment
- Development of integrated advice to support ecosystem-based management

5.6.1 Summary of progress in relation to Terms of Reference

Terms of Reference	Progress
ToR a) Engage with and work with Chairs of EG to ensure that EG work supports and meets the science objectives and advisory needs of ICES	Since March 2020 the IEASG chair has engaged in defining EG ToRs, participated in EG meeting (WGINOSE), discussed EG output and reports with EG chairs and ICES Secretariat. The chair is organizing an IEASG meeting in October, with presentations from, and discussions with, the HAPISG EGs WGCEAM, WGSHP and WGMRE. The chair has also engaged in a proposal to EuroMarine on conceptual mapping methodologies to support transdisciplinary research and IEAs.
ToR b) Help EG formulate and prepare their draft terms of reference and resolutions	The IEASG chair has engaged in the drafting of ToRs for several EGs to be approved in 2020
ToR c) Review and report on the science being undertaken within EG to SCICOM, with a focus on identifying science highlights and priorities and demonstrating the impact of their science	The IEASG chair has communicated with EG chairs regarding science highlights. Some highlights are detailed below.
ToR d) Review scientific products/deliverables of the EG and provide feedback on ways to improve the impact and influence of their work	See above. The interest in collaboration between EGs is high, and IEASG meetings, workshops like WKINTRA, WKCONSERVE, WKTRANSPARENT, is crucial for cross EG collaboration and discussion to improve the scientific work and an effective uptake of new methods in EG work.
ToR e) Provide feedback to SCICOM on research priorities and implementation of ICES strategy	The IEASG chair will cochair WKTRANSPARENT to further develop the risk assessment framework used in the Ecosystem Overviews in April 2020, and is now well into the planning of this WK. The IEASG chair is also member of the subgroup developing the Ecosystem Advice Framework (EAF) in ICES, and involved in discussions under ACOM on i) ICES progress on EBM, a topic that will be discussed during ACOMs September meeting, and ii) the role of stakeholders in ICES, including the need for an ICES stakeholder Strategy.
ToR f) Identify shortfalls in skills and knowledge needed to achieve ICES objectives within the SGs area and work within the SG and through SCICOM and operational groups to develop capability	Within the IEASG, and with the support from SIHD, there are no major gaps in skills to address the IEASG objectives. The focus should be on bridging disciplines and EGs, and on communication with stakeholders to learn more about societal needs and priorities. There is also a need for a better overview (or strategy, roadmap) of how the work in the different EGs and SGs support EBM implementation in ICES ecoregions, for both inhouse use for assessing progress and gaps, and for communication with stakeholders and clients.
ToR g) Identify gaps and overlaps in the work of EG, and propose consolidation, rationalization or forming of new EG to SCICOM as appropriate	There is limited overlap between the EGs. WGs are organized on topics of interest across groups. Also, with increasing focus on scoping for IEAs, there is more interactions with stakeholders. WGEAWESS has led a EuroMarine proposal on conceptual mapping, also useful approaches for stakeholder interactions.
ToR h) Help EG Chairs to adopt practices which ensure scientific information generated by EG is	See above.

Terms of Reference	Progress
receiving adequate quality control consistent with scientific norms	
ToR i) Facilitate active horizontal and vertical communication, collaboration and co-ordination between EG and all other relevant ICES groups and identify, in cooperation with EG Chairs, opportunities for internal and external collaboration	This ToR is addressed more or less continuously in discussions with EG chairs, and specifically during IEASG meetings and in supporting relevant WGs. EGs have also had back-to-back meetings to focus on shared interests and challenges. Several IEA EGs and the IEASG chair are involved in an EU-project on a whole-Atlantic IEA, and in the above mentioned EuroMarine proposal.
ToR j) Represent the SG at SCICOM meetings and SCICOM/ACOM leadership meetings in spring and at the ASC	The IEASG chair will participate in the 2020 SCICOM and leadership meetings in spring and autumn.
ToR k) Map the EGs and their ToR against the information and data that ICES needs to deliver the Science Plan and its advisory work, suitably prioritized	IEASG EGs are targeting key topics in the Science Plan, including i) developing <i>Ecosystem science</i> (assessing and reporting on trends in physical and biological systems; describing key links; methods development, comparative approaches), ii) assessing <i>Impacts of human activities</i> (e.g., distribution, intensity and impacts of pressures, separately and combined, vulnerability assessments, empirical and modelling approaches, Management strategy evaluations), iii) support multispecies and ecosystem considerations in <i>fisheries management and seafood production</i> (e.g., develop multispecies and ecosystem models to test fisheries management strategies, increased understanding of combined impacts of climate change, changing foodwebs and management, assess changing species spatial distributions and the role of emerging foodwebs for seafood production, link seafood production to societal indicators and explore interactions and tradeoffs), and finally iv) in supporting <i>Conservation and management science</i> (e.g., developing evidence base and assessment tools to support conservation and management, assess suitability and effectiveness of policies, provide evidence for setting policy objectives, develop and publish IEAs, develop ecosystem overviews).
ToR l) 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	The IEASG chair cochaired WKECO3 on the next generation Ecosystem Overviews in spring 2019, and will cochaire WKTRANSPARENT in December 2020 on improving the risk assessment framework used in the EOs.
ToR m) Promote the development of outline 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. IEASG will promote innovative approaches including using partial component based	There is much focus on developing IEA methods; WKCONSERVE developed roadmaps for integration of socio-economic data and aspects in IEAs, WKINTRA and WGCERP are working on the use of time series data and indicators in IEAs. Several of the IEA WGs are increasingly focusing on ecosystem risk assessments of multiple impacts, and balancing impacts and benefits. The IEASG meeting in October will support discussions on how to include shipping and renewable energy as sectors in the IEAs, as well as discussions on approaches on cumulative impact assessments.

Terms of Reference	Progress
analyses, and use of combination quantitative and expert judgement approaches	
ToR n) Maintain a watching brief over initiatives in IEA in the wider community beyond ICES. This should include new approaches or methods for IEA, and broadening of the IEA concept to potentially include economic and social drivers and impacts	To follow-up a SCICOM action point, the IEASG chair is engaged in ongoing discussions with SIHD chairs and ACOM and SCICOM chairs on stakeholder interactions in ICES, with the aim of bringing IEA perspectives and needs into this process.
ToR o) 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	There is variable use of data from the Data Centre among the IEA groups, and this is a topic that needs to be followed up. It is a challenge for several IEA groups that data are stored nationally and not in the ICES data base. Adherence to TAF and quality assurance for product in the EOs is a push in the right direction.

5.6.2 Expert groups

The IEASG expert groups are listed in Annex 2.

5.6.3 Science highlights

Solvang and Subbey (2019): An improved methodology for quantifying causality in complex ecological systems. The paper develop statistical methodology for quantifying causality in complex dynamical systems, based on analysis of multidimensional time series data of the state variables (WGIBAR)

Dalpadado *et al.* 2020. Climate effects on temporal and spatial dynamics of phytoplankton and zooplankton in the Barents Sea. Warming continues to increase and borealize lower trophic production in the Barents Sea (WGIBAR)

Eriksen *et al.* 2020. Diet and trophic structure of fishes in the Barents Sea: The Norwegian-Russian program “Year of stomachs” 2015 – Establishing a baseline. During the “Barents Sea year of the stomach” 27,657 stomachs from 70 fish species were examined. The paper present a conceptual model of fish feeding relations, updating our knowledge about trophic structure and interactions, and providing a baseline for further investigations. (WGIBAR)

Nakagawa *et al.* 2019. Integrating hawkes process- and biomass models to capture impulsive population dynamics. The paper presents a modeling framework that captures the impulsive biomass dynamics (bust-boom) of a fish stock, using capelin in the Barents Sea as a case. (WGIBAR)

Holm *et al.* 2019. Collaborative Research in Fisheries. A book on the ongoing transition of fisheries governance, from top-down command and control towards a more transparent and participatory form. (WGMARS)

Tzanatos *et al.* 2020. Mediterranean nekton traits: distribution, relationships and significance for marine ecology monitoring and management. A trait-based assessment of the Mediterranean Sea at the level of population, community, ecosystem and landscape, in relation resilience of ecosystem functioning. (WGCOMEDA)

Beukhof *et al.* 2019. Marine fish traits follow fast-slow continuum across oceans. The paper investigate trait-environment relationships and project the trait composition of marine fish communities across the continental shelf seas of the Northern hemisphere. The results show

that traits related to growth, maturation and lifespan respond most strongly to the environment, with implications for projection of climate change responses. (WGCOMEDA)

Hardison *et al.* 2019. A simulation study of trend detection methods for integrated ecosystem assessment. The paper demonstrates that the ability to detect trends in time series is hampered by the influence of autocorrelated residuals in short series lengths. Results indicate biased rejection rates in the presence of even weak autocorrelation for series lengths often encountered in indicators developed for ecosystem-level reporting (N = 10, 20, 30). (WGNARS)

Arneberg and Solvang (submitted). A method for warning signal identification in integrated ecosystem assessments by statistical time series modelling. The paper presents a method to identify warming signals in time series, adopting a state space representation with the trend component is estimated by a Kalman filter algorithm. The algorithm obtains one- or more-years-ahead prediction values using all past information from the data, and observed values can be assessed whether they fall within prediction bands based on past trends or not. (WGINOR)

Communication with EG (summary paragraph of activities undertaken)

See table above

5.6.4 Summary of new EG proposals and EG closing

None

5.6.5 Forward look (including actions for SG and SCICOM/ ACOM)

Key topics to IEASG but that also goes beyond IEASG:

- The development of an ICES stakeholder strategy that embraces both ACOM and SCICOM perspectives
- Improved integration across EGs, SGs, SCICOM and ACOM in an ICES strategy or roadmap to support the implementation of EBM in ICES regions.

5.7 Ecosystem Observation SG (Sven Kupschus, term started January 2017)

Introduction

The Ecosystem Observation Steering Group is responsible for guiding and supporting expert groups that are meeting immediate data demands and contributing to the running and further development of effectively coordinated, integrated, quality assured, and cost-effective monitoring in the ICES region and beyond.

Topics covered include:

- Evaluating and optimising survey design to meet the needs of member countries and support advisory requests
- Design, planning and coordination of egg and larval, acoustic and trawl surveys
- Identifying and evaluating new technologies for observation and monitoring
- Advising on the design, deployment and efficiency of sampling methods and gears and the use of resulting data for assessment and advice
- Aging and estimating life history parameters of sampled fauna

- Developing monitoring to meet emerging data, science and advisory needs, with a focus on integrated ecosystem assessment and ecosystem-based management

5.7.1 Summary of progress in relation to Terms of Reference

Terms of Reference	Progress
a) Engage with and work with Chairs of EG, SCICOM and ACOM to enable and support EG contributions to both the science objectives and advisory needs of ICES;	General: Developed a structure for the future of EOSG and DSTSG through a consultation process with EG chairs and a workshop. The new structure specifically emphasises the need for direct contributions to the advisory processes and development of the science underlying such advice.
b) Review and report on the science being undertaken within EG to SCICOM and ACOM, with a focus on identifying science highlights and priorities and demonstrating the impact of their science, including how science was used in ICES advice (method development, advisory products);	At WGCHAIRS, the EOSG EG chairs suggested a science highlights series focused on advancements in technology. ICES Comms has recently agreed to work on this series, with timing related to the introduction of DSTSG in early 2021. Other science highlights are reported separately, but SG chair has been encouraging EGs to submit and develop new science and to report on existing science.
c) Provide feedback to SCICOM and ACOM on research priorities and implementation of ICES strategy;	EOSG Chair has reported on the need for the alignment between EOSG and the data users in FRSG and IEASG which is now being implemented. EOSG Chair has communicated with Johannes Karstensen on opportunities to collaborate on oceanography and ecosystem processes in terms of improving the basis of our science and the data collection. Additionally, EOSG Chair has discussed with SCICOM chair and Science PO some initial ideas for a session proposal for the Ocean Sciences Meeting 2022. EOSG Chair has developed better communication with RCGs and hopefully an effective way these groups, as well as other national data collection programs, can both feed into as well as contribute to improved science developments.
d) Identify shortfalls in expert availability, skills and knowledge needed to achieve ICES objectives within the SG area and work within the SG and through SCICOM, ACOM, Strategic Initiatives and operational groups to develop capacity and capability;	A lot of this has been on hold temporarily while clarifying the SG structure and objectives earlier in the year. We now have a much clearer understanding of the future needs and are following the suggestions from WKREO on seeding new groups with new skills to with the support from the RCGs (Maria Hansson) and ACOM (Lotte Worsøe Clausen).
e) Identify gaps and overlaps in the work of EGs, and propose consolidation, rationalization or forming of new EGs to SCICOM and ACOM as appropriate;	The EOSG strategy to both issues has been to develop joint workshops to facilitate the development and transfer of expertise across disciplines. Generally, EOSG has struggled in modelling and ecological areas of expertise
f) Facilitate active horizontal and vertical communication, collaboration and co-ordination between EG and all other parts of ICES and identify, in cooperation with EG Chairs, opportunities for internal and external collaboration;	EOSG Chair has encouraged the development of cross EG workshops and generally EOSG chairs have been very receptive of the approach particularly since the workshops generally provide additional support from the national institutes in terms of time which make the addressing of such wider issues more effective. EOSG Chair has also observed some exemplary coordination with regards to recommendations

Terms of Reference	Progress
	generally. Often now communication occurs between chairs before recommendations are formulated or at least a follow up is being initiated to explain the background to the recommendation. The recommendations database should aid the transition from when recommendations were merely a means of delegating tasks to other EGs.
g) Help EG Chairs to adopt working practices which ensure scientific information generated by EG is receiving adequate quality control consistent with scientific norms;	EOSG Chair has had little to do on this, generally EG chairs have taken on the role themselves and coupled with the standardised reporting this has been sufficient. EOSG Chair has assisted and reviewed some EG work on the request of some EG members and chairs but generally found that most EOSG work either adheres to scientific standards, or regresses are picked up by EG members. ACOM and the TIMES series editors also pick up ACOM ToR reviews and survey protocols which is a useful additional independent check.
h) Review EG reports and activities and, in dialogue with the SCICOM chair and ACOM leadership, provide feedback on ways to improve the impact, communication and influence of their work;	The communication on this topic is less than ideal. Focus of ACOM and SCICOM is not generally on data collection while EG groups focus more on the quality of their work than on the impact. Reviews of reports have predominantly focused on the word count of the executive summary and technical issues with the transition to “scientific reports”. EOSG Chair was a little surprised that an opportunity was missed to leverage the working knowledge of the survey expert group system as to likely impact of the COVID-19 on data collection. While the national data submitters certainly had the tabular information for their own surveys it was clear from talking to the EGs that a lot of cooperation communication and mitigation was being implemented than provided a more coherent picture of the likely impact on surveys.
i) Encourage EGs to come forward with proposals and initiatives for longer term science development in support of ICES advice;	While EOSG Chair has done this more on a personal plea-basis, for example WGFAST or WGSSSE, generally ToRs are already extensive to deal with the routine operations of data collection groups. Most groups now have some ToRs in this direction, but this is new territory for most EOSG groups and something they felt needed discussion and interactions which have suffered through webex meetings that are hopefully temporarily.
j) Help EG Chairs to formulate and prepare their draft ToR and Resolutions for research-oriented work;	EOSG Chair reviews all EG ToRs and provide detailed comments while also suggesting edits and changes to encourage more scientific advancement and adherence of the resolutions to ICES guidelines. EOSG Chair sees more active SCICOM input and encouragement necessary to ensure that EGs continue to provide national science and advisory priorities as the science plan appears to be too “general” to evaluate utility of the individual ToRs for the groups.
k) For advisory ToR: to work closely with the ICES secretariat, ACOM leadership and the EG chairs in preparing the research and advisory work plans for the upcoming year to ensure the advisory ToR are allocated to EGs and addressed	EOSG Chair has supported the development of ToRs for WKING, WGELECTRA, WKRBES-EST2 in conjunction with ACOM. He has contributed to additional EG ToRs outside of EOSG to ensure communication and to avoid duplication with existing groups.

Terms of Reference	Progress
adequately and within the advisory request timeframe;	
l) To give Special Requests received during the year immediate and rapid attention to inform the decision about whether or not the Special Request can be accepted and addressed;	Generally this task is handled by ACOM rather than the SG chair where requested I have contributed to the process, but this is generally an ad hoc procedure at the moment. I have not heard of any issues either from the EOSG chairs or ACOM, but note that communication is less than complete in the process.
m) To support the ICES Secretariat and/or the ACOM leadership in liaising directly with the Chairs of relevant EG when processing Special Requests;	See above.
n) Represent the SG in SCICOM and ACOM meetings, SCICOM/ACOM leadership meetings, WGCHAIRS and at the ASC.	Aside of this year's ASC which has been postponed, EOSG Chair has attended all meetings. Generally the FRSG chair and EOSG Chair are the only SG chairs attending the ACOM meetings.
o) Developing more efficient and effective data collection through better integration and evaluation of existing ecosystem monitoring information and support implementation of new methods and technologies.	Much of this work in the past has focused on technical elements of information we can collect. EOSG is now in position to provide better advice on what should be collected given new and emerging data needs through the development of new analytical methods, while DSTSG will tend to focus more on the how elements.
p) Collaborating with Regional Co-ordination Groups and national data collectors to evaluate and optimise survey design to better meet the needs of member countries, support advisory requests, and aid ICES science development.	The groundwork for this has been laid by WKREO and EOSG Chair will continue to work with ACOM and the RCGs on implementing ways in which RCGs and national data collectors can more effectively interact with data collectors at the international to ensure better evaluations of existing data collections and receive advice on data collection prioritisation. WK user has already provided the start of a framework to help data collectors and users evaluate the existing collections and share the experiences across the data collectors beyond mere consistency of surveys.
q) Developing monitoring to meet emerging data, science and advisory needs, with a regional focus on integrated ecosystem assessment and ecosystem-based management	EG chairs and EOSG Chair have conducted an extensive consultation process as to how to progress from what is largely independent collection of different ecosystem components to a more integrated approach for the ecosystem approach. Prioritisation and integration of the data collections are the next key steps for the new SG chair to take forward.
r) Overseeing design, planning and coordination of egg and larval, acoustic and trawl surveys and development of publication of survey protocols	EOSG Chair has contributed to discussions on future needs for several surveys and have worked closely with Ruth Andersen (ICES Editor) to transition the task of editing and publishing from SISPs to a special form of TIMES article. This will see more consistent formatting and content approaches and more rigorous attention to the readability of what is sure to continue to be an important ICES legacy document. Overall 3 SISPs were published (two updates and one new) this year and one new manual from WGACEGG is in the process of becoming the first TIMES survey manual.

5.7.2 Expert groups

The EOSG expert groups is listed in Annex 2.

5.7.3 Science highlights

WGNAEO (January - report was not available in time for March SCICOM)

- This meeting was the first formal step in combining two surveys as a coordinated ecosystem survey. The ongoing spatial overlap for the two vessels will be the 5Zjm area, with the US survey continuing farther west (5YZ6) and the Canadian survey farther east (4VWX).
- Initially we will focus on the documentation of existing oceanographic monitoring conducted by DFO and NEFSC, later expanding to include monitoring efforts in the region by other organizations.

WKUSER (February, but report was not available in time for March SCICOM)

- Provided an outline for approaches to dealing with changes to surveys on different temporal scales and perspectives including a practical decision-making framework.
- Given the current covid-19 situation some of this work became relevant all too soon. Unfortunately, full use of the framework still requires better / more available monitoring evaluation tools and suggests such work should be undertaken routinely as part of monitoring work.

WGIPS

- A session was held at WGIPS 2020 to assess auxiliary pelagic ecosystem surveying techniques currently used on surveys coordinated by WGIPS. A new ToR was agreed in 2019 (ToR i) that auxiliary monitoring of ecosystem components will be presented in a separate session at WGIPS from the standard fishery survey results for the target species in 2020 and 2021.
- Issues with the ICES acoustic database repository were discussed amongst users and developers during the meeting and the intention to further consolidate both the software and the database as common tools to be used amongst all surveys coordinated within WGIPS was agreed.
- Exemplary communication with other WGs on recommendations (Michael O'Malley).

WGFAST

- Big meeting as usual with 100 participants, others had to view the meeting on-line.
- Topics discussed this year were acoustic backscatter models, the netCDF4 open source data format for acoustic data, a Python software package, Echoype, to read, process, and analyze acoustic data, and applications of artificial intelligence (AI) and machine learning (ML) to acoustic data.
- Michael Jech chair has been very conscious of the need to work across expert groups and has the support of EG.

WGELECTRA

- In this heated political arena, ICES WGELECTRA provided a platform for scientists to discuss their research and build on collaborative projects. Substantial efforts were invested during the last 10 years to examine the effect of

pulsed currents on individual level for a range of species, species groups and life stages.

- In their 2020 meeting, WGELECTRA produced a state-of-the-art review of the scientific knowledge. Effects of pulse trawling on marine organisms, populations and ecosystems are reviewed and compared to the conventional beam trawling. The report provides a solid scientific basis about the pros and cons of pulse trawls when exploiting the total allowable catch of sole to be used in decision making in the future.

WGDG

- A generic DATRAS format for submission has been agreed upon across surveys, after in-depth discussions in depth of its pros and cons. Implementation is scheduled for autumn 2020.

WGACEGG

- A manuscript on anchovy and sardine habitats in the European Atlantic Area based on WGACEGG grid maps series, already presented as a poster at ICES ASC 2019, will be submitted later in 2020, as TOR b deliverable.
- A joint meeting with the Mediterranean acoustic community (MEDIAS group) was organised in 2018, and included a training session on the acoustic data processing R package EchoR, to address TOR g.
- A manual, combining DEPM and acoustic surveys protocols, to be submitted to the Series of ICES Survey Protocols, allowed to further standardise methodologies in use in the WGACEGG community to address TORs g and i.

IBTSWG

- The developments of a new survey trawl were discussed. The two approaches led by Scotland and by Ireland joined in Nov/Dec 2019 on gear trials on board of the Scottish vessel Scotia. Successful fishing was done with both gears on shallow as well as deeper waters within the normal range of the NS-IBTS. The preliminary results indicate that the lighter Irish gear with a slightly higher net opening caught better the species in the water column like sprat, but the heavier Scottish gear caught better the bottom dwelling species. The trials indicated that both gears have good ground contact, do not dig in in shallower water, and seem more stable than the GOV.

WGBEAM

- The group managed to effectively address their ToR, noteworthy because they were one of the first groups to be effected by the lock-downs. With less than 7 days' notice all adjustments were made and the meeting proceeded, from 13 different households in 9 countries, locations varying from an institute's meeting room to a parent's guest room, kitchen, sleeping room, basement, home office or living room. Despite the unplanned and unforeseen circumstances, good progress on almost all tors has been made.

5.7.4 Communication with EG

EOSG Chair has communicated with a number of EG chairs during the development of resolutions and additions to new ToRs and attended some of the survey EGs by WebEx, something that has become a lot more natural with COVID-19 (one of the few things). EOSG Chair also took the opportunity to update groups on the outcome of WKREO and seek further input on discussion on the future of EOSG. Consequently,

the groundwork for the changes now approved by SCICOM to transfer many of the existing EGs from EOSG to the new DSTSG went very smoothly and people were well aware of the reasoning and the need.

EOSG plans for change and the need for better communication with advice users were discussed at WGCHAIRS in January 2020 in a subgroup meeting with FRSG. A presentation on the outcome of the consultation process within EOSG found good resonance with FRSG chairs opening a promising avenue for future collaboration between the EGs across the SGs. The new SG-structure now should facilitate this and it is hoped that the support and interest continues.

There is also an RCG initiative based on results from WKREO, which are being followed up together by EOSG Chair together with Lotte Worsøe Clausen. EG chairs have been involved in this and this is hoped to do more to set the groundwork for a new direction for EOSG.

Due to the recent pandemic extensive communication with EG chairs has been necessary to ensure the data availability and assuring the quality for advisory processes. Despite the significant disruption, EOSG was able to report on the likely key impact on advice in a very short time and the SG thanks in no small part to the responsiveness of EG chairs pulling together in a tough situation and had drawn up contingency plans proactively.

5.7.5 Summary of new EG proposals and EG closings since March

New working groups and workshops:

- WKOISS – Workshop on Operational Implementation of Stomach Sampling
- WKING – Workshop on Innovative Fishing Gear (EU special request linked to WGFTFB)
- WKBIOPTIM4 - The Fourth Workshop on Optimization of Biological Sampling
- WKRDB-POP2 - The Second Workshop on Populating the RDBES data model
- WGAcousticGov - Working Group on the Acoustic Trawl Data Portal Governance
- WKABM - Workshop on Acoustic Backscatter Models
- WGSSE - Working Group on Size and Species Selection Experiments (in preparation)

New resolutions for existing groups:

- WGBEAM – Working Group on Beam Trawl Surveys (new resolution)
- WGRFS – Working Group on Recreational Fisheries Surveys (new resolution)
- WGACEGG- Working Group on Acoustic and Egg Surveys for small pelagic fish (new resolution, shortened name)
- WGCATCH - Working Group on Commercial Catches (in preparation)

5.7.6 Dissolved working groups:

PGDATA has been dissolved in its current form and will be resurrected as WGQUALITY under DSTSG due to its now closer ties with the TAF process

Shift of some EOSG expert groups to DSTSG:

Roughly half of the EGs under EOSG are moving to the new DSTSG in January 2021, predominantly those involved in quality assurance and technological development. The groups are aware and positive about the move. Details of arrangements and associated operational changes will be made available soon.

Groups with focus on technology

WGTFID	Working Group on Technology Integration for Fishery-Dependent Data	EOSG
WGFAST	Working Group on Fisheries Acoustics, Science and Technology	EOSG
WGMLEARN	Working group on machine learning in marine science	EOSG

Groups with focus on data

WGSMAST	Working Group on SmartDots Governance	EOSG
WGDG	Working Group on DATRAS Governance	EOSG
WGACOUSTICGOV	Working Group on Acoustic Data Governance	EOSG
SCRDB	Steering Committee of Regional Fisheries Data Base	EOSG
WGALES	Working Group on Atlantic Fish Larvae and Eggs Surveys	EOSG
WGBIOP	Working Group on Biological Parameters	EOSG
WGCATCH	Working Group on Commercial Catches	EOSG
WGRFS	Working Group on Recreational Fisheries Surveys	EOSG

5.7.7 Forward look (including actions for SG and SCICOM/ ACOM)

The outlook for EOSG has changed significantly with SCICOM approval for the new Data Science and Technology Steering Group (DSTSG); the Ecosystem Observation Steering Group thanks SCICOM and ACOM for their support during the process. The transition phase will be managed by the current and newly elected EOSG chairs, but full implementation will take longer, and the handover between steering group chairs is critical to the success. The new SCICOM Chair has been an integral part of this process and a good sounding board for ideas in his former role as SCICOM member and will enable a smooth transition from merely everything to do with data collection, to an integrated element of the community is structurally facilitated.

Focus for the rest of the year will be on:

- Continue the dialog with data users on how to help drive ICES science forward by looking across data collections within regions to consider ecosystem processes relevant to management.

- Explore practical options for implementation of the fisheries independent monitoring groups to seek establishment of more analytically focused groups in EOSG than are more closely aligned with the data users.
- Develop the dialog with RCGs and the national laboratories on how EOSG can support their needs for better evaluation tools for data collection to improve efficiency and scope of the monitoring.
- Work with DSTSG and its groups to maintain and improve data delivery and data standards as well as developing new analytical and technical solution to data collection.

There is still a perception in the ICES network that data collection is an important, but independent task from science/advice. Much of the SG chairs work and experiences, including collaboration with EG chairs, suggest this is an outdated and rather unhelpful perspective. Those advisory EGs that have close ties to their respective data collection EGs (HAWG, WGWIDE) operate on an interactive/cyclical basis actively interacting through participation of data collectors at the advisory meetings. In demersal advisory EGs, communication has mostly focused on passive (reports / assumptions) which has led to an undesirable isolation of data collection from the rest of the community with negative impacts on the quality of the advice. To more fully realise the potential of the ICES network as a whole, a closer focus on the work of these groups and the multidisciplinary skills needs of these groups is needed.

5.8 Fisheries Resources SG (Patrick Lynch, term started February 2019)

5.8.1 Introduction

The Fisheries Resources Steering Group (FRSG) is responsible for guiding and supporting expert groups that are working on advisory-related and science topics contributing to the management of wild-capture fisheries.

Topics covered include:

- single-species and multi-species stock assessment, including data-limited methods.
- management strategy evaluations, addressing uncertainty, and improving the transparency, robustness, efficiency and repeatability of stock assessment
- operationalisation of ecosystem-based fishery management and maximum sustainable yield concepts and their application in mixed, multispecies and emerging fisheries
- fisheries spatial dynamics, mixed fishery interactions and responses to management measures

5.8.2 Summary of progress in relation to Terms of Reference

Terms of Reference	Progress
a) Engage with and work with Chairs of EG, SCICOM and ACOM to enable and support EG contributions to both the science objectives and advisory needs of ICES;	Ongoing via remote correspondence, an in-person meeting during WGCHAIRS in 2020, and attendance/participation in ACOM and SCICOM meetings and activities throughout the year.
b) Review and report on the science being undertaken within EG to SCICOM and ACOM, with a focus on identifying science highlights and priorities and demonstrating the impact of their science, including how	Ongoing through this report, participation at ACOM, SCICOM, and FRSG meetings, working with the Secretariat, as well as the EG summary table on SharePoint.

Terms of Reference	Progress
science was used in ICES advice (method development, advisory products);	
c) Provide feedback to SCICOM and ACOM on research priorities and implementation of ICES strategy;	Ongoing via collection of research priorities on FRSG SharePoint site and reporting at ACOM and SCICOM.
d) Identify shortfalls in expert availability, skills and knowledge needed to achieve ICES objectives within the SG area and work within the SG and through SCICOM, ACOM, Strategic Initiatives and operational groups to develop capacity and capability;	This discussion was initiated at the 2020 WGCHAIRS meeting through plenary discussions and a breakout discussion with the SG. FRSG reports capture capacity gaps that apply to most, if not all, EGs. Capitalizing on efficiencies learned through the COVID pandemic may be one way to address capacity limitations.
e) Identify gaps and overlaps in the work of EGs, and propose consolidation, rationalization or forming of new EGs to SCICOM and ACOM as appropriate;	At this point, consolidation, rationalization, or forming new EGs has not been identified as a priority.
f) Facilitate active horizontal and vertical communication, collaboration and co-ordination between EG and all other parts of ICES and identify, in cooperation with EG Chairs, opportunities for internal and external collaboration;	Communication throughout the ICES community occurs via regular operations (remote correspondence, meetings, etc.).
g) Help EG Chairs to adopt working practices which ensure scientific information generated by EG is receiving adequate quality control consistent with scientific norms;	Ongoing via working with ACOM and the ICES Secretariat on quality control policies. FRSG products are generally subject to a high level of quality control and quality assurance.
h) Review EG reports and activities and, in dialogue with the SCICOM chair and ACOM leadership, provide feedback on ways to improve the impact, communication and influence of their work;	Ongoing, largely through review and discussion of EG activities and products in close communication with ACOM Leadership.
i) Encourage EGs to come forward with proposals and initiatives for longer term science development in support of ICES advice;	EGs have been encouraged via in-person meetings and identification of strategic directions for ICES. These directions have been ranked and communicated to ICES. FRSG is tentatively planning a meeting focused on strategic directions for stock assessments.
j) Help EG Chairs to formulate and prepare their draft ToR and Resolutions for research-oriented work;	Ongoing with FRSG review occurring prior to submission to ACOM or SCICOM.
k) For advisory ToR: to work closely with the ICES secretariat, ACOM leadership and the EG chairs in preparing the research and advisory work plans for the upcoming year to ensure the advisory ToR are allocated to EGs and addressed adequately and within the advisory request timeframe;	Ongoing via routine coordination with the Secretariat and ACOM/ACOM Leadership.
l) To give Special Requests received during the year immediate and rapid attention to inform the decision about whether or not the Special Request can be accepted and addressed;	Ongoing as Special Requests are received. Also, EG chairs have expressed concern over being able to address all special requests, and are encouraged to decline when there is not sufficient capacity to appropriately respond to the request.
m) To support the ICES Secretariat and/or the	This has been facilitated particularly through

Terms of Reference	Progress
ACOM leadership in liaising directly with the Chairs of relevant EG when processing Special Requests;	WGCHAIRS, but there is also regular remote dialogue between EG Chairs, ACOM Leadership, and the FRSG Chair.
n) Represent the SG in SCICOM and ACOM meetings, SCICOM/ACOM leadership meetings, WGCHAIRS and at the ASC.	Ongoing with participation and presentations at all stated meetings, and continued plans to do so.
o) Represent fisheries assessment and management science in SCICOM and ACOM and work with other SG Chairs and Chairs of EGs to ensure that ICES maintains active and impactful research on these topics.	Ongoing via participation in SCICOM, ACOM, ACOM Leadership, and communication within the SG.
p) Ensure that the development of ICES science is informed by knowledge of current and emerging advisory needs.	Ongoing through communication of advisory needs and priorities via regular presentations to SCICOM.
q) Provide feedback to ACOM and advisory services to ensure they are well informed of current and emerging science with potential to meet their needs.	Ongoing through regular participation and presentations to ACOM and ACOM Leadership.
r) Provide feedback to SCICOM and research-oriented groups to ensure they are well-informed of developments in advisory request with potential to meet their needs.	Ongoing via this report and participation in SCICOM meetings and participation at the ASC. The FRSG is coordinating within the ICES community on sessions at the ASC as well as proposed workshops and working group activities.
s) Contribute to the development of an ICES culture where other SGs and all EGs better understand advisory needs and have the potential to support advice.	Ongoing through collaboration with other SG chairs and communication within FRSG in coordination with ACOM/ACOM Leadership. The FRSG Chair continues to contribute to new ICES initiatives and activities, such as the formation of a new Data Science and Technology Steering Group, TAF Governance, and others.
t) Work with ACOM leadership to review suggestions from EG for benchmark processes and present to ACOM and SCICOM an annual plan for benchmark processes for the coming three years.	Following recommendations from the ACOM subgroup on the benchmark process, the FRSG Chair is now an active member of the Benchmark Oversight Group.
u) Steer the development and implementation of methods to assess the state of fisheries resources and account for the fisheries impacts in advisory/management perspective.	The FRSG has highlighted various needs, challenges, and priorities and will continue meeting to establish initiatives and activities that address needs via development and implementation of new methods.

5.8.3 Expert Groups

The FRSG expert groups are listed in Annex 2.

5.8.4 Science highlights

Arctic Fisheries Working Group (AFWG)

AFWG provided scientific advice to support the management of cod, haddock, saithe, redfish, Greenland halibut and capelin in subareas 1 and 2. Taking the catch values provided by the Norwegian fisheries ministry for Norwegian catches, and raising the total landed value to the total catches gives an approximate nominal first-hand landed value for the combined AFWG stocks of ca. 20 billion NOK in 2018 (ca. 2 billion EUR).

Herring Assessment Working Group for the Area South of 62 deg N (HAWG)

The herring assessment working group (HAWG) met on an interactive virtual platform in March 2020 to assess the state of five herring stocks and two sprat stocks. HAWG also provided advice for four sandeel stocks in February anticipated by an inter-benchmark for two of them. The working group conducted update assessments for the five herring stocks. An analytical assessment was performed for the combined North Sea and Division 3.a sprat, and a data limited assessment (ICES category 3) was conducted for English Channel sprat (spr.27.7de).

Joint NAFO/ICES Pandalus Assessment Working Group (NIPAG)

The NIPAG met at Havforskningsinstituttet (IMR), Tromsø, Norway from 8 to 13 November 2019 and at ICES HQ in Copenhagen from 20 to 21 February 2020 to review stock assessments referred to it by the Scientific Council of NAFO and by the ICES Advisory Committee. The next NIPAG meeting is at ICES HQ in Copenhagen from 27 October to 02 November 2020.

North Western Working Group (NWWG)

The NWWG met remotely in April 2020 to assess the stock status of two stocks of cod in Greenland waters, Greenland halibut, golden redfish, and Greenland slope beaked redfish. Iceland decided that it would be without ICES advice for the 2020/2021 fishing year for five stocks (cod, haddock, saithe, herring, and Icelandic slope beaked redfish) considered local and are usually assessed during the meeting. The group will meet again in November to review stock assessments of four Faroese stocks and capelin.

Assessment Working Group on Baltic Salmon and Trout (WGBAST)

The WGBAST met by correspondence 31 March – 8 April 2020. The group was mandated to assess the status of salmon in Gulf of Bothnia and Main Basin (subdivisions 22–31), Gulf of Finland (subdivision 32) and sea trout in subdivisions 22–32, and to propose consequent management advices for fisheries in 2021.

Baltic Fisheries Assessment Working Group (WGBFAS)

The WGBFAS met in April to assess the status and produce a draft advice of the following stocks: Sole in Division 3.a, SDs 20–24; Cod in Kattegat, Cod in SDs 22–24, Cod in SDs 24–32; Herring in SDs 25–27, 28.2, 29 and 32; Herring in SD 28.1 (Gulf of Riga); Herring in SDs 30–31 (Gulf of Bothnia); Sprat in SDs 22–32; Plaice in SDs 21–23, Plaice in SDs 24–32; Flounder in SDs 24–25 (no catch advice); Flounder in SDs 26 + 28 (no catch advice); Flounder in SDs 27 + 29–32 (no catch advice); Dab SDs 22–32 and Brill 22–32. Due to the COVID 19 pandemic most of the draft advice were in the abbreviated form. Only for the recently benchmarked stocks: ; Herring in SDs 25–27, 28.2, 29 and 32, Sprat in SDs 22–32 and Herring in SDs 30–31 (Gulf of Bothnia) were full advice sheets drafted.

Working Group for the Bay of Biscay and the Iberian Waters Ecoregion (WGBIE)

Information not provided

Working Group for the Celtic Seas Ecoregion (WGCSE)

The WGCSE met by correspondence in May 2020 and provided updated fisheries data, assessments and draft advice for the main demersal fish and Nephrops stocks across ICES subareas 6 and 7 (with the distribution of megrim, seabass, anglerfish and saithe extending into other divisions). As in previous years, advice for Nephrops, anglerfish

and Rockall megrim were not issued until autumn to make use of the most up to date survey information. This year, advice for the Celtic Sea gadoids (cod.27.7e-k, had.27.7b-k and whg.27.7b-ce-k) had been delayed until autumn to allow evaluation of the French data processing and resubmission of a full data series as part of the Benchmark workshop on Celtic Sea stocks (WKCELTIC).

Working Group on the Biology and Assessment of Deep Sea Resources (WGDEEP)

The WGDEEP met in 2020 to develop draft advice for half of the 29 deep water stocks, including roundnose grenadier, roughhead grenadier, roughsnout grenadier, alfonosinos, black scabbardfish, orange roughy, blue ling, tusk, greater forkbeard and blackspot seabream.

Working Group on Science to Support Conservation, Restoration and Management of Diadromous Species (WGDIAD)

The annual meeting of WGDIAD was held on 10 September 2019 during the ICES Annual Science Conference in Gothenburg, Sweden. The Annual Meeting received reports from ICES Expert Groups and workshops working on diadromous species, and considered their progress and future requirements.

Joint EIFAAC/ICES/GFCM Working Group on Eels (WGEEL)

The WGEEL met in Bergen, Norway, from 27 August to 2 September 2019 to report on developments in the state of the European eel (*Anguilla anguilla*) stocks, their fisheries and other anthropogenic impacts, and to generate draft advice.

Working Group on Elasmobranch Fishes (WGEF)

The WGEF met by video-conference from 16 to 25 June to assess elasmobranch stocks. Advice for skates stocks in the Celtic Seas and Bay of Biscay-Iberia ecoregions as well as for spurdog in the Northeast Atlantic will be released in October.

Working Group on Southern Horse Mackerel, Anchovy, and Sardine (WGHANSA)

Information not provided.

Working Group on Mixed Fisheries Advice (WGMIXFISH and WGMIXFISH-Meth)

ICES Working Group on Mixed Fisheries Advice (WGMIXFISH) meet in Copenhagen from the October to 1 November to produce management advice for three areas: North Sea, Celtic Sea and Iberian Waters. These catch options take into account the consequences of technical interactions in multistock, multigear fisheries.

The workshop WKMIXFISH which meet in Copenhagen from the 3–5 March 2020 to reviewed the current mixed fisheries advice and identify future direction given the changing needs of the advisory system. This workshop provided an effective platform for researchers, managers and stakeholders to jointly identify the key challenges and drivers for advice on mixed fisheries, review how current methods and approaches meet their needs and to identify future priority areas.

Working Group on Mixed Fisheries Methodology (WGMIXFISH-METHODS) met by correspondence from the 22–26 June 2020 to explore and apply methodologies for the improved production of mixed fisheries options. Work also focused on increasing quality, transparency and reproducibility of this advice product, and on the implementation of the recommendations from WKMIXFISH.

Working Group on North Atlantic Salmon (WGNAS)

Information not provided

Working Group on Northwest Atlantic Mackerel Ecology and Assessment

The first meeting of this Expert Group was postponed to 2021.

Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK)

The WGNSSK met by correspondence in spring 2020 and will meet by correspondence in September to assess and develop draft advice for the main demersal stocks in the North Sea, Skagerrak, and Eastern English Channel, including commercial gadoid species (cod, haddock, whiting, saithe, and Norway Pout), flatfish (sole and plaice), and shellfish (Nephrops). WGNSSK also increasingly includes analyses for a number of other bycatch species such as turbot, brill, pollack, dab, flounder, lemon sole, witch flounder, grey gurnard, and striped red mullet.

Working Group on Widely Distributed Stocks (WGWIDE)

WGWIDE was meeting late August.

Working Group on Transparent Assessment Framework (WGTAFGOV)

No information provided.

Working Group with the Aim to Develop Assessment Models and Biological Reference Points for Sea Trout (Anadromous *Salmo trutta* populations; WGTRUTTA)

The Working Group completed its first 3-year term in 2020. ICES has published the Final Report. A sea trout database structure has been created, to provide a central depository for data used by the WG, and consists of two components: for environmental and bio-ecological data. An inventory of data collection methods across the 19 countries of the natural range has been compiled, recognizing that there are common methodological approaches but few, if any, that are uniform across all countries. The WG are liaising with ICES and their Regional Database and Estimation System (RDBES), working towards a time when ICES will host the database. A review of the scientific literature on ecological factors affecting the abundance and life history of anadromous fish, has been published in Fish and Fisheries (Nevoux *et al.* 2019). A set of length-based indicators has been developed to assess the status of a stock (after WKLIFE), using index catchments to demonstrate these indicators and to identify where pressures may have had an impact. Two papers have been published describing the development and application of these length-based indicators of sea trout stock status (Shephard 2018a, Shephard, 2019). The WG has extended the development and application of the Trout Habitat Scores (THS) model using Baltic data from Sweden, and commenced testing this with data from Northern Ireland. The challenges of developing and applying a BRP approach to sea trout were further explored by applying several curve fitting approaches (including Beverton-Holt, Ricker, Hockey Stick) to 'data rich' stocks with data from counts, returning stock estimates, catches, and juvenile abundance surveys. A 'one-size-fits-all' option is highly unlikely, but a suite of tools is more promising, especially if they can be targeted towards a relatively small number of sea trout stock groupings. A resolution for a 2nd term has been approved (2020–2023).

Workshops

There were also at least 22 different workshops in 2020 (January-August), including benchmark stock assessments and other scientific work related to fisheries resources:

(IBPBash, WKBALTIC, WKCLUB, WKCOLIAS, WKD3Lists, WKDEM, WKEEL-MIGRATION, WKENSEMBLE, WKEUVME, WKFlatNSCS, WKGSS, WKMIXFISH, WKMSEMAC, WKNSCodID, WKNSROP, WKREBUILD, WKRFSAAM, WKSHARK6, WKSTATUS, WKTAf-BI, WKTAf-BN, WKTAf-SNS.

Workshops that will meet September to December:

WKDLSSL2, WKDSG, WKGMS3, WKMSDEV, WKRPChange

5.8.5 Communication with EG (summary paragraph of activities undertaken)

The EGs remain very active in conducting stock assessments and developing draft advice for ICES/ACOM. Communication within the entire Steering Group occurs a few times per year, with standing meetings at WGCHAIRS and the ICES ASC. Additional remote meetings occur as needed. There is regular communication between the FRSG Chair and EG Chairs to review TOR and other activities/initiatives within each EG. The EGs themselves follow fairly prescribed operating procedures as they provide directly to the ICES annual advisory process. Overall, concerns and recommendations are communicated to ACOM, SCICOM, and the ICES community.

5.8.6 Summary of new EG proposals and EG closing

The FRSG now includes WGHARP, WGTRUTTA, and WGTAFGOV.

5.8.7 Forward look (including actions for SG and SCICOM/ ACOM)

Given its scope of work, the FRSG is well-positioned to coordinate on strategic and research directions that are advice-relevant. The group is aiming to hold a strategic visioning meeting in 2021 that will identify new directions, initiatives, and methods and will develop and implementation strategy to address those identified to be highest priority. The FRSG is currently coordinating with the Integrated Ecosystem Assessments Steering Group in planning a workshop on evaluating and optimizing the use of ecosystem overviews in the advisory process. The SG is also sponsoring and coordinating a proposed session for the 2021 Annual Science Conference on structural uncertainty in fishery stock assessments. In addition to these efforts, the SG is actively compiling and prioritizing its science needs to facilitate more organized communication and action-based responses to priority needs. The SG is taking on a more active role in ICES benchmark process.

6 Operational Groups

6.1 Data and Information Group (DIG)

This section outlines key activities in the Data and Information Group (DIG) and ICES Data Centre between the March 2020 and September 2020 Science Committee (SCICOM) meetings with emphasis on the DIG meeting 25–29 May 2020.

DIG is working towards a proposal for separating data policy and licensing for data across ICES.

DIG was also requested to examine requirements for hosting data visualisation systems and community contributed datasets separate from the main systems. After reviewing the type of proposals commonly encountered, DIG is building decision support and improved guidance for the ICES expert groups.

Work in the ICES Data centre are increasingly aligning FAIR principles for making data Findable, Accessible, Interoperable, and Reusable. In particular, a service-oriented design towards the new portal exemplifies this. In addition, the work on accreditation and data flow diagrams is documenting this approach.

Both newly established and ongoing governance groups are delivering on a wide range of activities to improve the way the ICES community interact with systems and data.

Work on finding reviewers for existing Data Type Guidelines has been revitalised, and is progressing toward a point where more data guidance can be referenced in a dedicated data policy.

DIG has revised the challenges and opportunities tracker of data and information management related topics. Several have been upgraded in their potential to disrupt.

Finally, DIG has unanimously agreed on a new chair to take over from January 2021.

6.1.1 Data Centre accreditation

The Data Centre submitted the final accreditation application in June 2020, after a review by the DIG chair (Jens Rasmussen, UK) and informing the Data and Information Group at their annual meeting in May. The Core Trust Seal (CTS) organization invoiced the administrative fee to ICES in July 2020, which then triggers the formal timeline for CTS to select reviewers. CTS have up to 2 months to provide feedback and comments to the application, and ICES can make up to 5 iterations of the application based on this feedback. We would therefore anticipate feedback from CTS reviewers by late September 2020.

The application responds to the 16 requirements of the CoreTrustSeal accreditation certification, each requirement is scored on a scale of 0-4 (from not applicable to fully implemented). In the application, ICES have self-assessed as follows:

- 13 requirements are fully implemented in the (ICES) repository
- 3 requirements are in the implementation phase

Of the three requirements in the implementation phase, these relate to the planned changes to the data policy/data licencing and the description of the data flows through schematics (see <https://doi.org/10.17895/ices.advice.6101>). We have continued the refinement of the ICES managed data flows schematics, which will form a part of the accreditation. This complements the wider effort on addressing quality control of data, and quality assurance of advice – where process flows of the overall advice are seen as

key to understanding where control checks are needed, and where they will have the greatest impact.

6.1.2 Data Policy and Licensing

Currently all aspects of process and handling of data (policy) are combined with the rights and permissions of data use (license) in the ICES data policy document. This means each variation of data access or use permissions results in a new data policy. DIG is working up a proposal to create a global data policy that outlines all aspects of how data are received, maintained, and safeguarded at ICES, while the data made available via ICES data portals can have different licenses associated with each collection to reflect permissions, limitations, and responsibilities to users of the data.

Large amounts of data managed through ICES are openly available, and through both breakout group work and plenary discussion, DIG identified that the license conditions for using this type of data from ICES is largely aligned with the Creative Commons Attribution License. There are however some differences that will need further consideration and decisions for the ICES Science and Advisory Committees and Council over the coming period.

DIG is also developing a set of model licenses for more restrictive data access, with an aim to present a package of a revised data policy and license proposals in March once the feedback from the data centre accreditation is known.

6.1.3 Community Contributed Data and Data Visualisation

At the March 2020 SCICOM meeting DIG was tasked with developing guidance for deploying and managing data visualisation systems. There has also been a request from the ACOM Chair to consider mechanisms in a wider context that could include datasets that cannot currently be hosted on an existing ICES system.

ICES Data Centre receives between 10 and 20 new requests each year to host some kind of data, information, or data visualisation that does not fit into existing systems.

DIG and ICES Data Centre developed the first version of the Best Practice for Data Management in 2019, and the document already outlines a number of best practise principles that should ideally have been addressed by the time data are to be hosted at ICES. Unfortunately, for the majority of requests, these considerations are generally not documented.

The requests for hosting stand-alone datasets and visualisations does not currently fall under any contractual obligation or governed system, and so it falls to the ICES Data Centre to evaluate and prioritise these against resources available, and balancing risks to ICES' reputation.

While it is positive that the ICES community increasingly wants to openly share content, it is still important that requests are considered thoroughly to avoid quality issues, duplication, or potential impact on the credibility of the organisation.

DIG recognises the need for a clear and effective decision and prioritisation model to help support and govern a rising number of requests in this area. A decision template is being developed in conjunction with improved guidance.

6.1.4 Governance Activities

During the 2020 meeting of DIG, governance groups provided an update on their activities. Although not directly associated with DIG in organisational structure, the dialogue was very useful. All groups are working well at different stages of

establishment, and even the newly started governance groups in 2020 are getting up to speed of defining scope and processes for prioritising issues and decisions.

Commonly across the governance groups and DIG, it was felt that enhanced communication is useful, so a WebEx session is being planned for the autumn to ensure communication is maintained and updates can be shared.

The format and meeting schedule of governance groups means that the existing scientific report formats is often a poor fit for the groups to report back. It is hoped that SCICOM will recognise this, and that the business report format can be a workable substitute for governance groups. DIG is seeking feedback on this suggestion, and will also engage with the secretariat, and relevant steering group chairs to ensure reporting is meaningful and comprehensive, yet aligned with the different meeting structure of governance groups.

6.1.5 Data Guidelines Review

The ICES Data Type Guidelines have been around for a long time (most were created around 1999 and revised in 2006), and last year DIG decided to contact other groups to seek assistance in review and ongoing maintenance for a number of these guidelines. Unfortunately, due to losing a critical member in this process, the progress has been limited. During the DIG meeting, a renewed approach for consultation and review was developed whereby DIG will remain more actively involved, and still seek outside review assistance, primarily from the ICES community, but also outside where necessary

6.1.6 Revised Challenges and Opportunities

As part of the routine annual review of challenges and opportunities relating to Data and Information management in ICES, several items were revised. In this update, several new and revised topics represent medium to high potential to disrupt:

High potential

- Quality of open code (Developing culture of code reviews to reduce risk)
- Quality Management Framework (Significant improvement in processes, but potentially large resource requirement)
- Adoption of new technology (opportunities in new technologies bringing more effective collaboration (e.g. remote meetings), but also risk of alienating some users)
- Data Availability (Lack of data submissions (e.g. COVID-19 restrictions))

Medium potential

- Data storage and volumes (cloud adoption, expectations, lower granularity analysis)
- Semantic interoperability (Low uptake, but potential to support quality processes and data integration)
- Accreditation of Data Centre (Recognition and reputation, large resource investment)
- Data Licensing (misalignment between member countries, ICES can provide more clarity with revised licensing structure)
- Hosting Community data and applications (Reputational risks and loss of control, but potential for closer engagement with EG's once clear rules and guidance provided)

6.1.7 New chair for DIG

The current chair of DIG (Jens Rasmussen, UK) has served 3 years + 1 year extension, and a new chair was unanimously agreed by DIG members at the May 2020 meeting.

Sjur Ringheim Lid from Norway, will take over as chair from 1 January 2021. Sjur is a long standing and experienced member of DIG. As a Senior Software engineer at the Norwegian Marine Data Centre, he will bring extensive expertise to the role.

As a reflection on his tenure as chair of DIG, Jens has highlighted 4 areas that he regards as key achievements and continued work for DIG:

- Being a "critical friend" to the ICES Data Centre, engaging with and providing feedback to the ICES Data Centre projects.
- Enhancing governance of data and information systems, and getting wider community engagement in the prioritisation of developments and issues for data.
- Deeper integration potential for ICES data than ever before with deployment of web services, more interoperable vocabularies, metadata, and persistent identifiers for data.
- Engagement between key bodies in ICES has increased, which has been critical for the adoption of the FAIR principles, guiding us towards the strategic improvements in science and advice plans

6.2 Training Group (TG)

Training Group: Jan Jaap Poos (Chair), Steven Cadrin, Martin Pastoors, Jörn Schmidt, Rafael González-Quirós, Daniel Duplisea, Pieter Jan Schon

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 those involved in advisory process, have the skills necessary to complete such work. The objective of ICES involvement in training is quality assurance in the advisory process.

Over 30 courses have been offered on a range of topics, 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, analysis 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 700 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.

6.2.1 ICES training courses end of 2019

In 2019, the ICES Training offered seven training courses on a range of topics, held at ICES HQ and abroad. Reports from each course are available online.

(<http://ices.dk/news-and-events/Training/Pages/Previous-reports.aspx>)

- Introduction to Stock Assessment
21-25 October 2019, ICES HQ, Copenhagen, Denmark.

- [Introduction to CPUE standardization and development of annual indices of stock abundance](#)
4-8 November 2019, ICES HQ, Copenhagen, Denmark.
- [Principles and methods of broadband technologies: application to fisheries acoustics](#)
10-17 December 2019, Onboard G.O. Sars, Bergen, Norway

6.2.2 ICES training courses 2020

In 2020, ICES training had planned on offering several courses. However, due to the COVID-19 pandemic only “*Data-limited stock assessment methods and reference point estimation*” was able to run as scheduled.

Other courses have either been postponed until 2021 or moved online. The ICES secretariat is currently working with the Training Group on creating official guidelines regarding moving training courses online.

Below is a summary of the 2020 courses:

- [Data-limited stock assessment methods and reference point estimation](#)
6-10 January 2020, Nanaimo, British Columbia, Canada
 - 29 participants
- [Fish stock assessment: SAM and TMB](#)
12 - 16 October 2020, **online course**
 - 30 registered participants (MAX capacity met)
- [Bayesian Network Analysis and the Social-Cultural Dimension](#)
7-11 December 2020, **online course**
 - 4 registered participants

Courses in the pipeline for 2021:

- [Spatial models in marine science using INLA and inlabru](#)
 - Postponed in 2020, dates and location TBC 2021 (Originally May 2020)
- [Social science methods for natural scientists](#)
 - Postponed in 2020, dates and location TBC 2021 (Originally Sept 2020)
- Opening the Box
 - 8-12 February 2021, ICES Headquarters, Copenhagen, Denmark or online
- Introduction to Management Strategy Evaluation
 - Dates and location TBC 2021
- Scientific publishing and editing
 - Dates and location TBC 2021
- Close Kin Mark Recapture
 - TBC 2021, San Sebastian. With AZTI support
- VMS tools, mapping and changing fish patterns
 - Dates and location TBC 2021

- Large-scale tag-recapture campaigns and their potential role in the management of fisheries resources
 - Dates and location TBC 2021
- Egg surveys (under development)
 - Dates and location TBC 2021/2022

6.2.3 Promotion of training courses

During the COVID-19 pandemic promotion of training courses has been put on hold due to the uncertainty of their timing. When courses have confirmed dates, e-mails are sent to specific WGs and EGs in the ICES community, who might benefit from the courses. The Training Group expects that instructors and participants will be more experienced with remote learning after COVID-19, and remote instruction may be more feasible in the ICES Training Programme. In addition, one course is featured in each of the ICES newsletters. Course offerings are always available on the ICES website training pages. National representatives to SCICOM and ACOM are encouraged to disseminate information about ICES training courses in their own organisations.

6.2.4 ICES training and ICES projects

Through participation in H2020 projects, ICES training is contributing to training opportunities, in cooperation with other project contributing partners.

PANDORA project: Paradigm for Novel Dynamic Oceanic Resource Assessments. ICES is lead partner in implementation of courses across all the projects work packages. Topics are to be defined by stakeholders at regional workshops. Broadly, courses will include survey sampling techniques, data required for assessments, training on state-of-the-art tools and stock assessment challenges.

All projects are offered the option to submit [training course proposals online](#), which are out through the training course selection process by the committee. If the project is able to provide funding for a specific training, ICES training can support the training activity, with handling applications, administration, SharePoint etc. with the condition that registration will be open for all. This is to ensure that training activities, be it through projects or standard ICES training, adhere to the aim of cost neutrality.

6.2.5 Building Capacity to Meet Future ICES Advisory Needs Through Education

Council defined education as the long-term process (graduate or post graduate education) that prepares future experts through Masters' and Ph.D. coursework and research and training as the short-term process of developing skills within the existing pool of experts through short courses, such as those provided by ICES under the guidance of the Training Group.

Council and Bureau want to develop a strategy that will build capacity (through graduate- and post-graduate education) for meeting future ICES science-based advisory needs. This strategy will involve coordination among North American and European Universities to develop multidisciplinary, multi-institutional coursework, research opportunities and scientific personnel exchanges.

The previously scheduled workshop (WKEDU) that was to be held at the ICES Secretariat in Copenhagen during the week of June 15, 2020 had to be postponed due to the COVID-19 pandemic.

The training group is represented in the initiative by membership of several Training Group Members, and Steve Cadrin being chair of WKEDU.

6.2.6 Develop and run an engaging training programme.

Within the ICES Joint work Plan 2019-2024 the training group is tasked to evaluate, develop, and implement a strategy for the ICES Training Programme, including assessment of training needs, online training courses, considerations of alternative training initiatives (courses arranged by Ph.D/Post.doc), and exploring options for accreditation of the training course.

As a first step, we plan to evaluate the impact of the courses that were held over the last 5 years, and solicit views on the future direction of the training courses. This direction will include the content of the courses but also the form of the courses. That is to say, how strong is the preference of participants to either offline or online courses. The latter is especially relevant in the light of the current COVID-19 pandemic, but also the initiatives to reduce the carbon footprint of the work within the ICES community.

Once the views of the current program and the direction of the program within ICES is polled, the results can be used to develop and implement a strategy in 2021.

6.2.7 Overview of expenses to ICES training programme.

In 2019 the ICES training programme had expenses totalling **629,000 DKK**. This includes instructor honorarium, travel, per diem and catering for course participants.

Income from course fees from 2019 totals **857,000 DKK**.

Overall is a surplus of **228,000 DKK**.

6.3 Science Impact and Publication Group (SIPG)

The Science Impact and Publication Group (SIPG) was established in 2017 and coordinates and supports the publication and dissemination of research conducted under the auspices of ICES. The group is responsible for guiding, monitoring and sharing ICES publication output and increasing the reach and impact of ICES publications. SIPG is chaired by Nils Olav Handegard, and has eight external members and five members from the ICES Secretariat (ICES Editor, Editorial Assistant, Technical editor, Head of ICES Data, and Web analyst).

6.3.1 ICES Library functionality assessment (ToR 1a, b, and d)

At the mid-term 2020 SCICOM meeting, SCICOM approved that SIPG should look into different options to improve the ICES library, with focus on 3 options: (1) improve the existing library; (2) create a new on premises ICES library; or (3) use a hosted library. Since the mid-term SCICOM meeting, all three options have been looked into with extensive help and advice from librarians and database managers from a number of institutions in ICES countries (e.g. NOAA, IFREMER, IMR, Marine Scotland, IPMA), and through contact with relevant companies specialised in repositories.

Summary of relevant findings:

(1) We have been recommended not to custom build a new repository, or invest significant time on improving our existing repository, since it would require a substantial investment of time and resources to work on aspects which have already been solved in the open source and hosted solutions.

(2) SIPG considers using a commercially hosted repository would be the most cost-effective way of achieving our aims, providing a professionally run library, with continuous technical back-up for continuity of service, trouble-shooting or improvements. This is also in line with the recommendation from the assessment.

(3) Five commercial repositories are being evaluated as potential candidates due to the functionalities offered and the quality of their repositories.

SIPG has established a subgroup that will conduct a detailed evaluation of the five repository options for SIPG. Based on this SIPG will make a recommendation.

6.3.2 Publications licencing and ICES disclaimers (*ToR 1b, 2 and 4*)

6.3.2.1 Publications licencing

ICES owns the copyright of all ICES own publications. To enable the use of copyrighted material by third-parties the standard approach is to use [copyright licences](#), with one of the most broadly adopted schemes being [creative commons](#). ICES currently has not adopted any particular copyright licencing scheme for its publications, but rather relies on a text drafted into the reports. This text requires that ICES work be cited when used, and excludes commercial use of ICES publications.

SIPG has evaluated the current licencing policies, and potential associated issues and has made the following recommendations:

- (i) ICES should adopt creative commons 4.0 licencing (CC)
- (ii) ICES should continue to require citations when an ICES Publication is used (include the CC-BY derivative).
- (iii) ICES should allow commercial use of publications (avoid the CC-NC derivative)

In conclusion SIPG recommends that ICES publications adopt CC-BY 4.0 for their publications. SCICOM has approved this recommendation.

6.3.2.2 Publications disclaimers

SIPG has reviewed the disclaimers and recommends that ICES use the following wording for the two standard disclaimers:

- (1) “This document has been produced under the auspices of an ICES Expert Group or Committee. The contents therein do not necessarily represent the view of the Council”, which is slightly different from the existing, i.e. ‘under the auspices of’ rather than the ‘direct product of a group’. The change has been made to better accommodate CRR, TIMES and ID Leaflets since these often have invited authors
- (2) “This document is approved by the ICES Advisory Committee and produced under the auspices of the International Council for the Exploration of the Sea”, which is similar to the original text.

SIPG discussed whether the first disclaimer is appropriate when ICES is claiming both authorship and copyright of the report, but is at the same time waving responsibility for the content. It was clarified that the disclaimer is in place to give the expert groups the freedom to express their opinions. This falls outside the remit of SIPG, and SIPG would like SCICOM and ACOM’s opinion about the use of disclaimer 1. SIPG will recommend both disclaimers until any changes are requested by ACOM and SCICOM.

SCICOM has evaluated text 1 and deemed it fit for purpose.

6.3.2.3 ICES Business Reports Series (*ToR 1a, 1b and 2*)

The ICES Business Report Series hosts reports from Expert Groups and ICES committees that produce reports with an ICES procedural, rather than a scientific, focus, and

which do not fit under the umbrella of ICES Scientific Reports. Due to the wide variety of reports encompassed, SIPG was tasked to evaluate if a DOI and ISSN number should be used, and how the cover set should be organized for the different reports. SIPG made the following recommendations:

- (i) ICES Business reports should be issued a DOI
- (ii) ICES Business reports should be issued an ISSN
- (iii) Due to differences in author acknowledgment and type of disclaimer used, a given set of different inner covers will be available for the template, along with specific instructions on when each should be used.

SCICOM has approved the proposed changes

6.3.3 Review of ICES Peer-reviewed Publications

6.3.3.1 General updates

- (i) The project to expand the scope of TIMES has been very successful. Several groups new to the series have submitted publication proposals, and the longer-term goal of raising the publication numbers to 3-5 issues per year should already be achieved in 2020.
- (ii) The Series of ICES Survey Protocols has successfully joined the Techniques in Marine Environmental Sciences Series (TIMES), with the first volume due to be published before the end of the year. Specific guidelines have been developed for ICES Survey protocol authors and can be viewed [here](#)
- (iii) The [ICES publications](#) website is undergoing updating and restructuring.
- (iv) The CRR/TIMES Guidelines for authors have been updated to include more comprehensive instructions on how and when to submit a publication resolution, and can be viewed [here](#).

6.3.4 Publication overview

6.3.4.1 CRR

CRR published since 2019 SCICOM Meeting: 1; CRR reports in publication process (in preparation or under review): 7; cancelled CRR since the 2020 mid-term SCICOM meeting: 2. Published CRR since the 2019 SCICOM meeting:

No.349 ICES Report on Ocean Climate 2018. Prepared by the Working Group on Oceanic Hydrography. 119 pp. Multiyear resolution – C. Res. 2013/1/SSGEF05

Cancelled CRR since the 2019 SCICOM meeting: (i) **2018/1/EOSG01** – Effect of tow duration on catch rates and species richness in the North Sea and Northeast Atlantic IBTS. Authors did not anticipate being able to complete report by the deadline. They will resubmit the resolution when the report is closer to completion; (ii) **2016/1/SSGEPD04** - A Status Report on Harmful Algal Events in the ICES area. Cancelled for exceeding the 2-year time limit. The authors plan to update and resubmit the resolution in 2020/2021.

6.3.4.2 Techniques in Marine Environmental Sciences (TIMES)

TIMES published since 2019 SCICOM Meeting: 2; TIMES reports in publication process (in preparation or under review): 4. Published TIMES since the 2019 SCICOM meeting:

- No. 63 Protocol for the verification of ballast water compliance monitoring devices. M.N. Tamburri, S.A. Bailey, R.A. Everett, M.R. First, S. Gollasch, O. Outinen, and L.A. Drake. June 2020. 13 pp. C. Res. 2019/1/HAPISG03
- No. 62 Guidelines for the use of Diffusive Gradients in Thin Films for measuring metal fluxes in sediment. E. D. Amato, T. Bolam, and M. J. Belzunce-Segarra. December 2019. 19 pp. C. Res. 2017/1/EPISG06

6.3.4.3 ID Leaflets for Plankton

Leaflets published since 2019 SCICOM Meeting: 4; Leaflets undergoing final revisions before publication: 1; Leaflets in process (in preparation or under review): 9. Published Plankton ID leaflets since the 2019 SCICOM meeting:

- No.192 Tubulariidae, Fleming, 1828. P. Licandro. May 2020. 11 pp.
- No.191 Pinnotheridae de Haan, 1833. J. I. González-Gordillo, and J.A. Cuesta. April 2020. 20pp
- No.190 Varunidae H. Milne-Edwards, 1853, and Ocypodidae Rafinesque, 1815. J.A. Cuesta and J.I. González-Gordillo. April 2020. 22pp.
- No. 189 *Clausocalanus* Giesbrecht, 1888. M.G. Mazzocchi. April 2020. 22pp.

6.3.4.4 ID Leaflets for Diseases in Fish and Shellfish

Leaflets published since 2019 SCICOM Meeting: 0. Leaflets in process (in preparation or under review): 12

7 Strategic Initiatives

7.1 Strategic Initiative on Climate Change Impacts on Marine Ecosystems (SICCME)

The SICCME leadership has undergone substantial changes in the last year with both ICES chairs (Myron Peck, Germany and John Pinnegar, UK) and the PICES chairs (Jackie King, Canada and Shin-ichi Ito, Japan) ending their terms. Incoming chairs on the ICES side are Christian Möllmann (Germany) and Mark Payne (Denmark) and on the PICES side are Kirsten Holsman (USA) and Xiujuan Shan (China). In addition, the onset of the global COVID-19 pandemic has also provided numerous challenges for all of the individual members that have taken most of their focus during the previous six months. The combination of these two factors has caused the loss of any momentum that the initiative had previously.

The next steps for SICCME will be to focus on re-establishing itself after these changes. A key initiative that is being explored in this regard is to link the ICES and PICES communities more actively via an online forum. The possibility of joint leadership meetings is also being explored, although initial attempts at scheduling such a meeting across three time zones (Europe, US West Coast, China) in the midst of the pandemic has provided challenging. Nevertheless, it was possible for ICES SICCME to participate in the PICES S-CCME annual meeting this October, and this proved to be a very valuable way to re-establish cooperation between the two groups. All chairs are looking forward to a productive future working together.

7.1.1 Events, since the March 2020 SCICOM report:

20–23 April 2020. The **Working Group on Integrative Physical-biological and Ecosystem Modelling (WGIPEM)** was scheduled to meet at the Royal Belgian Institute of Natural Sciences, Brussels, Belgium. However, this meeting was cancelled due to the COVID-19 pandemic, and has been rescheduled to 2021.

7–10 September 2020. The **Joint ICES/PICES Working Group on Impacts of Warming on Growth Rates and Fisheries Yields (WGGRIFY)** met online. The group brings together worldwide scientific expertise to assess the impact of warming on fish growth, and the implications for fisheries yield, on a global scale. ICES WGGRIFY was approved by PICES in May 2020 and is now officially an ICES/PICES WG. The WGGRIFY co-chairs welcomed Dr. Shin-ichi (University of Tokyo) as a PICES-affiliated co-chair. Membership in WGGRIFY now includes members from China, Korea, Japan, and Russia in addition to EU countries, Canada and the US. The aim of the meeting was to introduce WGGRIFY members to each, build a common understanding of the WGGRIFY TORs, and develop implementation plans for each of the TORs that will guide activities over the next 6 months.

7.1.2 Upcoming events:

September 2020: ICES Annual Science Conference (ASC), Copenhagen, Denmark. Postponed to 2021 (see below).

September 2020: Kick-off meeting of EU H2020 Future-MARES, a large (32 partner, 15 nations) 4-year programme advancing knowledge on climate change impacts to marine and transitional waters and the effectiveness of nature-based solutions to safeguard / enhance ecosystem services. FutureMARES has three over-arching case studies: Habitat Restoration (e.g. seagrasses, shellfish), Habitat Conservation (e.g. MPAs, charismatic megafauna), and Sustainable Harvesting (e.g. ecosystem-based fisheries, IMTA). Projections of climate impacts including effectiveness of scenarios of NBS will be made for 7 regional European marine ecosystems contributing to SICCME activities. FutureMARES is coordinated by Myron Peck. John Pinnegar and several other members of SICCME are involved in the programme.

September 2020. ICES/ PICES Working Group on Small Pelagic Fish (WGSPF) will meet online. The group aims to advance understanding how drivers (environmental and/or anthropogenic) impact the population dynamics of SPF, perform comparative analyses, and coordinate research. The group is also planning a symposium for 2022 (see below).

1 November 2020. Literature submission cut-off date for IPCC WGII (postponed from 1 July). Literature to be included in the upcoming 6th Assessment report must be submitted by this date.

4 December 2020 – 29 January 2021. Expert and Government review of IPCC WGII Second Order Draft (postponed from 7 August - 2 October 2020)

Spring 2021: ICES Working Group on Seasonal-to-Decadal Prediction of Marine Ecosystems (WGS2D) to be held online. The group is chaired by Mark Payne (DK) and considers ocean predictions on timescales from seasons to decades in order to support marine resource management. The group contains 26 members from 10 countries. Activities in this ICES group parallel those in the PICES Working on Climate and Ecosystem Predictability (WG-CEP) and the two groups are in regular contact.

Spring 2021. Working Group on Integrative Physical-biological and Ecosystem Modelling (WGIPEM) Next meeting.

February 2021: IPCC WG II - AR6 fourth and final Lead Author Meeting (Guatemala) to be attended by Christian Möllmann (lead author – ‘Europe’), John Pinnegar (lead author – ‘Small Islands’); Kirstin Holsman (lead author – ‘North America’); Shin-ichi Ito and Mette Skern-Mauritzen (lead author – ‘Ocean and coastal ecosystems and their services’).

May 31 – June 2 2021. First International Ocean Decade Conference, Berlin, marking the start of the UN Decade for Ocean Science for Sustainable Development.

September 2021: ICES Annual Science Conference (ASC), Copenhagen, Denmark. Several theme sessions have been accepted for consideration that are of relevance to SIC-CME (and which cite the Strategic Initiative). These include: [K] Taking stock on ocean acidification research for provision of future efforts (Silvana Birchenough et al.); [O] Impacts of human pressures on ecosystem components assessed by dynamic modelling (Solfrid Sætre Hjøllø *et al*); [D] Past, present and future of marine plankton assemblages and communities (Dafne Eerkes-Medrano et al.); [E] Connecting economic, social science, and interdisciplinary research and management advice (Alan Haynie); In addition, the following Networking Sessions will be held i) ICES in a Net-Zero Emission World (A Local / Remote Network Session) (Bill Karp & Bill Turrell); ii) Marine Ecological Forecasts – what do we need? (Mark Payne and Sevrine Sailley).

26–28 October 2021, ICES 4th Decadal Variability of the North Atlantic and its Marine Ecosystems: 2010–2019. Bergen, Norway. This symposium is part of a series of decadal symposiums organized by ICES, where researchers gather to review the variability of North Atlantic environmental conditions and marine ecosystems over the past decade. Researchers aim to understand the relationship between ecosystem components and how they influence the distribution, abundance and productivity of living marine resources. In addition, researchers will review recent advances in sub-decadal forecasts of ecosystem change.

20-24 February, 2022 International Symposium on Small Pelagic Fish: New Frontiers in Science for Sustainable Management Lisbon, Portugal. The symposium will highlight the state-of-the-art in the following and other topics surrounding the sustainable exploitation of SPF within an ecosystem context. Climate change impacts are expected to be a recurring theme of this symposium.

7.2 Strategic Initiative on the Human Dimension (SIHD)

7.2.1 SIHD Chair News

Alan Haynie (USA) is currently the sole SIHD Chair and will work with ICES leadership and SIHD members to identify new co-chairs in coming months.

7.2.2 Recent and SIHD Activities

Since March 2020, the SIHD has engaged in a variety of ongoing activities, all of which have been online due to COVID-19. This has been unfortunate in terms of workshop social connections, but the workshops of SIHD-related expert groups have been very well attended and robust progress continues.

The Working Group on Balancing Economic, Social, and Ecological Objectives in Integrated Assessments (WGBESEO, ToR), chaired by David Goldsborough (The Netherlands), David Langlet (Sweden), and Paulina Ramirez-Monsalve (Denmark) was formed in January. WGBESEO held its first online meeting 15-16 April 2020 and had a follow-up meeting 8 June 2020. A number of online meetings will be held in the coming months to continue the exciting work of the group.

In its ongoing [ToRs](#), [WGMARS](#) members i) research on behavioural economics/nudging in fisheries, ii) research on integrated ecosystem assessments in the context of ICES Regional Groups, and iii) carry out a social network analysis of ICES expert groups. Findings of this work will be published each in an academic paper, and are complemented by WGMARS outreach activities. During this year's WGMARS annual meeting in April 2020, there was a robust exchange with selected NOAA experts on NOAA IEA/EBM work and programs. Leyre Goti (Germany) has joined Patricia Clay (USA) as a co-chair.

The WGECON and WGSOCIAL expert groups held joint online meetings 15-19 June, 2020. This format provided lots of great interdisciplinary discussions and collaboration and research planning.

[WGECON](#), chaired by Rasmus Nielsen, Denmark, Olivier Thebaud, France, and Arina Motova, UK, was developed to address economic issues, focusing on the development of economic metrics and the development of core economic analyses for fisheries advice and contributing economic indicators for ICES ecosystem overviews. The Final report of the first 3 years is being completed now.

[WGSOCIAL](#), chaired by Lisa Colburn (USA), Amber Himes-Cornell (FAO), and Marloes Kraan (The Netherlands) has continued its work on developing social indicators in several ICES ecoregions. WGSOCIAL is working to complete its Final Report for its first 3 years and has given lots of attention to COVID-19 research and policy analysis, as described in greater detail below.

7.2.3 Recent and Upcoming COVID-19 Research and Communications Activities

WGSOCIAL, led especially by co-chair Marloes Kraan, in collaboration with many ICES social scientists, has contributed to a variety of activities in recent months to promote collaboration and communication of COVID-19-related research and management actions. This 7 April [ICES web story](#) describes some of their recent exciting work. Many SIHD members are active in their countries in response to the myriad management challenges of COVID-19. The crisis reveals both the incredible value of economic and social data and expertise and the need for more support for this type of work to help communities and diverse stakeholders adapt to dramatic changes.

On Wednesday 16 September, 16:00–17:30 CEST, SIHD members will hold an [ICES Webinar](#), featuring SIHD members' work and research on COVID-19. Talks will be given by Alan Haynie (USA), Doug Lipton (USA), Cristina Pita (Portugal), and Marloes Kraan (The Netherlands).

7.2.4 Upcoming SIHD Planned Activities

Update the SIHD Roadmap. SIHD has been working to update the SIHD Roadmap in order to promote an ongoing discussion about how ICES can become a more active and influential contributor to social and economic science. In 2018, SIHD- chairs produced a document “the SIHD Roadmap” and opened a SIHD forum on the ICES website. The roadmap contains information on planned activities for both the next two years and ideas about SIHD activities over the coming decade. We had planned an update of the SIHD Roadmap for this year's ASC, but will hold several virtual meetings and utilize the SIHD Forum in coming months to complete the update of the Roadmap this year.

SIHD and other ICES human dimensions members are working to plan the **ICES/PICES MSEAS Symposium** which was scheduled to be held this spring in Yokohama, Japan and has been rescheduled for May 2021.

The [Report](#) of the Workshop on Challenges, Opportunities, Needs and Successes for including human dimensions in IEAs ([WKCONSERVE](#)), which was held in October 2019 in Copenhagen, lays out a variety of ways in which human dimensions can be better incorporated in diverse ICES work. We will work with expert groups, IEA members, ICES staff and others to continue to better integrate human dimensions research into ICES.

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

Change of Chairs (ACOM, SCICOM, Steering Groups (SG)/Operational Groups (OG)/Strategic Initiatives (SI))

AFFILIATION	GROUP NAME	CHAIR – OUTGOING	CHAIR – INCOMING
SCICOM	ICES Science Committee (SCICOM)	Simon Jennings, UK	Jörn Schmidt, Germany
OG	Data and Information Group (DIG)	Jens Rasmussen, UK	Sjur Ringheim Lid, Norway
SG	Data Science and Technology Steering Group (DSTSG) – <i>established from 1 January 2021</i>	–	Jens Rasmussen, UK
SG	Ecosystem Processes and Dynamics SG (EPDSG)	Silvana Birchenough, UK	Steven Degraer, Belgium
SG	Integrated Ecosystem Assessments SG (IE-ASG)	Mette Skern-Mauritzen, Norway	Debbi Pedreschi, Ireland
SG	Ecosystem Observation Steering Group (EOSG)	Sven Kupschus, UK	Joël Vigneau, France
SI	ICES-PICES Strategic Initiative on Climate Change Impacts on Marine Ecosystems (SICCME)	Jacquelynne R. King, Canada, PICES)	Kirsten Holsman (USA, PICES)
SI	Strategic Initiative on the Human Dimension (SIHD)	Johanna Ferretti, Germany	TBA

Established Expert Groups

AFFILIATION (SG)	GROUP NAME	CHAIR – OUTGOING	CHAIR – INCOMING
EPDSG	ICES/PICES Working Group on Ocean Negative Carbon Emissions (WGONCE)		Louis Legendre, France (ICES), Carol Robinson, UK (ICES) and Nianzhi Jiao, China (PICES), Douglas Wallace, Canada (PICES)
EOSG	Working Group on Size and Species Selection Experiments (WGSSSE)		Haraldur Arnar Einarsson, Iceland/FAO, – Michael Pol, USA
DSTSG	Working Group on Spatial Fisheries Data Governance (WGSFDGOV)		Christian von Dorrien*, Germany
DSTSG	Working Group on the Governance of Quality Management of Data and Advice (WGQuality)		David Currie, Ireland

Expert Groups that changed Steering Group

AFFILIATION (SG)	EXPERT GROUPS	OLD AFFILIATION (SG)	NEW AFFILIATION (SG)
	Working Group on DATRAS Governance (WGDG)	EOSG	DSTSG
	Working Group on Technology Integration for Fishery-Dependent Data (WGTIFD)	EOSG	DSTSG
	Working Group on Fisheries Acoustics, Science and Technology (WGFAST)	EOSG	DSTSG
	Working Group on Spatial Fisheries Data Governance (WGSFDGOV)	HAPISG	DSTSG
	Working Group on Governance of the Regional Database & Estimation System (WGRDBESGOV)	EOSG	DSTSG
	Working Group on Atlantic Fish Larvae and Eggs Surveys (WGALES)	EOSG	DSTSG
	Working Group on Recreational Fisheries Surveys (WGRFS)	EOSG	DSTSG
	Working Group on Acoustic Data Governance (WGAcousticGov)	EOSG	DSTSG
	Working group on machine learning in marine science (WGMLEARN)	EOSG	DSTSG
	Working Group on SmartDots Governance (WGSMART)	EOSG	DSTSG
	Working Group on Biological Parameters (WGBIOP)	EOSG	DSTSG
	Working Group on Commercial Catches (WGCATCH)	EOSG	DSTSG
	Workshop on Acoustic Backscatter Models (WKABM)	EOSG	DSTSG

Renamed Expert Groups

AFFILIATION (SG)	EXPERT GROUPS	CHAIR – OUTGOING	CHAIR – INCOMING
ASG	Working Group on Environmental Interactions of Aquaculture (WGEIA) will be renamed Working Group on Risks, Environmental Interactions of Aquaculture (WGREIA)	Terje Svåsand, Norway	Ellen Sofie Grefsrud, Norway
EOSG	Working Group on Acoustic and Egg Surveys for Sardine and Anchovy in ICES Areas 7, 8 and 9 (WGACEGG) will be renamed Working Group on Acoustic and Egg Surveys for small pelagic fish in NE Atlantic (WGACEGG)		Jeroen van der Kooij, United Kingdom and Maria Manuel Angélico
DSTSG	Steering Committee for the Regional Database and Estimation System (SCRDB) will be renamed Working Group on Governance of the Regional Database & Estimation System (WGRDBESGOV)		David Currie, Ireland and Katja Ringdahl, Sweden

Change of Expert Group chairs

AFFILIATION (SG)	EXPERT GROUPS	CHAIR – OUTGOING	CHAIR – INCOMING
ASG	Working Group on Application of Genetics in Fisheries and Aquaculture (WGAGFA)	Jann Thorsten Martinsohn, Germany	Naiara Rodriguez-Ezpeleta, Spain
IEASG	ICES/PICES/PAME Working Group on Integrated Ecosystem Assessment (IEA) for the Central Arctic Ocean (WGICA)	-	Martine van den Heuvel-Greve, Netherlands
DSTSG	Working Group on SmartDots Governance (WGSMART)	Karen Bekaert, Belgium	Jane Aanestad Godiksen, Norway (Return)
DSTSG	Working Group on Commercial Catches (WGCATCH)	Kirsten Birch Håkansson, Denmark	Estanis Mugerza, Spain
EOSG	Working Group on Mackerel and Horse Mackerel Egg Surveys (WGMEGS)	Matthias Kloppmann, Germany	Brendan O’Hea, Ireland
EPDSG	Working Group on Operational Oceanographic products for Fisheries and Environment (WGOOFE)	Rodney Forster, UK, and Dominique Obaton, France	Francisco Campuzano, Portugal, and Tomasz Dabrowski, Ireland
EPDSG	ICES - IOC Working Group on Harmful Algal Bloom Dynamics (WGHABD)	Eileen Bresnan, UK	Dave Clarke, Ireland
EPDSG	Benthos Ecology Working Group (BEWG)	Silvana Birchenough, UK	Johan Craeymeersch, the Netherlands, and Paolo Magni, Italy
EPDSG	Working Group on Oceanic Hydrography (WGOH)	Paula Fratantoni, USA, and César González-Pola, Spain	Caroline Cusack, Ireland, and Tycjan Wodzinowski, Poland
FRSG	Herring Assessment Working Group for the Area South of 62°N (HAWG)	Valerio Bartolino, Sweden Afra Egan, Ireland	Cecilie Kvamme, Norway will replace Valerio Bartolino
FRSG	North-Western Working Group	Kristján Kristinsson, Iceland	tbc
FRSG	Working Group on Southern Horse Mackerel, Anchovy, and Sardine	Alexandra (Xana) Silva, Portugal	tbc
FRSG	Working Group on North Atlantic Salmon	Martha Robertson, Canada	Dennis Ensing, UK
HAPISG	Working Group on the History of Fish and Fisheries (WGHIST)	Ruth Thurstan, UK; and Emily Klein, USA	Bryony Caswell, UK; and co-chair (tbc)
HAPISG	Working Group on Marine Habitat Mapping (WGMHM)	James Strong, UK	Julian Burgos, Iceland
HAPISG	Working Group on Multispecies Assessment Methods (WGSAM)	Alexander Kempf, Germany	Valerio Bartolino, Sweden
HAPISG	Working Group on Bycatch of Protected Species (WGBYC)	Sara Königson, Sweden, and Kelly Macleod, UK	Allen Kingston, UK, and Guðjón Már Sigurðsson, Iceland

Expert Groups to be dissolved by the end of 2020

AFFILIATION (SG)	EXPERT GROUPS	CHAIR – OUTGOING	CHAIR – INCOMING
ASG	Stakeholder Workshop on the Value of Genetic and Genomic Tools for identifying species in mixed landings, fish products and by-products (WKGenoTools)	Claudia Junge, Norway - Jann Thorsten Martinsohn, Italy	
ASG	Workshop on the manual for genetic sampling from fisheries products in the NAFO Area (WKGenMan)	Naiara Rodriguez-Ezpeleta - Jann Thorsten Martinsohn	
EOSG	Planning Group on Data Needs for Assessment and Advice (PGDATA)	Joël Vigneau, France	
EOSG	Workshop on unavoidable survey effort reduction (WKUSER)-Postponed from 2017	Stan Kotwicki, US, Sven Kupschus, UK and Wayne Palsson, USA	
EOSG	The Workshop on Scale, Otolith Biochronology Archives (WKBioArc)	Deirdre Brophy, Ireland, and Martha Robertson, Canada	
EOSG	Workshop on Innovative Fishing Gear (WKING)	Antonello Sala ,Italy and Manu Sistiaga, Norway	
EOSG	The Second Workshop on Populating the RDBES data model (WKRDB-POP2)	David Currie, Ireland and Edvin Fuglebakk, Norway	
EOSG	The Second Workshop on Estimation with the RDBES data model (WKRDB-EST2)	Nuno Prista, Sweden and Kirsten Birch Håkansson, Denmark	
EPDSG	Workshop on Scallop Aging (WKSA)	David Palmer, UK, and Karen Vanstaen, UK	
FRSG	Benchmark Workshop for Demersal species (WKDEM)	Richard Nash, UK and Daniel Howell, Norway	
FRSG	Benchmark Workshop for Flatfish stocks in the North Sea and Celtic Sea (WKFlatNSCS)	Meaghan Bryan, USA and Timothy Earl, UK	
FRSG	Benchmark Workshop on Greater Silver Smelt (WKGSS)	Pamela Woods, Iceland	
FRSG	Benchmark Workshop on herring (<i>Clupea harengus</i>) in the Gulf of Bothnia (WKCluB)	Noel Holmgren, Sweden	
FRSG	ICES-JRC Workshop on Model Ensembles for Stock Assessment and Advice (WKENSEMBLE)	Liz Brooks, USA, Cólín Minto, Ireland, and Ernesto Jardim, IT	
FRSG	Inter-Benchmark Process on BAItic Sprat (<i>Sprattus sprattus</i>) and Herring (<i>Clupea harengus</i>) (IBPBASH)	Bjarte Bogstad, Norway	
FRSG	Workshop of Fisheries Management Reference Points in a Changing Environment (WKRChange)	Anna Rindorf, Denmark, Jeremy Collie, USA, and Daniel Howell, Norway	

AFFILIATION (SG)	EXPERT GROUPS	OLD AFFILIATION (SG)	NEW AFFILIATION (SG)
FRSG	Scoping workshop on next generation of mixed fisheries advice (WKMIXFISH)	Paul Dolder, UK	
FRSG	Second Workshop on Data-Limited Stocks of Short-Lived Species (WKDLSSL2)	Andrés Uriarte, Spain, and Mollie Elizabeth Brooks, Denmark	
FRSG	Workshop on EU regulatory area options for VME protection (WKEUVME),	Ellen Kenchington, Canada, and Peter Hopkins, Belgium	
FRSG	Workshop on guidelines and methods for the evaluation of rebuilding plans (WKREBUILD)	Vanessa Trijoulet, Denmark, and Martin Pastoors, Netherlands	
FRSG	Third Workshop on guidelines for management strategy evaluations (WKG MSE3)	José De Oliveira, United Kingdom,	
FRSG	Workshop on Management Strategy Evaluation of Mackerel (WKMSEMAC)	Andrew Campbell, Ireland	
FRSG	Workshop on Standards and Guidelines for fisheries dependent data (WKDSG)	Edvin Fuglebakk, Norway, and Steven Mackinson, UK	
FRSG	Workshop on Stock Identification of North Sea Cod (WKNSCodID)	Steve Cadrin, US	
FRSG	Workshop on the Ecosystem Based Management of the Baltic Sea (WKBALTIC)	Rudi Voss, Germany and David Reid, Ireland	
FRSG	Workshop on the North Sea reopening protocol (WKNSROP)	Alexander Kempf, Germany, and José De Oliveira, United Kingdom	
FRSG	Workshop on the OSPAR and NEAFC joint advice request to generate species distribution maps for listed deep sea shark species and provide scientific support for ICES advice on bycatch management options (WKSHARK6)	Maurice Clarke, Ireland	
FRSG	Workshop on the Review and Future of State Space Stock Assessment Models in ICES (WKRFSAM)	Noel Cadigan, Canada	
FRSG	Workshop on the temporal migration patterns of European eel (WKEELMIGRATION),	Alan Walker, United Kingdom	
FRSG	Workshop on Training for the Transparent Assessment Framework: Bay of Biscay and the Iberian Coast (WKTAF-BI)	Arni Magnusson, ICES, and Colin Millar, ICES	
FRSG	Workshop on Training for the Transparent Assessment Framework: Baltic Sea and Norway (WKTAF-BN)	Arni Magnusson, ICES, and Colin Millar, ICES	
FRSG	Workshop to review and progress the reported lists of MSFD Descriptor 3 (WKD3lists)	Maurice Clarke, Ireland	

AFFILIATION (SG)	EXPERT GROUPS	OLD AFFILIATION (SG)	NEW AFFILIATION (SG)
FRSG	Workshop to review and update OSPAR status assessments for stocks of listed shark, skates and rays in support of OSPAR (WKSTATUS)	Paddy Walker, The Netherlands	
FRSG	Workshop on Atlantic chub mackerel (WKCOLIAS)	Alexandra Silva (Portugal) and Teresa G. Santamaría (Spain),	
HAPISG	Working Group on Methods for Estimating Discard Survival (WGMEDS)	Thomas Catchpole, UK, and Sebastian Uhlmann, Belgium	
HAPISG	Workshop on Global Ocean Social Sciences (WKGLOSS)	Olivier Thebaud, France, Jörn Schmidt, Germany, Denis Bailly, France	
HAPISG	Workshop on Fish of Conservation and By-catch Relevance (WKCOFIBYC)	Maurice Clarke, Ireland	
HAPISG	Workshop on fisheries Emergency Measures to minimize BYCatch of short-beaked common dolphins in the Bay of Biscay and harbor porpoise in the Baltic Sea (WKEMBYC)	Vincent Ridoux, France	
IEASG	Workshop on methods and guidelines to link human activities, pressures and state of the ecosystem in Ecosystem Overviews (WKTRANSPARENT)	Henn Ojaveer, Denmark, Debbi Pedreschi, Ireland and Gerjan Piet, Netherlands	

2021 workshops

AFFILIATION	WORKSHOP NAME	CHAIR	COMMENTS
EOSG	Workshop 2 on the identification of clupeid larvae (WKIDCLUP2) (<i>also met in 2020</i>)	Matthias Kloppmann, Germany	
DSTSG	Fourth Workshop on Optimization of Biological Sampling (WKBIOPTIM4)	Gwladys Lambert, UK, Isabella Bitetto, Italy and Patricia Gonçalves, Portugal	
DSTSG	Workshop on Operational Implementation of Stomach Sampling (WKOISS)	Pierre Cresson, France and Maria Valls, Spain	
DSTSG	Workshop on Acoustic Backscatter Models (WKABM)	Sven Gastauer, United States	
DSTSG	Workshop on Age reading of Sea bass (<i>Dicentrarchus labrax</i>) 2 (WKARDL2)	Mary Brown, UK; Valerio Visconti, UK	
DSTSG	Workshop on Age estimation of European anchovy (<i>Engraulis encrasicolus</i>) (WKARA3)	Gualtiero Basilone, Italy	
DSTSG	Workshop on Estimation of Commercial Catches I – Ratio estimators (WKRATIO)	Liz Clarke, UK-Scotland, and Laurent Dubroca, France	

AFFILIATION	WORKSHOP NAME	CHAIR	COMMENTS
EOSG	Workshop on Adult Egg Production Methods Parameters estimation in Mackerel and Horse Mackerel (WKAEPM)	Maria Korta, Spain	
EOSG	Workshop on Mackerel, Horse Mackerel and Hake Eggs Identification and Staging (WKMACHIS)	Matthias Kloppmann, Germany	
FRSG	Workshop for Salmon Life Cycle Modelling (WKSaModel)	Dennis Ensing, UK or Martha Robertson, Canada	
FRSG	Second Workshop on Atlantic chub mackerel (<i>Scomber colias</i>) (WKCOLIAS2)	Cristina Nunes, Portugal, and Alba Jurado-Ruzafa, Spain	
FRSG	Workshop on the future of eel advice (WKFEA)	Estibaliz Diaz, Spain, and Alain Biseau, France	
FRSG	Workshop on the Inclusion of Discard Survival in Stock Assessments (WKSURVIVE)	Tom Catchpole, UK, and Fabian Zimmermann, Norway	
FRSG	Benchmark Workshop for North sea stocks (WKNSEA)	Marie Storr-Paulsen, Denmark	
FRSG	Benchmark Workshop on the application of SPiCT to produce MSY advice for selected stocks (WKMSYSPiCT)	Manuela Azevedo, Portugal, and Massimiliano Cardinale, Sweden	
FRSG	Workshop on Tools and Development of Stock Assessment Models Using a4a and Stock Synthesis (WKTADSA)	Lisa Readdy, UK	
FRSG	Workshop on Fisheries Overviews (WKFO)	Bjarte Bogstad, Norway, and Youen Vermard, France	
FRSG	Inter-benchmark process to implement changes to data-limited short-lived species assessments (IBPSprat)	Jonathan White, Ireland	
FRSG	TAF Reporting Workshop (WKREPTAF)	Niels Hintzen, the Netherlands	
FRSG	Benchmark Workshop for Barents Sea and Faroese Stocks (WKBarFar)	Daniel Howell, Norway	
FRSG	Benchmark Workshop on selected stocks in the Western Waters in 2021 (WKWEST)	Mathieu Lund, UK, and Arved Staby, Norway	
HAPISG	Workshop on Transboundary issues in marine spatial planning (WKTBMIP)	Roland Cormier, Germany; Lodewijk Abspoel, the Netherlands; and Andrew Minkiewicz, United States	
HAPISG	Workshop on the Socio-economic implications of offshore wind on Fishing Communities (WKSEIOWFC)	Tara Hooper, UK; and Annie Hawkins, USA	
HAPISG	Workshop on Predictive Habitat Modelling (WKPHM)	Chris Rooper, Canada	

AFFILIATION	WORKSHOP NAME	CHAIR	COMMENTS
HAPISG	A series of two Workshop to develop a suite of management options to reduce the impacts of bottom fishing on seabed habitats and undertake trade-offs analysis of the overall benefit to seabed habitats and loss of fisheries revenue/contribution margin from these options (WKTRADE3)	Josefine Egekvist, Denmark; and Jan Geert Hiddink, UK	
HAPISG	ICES/IUCN-CEM FEG Workshop on Testing OECM Practices and Strategies (WKTOPS)	Ellen Kenchington, Canada, and Jake Rice, Canada	
EPDSG	Workshop on Workshop on Scallop Aging 2 (WKSA2)	Dave Palmer, UK, Karen Vanstaen, UK, and Charlotte Reeve, UK	
IEASG	Third Workshop on integrated trend analyses in support to integrated ecosystem assessment (WKINTRA3) (<i>awaiting approval for postponement to 2021</i>)	Benjamin Planque, Norway, and Saskia Otto, Germany	

Annex 2: Full list of ICES Expert Groups

Expert Groups under Aquaculture Steering Group

	EG name	EG Acronym	EG Chair	Year start	Year end	Number attending (2020)	Number of countries (2020)
1	Working Group on Pathology and Diseases of Marine Organisms	WGPDMO	Ryan Carnegie, USA	2019	2021	11	9
2	Working Group on Social and Economic Dimensions of Aquaculture	WGSEDA	Gesche Krause, Germany	2018	2020	26	13
3	Working Group on Application of Genetics in Fisheries and Aquaculture	WGAGFA	Jann Martinsohn, Italy	2018	2020	33	14
4	Working Group on Scenario Planning on Aquaculture	WGSPA	Ben Halpern, USA	2018	2021	Pending meeting	Pending meeting
5	Working Group on Environmental Interactions of Aquaculture	WGEIA	Terje Svåsand, Norway	2018	2020	17	6
6	Working Group on Ecological Carrying Capacity in Aquaculture	WGECCA	Jeffrey Fisher, Ireland	2019	2021	13	5
7	Working Group on Open Ocean Aquaculture	WGOOA	Bela Buck, Germany	2019	2021	19	9
9	Stakeholder Workshop on the Value of Genetic and Genomic Tools for identifying species in-mixed landings, fish products and by-products	WKGenoTools	Claudia Junge, Norway Jann Martinsohn, Italy	2019	2020 (postponed)	10	5

Expert Groups under Ecosystem Processes and Dynamics Steering Group

	EG name	EG Acronym	EG Chair	Year start	Year end	Number attending (2020)	Number of countries (2020)
1	Working Group on Biodiversity Science	WGBIODIV	Christopher Lynam, UK, and Andrea Belgrano, Sweden	2019	2021	18	9
2	Working Group on Integrated Morphological and Molecular Taxonomy	WGIMT	Jasmin Renz, Germany, and Elaine Fileman, UK	2020	2022	23	11
3	Benthos Ecology Working Group	BEWG	Silvana Birchenough, UK	2018	2020	24	11
4	Working Group on Phytoplankton and Microbial Ecology	WGPME	Marie Johansen, Sweden and Rowena Stern, UK	2019	2021	20	11
5	Working Group on Crangon fisheries and life history	WGCRAN	Claudia Günther, Germany	2019	2021	pending report	pending report
6	Working Group on Zooplankton Ecology	WGZE	Sophie Pitois, UK, and Lidia Yebra, Spain	2018	2020	27	14
7	Working Group on Oceanic Hydrography	WGOH	Paula Fratantoni, USA, and César González-Pola, Spain	2018	2020	21	14
8	Working Group on the Biology and Life History of Crabs	WGCRAb	Carlos Mesquita, UK	2020	2022	pending meeting	pending meeting
9	Working Group on Resilience and Marine Ecosystem Services	WGRMES	Sebastian Villasante, Spain, and Andrea Belgrano, Sweden	2018	2020	pending meeting	pending meeting
10	ICES IOC Working Group on Harmful Algal Bloom Dynamics	WGHABD	Eileen Bresnan, UK	2018	2020	19	14
11	Working Group on Cephalopod Biology and Life History	WGCEPH	Graham Pierce, Spain, Ana Moreno, Portugal, and Daniel Oesterwind, Germany	2020	2022	42	10
12	Working Group on Fisheries-Induced Evolution	WGEVO	Raul Primicerio, Norway	2019	2021	pending meeting	pending meeting
13	Working Group on Operational Oceanographic Products for Fisheries and the Environment	WGOOFE	Tomasz Dabrowski, Ireland; and Francisco Javier Campuzano, Portugal	2021	2023	pending meeting	pending meeting

14	Working Group entitled “Towards a EUROpean OBservatory of the non-indigenous calanoid copepod <i>Pseudodiaptomus marinus</i>”	WGEUROBUS	Marco Uttieri, Italy, and Arantza Iriarte, Spain	2019	2021	pending meeting	pending meeting
16	Working Group on Seasonal-to-Decadal Prediction of Marine Ecosystems	WGS2D	Mark Payne, Denmark	2017	2019	pending	pending
17	Scallop Assessment Working Group	WGScallop	Lynda Blackadder, UK	2019	2021	pending meeting	pending meeting
18	Working Group on Marine Mammal Ecology	WGMME	Anders Galatius, Denmark, and Anita Gilles, Germany	annual		32	13
19	OSPAR/HELCOM/ ICES/Working group on Seabirds	JWGBIRD	Ian Mitchell, UK; Nele Markones, Germany; Volker Dierschke, Germany	annual		pending	pending
20	Workshop on Scallop Aging	WKSA	David Palmer, UK, and Karen Vanstaen, UK	annual		21	5
21	ICES/ PICES Working Group on Small Pelagic Fish	WGSPF	Myron Peck, Germany (ICES), Ignacio Catalan, Spain (ICES), Ryan Rykaczewski, USA (PICES), and Akinori Takasuka, Japan (PICES)	2020	2022	31	18
22	ICES-PICES Working Group on Impacts of Warming on Growth Rates and Fisheries Yields	WGGRAFY	C. Tara Marshall, UK (ICES), Paul Spencer, USA (PICES), Alan Baudron, UK (ICES) and John Morrongiello, Australia	2020	2022	30	11
23	ICES/ PICES Working Group on Ocean Negative Carbon Emission	WGONCE		2021	2023	pending meeting	pending meeting

Expert Groups under Human Activities, Pressures and Impacts Steering Group

	EG name	EG Acronym	EG Chair	Year start	Year end	Number attending (2020)	Number of countries (2020)
1	Working Group on Marine Benthos and Renewable Energy Developments	WGMBRED	Jan Vanaverbeke, Belgium, and Joop Coolen, the Netherlands	2019	2021	21	10
2	Working Group on Marine Renewable Energy	WGMRE		2017	2019	pending	pending
3	Working Group for Marine Planning and Coastal Zone Management	WGMP CZM	Andrea Morf, Sweden, and Catriona Nic Aonghusa, Ireland	2020	2022	pending report	pending report
4	Working Group on the Effects of Extraction of Marine Sediments on the Marine Ecosystem	WGEXT	Keith Cooper, UK	2020	2022	pending report	pending report
5	Working Group on Biological Effect of Contaminants	WGBEC	Juan Bellas, Spain, and Steven Brooks, Norway	2019	2021	18	11
6	Marine Chemistry Working Group	MCWG	Koen Parmentier, Belgium	2019	2021	12	9
7	Working Group on Marine Sediments in Relation to Pollution	WGMS	Maria Belzunce, Spain, and Claire Mason, UK	2018	2020	12	6
8	Working Group on Economics	WGECON	Arina Motova, UK, Rasmus Nielsen, Denmark, and Olivier Thebaud, France	2018	2020	31	11
9	Working Group on Marine Litter	WGML	Thomas Maes, UK; Francois Galignani, France; and Andy Booth, Norway	2018	2020	pending meeting	pending meeting
10	ICES Working Group on Introduction and Transfers of Marine Organisms	WGITMO	Cynthia McKenzie, Canada	2019	2021	44	23
11	ICES/IOC/IMO Working Group on Ballast and Other Ship Vectors	WGBOSV	Lisa Drake, USA	2019	2021	28	15
12	Stock Identification Methods Working Group	SIMWG	Christoph Stransky, Germany	2020	2022	14	7
13	Working Group on the value of Coastal Habitats for Exploited Species	WGVHES	Olivier Le Pape, France, and David Eggleston, USA	2019	2021	13	6

	EG name	EG Acronym	EG Chair	Year start	Year end	Number attending (2020)	Number of countries (2020)
14	Working Group on Spatial Fisheries Data	WGSFD	Roi Martinez, UK, and Neil Campbell, UK	2019	2021	pending report	pending report
15	Working Group on Marine Habitat Mapping	WGMHM	James Strong, UK	2018	2020	10	8
16	Methods Working Group	MGWG	Arni Magnusson, ICES, and Christopher Legault, USA	2017	2019	pending	pending
17	Working Group on the History of Fish and Fisheries	WGHIST	Ruth Thurstan, Australia and Emily Klein, USA	2018	2020	pending report	pending report
18	Working Group on Multispecies Assessment Methods	WGSAM	Sarah Gaichas, USA, and Alexander Kempf, Germany	2019	2021	pending meeting	pending meeting
19	Working Group on Methods for Estimating Discard Survival	WGMEDS	Tom Catchpole, UK, and Sebastian Uhlmann, Belgium	2017	2019	15	10
20	Working Group on Fisheries Benthic Impact and Trade-offs	WGFBIT	Tobias van Kooten, Netherlands; Ole Ritzau Eigaard, Denmark; and Gert van Hoey, Belgium	2018	2020	pending report	pending report
21	Working Group on Spatial Fisheries Data Governance	WGSFDGOV	Christian von Dorrien, Germany	2020	2022	pending report	pending report
22	Working Group on Cumulative Effects Assessment Approaches in Management	WGCEAM	Vanessa Stelzenmüller, Germany, Roland Cormier, Germany, and Gerjan Piet, the Netherlands	2019	2021	pending report	pending report
23	Working Group on Offshore Wind Development and Fisheries	WGOWDF	Andy Lipsky, USA and Chair (TBD), Europe	2020	2022	28	5
24	Working Group on Shipping Impacts in the Marine Environment	WGSHP	Cathryn Murray, Canada, and Ida-Maja Hassellöv, Sweden	2019	2021	24	11
25	Working Group on Bycatch of Protected Species	WGBYC	Kelly Macleod, UK and Sara Königson, Sweden	annual		38	19
26	ICES/NAFO Joint Working Group on Deep-water Ecology	WGDEC	Laura Robson, UK	annual		25	11
27	Working Group on the Ecosystem Effects of Fishing Activities	WGECO	Brian Smith, USA, and Tobias van Kooten, the NL -	annual		13	9

* Parented by the Data Science and Technology Steering Group from 1 January 2021

28	Workshop on fisheries Emergency Measures to minimize BYCatch of short-beaked common dolphins in the Bay of Biscay and harbor porpoise in the Baltic Sea	WKEMBYC	Vincent Ridoux, France	annual	27	10
29	Workshop on Fish of Conservation and Bycatch Relevance	WKCOFIBYC	Maurice Clarke, Ireland	annual	pending meeting	pending meeting
30	Workshop on Transboundary issues in marine spatial planning	WKTBIMP	Roland Cormier, Germany; Lode-wijk Abspoel, the Netherlands; and Andrew Minkiewicz, United States,	annual (2021)	pending meeting	pending meeting

Expert Groups under Integrated Ecosystem Assessments Steering Group

	EG name	EG Acronym	EG Chair	Year start	Year end	Number attending (2020)	Number of countries (2020)
1	Working Group on Comparative Analyses between European Atlantic and Mediterranean marine ecosystems to move towards an Ecosystem-based Approach to Fisheries	WGCOMEDA	Marta Coll, Spain, Manuel Hidalgo, Spain, Hilmar Hinz, Spain and Christian Möllmann, Germany	2020	2022	31	10
2	Working Group on Ecosystem Assessment of Western European Shelf Seas	WGEAWESS	Steven Beggs, UK and Eider Andon-egi, Spain	2020	2022	27	10
3	ICES/HELCOM Working Group on Integrated Assessments of the Baltic Sea	WGIAB	Matilda Valman (HELCOM), Sweden, Laurene Pécuchet, Denmark, Saskia Otto, Germany and Martin Lindegren, Denmark	2019	2021	22	8
4	Working Group on the Integrated Assessments of the Barents Sea	WGIBAR	Elena Eriksen, Norway and Anatoly Filin, Russia	2020	2022	31	2
5	ICES/PICES/PAME Working Group on Integrated Ecosystem Assessment (IEA) for the Central Arctic Ocean	WGICA	John Bengtson (ICES), USA, Sei-Ichi Saitoh (PICES), Japan, and Hein Rune Skjoldal (PAME), Norway	2019	2021	41	10
7	Working Group on the Integrated Assessments of the Norwegian Sea	WGINOR	J. Óskarsson, Iceland, and Per Arneberg, Norway	2019	2021	Meeting pending	Meeting pending
8	Working Group on Integrated Assessments of the North Sea	WGINOSE	Andy Kenny, UK and Erik Olsen, Norway	2017	2020	14	8

	EG name	EG Acronym	EG Chair	Year start	Year end	Number attending (2020)	Number of countries (2020)
9	Working Group on Integrative, Physical-biological, and Ecosystem Modelling	WGIPEM	Morgane Travers-Trolet, France and Marie Maar, Denmark	2019	2021	Meeting cancelled	Meeting cancelled
11	Working Group on Maritime Systems	WGMARS	Patricia M. Clay, USA and Johanna Ferretti, Germany	2020	2022	23	8
12	Working Group on Northwest Atlantic Regional Sea	WGNARS	Geret DePiper, USA and Robert Gregory, Canada	2020	2022	31	3
13	Working Group on SOCIAL indicators	WGSOCIAL	Lisa L. Colburn, USA, Amber Himes-Cornell, FAO, Marloes Kraan, the Netherlands	2018	2020	56	Report pending
14	Workshop on integrated trend analyses in support to integrated ecosystem assessment	WKINTRA3	Saskia Otto, Germany, Benjamin Planque, Norway	2020	2020	Meeting pending	Meeting pending
15	Working Group on Common Ecosystem Reference Points	WGCERP	Mary Hunsicker, USA, Xiujuan Shan, China, Benjamin Planque, Norway, and Saskia Otto, Germany	2019	2021	Meeting pending	Meeting pending
16	Working Group on Integrated Ecosystem Assessment of the Greenland Sea	WGIEAGS	Jesper Boje, Denmark/Greenland, and Colin Stedmon, Denmark	2020	2022	22	4
17	Working Group on Balancing Economic, Social and Ecological Objectives	WGBESEO	David Goldsborough, Netherlands, David Langlet, Sweden, and Paulina Ramirez-Monsalve, Denmark	2020	2022	23	13
18	Workshop on methods and guidelines to link human activities, pressures and state of the ecosystem in Ecosystem Overviews	WKTRANSPAR- ENT	Henn Ojaveer, Denmark, and Mette Skern-Mauritzen, Norway	2020	2020	Meeting pending	Meeting pending
19	Working Group on Integrated Assessment of the Azores	WGIAZOR	Mario Pinho, Portugal, and Maria de Fatima Borges, Portugal	2020	2022	18	2
20	Joint ICES/PICES Working Group on Integrated Ecosystem Assessment of the Northern Bering Sea-Chukchi Sea	WGIEANBS-CS	Elizabeth Logerwell, USA, and Yury Zuenko, Russia	2021	2023	Meeting pending	Meeting pending

Expert Groups under Ecosystem Observation Steering Group

	EG name	EG Acronym	EG Chair	Year start	Year end	Number attending (2020)	Number of countries (2020)
1	International Bottom Trawl Survey Working Group	IBTSWG	Ralf van Hal, Netherlands, and Pascal Lafargue, France,	2019	2021	pending report	pending report
2	Planning Group on Data Needs for Assessments and Advice	PGDATA	Joël Vigneau	2018	2020	9	9
3	Working Group on Acoustic and Egg Surveys for Sardine and Anchovy in ICES Areas VII, VIII and IX	WGACEGG	Jeroen van der Kooij, U.K and Maria Manuel Angélico, Portugal	2020	2022	pending meeting	pending meeting
4	Working Group on Atlantic Fish Larvae and Eggs Surveys	WGALES	Patrick Polte, Germany, Richard D.M. Nash, Norway	2020	2022	pending meeting	pending meeting
5	Working Group on Beam Trawl Surveys	WGBEAM	Ingeborg de Boois, the Netherlands	2020	2022	13	8
6	Baltic International Fish Survey Working Group	WGBIFS	Olavi Kaljuste, Sweden	2018	2020	pending report	pending report
7	The Working Group on Biological Parameters	WGBIOP	Pierluigi Carbonara, Italy, Cindy van Damme, the Netherlands and Julie Davies, Denmark	2018	2020	pending meeting	pending meeting
8	Working Group on Commercial Catches	WGCATCH	Kirsten Birch Hakansson, Denmark, and Estanis Mugerza, Spain	2020	2022	pending meeting	pending meeting
9	Working Group on Electrical Trawling	WGELECTRA	Adriaan Rijnsdorp, the Netherlands, Matthias van Opstal, Belgium	2018	2020	12	5
10	Working Group on Fisheries Acoustics, Science and Technology	WGFAST	Richard O'Driscoll, NZ	2020	2022	102	20
11	ICES-FAO Working Group on Fishing Technology and Fish Behaviour	WGFTFB	Daniel Stepputtis, Germany, Antonello Sala, Italy and Pingguo He, USA	2020	2022	pending report	pending report

* Parented by the Data Science and Technology Steering Group from 1 January 2021

	EG name	EG Acronym	EG Chair	Year start	Year end	Number attending (2020)	Number of countries (2020)
12	Working Group on International Deep Pelagic Ecosystem Surveys	WGIDEEPS	Hannes Höffle, Norway, and Matthias Bernreuther, Germany	2020	2020	pending report	pending report
13	Working Group of International Pelagic Surveys	WGIPS	Bram Couperus, The Netherlands, and Michael O'Malley, Ireland	2019	2021	25	11
14	Working Group on Improving use of Survey Data for Assessment and Advice	WGISDAA	Sven Kupschus, UK	2018	2020	pending meeting	pending meeting
15	Working Group on Integrating Surveys for the Ecosystem Approach	WGISUR	Ralf van Hal, the Netherlands	2018	2020	pending meeting	pending meeting
16	Working Group on Mackerel and Horse Mackerel Egg Surveys	WGMEGS	Matthias Kloppmann, Germany and Gersom Costas, Spain	2018	2020	pending report	pending report
17	Working Group on Nephrops Surveys	WGNEPS	Jennifer Doyle, Ireland	2019	2021	pending meeting	pending meeting
18	Working Group on Recreational Fisheries Surveys	WGRFS	Kieran Hyder, UK and Keno Ferter, Norway	2020	2022	pending report	pending report
19	Workshop on Scale, Otolith Bio-chronology Archives	WKBioArc	Deirdre Brophy, Ireland, and Martha Robertson, Canada	2020	2020	pending report	pending report
20	Working Group on SmartDots Governance	WGSMArt	Julie Coad Davies, Denmark and Jane Aanestad Godiksen, Norway	2019	2021	pending meeting	pending meeting
21	Working Group on DATRAS Governance	WGDG	Ingeborg de Boois, Netherlands	2020	2022	7	4
22	Working group on machine learning in marine science	WGMLEARN	Ketil Malde, Norway, and Jean-Olivier Irisson, France.	2019	2021	pending meeting	pending meeting
23	Working Group on Technology Integration for Fishery-Dependent Data	WGTIFD	Brett Alger, United States and Lisa Borges	2019	2021	pending meeting	pending meeting
24	Working Group on Surveys on Ichthyoplankton in the North Sea and adjacent Seas	WGSINS	Norbert Rohlf, Germany	2019	2021	pending meeting	pending meeting

* Parented by the Data Science and Technology Steering Group from 1 January 2021

	EG name	EG Acronym	EG Chair	Year start	Year end	Number attending (2020)	Number of countries (2020)
25	Workshop on unavoidable survey effort reduction	WKUSER	Stan Kotwicki, US, Sven Kupschus, UK and Wayne Palsson, USA	2020	2020	45	7
26	Workshop on Acoustic Backscatter Models	WKABM	Sven Gastauer, United States	2021	2021	pending meeting	pending meeting
27	Working Group on Acoustic Data Governance	WGAcousticGov	Ciaran O'Donnell, Ireland	2020	2022	pending report	pending report
28	Steering Committee for the Regional Database and Estimation System	SCRDB	David Currie, Ireland, and Katja Ringdahl, Sweden	2020	2020	pending meeting	pending meeting
29	Fourth Workshop on Optimization of Biological Sampling	WKBIOPTIM4	Gwladys Lambert, UK, Isabella Bitetto, Italy, and Patricia Gonçalves, Portugal	2021	2021	pending meeting	pending meeting
30	The Second Workshop on Populating the RDBES data model	WKRDB-POP2	David Currie, Ireland and Edvin Fuglebakk, Norway	2020	2020	pending report	pending report
31	Workshop on Innovative Fishing Gear	WKING	Antonello Sala, Italy and Manu Sistiaga, Norway	2020	2020	pending report	pending report
32	Workshop 2 on the identification of clupeid larvae	WKIDCLUP2	Matthias Kloppmann, Germany	2020	2020	pending report	pending report
33	Working Group on Northwest Atlantic Ecosystem Observations	WGNAEO	Philip Politis, USA, and Don Clark, Canada	2020	2022	22	2
34	Workshop on Operational Implementation of Stomach Sampling (WKOISS)	WKOISS	Pierre Cresson, France and Maria Valls, Spain	2021	2021	Pending meeting	Pending meeting
35	Workshop on Age reading of Sea bass (<i>Dicentrarchus labrax</i>) 2	WKARDL2	Mary Brown, UK and Valerio Visconti, UK	2021	2021	Pending meeting	Pending meeting
36	Workshop on Age estimation of European anchovy (<i>Engraulis encrasicolus</i>)	WKARA3	Gualtiero Basilone, Italy and Andrés Uriarte, Italy	2021	2021	Pending meeting	Pending meeting
37	Workshop on Estimation with the RDBES data model	WRDB-EST2	Nuno Prista, Sweden and Kirsten Birch Håkansson, Denmark	2020	2020	Pending report	Pending report

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	EG name	EG Acronym	EG Chair	Year start	Year end	Number attending (2020)	Number of countries (2020)
38	Working Group on Size and Species Selection Experiments	WGSSE	Haraldur Arnar Einarsson, Iceland/FAO, and Michael Pol, USA	2020	2022	Pending meeting	Pending meeting
39	Workshop on Adult Egg Production Methods Parameters estimation in Mackerel and Horse Mackerel	WKAEPM	Maria Korta, Spain	2021	2021	Pending meeting	Pending meeting
40	Workshop on Mackerel, Horse Mackerel and Hake Eggs Identification and Staging (WKMACHIS)	WKMACHIS	Matthias Kloppmann, Germany	2021	2021	Pending meeting	Pending meeting

Expert groups under Fisheries Resources Steering Group

	EG name	EG Acronym	EG Chair	Year start	Year end	Number attending (2020)	Number of countries (2020)
1	Arctic Fisheries Working Group	AFWG	Daniel Howell	annual	-	18	4
2	Herring Assessment Working Group for the Area South of 62° N	HAWG	Valerio Bartolino - Afra Egan	annual	-	March - 28	8
3	Joint NAFO/ICES Pandalus Assessment Working Group	NIPAG	Ole Ritzau Eigaard - Katherine Sosebee	annual	-	March - 6 October - tbc	3 tbc
4	Northwestern Working Group	NWWG	Kristján Kristinsson	annual	-	15	4
5	Assessment Working Group on Baltic Salmon and Trout	WGBAST	Stefan Palm	annual	-	25	9
6	Baltic Fisheries Assessment Working Group	WGBFAS	Mikaela Bergenius	annual	-	33	9
7	Working Group for the Bay of Biscay and the Iberian Waters Ecoregion	WGBIE	Ching Villanueva - Lisa Readdy	annual	-	22	5
8	Working Group for the Celtic Seas Ecoregion	WGCSE	Sofie Nimmegeers - Timothy Earl	annual	-	28	5
9	Working Group on North-west Atlantic Mackerel Ecology and Assessment	WGNAM	Kiersten Curti and Stephane Plourde	2020	2022	Meeting postponed to 2021	

	EG name	EG Acronym	EG Chair	Year start	Year end	Number attending (2020)	Number of countries (2020)
10	Working Group on the Biology and Assessment of Deep-sea Fisheries Resources	WGDEEP	Elvar Halldor Hallfredsson - Pascal Lorange	annual	-	20	8
11	Working Group on Science to Support Conservation, Restoration and Management of Diadromous Species	WGDIAD	Dennis Ensing - Hugo Maxwell	2018 - 2019	2020	Pending report	Pending report
12	Joint EIFAAC/ICES/GFCM Working Group on Eels	WGEEL	Alan Walker	annual	-	43	16
13	Working Group on Elasmobranch Fishes	WGEF	Jurgen Batsleer Pascal Lorange	annual	-	31	10
14	Working Group on Southern Horse Mackerel, Anchovy, and Sardine	WGHANSA	Alexandra (Xana) Silva	annual	-	May - 24 November – Pending meeting	4
15	Working Group on Mixed Fisheries Advice	WGMIXFISH-ADV	Claire Moore	annual	-	Pending meeting	
16	Working Group on Mixed Fisheries Advice Methodology	WGMIXFISH-METH	Claire Moore	annual	-	21	11
17	Working Group on North Atlantic Salmon	WGNAS	Martha Robertson	annual	-	31	11

	EG name	EG Acronym	EG Chair	Year start	Year end	Number attending (2020)	Number of countries (2020)
18	Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak	WGNSSK	José De Oliveira	annual	-	34	8
19	Working Group on Transparent Assessment Framework Governance	WGTAFGOV	Nils Olav Handegard	2020	2022	5	3
20	Working Group on Widely Distributed Stocks	WGWIDE	Gudmundur J. Oskarsson	annual	-	38	9
21	Working Group to develop and test assessment methods for Sea trout populations (anadromous <i>Salmo trutta</i>)	WGTRUTTA	Johan Höjesjö and Alan Walker	2020	2023	Pending report	Pending report
22	Benchmark Workshop for Demersal species	WKDEM	Richard Nash and Daniel Howell	Annual		23	5
23	Benchmark Workshop for Flatfish stocks in the North Sea and Celtic Sea	WKFlatNSCS	Meaghan Bryan and Timothy Earl	Annual		21	8
24	Benchmark Workshop on Greater Silver Smelt – Data compilation meeting	WKGSS	Pamela Woods	Annual		8	4
25	Benchmark Workshop on herring (<i>Clupea harengus</i>)	WKCLUB	Noel Holmgren	Annual		Pending report	Pending report

	EG name	EG Acronym	EG Chair	Year start	Year end	Number attending (2020)	Number of countries (2020)
26	Inter-benchmark Process (IBP) on Baltic Sprat (<i>Sprattus sprattus</i>) and Herring	IBPBASH	Bjarte Bogstad	Annual		10	6
27	Second Workshop on Data-Limited Stocks of Short-Lived Species	WKDLSSLS2	Andrés Uriarte and Mollie Elizabeth Brooks	Annual		16	5
28	The scoping workshop on next generation of mixed fisheries advice	WKMIXFISH	Paul Dolder	Annual		36	8
29	Third Workshop on guidelines for management strategy evaluations	WKGMSE3	José De Oliveira	Annual		Meeting pending	
30	Workshop of Fisheries Management Reference Points in a Changing Environment	WKRPCHANGE	Anna Rindorf, Jeremy Collie and Daniel Howell	Annual		20	9
31	Workshop on Atlantic chub mackerel (<i>Scomber colias</i>)	WKCOLIAS	Alexandra Silva and Teresa G. Santamaría	Annual		18	2
32	Workshop on EU regulatory area options for VME protection	WKEUVME	Ellen Kenchington and Peter Hopkins	Annual		24	9
33	Workshop on guidelines and methods for the evaluation of rebuilding plans	WKREBUILD	Vanessa Trijoulet and Martin Pastors	Annual		25	9

	EG name	EG Acronym	EG Chair	Year start	Year end	Number attending (2020)	Number of countries (2020)
34	Workshop on Management Strategy Evaluation of Mackerel	WKMSEMAC	Andrew Campbell	Annual		16	9
35	Workshop on Model Ensembles for Stock Assessment and Advice	WKENSEMBLE	Liz Brooks, C��il��n Minto and Ernesto Jardim	Annual		24	7
36	Workshop on MSE development	WKMSSEDEV	Daniel Howell	Annual		Postponed to 2021	
37	Workshop on Standards and Guidelines for fisheries dependent data	WKDSG	Edvin Fuglebakk and Steven Mackinson	Annual		Meeting pending	
38	Workshop on stock identification of North Sea Cod	WKNSCODID	Steve Cadrin	Annual		26	6
39	Workshop on the distribution and bycatch management options of listed deep-sea shark species	WKSHARK6	Maurice Clarke	Annual		12	7
40	Workshop on the Ecosystem Based Management of the Baltic Sea	WKBALTIC	R��diger Voss and David Reid	Annual		26	8
41	Workshop on the North Sea reopening protocol	WKNSROP	Alexander Kempf and Jos�� De Oliveira	Annual		16	6

	EG name	EG Acronym	EG Chair	Year start	Year end	Number attending (2020)	Number of countries (2020)
42	Workshop on the Review and Future of State Space Stock Assessment Models in ICES	WKRFSAM	Noel Cadigan	Annual		22	6
43	Workshop on the temporal migration patterns of European eel	WKEELMIGRATION	Alan Walker	Annual		16	9
44	Workshop on the use of surveys for stock assessment and Reference Points for Rays and Skates	WKS KATE	Graham Johnston and Jurgen Batsleer	Annual		Meeting pending	
45	Workshop on Training for the Transparent Assessment Framework: Bay of Biscay and the Iberian Coast	WKTAF-BI	Arni Magnusson and Colin Millar	Annual		5	2
46	Workshop on Training for the Transparent Assessment Framework: Baltic Sea and Norway	WKTAF-BN	Arni Magnusson and Colin Millar	Annual		7	4
47	Workshop to review and progress the reported lists of EU's MSFD Descriptor 3	WKD3LISTS	Maurice Clarke	Annual		Pending report	Pending report
48	Workshop to review and update OSPAR status assessments for stocks of listed shark, skates and rays in support of OSPAR	WKSTATUS	Paddy Walker	Annual		13	7

Annex 3: ICES co-sponsored symposia 2019–2022

YEAR	DATE	TITLE	RESOLUTION NO	VENUE	CONVENERS	CO-SPONSORS	SUPPORT/COMMENTS	PUBLICATION	ICES SUPPORTS & WORK ORDER
2022									
2022	20-24 February	International Symposium on Small Pelagic Fish: New Frontiers in Science for Sustainable Management	2020/3/EPDSG01* *APPROVED 7 APRIL 2020	Lisbon, Portugal	Marta Coll (Spain, ICES), Myron Peck (Germany, ICES), Ryan Rykaczewski (USA, PICES), Ignacio Catalán (Spain, ICES), Akinori Takasuka (Japan, PICES) and Miguel Bernal (FAO-GFCM)	PICES	Financial support of €10,000 to support travel of selected early career scientists.	No IJMS requested Other peer reviewed journals planned.	Julie Kellner & Malene Eilersen (1071-54)
2021									
2021	New Date* 2-4 March <i>Original date 21-23 April 2020 postponed due to COVID-19</i>	International Symposium on Plastics in the Arctic and Sub-Arctic Region	2018/3/HAPISG01	Reykjavik, Iceland	Hrönn Jörundsdóttir, Matis, Reykjavik, and Thomas Maes, Centre for Environment, Fisheries and Aquaculture Science, Lowestoft	The Icelandic Ministry of Foreign Affairs, The Icelandic Ministry of the Environment and Resources, The Icelandic Ministry of Industry and Innovation, The Marine and Freshwater Research Institute, The Nordic Council of Ministers	Financial support of €10,000 to fund travel support for early career scientists.	A special issue IJMS requested	Vivian Piil, Wojciech Wawrzynski & Terhi Minkkinen (1071-45)
2021	New Date* 3-7 May <i>Original date 11-15 May 2020 held as Oceans Past</i>	Oceans Past IX 2021	2018/3/HAPISG04	Ostend, Belgium	Ben Fitzhugh (USA) & Ruth Thurstan (UK)		Subsidise travel and accommodation costs for 10 Early Career Scientists from ICES member countries (500 EUR each, total €5,000); Sup-	IJMS not requested	Julie Kellner & Malene Eilersen (1071-50)

YEAR	DATE	TITLE	RESOLUTION NO	VENUE	CONVENERS	CO-SPONSORS	SUPPORT/COMMENTS	PUBLICATION	ICES SUPPORTS & WORK ORDER
	<i>VIII virtual meeting due to COVID-19</i>						port an ECS networking event during the conference (€2,000) and; Subsidise travel costs for two keynote speakers to attend from underrepresented countries further afield (€2,000)		
2021	New Date* TBD May <i>Original date 25-29 May 2020 postponed due to COVID-19</i>	Marine Socio-Ecological Systems - MSEAS 2020: Navigating global change in the marine environment with socio-ecological knowledge	2016/3/IEASG07	Yokohama, Japan	Rich Little (Australia), Marloes Kraan (Netherlands), Mitsutaku Makino (Japan), Doug Lipton (US) and Keith Criddle (US)	PICES, ICES	Financial support of €10,000 to fund travel support for early career scientists. ICES IT support	IJMS not requested	Wojciech Wawrzynski & Alondra Sofia Rodriguez (1071-46)
2021	14-18 June	Baltic Sea Science Congress	2020/3/IEASG03* *APPROVED 7 APRIL 2020	Århus, Denmark	Professor Jacob Carstensen (chair of Scientific Committee), Associate professor Peter Grønkjær (Department of Biology), Nikolaj Reducha Andersen (Department of Bioscience), Helle Knudsen-Leerbeck (Department of Bioscience), Charlotte Hviid (Department of Bioscience), and Anne van Acker (Department of Bioscience).	Århus University	Financial support of €10,000 to fund participation of early career scientists ICES Communications support to advertise	No IJMS requested	Wojciech Wawrzynski & Karolina Reducha (1071-56)

YEAR	DATE	TITLE	RESOLUTION NO	VENUE	CONVENERS	CO-SPONSORS	SUPPORT/COMMENTS	PUBLICATION	ICES SUPPORTS & WORK ORDER
2021	New Date* 20-24 September <i>Original date 11-15 October 2020 postponed due to COVID-19</i>	World Fisheries Congress 2020	2018/3/HAPISG05	Adelaide, Australia	Bronwyn Gilanders (Australia) and Tim Ward (Australia)	Brand South Australia, PIRSA, SARDI, Adelaide Convention Bureau, Adelaide Convention Centre, FRDC, CSIRO, Austral Fisheries, FMA, IMAS	Financial support of €10,000 to fund travel support for early career scientists ICES IT support Coordinate selection of early career scientists travel awards	The WFC2020 International Program Committee Chairs are currently exploring options for publishing proceedings from the Congress.	Julie Kellner & Anna Davies (1071-49)
2021	26-28 October	ICES 4 th Decadal Variability of the North Atlantic and its Marine Ecosystems: 2010-2019	2020/3/EPDSG02* *APPROVED 7 APRIL 2020	Bergen, Norway	Kjell Arne Mork (Norway), Cesar Gonzalez-Pola (Spain), Paula Frantoni (USA), Caroline Cusack (Ireland), Stephen Dye (UK) and Barbara Berx (Scotland)	IOC-UN, NAFO	Financial support of 10,000€ to support travel of selected early career scientists ICES Secretariat support: communications, early career selection, physical attendance	No IJMS requested Dedicated volume of decadal symposium planned	Julie K, Julie KH (1071-55)
2020									
<i>All 2020 Symposia were postponed due to COVID-19</i>									
2019									
2019	19–21 November	International Symposium on Fisheries Sustainability: Strengthening the Science-Policy Nexus	2018/3/FRSG03	Rome, Italy	Manuel Barange (Italy, FAO)	The convener is actively identifying other partner institutions and co-sponsors and sent an email to the advisory committee requesting suggestions on 1/2/2019.	Travel and subsistence support is requested for SCICOM chair Simon Jennings, the new Fisheries Resources Steering Group chair and a keynote speaker. The Secretariat may be asked to provide general professional and secretarial support to	IJMS not requested	Julie Kellner, Anna Davies & Malene Eilersen (1071-47)

YEAR	DATE	TITLE	RESOLUTION NO	VENUE	CONVENERS	CO-SPONSORS	SUPPORT/COMMENTS	PUBLICATION	ICES SUPPORTS & WORK ORDER
							the SCICOM chair and the new Fisheries Resources Steering Group chair that will be attending the symposium. Financial support of €10,000.00 has been approved by SCICOM for early career scientists. Finished Report.		
2019	5–7 November	Shellfish - Resources and Invaders of the North	2017/3/EPISG02	Tromsø, Norway	Carsten Hvingel (Norway), Gordon Kruse (USA) and Bernard Sainte-Marie (Canada)	PICES, NAFO, NEAFC	Financial support of €10,000 to fund travel support for early career scientists as well as publication in a special edition of the ICES Journal. Secretariat support setting up a web page, handling abstract submissions and registration of participants, as well as general support for the symposium. Finished Report.	IJMS requested	Julie Krogh Hallin, Henrik Larsen, Mike Drew & Terhi Minkinen (1071-41)
2019	25-27 June	Second International Science and Policy Conference on Implementation of the Ecosystem Approach to Management in the Arctic	2018/3/IEASG04	Bergen, Norway	Hein Rune Skjoldal (Norway), Lis L. Jørgensen (Norway) and Elisabeth Logerwell (USA)	The cost of the meeting will be covered by Norway through the local organizer (Institute of Marine Research in Bergen) with some contribution from PICES and	It is anticipated that little extra support from the ICES Secretariat is needed. Finished Report.	IJMS not likely	Julie Kellner & Malene Eilersen (1071-48)

YEAR	DATE	TITLE	RESOLUTION NO	VENUE	CONVENERS	CO-SPONSORS	SUPPORT/COMMENTS	PUBLICATION	ICES SUPPORTS & WORK ORDER
						possibly other sponsors (NOAA , PAME, AMAP, CAFF).			
2019	12–14 June	Challenging the scientific legacy of Johan Hjort: Time for a new paradigm shift in marine research?	2016/3/SSGEPD06	Bergen, Norway	Olav Sigurd Kjesbu, Institute of Marine Research, Bergen, Norway; Iain Suthers, School of Biological, Earth, and Environmental Sciences, University of South Wales, Australia; Vera Schwach, NIFU, Nordic Institute for Studies in Innovation, Research and Education, Oslo, Norway, and Jennifer Hubbard, Department of History, Ryerson University, Toronto, Canada.	The symposium will be funded by a conference fee and support will be requested from the Norwegian Ministry of Fisheries and Coastal Affairs, ICES, and other organizations and governmental agencies, such as The International Commission for the History of Oceanography (ICHO) and the Research Council of Norway.	Financial support of €10,000.00 approved by SCICOM for early career scientists. Finished Report	A special issue IJMS requested	Maria Lifentseva & Anna Davies (1071-41)
2019	3–4 June	NASCO Symposium: Managing the Atlantic Salmon in a Rapidly Changing Environment – Management Challenges and Possible Responses	2016/3/SSGEPD05	Tromsø, Norway	TBA	NPAFC and NASCO. NASCO and NPAFC have made budgetary provision to support the symposium	ICES support for the Book of Abstracts, travel and subsistence of ICES participants (HoSS, SCICOM, Secretariat). Finished Report.	IJMS requested	Lotte Worsøe Clausen & Liese Carleton