

SCICOM PROGRESS REPORT 2019

ICES SCIENCE COMMITTEE

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SCICOM Progress Report 2019

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



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the Exploration of the Sea

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1 Summary

The ICES Science Committee continues to strive to increase the scope, scale and impact of ICES science. 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. The last year has seen positive and continuing progress towards cross-ICES projection and operation of science, as guided by the science plan “Marine ecosystem and sustainability science for the 2020s and beyond”. Coverage of science in ICES “news and events” has been high, with stories based on the new communications plan, clearly linked to ICES science priorities and highlighting the breadth of work in our expert groups.

Notable activities in 2019 have included (i) release of the ICES Science Plan and science implementation plan, (ii) a stronger focus on supporting expert groups, (iii) rapid increases in ICES engagement in aquaculture science, the social and economic sciences and technology, with many new scientists participating in ICES community, (iv) an increased frequency and strategic emphasis on science communication, (v) the initiation of a new publication series for expert group reports to increase visibility of, and access to, ICES science, (vi) implementation of a system within which all expert groups are parented by steering groups, to more strongly link science and advice, (vii) broadening the scientific scope of the Annual Science Conference and (viii) maintaining and developing international collaborations. These activities have taken place alongside the recurrent delivery of science outputs and publications, and running an annual programme of conferences.

One hundred and fifty-two expert groups, supported by six steering groups, were active in 2019. Recently founded expert groups focusing on new aquaculture topics, social and economic sciences, and machine learning, attracted individual 76 scientists to their first ICES expert group meeting, and demonstrated the potential of ICES to grow beyond its existing constituency. The ASC engaged 763 participants from 38 countries, including 175 early career scientists. In 18 theme sessions, 291 talks and 103 posters were presented.

Eight Co-operative Research Reports (CRR) were published since the last SCICOM report to Council, four within the 2019 calendar year. A further nine reports are being prepared for publication in future years. The first Plankton ID Leaflet for over 15 years was published at the start of 2019, with two more likely to be published in 2019. Another four Plankton ID Leaflets are in preparation. Two Identification (ID) Leaflets for diseases in fish and shellfish were published in 2019, and four leaflets are currently in preparation. One Techniques in Marine Environmental Sciences (TIMES) was published with four in the pipeline. Efforts are ongoing to reinvigorate the TIMES series.

Four ICES training courses have been run to date in 2019, engaging 78 participants, with three courses still to be held. Coverage of topics has been relatively broad and topics have included marine spatial planning, genetics, and mapping/ spatial analysis, in addition to the core training linked to stock assessment.

The Data and Information Group (DIG) took a decision to start accreditation of ICES data management processes with the CoreTrustSeal (CTS) certification, with a view to applying for accreditation (for datasets managed within the Data Centre) in 2020.

CoreTrustSeal 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.

Inter-institutional collaborations in 2019 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 also been engaging in international processes linked to the Arctic, the UN Decade of Ocean Science and science and advice in Areas Beyond National Jurisdiction. ICES co-sponsored five international symposia in 2019 and four are planned for 2020, with partners including PICES, FAO, PAME, CAFF, AMAP, Arctic Council, Nordic Council of Ministers, OSPAR and IOC. Topics addressed by these symposia cover 6 of the 7 ICES science priorities.

Further progress with implementing the ICES Science Plan is being supported by ongoing and emerging projects to restructure ICES website, to introduce more consistent and more concise resolutions forms, to improve and quality control expert group descriptions and terms of reference and to develop a resolutions database. The main priorities beyond this are detailed in the implementation plan and include efforts (i) to 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, changes to the website, increased use of science highlights and an active communications strategy, development of impact case studies, and broader ASC formats), (ii) to provide clear and accessible paths for new participants to engage with ICES, (iii) to continue to strengthen links between science and advice and (iv) to 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).

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. We are very grateful for the contributions these submissions have made to delivery of ICES Science Plan.

2.1 Purpose of the SCICOM 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 2019 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 activity in the steering groups, expert groups, strategic initiatives, operational groups, and outcomes of the Annual Science Conference (ASC), as well as implementation of 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. The report is relatively long because it also serves as a reference document for use of SCICOM members, the Secretariat and the ICES network more widely. For this reason, the full report is supplemented with a summary report that emphasises the main achievements of the ICES science community and SCICOM in 2019.

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 ICES science plans. Through planning of the work of ICES groups the science committee strives to ensure there are effective working relationships between all parties contributing to implementation of 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 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.

Our 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 groups contributing to the work of the Science Committee

Five 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.

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 Science priorities, planning and delivery

3.1 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 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.

3.2 Science collaboration, including symposia

ICES science is necessarily international, and our wider networks of collaboration help to strengthen our science and influence and provide benefits for both ICES and partners. ICES Science Plan and the associated implementation plan commit ICES to working closely with regional and global partners. Relationships with partners extend the reach of ICES science into the Mediterranean, Black Sea, Arctic, North Pacific Ocean

and globally. Partnerships bring mutual benefits, because they strengthen the contribution of regional expertise to larger-scale and global processes and because they contribute to shaping and delivering marine science and advice beyond the ICES region. ICES community exchange knowledge and expertise with regional and global partners through collaborative projects, networks and training. ICES also engages with partners by developing joint expert groups, co-sponsoring conferences and conference sessions and contributing to overviews and assessments of the state and uses of the marine environment. Specifics of these interactions are described throughout this report, but some key activities related to our international collaborations are:

Joint expert groups including the ICES/ PICES Working Group on Small Pelagic Fish, the ICES/IOC/IMO Working Group on Ballast and Other Ship Vectors, the ICES-PICES Working Group on Impacts of Warming on Growth Rates and Fisheries Yields and the ICES/PICES/PAME Working Group on Integrated Ecosystem Assessment (IEA) for the Central Arctic Ocean.

Joint sessions at annual meetings such as the 2019 ASC Session with PICES on “Understanding humans within ecosystems: Innovative tools, strategies, and research” and the 2019 PICES Annual Meeting Sessions with ICES “Creating More Effective Integrated Ecosystem Assessments (IEAs) in PICES Countries” and “Integrating economic and social objectives in marine resource management.”

Activities driven by Strategic Initiatives provided representation and engagement at the IMBER Annual Science Meeting, joint input from ICES and PICES experts to the IPCC Reports and engaged many scientists from outside ICES countries at a series of workshops and meetings.

Co-sponsorship of five international symposia in 2019 and four planned for 2020, with partners including PICES, FAO, PAME, CAFF, AMAP, Arctic Council, Nordic Council of Ministers, OSPAR and IOC. Topics addressed by these symposia cover six of the seven ICES science priorities.

At other levels, and with some inputs from SCICOM, ICES has also been engaging in international processes linked to the Arctic, the UN Decade of Ocean Science and science and advice in Areas Beyond National Jurisdiction.

3.3 Interactions with the 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 co-ordination and impact of expert groups and their science.

3.3.1 Engaging expert group chairs

To supplement the significant interaction between expert group chairs and the steering group chairs and supporting officers in the secretariat, SCICOM have continued to work with ACOM to communicate more closely with expert group chairs and to better

support their work. The main approaches used by the committees have been to establish a WGCHAIRS forum and to further expand and develop the content of the WGCHAIRS meeting.

The establishment of the WGCHAIRS forum has enabled consistent messaging across all ICES expert groups, usually with posts jointly signed by ACOM and SCICOM, and thus helping to promote a “one-ICES” perspective. The forum has also been valuable for receiving feedback from chairs on topics such as the development of the “ICES Scientific Reports” series and the e-evaluation process.

The WGCHAIRS meeting continues in an expanded format, with agenda items of relevance to all expert group chairs as well as items focused on chairs of groups addressing science and advice-related terms of reference. The meeting format is arranged to that it is initially focused on expert groups with a predominance of advisory terms of reference, then on issues of relevance to all chairs and finally on expert groups with a predominance of science terms of reference. Chairs can therefore attend the whole meeting or a shorter part of the meeting focused on the issues of greatest relevance to their groups.

The 2019 WGCHAIRS meeting included agenda items on the guidelines for ICES groups, implementation of the ICES Code of Conduct, best practices for data handling, the ACOM guidelines, reform of the steering group structure, the ICES Strategic and Science Plans, ICES viewpoints, highlighting ICES science, authorship of expert group reports, mentoring chairs, the development of fisheries and ecosystem overviews and evaluation and e-evaluation of expert groups. There were also breakout sessions for expert groups linked to steering groups, to co-ordinate their work and consider implementation of ICES Science Plan. Many actions were taken from this meeting continue to be used to further improve the “Guidelines for ICES groups” by ensuring they address issues that the chairs wish to know about (leading to changes in editions 2019-1 and 2019-2), and to co-ordinate the work of expert groups.

3.3.2 Guidance for expert group chairs

The “[Guidelines for ICES groups](#)” were developed in 2017-8 as a guide for anyone involved in ICES work, with a focus on the members and chairs of expert groups, operational groups, strategic initiatives, advice drafting groups, the Advisory Committee and the Science Committee. Large sections in the “Guidelines for ICES groups” focus on meeting the needs of expert groups.

The guidelines describe how to establish, run and report on the work of an expert group, the roles of members and chairs and the code of conduct for scientists contributing to ICES. The wider purpose of the guidelines is to ensure the same up to date messages on the expert groups reach all parts of the ICES community and lead to greater consistency and more efficiency in working practices.

Update 2019-1 of the “Guidelines for ICES groups” was published in the first quarter of 2019 (available [here](#)). The next edition (2019-2) is due to be released shortly after the Council meeting to include updates related to handling of resolutions, the interim e-evaluation process, submission of materials to “ICES Scientific Reports” series, and updated guidance on submitting science highlights. SCICOM have increasingly solicited feedback from the community on content of the guidelines, through steering groups, meetings of expert group chairs, and ACOM and SCICOM. The 2019-2 and subsequent releases of the “Guidelines for ICES groups” will be accompanied by a quick reference document to highlight changes in each new edition. ICES secretariat have also continued to work with ACOM and SCICOM to produce an introductory

presentation, based on the “Guidelines for ICES groups”, that expert group and other chairs can use to induct new members and explain ICES work.

3.3.3 Encouraging participation in expert groups

If ICES is to flourish it is essential that ICES continues to attract new participants into our expert groups, and in particular to effectively reach out to scientists and institutes that have not previously been part of the ICES community. For these reasons, SCICOM undertook a project to define the benefits of engaging with ICES. The full benefits identified are described in Annex 5. Material describing the benefits of engaging in our expert groups was used in handouts at the 2019 ASC and will be added to the updated ICES website in 2020. The material has been complemented with a series of personal stories about how scientists benefitted from their engagement in ICES (“[What has ICES done for you](#)”), as developed by ICES Communications.

The four main benefits of engaging in an ICES expert groups come from the opportunities they provide for participants to strengthen their science, develop their networks, to increase the impact of their work and to learn new skills. SCICOM members are committing to widely communicating these benefits nationally and in their networks, and seek wider support from ICES community to do this. The ICES community ultimately benefits from new expert group participants because they bring a greater diversity of ideas and approaches, grow the scope of the ICES community and thus strengthen ICES marine science and advice.

3.3.4 Expert group reporting

Reports from all expert groups that generate scientific output are now being published in the “ICES Scientific Reports” series (from 1 January 2019). This series has both an ISSN and a new citation format, with the changes intended to increase use and recognition of expert group science. Making all the reports part of an “ICES Scientific Reports” series, in conjunction with the individual DOI and a higher profile for editors and authors, addresses the concerns that have previously been raised by expert group chairs about the profile of these reports and their contributors. The new reports focus more strongly on science content than describing processes in the expert groups, thus making the contents more attractive to readers outside the ICES community. As part of the process of introducing the “ICES Scientific Reports” series, the existing four templates used for formatting ICES expert group reports have been replaced with a single design. There have been some challenges with the transition to the new report series, and with achieving consistency in the content and formatting of the opening pages and executive summaries of the new reports, but these are being addressed in ICES Secretariat and through further communication of expectations to expert group chairs.

A very small number of expert groups in the ICES system undertake activities other than science (e.g. WGCHAIRS focuses on supporting expert groups chairs to manage their groups and does not undertake science, and WGDIAAD co-ordinates work on diadromous fishes to support the Fisheries Resources Steering Group). These groups do not use the “ICES Scientific Reports” template and submit a report using the template for business meetings. This template will be refined and harmonised across ICES Secretariat during 2020.

3.3.5 Interim and final e-evaluation of fixed-term working groups

Expert groups meeting since 1 January 2019 have published their reports in a series “ICES Scientific Reports” with ISSN, DOI and a specified citation format. Reports in this series must include significant science and analytical content and not just a description of expert group processes. For this reason, fixed-term working groups have now been given the option to submit only an interim e-evaluation (not published as part of the report series), rather than an ICES Scientific Report, if they do not have science content to publish in their initial years of work. The interim e-evaluation is completed in interim years, whether or not the ICES Scientific Report is also published. The option not to publish an ICES Scientific Report does not, however, apply to fixed-term groups providing material that is related to an advice request: any fixed-term working group addressing advice-related terms of reference in any interim year must publish an ICES Scientific Report including, at least, the output linked to these terms of reference (as this will form the background to the advice).

The adoption of the e-evaluation process has allowed the removal of a lot of process-related content from the “ICES Scientific Reports” series (that often dominated interim report in previous years) and also reduces the workload of the secretariat who do not have to undertake extensive formatting work on reports with little or no science content.

A final e-evaluation is always required at the end of the term from any fixed-term working group, as this is one of the sources of information used to assess whether the group is dissolved or continued. The final e-evaluation is requested in addition to the ICES Scientific Report that the expert group will produce. All fixed-term working groups must also publish their final report in the “ICES Scientific Reports” series.

ICES new approach to e-evaluation of fixed-term working groups provides 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 progress of the fixed-term working groups.

3.3.6 Expert group recommendations

Recommendations are requested from expert groups to ensure that other expert groups, steering group chairs, ICES Secretariat, ICES Data Centre, ACOM, and SCICOM are aware of information from the expert groups that influences work in other parts of the network. Expert group chairs are now being asked to put all recommendations directly into the recommendations database, but only after they have checked that any recipient expert group is aware of the intention to submit a recommendation and considers it feasible to address. To avoid the proliferation of requests that there is insufficient capacity to address, the expert groups are now asked to list no more than five recommendations that they deem to be of high priority.

These refinements to the recommendations process encourage expert groups to focus on exchange of the most important recommendations and to exclude recommendations that cannot be addressed by ICES. The process will be moved entirely online from 2020. The review frequency for recommendations is being increased from once to at least 3× each year from 2020 to enable more rapid transfer of information within ICES community.

3.3.7 Expert group resolutions

ICES Secretariat have been working with SCICOM and ACOM to develop a unified resolution template (to replace at least 4 existing templates) and to ensure expert group terms of reference and texts get effective review and sign-off before posting on web. The new template is provided as a pdf form, and this allows data to be harvested directly from the fields and passed to the database. This is a significant step forward from an existing system where information was collated on heterogeneous word documents and could not readily be used for analysis and evaluation of expert group activity and performance. Once the information from the forms is fed into the resolutions database it will enable searches of expert groups and terms of reference by people interested in, and engaging in, ICES work (fulfilling requests and expectations from ICES community, as often raised at WGCHAIRS). The new system will also enable mapping of terms of reference to science plan codes to support implementation of the science plan and to identify gaps and areas for improvement in the science programme. The work on the resolution forms is being conducted as part of a wider overhaul of the resolutions process, and this is discussed in greater detail in Section 7.

3.4 Raising awareness of ICES science

An important aspect of the implementation of 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 ISSN for the publication of expert group reports, creation of a preliminary web-based and searchable ICES bibliography ([here](#)) 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. Some has been incorporated in the existing website, other texts are to be fed in to the restructured and refreshed website as it develops during 2020. Other opportunities to project our science and engage new scientists are also provided by the web restructuring project, and new sections of the website will include clear documentation on routes to engage with ICES, a revised process for collating and reviewing expert group summary texts (through the new resolutions form) and, in the longer term, enhance the capacity for scientists seeking collaborations and information on our work to easily search group texts and terms of reference by topic. The web interface for the bibliography / publications database will also be further developed to provide more advanced search facilities and summary graphics, but these tasks have been postponed at present to allow IT focus on development of the resolutions database.

3.4.1 Science highlights: processes and examples

A clear process has been established and communicated to collate science highlights to be used in “news and events” and support the needs of the science and communications plans. Submissions of science highlights are welcomed from any scientist in the ICES network who wishes to report new and impactful work that is conducted by ICES scientists and groups. Scientists are encouraged to use a short (provided) template for this purpose, and the completed template and any supporting materials can be uploaded to the [science highlights SharePoint](#) page. Since ICES is renowned for generating authoritative and impartial science, we emphasise that science highlights should not compromise or unreasonably sensationalise the underlying science. As well as relying on open submissions, the secretariat and communications team have been actively submitting some ‘series’ of contributions from expert groups on topics to be flagged more strongly, such as monitoring.

ICES Secretariat has been developing several topical science highlights series to draw attention to the work of our expert groups (Annex 4). In addition to these well-defined topical series, three ongoing series for broader participation by expert groups are under development, and the plan is to introduce them at the 2020 WGCHAIRS meeting. Most expert groups should be able to participate in at least one of these series. The proposed topics are 'Biodiversity', 'In the field' and 'In Other Words' (reviving an old series that was devoted to clarifying important terms and phrases used in the ICES community).

3.4.2 ICES website restructure

To improve the usability and findability of ICES website, ICES Secretariat has been working together with a website usability expert to restructure ICES website, with a view to implementing changes in 2020. The purpose of the project is to (i) clean up content and structure (eliminate content which doesn't fit the purpose and target groups, pages without visits, and content that is not up to date) and (ii) to restructure the content on the website (new menu, section landing pages, and sub menus) and change some design elements on some of the pages. SCICOM input through a sub-group led by Sarah Bailey and through the participation of the SCICOM chair in meetings of the restructuring project in the Secretariat. Project outcomes are positive for improved projection and recognition of ICES science, with "Science" proposed to be featured directly on the front page alongside "About ICES", "Data", "Advice" and "Join us". The levels below "Science" will lead the user into "Expert groups", "Science priorities" and "Publications" while "Join us" will directly show prospective participants in ICES how to get involved in expert groups and other activities and the benefits they provide. The restructuring of the website should really raise the profile of ICES science and support the wishes of SCICOM to focus the website more strongly on informing and engaging new participants.

The proposal for the "Science" front page will include boxes featuring:

Workshops and training courses: a link list with teaser to upcoming workshops and courses, ideally displayed several weeks in advance to allow time for potential participants to enquire and join.

Science plan: a link list to our science priorities

Scientific reports: flagging the latest reports and providing a link to the full and searchable set of reports in the library

A link section: linking to "join us", "find an expert group" (searchable, based on terms of reference and group texts), "ICES publications" and "Project collaborations"

3.4.3 Science content of the ASC

ICES aspires to run an ASC that is attractive to marine scientists from ICES community and beyond, thus raising awareness of ICES and ICES science and providing many opportunities to participate. Funding support for ASC attendance is often conditional on presentation of a poster or talk, and for this reason, proposals for theme and network sessions on topics that are accessible to a broad range of marine scientists are now encouraged in the call for proposals. In practical terms, this means that topics should be broad enough to cover at least one, and preferably more, of the sub-priorities in ICES Science Plan (indicated by bullets beneath the seven priorities: Ecosystem science, Impacts of human activities, Observation and exploration, Emerging techniques and technologies, Seafood production, Conservation and management science, Sea and

society). Theme and network sessions based solely on the work of a single project consortium or expert group, for example, are now flagged as not suitable and discouraged, unless the sessions are described in a way that openly encouraged submissions from scientists outside the project or expert group and working internationally on related topics.

Theme sessions provide the main forum for talks and poster presentations at ASC and showcase new and emerging marine science. They are the main way of projecting the breadth of our science. The topics of the theme sessions, with one exception, are defined by proposals solicited from ICES community, so SCICOM now give a strong steer about expectations as detailed above. From 2020, on a trial basis, SCICOM have reserved one theme session for contributed papers on any marine science topic relevant to ICES. The contributed papers session also provides an opportunity to flag underrepresented areas of science, with possibilities to later theme sections of this session to highlight ICES scientific priorities that were not strongly represented in the submitted theme and network sessions (e.g. oceanography, aquaculture and marine chemistry in 2020 submissions).

To ensure a broad ASC programme, SCICOM introduced a new process for session selection in 2019 (for the 2020 ASC), which involved a first selection round that ranked proposals within science priority areas and took at least one session from each area (two in the case of seafood production: one fisheries and one aquaculture) before continuing with the selection process. To accommodate more presenters and to at least stabilise the current rejection rate for spoken presentations (running at c 50%), SCICOM also recommend that future ASC venues should be able to accommodate at least five parallel sessions.

SCICOM also re-emphasised the importance of selecting diverse keynotes (subject area, nationality, gender) to raise awareness of ICES as a broad marine science community.

4 Steering Groups

4.1 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 2019. The reports also highlight the science being conducted in the groups and other issues relevant to implementation of the ICES Science Plan.

In 2019, the chairs of the Integrated Ecosystem Assessments Steering Group (Mette Skern-Mauritzen), the Ecosystem Processes and Dynamics Steering Group (Silvana Birchenough) and the Ecosystem Observation Steering Group (Sven Kupschus) all took the option to extend their terms by one year to the end of 2020.

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

4.2.1 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

4.2.2 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	Mike Rust attended first meetings of WGOOA and WGEIA and second meeting of WGSPA. He met with Chair of WGEIA in Norway and discussed increased ICES involvement with Canada and Norway at separate meetings. He obtained financial support and assisted with planning for WKEMOP and discussed the development of advice products for aquaculture with ACOM.
ToR b) Help EG formulate and prepare their draft terms of reference and resolutions	The SG chair worked with new and existing EG Chairs to ensure ToR were deliverable and that groups were working towards delivering them. The major focus has been on the new groups just getting started. The SG has been reducing the emphasis on viewpoints in favor of papers until it can fully flesh out the content of aquaculture advice products.
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 SG is developing opportunities for groups to work together and to articulate a vision to structure ASG. The SG is exploring an ecosystem approach to marine aquaculture to provide a common vision. Aquaculture was the focus of a session at ASC 2018, and will be advanced by a session at ASC 2019.
ToR d) Review scientific products/deliverables of the EG and provide feedback on ways to improve the impact and influence of their work	Reviews are on-going as EG meetings occur. The SG is exploring linkages to other organizations which are in need of scientific inputs on aquaculture, such as FAO

	and OIE. The SG will focus on advice deliverables in 2020.
ToR e) Provide feedback to SCICOM on research priorities and implementation of ICES strategy	Seven EGs and two WGs are now functional and contributing to implementation of the ICES Science Plan. Further focus will be on the science to advice linkage and looking at developing a WG on Aquaculture and Climate Change. Some interest in expanded economic and trade-off modelling is emerging.
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	The SG is proposing a survey and workshop to articulate process and needs for aquaculture advice products. That effort may identify gaps in ICES ASG.
ToR g) Identify gaps and overlaps in the work of EG, and propose consolidation, rationalization or forming of new EG to SCICOM as appropriate	The ASG is mostly expanding at this time. No overlaps, however there may be some opportunities for shared ToR between groups. Planning for a new WG on Aquaculture and Climate Change is underway.
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. Few products are available yet as most groups are new. 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	The SG has run some joint EG chair calls and meetings. EG chairs from different groups were co-conveners at ASC 2018 and ASC 2019. Members from WGSEDA are also actively interacting with the WGSOCIAL and WGECON to help ensure aquaculture is a part of these groups discussions. Planning an ASG webinar series to improve communication among EGs.
ToR j) Represent the SG at SCICOM meetings and SCICOM/ACOM leadership meetings in spring and at the ASC	SG chair attended meeting at ASC 2017, Spring 2018, Spring 2019, and ASC 2019. Unexpectedly had to miss meeting at ASC 2018.
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	The SG chair is 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	SG chair is formulating the outline for the paper. Structure and text will follow an ecosystem approach to aquaculture.

4.2.3 Expert groups

The ASG expert groups are listed in Annex 2.

4.2.4 Science highlights

- Workshop on Emerging Mollusc Pathogens (WKEMOP). The emergence of 'microvar' variants of the ostreid herpesvirus OsHV-1, which have caused significant Pacific oyster mortality from Europe to Australia and New Zealand, is the most significant mollusc disease development in decades. Preventing further spread of these pathogens and mitigating damage in

affected areas are twin challenges of OsHV-1 management today. This workshop identified strategies to prevent OsHV-1 microvariant dispersal to North American member countries, presently free of the microvars, and to maintain commercial production should an epizootic emerge. It also considered more broadly the OsHV-1 microvar emergence as a case study in response to emerging viral and bacterial pathogens, to identify general strategies for future responses and potential pitfalls with regard to their application. ICES is showing leadership here with this workshop and it resulted in connections being re-established between ICES and OIE. Report in preparation.

- Working Group on Environmental Interactions of Aquaculture (WGEIA). In the process of aligning the legal and management approaches for shellfish and finfish aquaculture among countries, to allow sharing of best practices and highlight areas that need more work. This is a large effort with data tables covering all impacts of marine aquaculture and how different countries are dealing with them. Included representation from China as well as ICES countries.
- Working Group on Pathology and Diseases of Marine Organisms (WGPDMO). Publishing an annual summary of new and emerging disease trends in wild and cultured fish and shellfish in the ICES area, the most comprehensive synopsis of marine disease trends for any region. Published two new leaflets on pathology and diseases of marine organisms, on *Piscirickettsiosis* (caused by the bacterium *Piscirickettsia salmonis*) and *Tenacibaculum maritimum*.
- Working Group on Social and Economic Dimensions of Aquaculture (WGSEDA). Has two review papers coming out. "Applying Indicators to Capture the Social Dimensions of Aquaculture"; and "Availability and usefulness of economic data on the effects of aquaculture: A North Atlantic comparative assessment". WGSEDA will turn its attention to examining the effectiveness of knowledge transfer approaches across the ICES region.
- Working Group on Scenario Planning on Aquaculture (WGSPA). Meeting global vs. EU aquaculture targets: This project aims to understand how international targets for aquaculture growth (2x) compare to EU country targets for growth – industry and government. The differences will help illuminate if/how EU member nations will be able to contribute to global targets, or conversely how much they (implicitly) expect other parts of the world to expand aquaculture to achieve global targets.

4.2.5 Communication with EG

The SG chair attended meetings of 3 WG's in person and one by Skype, and also met one on one with three Chairs at various non- ICES meetings.

Conducted a survey among SG to establish a webinar series. The likely plan is to run one webinar per month rotating among the chairs to introduce the activities of their WG. No Web meeting during September due to the ASC, nor July, Aug or Dec due to holidays, leaving 8 months open. One for each WG plus an extra per year. Plan to start in January 2020.

SG chair is proposing to engage all WG Chairs to develop advice products for aquaculture.

4.2.6 Summary of new EG proposals and EG closing

The Working Group on Ecological Carrying Capacity in Aquaculture (WGECCA) chaired by Dr Jeff Fisher met for the first time in Copenhagen in April 2019.

The Workgroup on Open Ocean Aquaculture (WGOOA) chaired by Dr. Bela Buck met for the first time in Copenhagen, in March 2019.

Preliminary discussion with Chairs of SICCME have taken place around the pros and cons of developing a WG on Aquaculture and Climate Change. The ASG chair will draft a “strawman” resolution and will seek a committed chair to develop.

4.2.7 Forward look

Efforts will continue to structure the ASG in order to define and support an Ecosystem Approach to Aquaculture Management. This requires the EG to interact. The process started at ASC 2018 and continued at ASC 2019, and in 2020 will be supported by an ASG webinar series to foster cross-group understanding and to develop a common vision. This topic will form the basis for the position paper in SG ToR L.

In 2020 the SG will focus on working with the ASG members and ACOM to explore advice products for aquaculture.

There has also been recent interest by PICES in developing an aquaculture focused working group, and the ASG chair will present a recorded presentation for the PICES ASM which will be held in Canada in October. The ASG chair has offered to continue discussion with PICES upon request.

Resolutions will be proposed to address the issue of replacing viewpoints with peer review papers in several WG ToR and to add an additional chair (Cornelia Kreiss) to WGSEDA. Other WG have requested minor work changes to ToRs.

The SG chair will continue to seek an individual who can lead development of a new working group on aquaculture and climate change.

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

4.3.1 Introduction

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

4.3.2 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	On track. Regular correspondence with EG chairs and with the ICES secretariat to support production of text and deliverables (e.g. production of annual reports, self-evaluations documents, setting new ToRs) as needed. Quarterly catch up with Supporting Officer Maria Lifentseva over Skype or email to ensure EPD ToR, reports and self-evaluations are submitted and checked on time.
ToR b) Help EG formulate and prepare their draft terms of reference and resolutions	On track. Regular e-mail discussions with EG chairs on ToR, report and deliverables. In some instances, Skype meetings are organised to ensure EG chairs are fully aware of ICES requests.
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 EG chairs. SG chair communicating with EG chairs mainly to inform and encourage the use of ICES Communication team, Tweeter and press release opportunities for wider publicity of scientific outputs.
ToR d) Review scientific products/deliverables of the EG and provide feedback on ways to improve the impact and influence of their work	Ongoing. Regular feedback provided on annual reports, ToR and e-evaluation documents to improve visibility, influence, realistic delivery and products.
ToR e) Provide feedback to SCICOM on research priorities and implementation of ICES strategy	SG chair attended the Chairs meeting in January 2019 and SCICOM meeting in March, as well as online meetings requested by EG chairs. SG chair submitted an overview background document to highlight and encourage the development and submission of theme sessions for future ASC. This document was approved by SCICOM.
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 EG across ongoing initiatives (e.g. ecosystems overviews, advisory requests), in joint open sessions and through developing viewpoints. Some further discussions will help to generate new viewpoints and publications (across common topics of interest).
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 for integration between Aquaculture SG and EPDSG (for example under ICES/IOC HABS there was a joint theme session during ASC 2019). Several new avenues for collaboration will be explored with the HAPISG chair. An international shipping session was run at the 2019 ASC.
ToR h) Help EG Chairs to adopt practices which ensure scientific information generated by EG is receiving adequate quality control consistent with scientific norms	Reports and documents are regularly reviewed.
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,	Active discussions spanning ICES and PICES EG were used to promote and foster integration and to support development of new scientific outputs, workshops and EGs.

opportunities for internal and external collaboration	
ToR j) Represent the SG at SCICOM meetings and SCICOM/ACOM leadership meetings in spring and at the ASC	Completed. EPD chair also represented ICES at the recent UN event "Ocean Science and the United Nations Decade of Ocean Science for Sustainable Development", this was the twentieth meeting of the United Nations Open-ended Informal Consultative Process on Oceans and the Law of the Sea, New York, (10 to 14 June 2019).
ToR k) Establish a core group of EPDSG Expert Group Chairs who, together with the EPDSG Chair, will share responsibility for implementing the work of EPDSG	On track. There is a core of 4-5 EGs Chairs that are always supportive, active and engage on dedicated requests, correspondence and feedback.
ToR l) Generate a position paper on the contribution of EPD to ICES science, data and advice	Task not started. Need to explore ideas and a relevant topic of common interest.

4.3.3 List of EG (provided by Secretariat)

The EPD expert groups are listed in Annex 2.

4.3.4 Science highlights (as bullets with references)

Papers and special issues:

- Van Hoey, G., Wischniewski, J., Craeymeersch, J., Dannheim, J., Enserink, L., Guerin, L., Marco-Rius, F., O'Connor, J., Reiss, H., Sell, A.F, Vanden Berghe, M., Zettler, M.L., Degraer, S., Birchenough, S.N.R. (2019). Methodological elements for optimising the spatial monitoring design to support regional benthic ecosystem assessments. Environmental monitoring and assessment DOI: 10.1007/s10661-019-7550-9
- Gogina, M., Zettler, M.L., Vanaverbeke, J., Dannheim, J., Van Hoey, G., Desroy, N., Wrede, A., Reiss, H., Degraer, S., Van Lancker, V., Foveau, A., Braeckman, U., Fiorentino, D., Holstein, J., Birchenough, S. (submitted) Interregional comparison of benthic ecosystem functioning: community bio-turbation potential in four regions along the NE Atlantic shelf". Ecological Indicators.
- Clare Greathead, Paolo Magni, Jan Vanaverbeke, Lene Buhl-Mortensen, Ursula Janas, Silvana Birchenough, Mats Blomqvist, Johan Craeymeersch, Jennifer Dannheim, Alexander Darr, Steven Degraer, Nicolas Desroy, Annick Donnay, Yessica Griffiths, Ivan Guala, Laurent Guerin, Hayley Hinchin, Celine Labrune, Henning Reiss and Gert Van Hoey (in prep.) Exploring the use of a generic framework to illustrate the importance of benthic marine ecosystems to the effectiveness of MPAs. Aquatic Conservation.
- ICES Theme Special issue entitled "Decommissioned offshore man-made installations" is now closed. A total of 14 accepted papers will be published in October (2019). Silvana Birchenough and Steven Degraer are special editors for this volume.
- Leon, P., *et al* (2019) Shell integrity of pelagic gastropods and its potential relationship with carbonate chemistry. ICES JMS. This work was developed following the award by the ICES Science Fund programme.

- A joint ICES/PICES Ocean acidification session entitled: “Taking stock on ocean acidification research for provision of future efforts” was submitted for consideration for the ICES ASC 2020.
- IOC/ICES WGHAB chair was invited to the international workshop “Global HAB: Evaluating, reducing and mitigating the cost of harmful algal blooms: a compendium of case studies” to be held in Victoria, British Columbia, Canada from October 17-19, 2019.
- WGHABD will have a joint meeting with WGBOSV and WGITMO in 2020 (2-4 March, Gdynia, Poland)

4.3.5 Communication with EG (summary paragraph of activities undertaken)

The EGs under EPD have been planning, working and achieving their proposed ToRs. There are no major issues in the work identified and delivered by the EGs. Issues to be considered are associated with the numbers of attendees at some EG. There have been some delays by some chairs in submitting reports and evaluations. The EPD chair has been contacting chairs to encourage timely completion. Several new EG and a workshop have been suggested and the documents will be submitted for SCICOM consideration.

4.3.6 Summary of new EG proposals and EG closing:

A series of proposed new EGs and workshops are outlined below, the documents have been drafted for SCICOM consideration, these are:

- ICES-PICES Working Group on Impacts of Warming on Growth Rates and Fisheries Yields (WGGRIFY), chaired by C. Tara Marshall, UK (ICES), Paul Spencer, USA (PICES), Alan Baudron (ICES) and John Morrongiello, Australia (Guest);
- Joint ICES/PICES Working Group on Small Pelagic Fish (WGSPF) (Myron Peck *et al.*). Resolution submitted;
- ICES/PICES Working Group on Ocean Negative Carbon Emission (WGONCE) which was formerly the ICES/PICES Working Group on Climate Change and Biologically-driven Ocean Carbon Sequestration (WGCC-BOC). A new resolution is being developed in consultation with PICES;
- ICES Workshop on Scallop Aging (WKSA); on age reading of the king scallop (*Pecten maximus*) in Aberdeen, Scotland, 9–13th March 2020, resolution submitted.

4.3.7 Forward look

There are several activities planned to support EGs under EPD, for the SG Chair to represent ICES, to help link work across the EGs and to explore areas to work with other SG chairs. These activities include:

- Joint theme session between HAPISG and EPDSG, entitled: “Global impacts of shipping” (conveners: Sarah Bailey, Canada and Silvana Birchenough, UK) held during ICES ASC 2019.
- EPD chair will be presenting an overview of ICES work to CIESM 7–11th October in Cascais, Portugal.
- EPD chair contributed to OSPAR ICG- Ocean acidification meeting from 10–11th September in Gothenburg; to draft technical specification sheet for an ocean acidification assessment(s) as a contribution to the QSR 2023.

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

4.4.1 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

4.4.2 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	Work carried out on routine basis by email correspondence, as needed. Participation at WGCAIRS to engage with EG Chairs.
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)	Communication with EG Chairs prior to each SCICOM meeting asking them to submit science highlights and priorities. Regular reporting to SCICOM meetings in accordance with deadlines. Facilitated submission of Feature Article: <i>Climate change opens new frontiers for marine invaders in the Arctic</i> (WGBOSV and WGITMO) Facilitating submission of biofouling Viewpoint to International Maritime Organization.
ToR c) Provide feedback to SCICOM and ACOM on research priorities and implementation of ICES strategy	Reviewed and provided feedback into the restructuring of ACOM EGs under SG structure. Reviewed and provided feedback on the ICES submission to UN Decade of Ocean Science.
ToR 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	MCWG has reported shortage of experts able to attend meetings. This led to SCICOM sub-group on web projection to provide recommendations for how ICES can improve web pages and better publicize new/existing expert groups to a wider set of individuals. Communication with EG Chairs (WGML, WGBEC, WGCEAM, WGSIP) to suggest development of Viewpoint proposals. With SCICOM Chair, have identified potential need for experts to assess shipping impacts – now

	facilitating development of new EG on impacts of shipping on the marine environment (WGSIP).
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	Ongoing work to establish new EG on impacts of shipping on the marine environment (WGSIP) ; working to avoid overlap with WGBOSV and WGSFD. SG chair has supported establishment of WGCEAM coming out of WKCEAM. No other gaps or overlaps identified to date. Ongoing work to establish renewal of WGMRE.
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	<p>Communication with Chairs of WGBEC, MCWG and WGMS to facilitate participation in AMAP/OSPAR/ICES workshop to develop harmonization of (time-series statistical analyses) systems being used to support contaminants temporal trend assessment work under AMAP and OSPAR. Communicate possible links with WGEXT, WGBRED, WGMRE and WGMPCZN with WGCEAM.</p> <p>Communication with incoming WGSIP Chairs concerning possible linkages with other EGs under API.</p> <p>Facilitate submission of biofouling viewpoint documents to the International Maritime Organization, via WGBOSV and ACOM.</p> <p>Facilitate communication between WGBOSV and WGITMO and ICES Q concerning proposal for thematic session at IUCN World Congress 2020.</p> <p>Participation in ICES web structure redesign through Skype interview with project consultant. Communications with ICES staff about web structure design and database needs to facilitate communication between EGs and SG Chair.</p>
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	No requests received nor insufficient practices identified at this time.
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	Ongoing work to improve the scientific content within final report of WGMRE.
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, WGSIP) to encourage proposals for new Viewpoints.
ToR j) Help EG Chairs to formulate and prepare their draft ToR and Resolutions for research-oriented work	Assisted incoming WGSIP Chairs to formulate draft ToR and Resolution to establish new EG on impacts of shipping in the marine environment. Routine review of ToR 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	No input on work plans required to date. ave provided rapid review of new advisory ToR for WGARP. Monitoring WGBYC, WGECCO, WKTRADE2 to assist/support as required.

to EGs and addressed adequately and within the advisory request timeframe	
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	WMBRED, WGMRE and WGSFD have received special requests in 2019; the requests have been successfully addressed in close cooperation with advisory staff.
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 at the ASC	Attendance at 2019 WGCHAIRS, spring SCICOM meeting, and ASC, including participation at Early Career Scientist breakfast.

4.4.3 List of Expert Groups

The HAPISG expert groups are listed in Annex 2.

4.4.4 Science Highlights

WGBOSV:

- Chan F, *et al.* (2019) Climate change opens new frontiers for marine species in the Arctic: current trends and future invasion risks. *Global Change Biology* 25:25-38. <https://doi.org/10.1111/gcb.14469>

WGITMO:

- ICES. 2019. ICES VIEWPOINT: Biofouling on vessels – what is the risk, and what might be done about it? In Report of the ICES Advisory Committee, 2019, vp.2019.01. <https://doi.org/10.17895/ices.advice.4679> (jointly with WGBOSV)

WGMEDS:

- Uhlmann S, C Ulrich and ScKennelly (eds). 2019. The European Landing Obligation: Reducing Discards in Complex, Multi-Species and Multi-Jurisdictional Fisheries. Springer International Publishing. <https://www.springer.com/us/book/9783030033071>
- ICES cooperative Research Report: “ICES Guidelines on Methods for Estimating Discard Survival” is forthcoming
- Journal article under revision: A critical review of European discard survival assessments

WGDEC:

- Continued to review how to best define Good Environmental Status for deep-sea habitats such as Vulnerable Marine Ecosystems, and identified that testing of methods developed through WGFBIT, building upon the ICES 2017 indicators and assessment framework, would be beneficial, building collaboration between the two working groups

- Met jointly with WGMHM this year to support improved collaboration on the use of predictive modelling techniques to provide wider coverage of potential VME distribution across the North Atlantic

WGMP CZM:

- Gee K, *et al.* 2019. Can tools contribute to integration in MSP? An assessment of selected tools and approaches. *Ocean & Coastal Management* 179: 104834. <https://doi.org/10.1016/j.ocecoaman.2019.104834>
- Abspoel L, *et al.* 2019. Communicating Maritime Spatial Planning: The MSP Challenge approach. *Marine Policy* (in press). <https://doi.org/10.1016/j.marpol.2019.02.057>
- Schupp MF, *et al.* 2019. Toward a Common Understanding of Ocean Multi-Use. *Frontiers in Marine Science*. <https://doi.org/10.3389/fmars.2019.00165>
- Cormier R, A Kannen. 2019. Managing risk through marine spatial planning, in: Zaucha, J., Gee, K. (Eds.), *Marine Spatial Planning Past, Present, Future*. Palgrave MacMillan, pp. 353–373. <https://doi.org/10.1007/978-3-319-98696-8>

MCWG:

- MCWG met jointly with, and actively cooperated in several ToRs of WGMS
- TIMES publication on chlorophyll a analysis is nearly complete

4.4.5 Communication with EG

Regular email communication by HAPISG Chair with EG Chairs to share major outcomes from WGCHAIRS, to solicit viewpoints and science highlights, and to identify/facilitate linkages between EGs under HAPI as well as those under other SG. The EG under HAPI have been actively working and achieving their proposed ToR. There are no major issues on the work identified and delivered by the EG, although there are delays with the submission of annual reports/self-evaluations by some EG. One of the new chairs of WGSHP resigned late Aug 2019 as unable to commit to the time/travel required; HAPISG Chair will support remaining chair and work together to determine if a replacement is needed.

4.4.6 Summary of new EG proposals

- Working Group on Cumulative Effects Assessment Approaches in Management (WGCEAM)
- Working Group on Shipping Impacts in the Marine Environment (WGSHP)

4.4.7 Recent actions and forward look

- Joint Network Session held at 2019 ASC with EPD and HAPISG Chairs as co-conveners entitled: Global impacts of shipping
- Laura Robson (chair of WGDEC), Cova Orejas and Patricia Puerta convened a session on vulnerable marine ecosystems (VMEs): key structural and functional elements in the deep-sea at 2019 ASC, bringing together experts from the Atlantic, Mediterranean and Pacific to identify ongoing work, key gaps in knowledge and application of new methods and technologies to detect, map, define and assess impacts on VMEs, and explore how Good Environmental Status could be achieved for these ecosystems

- HAPI Chair to attend PICES Annual Meeting as co-Convenor for joint ICES/PICES session: The impacts of marine transportation and their cumulative effects on coastal communities and ecosystems (Victoria, Canada, October)
- WGCEAM and WGSHP to hold inaugural EG meetings in late 2019
- WGBOSV Chair and ACOM Chair to attend IMO meeting (PPR 7) to formally submit biofouling Viewpoint and participate in review of international biofouling guidelines (February 2020)
- Workshop proposal for IUCN World Congress 2020, Filling gaps in marine conservation: Best practices and solutions to tackle invasive alien species, supported by WGBOSV and WGITMO (selection decision pending)

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

4.5.1 Introduction

The Integrated Ecosystem Assessments SG 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
- 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

4.5.2 Summary of progress in relation to ToR

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	IEASG chair has engaged in defining EG ToR and linking them to the ICES Science Plan, reviewed EG output and reports, and facilitated communication across EGs and between EGs and ICES Secretariat. The chair organised a very well attended IEASG meeting during the ASC to continue supporting the good communication already established across IEASG EGs.
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 2019
ToR c) Review and report on the science being undertaken within EG to SCICOM, with a focus on identifying science highlights and	The IEASG chair has identified science highlights (see below). Through cochairing the WKEO3 the IEASG chair lead the process of identifying science highlights of high relevance to stakeholders and that may be candidate

priorities and demonstrating the impact of their science	topics for inclusion in next generation ecosystem overviews.
ToR d) Review scientific products/deliverables of the EG and provide feedback on ways to improve the impact and influence of their work	Scientific products from IEASG EGs and others were reviewed and discussed as part of the WKEO3, with a focus on stakeholder interests and relevance. As cochair of WKCONSERVE, the SG chair took part in surveying the use and need for data and approaches to include the human dimension in IEASG EGs, and discussing and assessing opportunities and challenges in meeting their needs.
ToR e) Provide feedback to SCICOM on research priorities and implementation of ICES strategy	<p>IEASG EGs are working on topics relevant to most science priorities in the science plan, and are key to bridging between priorities.</p> <p>The WKEO3 report identified some priorities related to EO and advisory products to support EBM: management objectives, fisheries impact on seabed, climate predictions and projections, productivity changes in marine systems, identifying and mapping vulnerable areas, linking and quantifying pressures to ecosystem functions and processes.</p> <p>Workshops or working group on work processes related to stakeholder involvement and cocreation of knowledge were identified as valuable, to ensure high scientific quality also in this part of the process.</p> <p>The IEASG and FRSG chairs has initiated a discussion on how to improve the scientific support from IEAs to stock assessments, with the aim of organizing a WK on this topic in 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	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 already available in the ICES community. However, there is a limited competence in stakeholder involvement and cocreation processes.
ToR g) Identify gaps and overlaps in the work of EG, and propose consolidation, rationalization or forming of new EG to SCICOM as appropriate	<p>There is limited overlap between the EGs. Wks and WGs are organized for topics of interest across groups; eg. IEA methods (WKINTRA, WGCERP, WKCONSERVE) and ecosystem modelling (WGIPEM) for supporting IEAs. The IEASG chair is cochairing WKCONSERVE, bringing together chairs of IEA EGs, WGSOCIAL and WGECON to support bridging social and natural science in EG work.</p> <p>With increasing focus on scoping for IEA, and on products to support EBM, there are more interactions with stakeholders. A WK on stakeholder interactions and relevant approaches could increase the quality of communication with stakeholders. This was recognized as a central factor for translating science into advice by WKSCIENCE2ADVICE.</p>
ToR h) Help EG Chairs to adopt practices which ensure scientific information generated by EG is receiving adequate quality control consistent with scientific norms	Reviews as described in relation to previous ToR.

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 while supporting relevant WKS. EGs also have back-to-back meetings with others to provide a joint focus and address shared interests and challenges. Several IEA EGs and the IEASG chair are involved in an EU proposal on a whole-Atlantic IEA.
ToR j) Represent the SG at SCICOM meetings and SCICOM/ACOM leadership meetings in spring and at the ASC	The IEASG chair participated in the 2019 SCICOM and leadership meetings.
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 most priority areas in the Science Plan, as well as related areas such as Arctic research, Ecosystem overviews (EO), IEAs and MSFD. Some collaborate with SIHD to bring in the human dimension. There is less focus on data needs and feedback to ecosystem monitoring, and further collaboration with ecosystem modelling EGs is required for inclusion of forward projections (with testing of management strategies) into the IEA framework.
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. This WK i) prioritized among scientific products to be included in the next generation EOs based on stakeholder views and scientific maturity, ii) proposed an EO pipeline for new products, iii) identified the need for a WK to revise the risk assessment framework underlying the conceptual figure, iv) proposed a strategic initiative on science communication to support further development of the web based presentation of EOs. Also, the IEASG chair ensured that the revision of EOs was included in ToRs of IEA groups.
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 analyses, and use of combination quantitative and expert judgement approaches	The IEASG chair co-chaired a session on 'assessing ecosystem vulnerabilities to multiple drivers and stressors' at the ASC 2019, and will co-chair WKCONSERVE on challenges and opportunities for including human dimension in IEAs in October 2019. The IEASG chair is also supporting the work in WGCOMEDA, WGCERP and WKINTRA on IEA methods, and has engaged in an WGIPEM initiative proposing a session on ecosystem modelling for IEAs and management advice for the 2020 ASC.
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	The IEASG participated in the Open Science Meeting at BIO, Halifax, to promote WGNARS and discuss ICES and NOAA IEA approaches. The IEASG chair presented IEAs in an ICES perspective at the Science for Ocean Action conference in Bergen. The IEA chair is a lead author in both IPCC and UN World Ocean Assessment, and will bring ICES perspectives into these process, as well as IPCC and WOA perspectives back to the IEASG.
ToR o) Promote the development within EGs of standards and guidelines for good practice and Quality Assurance in the collation	There is variable use of data from the ICES Data Center among the IEA groups. The IEASG chair is trying to motivate the EG chairs to increase the use of and communication with the ICES Data Center. It is a

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	challenge for several IEA groups that much data is stored nationally and not in ICES databases.
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4.5.3 Expert groups

The IEASG expert groups are listed in Annex 2.

4.5.4 Science highlights

- The Open Science Meeting on IEAs, organized by WGNARS at Bedford Institute of Oceanography, successfully brought together both managers and scientists (also outside the IEA community) in a joint discussion on IEAs from both NOAA and ICES perspectives
- The ICES (WGICA)/PICES/PAME Second International Science and Policy Conference on Implementation of the Ecosystem Approach to Management in the Arctic was held in June in Bergen, focusing on Ecosystem Approach to Management of Arctic Marine Ecosystems: Integrating information at different scales in the framework of EA implementation
- R library and a shiny app for Integrated Trend Analysis by Frelat and Mollmann
- Frelat *et al.* in review. Does size matter? Influence of size synchrony on fish community stability using big data across large marine ecosystems. An output of WGCOMEDA.
- Koutsidi *et al.* in review. Trait-based ecological niches and potential inter-specific competition in Mediterranean nekton. Journal of Applied Ecology. An output from WGCOMEDA.
- Papapanagiotou *et al.* in review. A trait-based approach to an ecosystem model. Journal of Marine Systems. An output from WGCOMEDA.
- Baudron, AR, Serpetti, N, Fallon, NG, Heymans, JJ and Fernandes, PG, 2019. Can the common fisheries policy achieve good environmental status in exploited ecosystems: The west of Scotland demersal fisheries example. Fish Res 211: 217–230. An output from WGEAWESS
- Bentley, JW, Serpetti, N, Fox, C, Heymans, JJ & Reid, DG. (2019) Fishers knowledge improves the accuracy of food web model predictions for the Irish Sea. ICES J Mar Sci. doi/10.1093/icesjms/fsz003/5304545. An output from WGEAWESS

4.5.5 Present priorities and intended actions for 2019–20

In addition to working with EG and fulfilling generic ToR, the IEASG chair will, in the remainder of 2019 and in 2020, focus on

- Co-chairing of WKCONSERVE to bridge IEA with WGECON and WGSOCIAL
- Contributing to the ICES/PICES/PAME symposium on Ecosystem Approach in the Arctic
- Following up on the Arctic fisheries viewpoint

- Following up on the recommendations from WKSCIENCE2ADVICE
- Continuing discussion with the FRSG chair on IEA support to the stock assessment processes

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

4.6.1 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 co-ordinated, 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 co-ordination 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

4.6.2 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	This is still difficult for the SG, due to the large and increasing number of EGs with comparatively low attendance at the ASC and WGCHAIRS (3 out of 100+ chairs). The SG chair has reached out to EG chairs to develop a common vision as to how communication between EGs can be improved and has organised a WK to discuss the process as part of a scientific realignment.
ToR b) Help EG formulate and prepare their draft terms of reference and resolutions	The SG chair has worked with 14 expert groups, (8WG, 6WK) to prepare their TORs since January 2019. He has used this opportunity to communicate with the chairs and develop a common vision around the SG and its place in ICES, as well as ensuring the TORs are coherent and complementary between EGs.
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	WGFTFB: A new topic group was initiated to examine issues in passive gear, especially in its relation to avoiding bycatch of protected species. Another topic group, currently in its second year, focused on the use of artificial lights for bycatch mitigation. WGFAST: Wideband systems are expected to replace the current standard narrowband scientific

	<p>echosounders, and recent research quantified the impact of this change on abundance surveys.</p> <p>A joint session was held with the South Pacific Regional Fisheries Management Organization (SPRFMO) Habitat Modelling Working Group. The Ambassador of Peru to Ireland, Ms Ana Sánchez, visited during the meeting.</p> <p>WKNSIMP: Data quality was seen more critically by the data collectors than by the data users, probably because details about consistency problems were not fully known to the data users. However, not all problems encountered by the survey scientists have an effect on the data use and this, of course, depends on the purpose of its use. There was agreement on both sides that communication between data collectors and users on potential issues of data quality needs to be improved.</p>
ToR d) Review scientific products/deliverables of the EG and provide feedback on ways to improve the impact and influence of their work	4 SISP manuals were published (2 updated) and two entirely new ones had full external peer review. A further manual is awaiting comments from 2 nd reviewer.
ToR e) Provide feedback to SCICOM on research priorities and implementation of ICES strategy	<p>The SG chair participated in all SCICOM meeting and fed back to SCICOM when he had concerns or lacked knowledge about the extent to which EG were meeting ICES needs (science and advisory) in their work.</p> <p>The SG chair fed back on the relevance of the science conducted by EOSG to ACOM, and participated in the development of the QAQC process for advice more generally.</p> <p>The SG chair gave a presentation to ACOM on plans to align data collection with data usage within the SG. He received support from the EG and from ACOM to develop more detailed options.</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	<p>EOSG expert groups are generally adequately resourced to perform the current ToR. Limits become apparent when trying to develop new and scientifically more challenging tasks often resulting in avoidance of setting such ToR. There is room for more cooperative workshops to solve the issue and the SG chair has actively supported these.</p> <p>Data collection WGs are generally poorly attended by data users or others with extensive analytical skills. This is hampering data evaluation and new developments in data collection.</p>
ToR g) Identify gaps and overlaps in the work of EG, and propose consolidation, rationalization or forming of new EG to SCICOM as appropriate	<p>The SG chair has worked to develop a strategy towards realigning the SG tasks with a greater 'customer' focus. As part of the upcoming WKREO the SG will be looking at rationalisation across EGs (with their input).</p> <p>The SG chair has made EG aware of similar or at least abutting topics being worked on elsewhere in the ICES system. Differences in timing of the EGs seem to</p>

	make response times in inter EG communication very slow.
ToR h) Help EG Chairs to adopt practices which ensure scientific information generated by EG is receiving adequate quality control consistent with scientific norms	Most EG work to report on data collection for which there is an extensive QA QC procedure and appropriate documentation in place. Other more science oriented groups seem to be operating at a more scientifically rigorous level with significant peer to peer review within the group (symposium style). The SG chair has helped to ensure that this is highlighted in the TORs, the development of which provides for the most frequent form of communication with EG chairs.
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	The SG chair has used knowledge of the ICES structure to aid communication by highlighting similarities and synergies between EG. In particular, he has focused on the ACOM groups which have been comparatively isolated from the science elements. There are now EOSG EGs that are connecting with benchmark groups (WGISDAA, WGCATCH) and assessment groups (WGBEAM, IBTSWG). Success so far has been achieved at the level of the individual rather than the group but it is hoped that this will develop more broadly.
ToR j) Represent the SG at SCICOM meetings and SCICOM/ACOM leadership meetings in spring and at the ASC	The SG chair has attended both meetings and represented the EGs interests at these meetings.
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 prioritised (SP1.1).	ToR are mapped against the science plan headings at the time of inception. The SG chair has contributed to the resolutions database development, based on experience with EOSG, to help ensure that it is able to provide information in a usable format. The Science and Advisory plans provide no information on prioritisation between either the plans or the topics within plans. It is therefore not possible to prioritise the information or data needs.
ToR l) Promote continued improvements and innovation in the design and technology of surveys and other data collection schemes implemented in support of stock assessments and ecosystem studies, leading to gains in survey efficiency, increased diversity and resolution of data collected, and improvements in the interpretation, quality, utility and impact of the data in ICES advice (SP2.1, 2.2).	<p>The survey groups continue to evaluate new technologies that would help to perform existing tasks more efficiently and are generally well-placed to evaluate these appropriately.</p> <p>WGIPS: A session was held in 2019 to assess auxiliary pelagic ecosystem surveying techniques currently used on surveys coordinated by WGIPS.</p> <p>WKMESOMETH2: IBWSS survey program has the capacity to report the relative abundance of mesopelagic fish without disrupting core work program. Additional time and resources are required to allow for targeted biological sampling using a dedicated sampling gear.</p> <p>WGTIFD: Existing electronic tools and the data that they can provide on a vessel during a normal fishing operations were examined. The review will form the basis of future recommendations.</p>

	<p>WGISUR / WKNSIMP have looked at cooperating with RCGs to collect better information under the DCF.</p> <p>The SG chair has given presentations to the two ICES relevant RCGs on how ICES can provide them the advice for developing better surveys. This is being developed further as part of a new data collection evaluation.</p>
<p>ToR m) Determine how at-sea surveys can be adapted in the most cost-effective way to collect key information on ecosystem states and processes in support of the EAM, whilst maintaining the integrity of existing time-series of abundance estimates or indices used for stock assessments and advice.” (SP1.2,SP3.1)</p>	<p>WKESIG and WKICDAT have both evaluated model-based approaches to using survey data which should increase survey efficiency as well as provide ecosystem level information to be integrated.</p> <p>WKNSIMP (joint IBTSWG / WGISUR) have looked at monitoring approaches for better ecosystem survey implementations.</p>
<p>ToR n) Evaluate methods to mitigate the impacts of fishing on marine ecosystems through innovative gear design and technology, with a particular focus on by-catch reduction and development of fishing and survey gears which minimise fuel consumption and habitat damage; (SP2.1)</p>	<p>WGFTFB and WGELECTRA are the main EGs dealing with this ToR. The former is one of the most scientifically prolific EGs with a diverse expertise and range of backgrounds.</p> <p>WGFTFP has developed a new focus on options to avoid the by-catch of PETs in fisheries.</p>
<p>ToR o) Encourage cooperation and collaboration with the fishing industry and other stakeholders in addressing ToR l), m), and n) and develop specific ToR as appropriate</p>	<p>WGFTFB is the main group with permanent connections to the fishing industry. It seems there is other industry work (WKSCINDI) that is, as yet, not well connected to work in the SG.</p> <p>WGRFS works with the recreational fishermen and two WK (the other being WKHDR) are in development in this area for later in the year.</p>
<p>ToR p) Promote the development within EGs of standards and guidelines for good practice in data collection covering the design and implementation of surveys, fishery and other related data collection programmes, the archiving and interpretation of data and samples, the analysis of data, provision of data quality indicators, and the documentation of procedures.” (SP3.1)</p>	<p>The work on SISPs is continuing with new versions and entirely new manuals published this year. The WGBEAM SISP is finally published and the IBTSWG SISP has been reviewed and is awaiting final corrections. The entirely new WGNEPHS manual is in review. Two additional survey manuals on egg and larval surveys have been published this year. Most EGs are now routinely updating the information annually and full reviews are usually done at the end of a EG term unless there are major changes. PGDATA (as part of their new ToR) has adopted some responsibility for documenting and reviewing methodologies, acting as a repository of past information and assisting EGs with advising on statistical approaches.</p>
<p>ToR q) Organize SG meetings which will take place during the ASC and WebEx's, as appropriate, to discuss EG accomplishments and plans, with a focus on the overarching ToR specified above.</p>	<p>The SG chair attended WGCHAIRS and the ASC and the associated events, providing opportunities to communicate with the EG chairs. Webex has proven to be an inefficient means of communicating across EOSG, as the group is too large to get a significant number of chairs to engage. There is currently insufficient overlap / cooperation between EG to make this effective. EG chairs still see their role primarily in organising the EG meeting and writing the report.</p>

4.6.3 List of EGs

A full list of EOSG expert groups is provided in Annex 2.

4.6.4 Science highlights

As usual the EOSG EGs have done an excellent job in providing the assessment groups with the necessary scientific evidence to conduct their work. Data quality checks have been performed giving greater confidence in the assessments. Work continues on updating survey manuals and one new manual has been added this term with another undergoing update revisions. Significantly, work on manuals has become a routine part of working group activity when discussing or changing methods, thus suggesting the QAQC process has bedded in well.

EOSG is unique in amongst the traditional science steering groups in that its output provides the evidence base for most of the science and advice. As such output is an intermediate product it is difficult to demonstrate its significance in the ICES process through science highlights. For this reason the SG chair is especially pleased with the efforts that the data collection EG-chairs have put into a new science highlight series organised and produced by Julie Kellner and Celine Byrne called “Maintaining the continuity of long-term data sets: challenges and solutions”. It demonstrates that the groups have the commitments to ICES and pride in their important work, as well as publicising their role in science and advice.

In 2019 the first meetings of two new multi-annual WG dealing with cutting-edge methodologies were held. WGTIFD was looking at electronic monitoring methods for fisheries. NOAA has placed a lot of emphasis on this work as have some European institutes, so this EG is a great place to assess progress of the field to date and to decide what works where. In the long-term the group is hoping to come up with some standard methods and practices to ensure regional monitoring compatibility. WGMLEARN is an EG established following the success of a machine learning workshop last year. The group is looking at machine learning as a method of achieving efficiency and repeatability in analytical classification, as well as looking at ways to more comprehensively analyse the large marine data sets that are becoming available. The group has attracted a new set of scientists into the ICES community.

In addition, the WGs WGFTFB and WGFAST had record-breaking years for attendance and international visibility.

4.6.5 Communication with EG

EOSG parents more workshops than other SGs. Part of the reason is that the WGs have a substantial workload completing the routine tasks and very little time to deal with science and / or cross group questions- which are often better picked up by WK. The SG chair has actively encouraged cross EG cooperation and this is having a positive impact. Some EG work more freely with others and those are the ones where chairs see their role as wider than just running an EG meeting and preparing a report. Other EG communicate with the rest of the system through shared individuals, this seems particularly prevalent in the pelagic monitoring where survey groups attend the assessment groups and provide their input directly. Concerns for EOSG are that this approach is not prevalent in the demersal groups, and also that communication between pelagic and demersal monitoring is insufficient to make progress on the ecosystem approach. The EOSG chair has spoken to many of the data collection EG chairs to

examine options for making more directed progress and a WKREO has been set up to examine options in more detail with the support of ACOM. This is an important and unfortunately rare opportunity to come together as a SG, and get bottom up feedback on opportunities and risks.

4.6.6 Summary of new EG proposals and EG closing

EOSG has expanded with significantly more EGs being proposed than closed. There is need for the expansion into new work areas, especially by WK that foster communication. Most of the workshops are one-offs to deal with a specific topic for individual or joint WG. New to the system are two working groups (3-year fixed term) that are examining emergent technologies in improving data collection and data analysis (WGM-LEARN and WGTIFD as previously described).

4.6.7 Forward look

Solving the communication issues within the SG is still the most important challenge looking forward. Mechanisms for communication exist and are supported by the SG chair, but EOSG needs the right incentives and conditions to get uptake and support.

Organisation of the WKREO will hopefully bring together many of the chairs of the SG and allow groups to feed their knowledge and perspectives into the process. It is intended that this involvement will bring the buy-in needed. It will be important to respect the input provided by the groups when making decisions on SG size and workflows and the SG chair will take the results of WKREO back to ACOM and SCICOM.

The size of the SG needs to be addressed as does its operation at the ICES secretariat level.

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

4.7.1 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.

4.7.2 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 the 2019 ASC, and attendance/participation in ACOM and SCICOM.
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);	Ongoing through this report, participation at ACOM, SCICOM, and FRSG meetings, and the EG summary table on SharePoint.
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 has not been explicitly addressed; although the group summarizes operational issues, which may include those related to expertise and capacity.
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;	Gaps and overlaps have not yet been evaluated by the SG.
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;	Ongoing 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 on quality control policies.
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 participation in ACOM Leadership meetings.
i) Encourage EGs to come forward with proposals and initiatives for longer term science development in support of ICES advice;	This has not yet taken place in FRSG, as the SG is currently compiling needs and priorities, which would inform these proposals.
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	Ongoing via development of a 2020 work plan.

Terms of Reference	Progress
addressed 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;	Ongoing as Special Requests are received.
m) To support the ICES Secretariat and/or the ACOM leadership in liaising directly with the Chairs of relevant EG when processing Special Requests;	This has not been addressed specifically by the SG, but will as the need arises.
n) Represent the SG in SCICOM and ACOM meetings, SCICOM/ACOM leadership meetings, WGCHAIRS and at the ASC.	Ongoing with participation at all mentioned meetings, except WGCHAIRS, which has not yet met during the SG's existence.
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 meetings, 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 directly 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 participation in ACOM and ACOM Leadership meetings and fora.
r) Provide feedback to SCICOM and research-oriented group 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.
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.
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.	Ongoing, but not driven by FRSG; rather, FRSG participates in the ACOM benchmark prioritization process.
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.	In the early stages, given that information collected on needs and priorities will inform research and development of methods.

4.7.3 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 HAWG met in March 2019 to assess the state of five herring stocks and three sprat stocks. HAWG also provided advice for seven sandeel stocks but reported on those in February. 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 data limited assessments (ICES category 3 and 5) were conducted for English Channel sprat (spr.27.7de) and sprat in the Celtic Sea (spr.27.67a–c.f–k).

Joint NAFO/ICES Pandalus Assessment Working Group (NIPAG)

The NIPAG met at the NAFO Secretariat, Dartmouth, Canada from 17 to 22 October 2018 and March 2019 to review stock assessments referred to it by the Scientific Council of NAFO and by the ICES Advisory Committee.

North Western Working Group (NWWG)

The NWWG met in Copenhagen in Spring 2019 to assess the stock status of some of the demersal fish stocks (cod, haddock, saithe, and Greenland halibut) found in the areas around Greenland, Iceland, and the Faroe Islands as well as two pelagic fish stocks in Icelandic waters (summer spawning herring and capelin). In addition, both demersal and pelagic stocks of redfish were assessed, with some of these stocks being found in the Irminger Sea south of Iceland and Greenland.

Assessment Working Group on Baltic Salmon and Trout (WGBAST)

The WGBAST met in Saint Petersburg, Russia, 27 March–4 April 2019. 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 2020.

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 22–23 (no catch advice); Flounder in SDs 24–25 (no catch advice)

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

The WGBIE assessed the status of 23 stocks distributed from ICES Divisions 3.a–4.a through to Subarea 9, mostly distributed in Subareas 7, 8 and 9. The group was tasked with conducting assessments of stock status for 23 stocks using analytical, forecast methods or trends indicators to provide catch forecasts and a first draft of the ICES advice for 2019. For two of the *Nephrops* stocks updates were provided on catch data with the advice release delayed until October after the completion of the surveys used for the assessment.

Working Group for the Celtic Seas Ecoregion (WGCSE)

The WGCSE met in Belgium in spring 2019, and will meet by correspondence in fall 2019 to assess the main demersal stocks in Rockall, West of Scotland, Irish Sea, West of Ireland, Western English Channel, Bristol Channel, Celtic Sea and Southwest of Ireland.

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

The WGDEEP met in 2019 to develop draft advice for half of the 29 deep water stocks, including roundnose grenadier, black scabbardfish, orange roughy, ling, greater fork-beard 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 25 September 2018 during the ICES Annual Science Conference in Hamburg, Germany. 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 Gdańsk, Poland, from 28 August to 2 September 2018 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 18 to 27 June in Lisbon, Portugal to assess elasmobranch stocks. Advice for these stocks will be released on 4 October 2019.

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

The WGHANSA met by correspondence, 3–7 June 2019 to assess the status and to provide short-term catch scenarios for the stocks of anchovy in Division 9.a (components west and south) and for horse mackerel in Division 9.a. Assessments and short-term forecasts were updated according to the stock annexes

Working Group on North Atlantic Salmon (WGNAS)

The WGNAS met in Norway in spring 2019 to consider questions posed to ICES by the North Atlantic Salmon Conservation Organisation (NASCO) and also generic questions for regional and species Working Groups posed by ICES.

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

The WGNSSK met in Norway in spring 2019 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 and prawn). WGNSSK also increasingly includes analyses for a number of other bycatch species such as turbot, pollack, grey gurnard, and striped red mullet.

Working Group on Widely Distributed Stocks (WGWIDE)

The WGWIDE will be developing draft advice in September 2019 for blue whiting, Western and North Sea horse mackerel, North East Atlantic mackerel, Norwegian spring spawning herring, and boarfish.

Workshops

There were also at least 12 different workshops in 2019, including benchmark stock assessments and other scientific work related to fisheries resources (WKBALTCOD, WKBEDLOSS, WKBEDPRES2, WKDLSSL, WKEELDATA2, WKFORBIAS, WKIRISH6, WKNEPHROPS2019, WKROCKMSE, WKSARMP, WKSCINDI, and WKSALMON)

4.7.4 Communication with EG

The EGs remain very active in conducting stock assessments and developing draft advice for ICES/ACOM. The FRSG has been in operation for less than one year. The Steering Group continues to get organized, identify its role within ICES, and establish its operating procedures. The primary mode of communication among this group is SharePoint. The EGs will provide operating concerns affecting their group, as well as science priorities, in their individual SharePoint pages. These concerns and recommendations will be summarized on the FRSG SharePoint site, which will facilitate efficient communication to ACOM, SCICOM, and the ICES community. The group also held an in-person meeting at the 2019 ASC and has decided to hold in-person meetings every year at the ASC in future as well as at WGCHAIRS.

4.7.5 Summary of new EG proposals and EG closing

The FRSG will include two more EGs going forward (WGHARP and WGTRUTTA); although. These are not new EG, but reassignments from other SG.

4.7.6 Forward look

Given its scope of work, the FRSG is well-positioned to coordinate on strategic and research directions that are advice-relevant. Given that the SG is in its early stages, the group's forward looking activities are also in their early stages. 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 2020 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.

5 Operational Groups

5.1 Data and Information Group (DIG)

5.1.1 ICES Data Management Update

A number of activities have progressed significantly, both in terms of concrete information, and an ongoing improvement programme for managing data collections across ICES. Nonetheless, data management cannot afford to stay still, and the work of DIG with the Data Centre to progress data governance, accreditation and to continuously review our policies, licencing and services around data are showing that there is still a great deal of work to do.

In the period since the last update to SCICOM, the main activities, progressed in collaboration between DIG and ICES Data Centre, are:

- Completed governance evaluation for TAF, and planned out further evaluations.
- Discussed and agreed approach to data centre accreditation
- Updated the future opportunities and challenges tracker for data and technology related issues
- Work on data policies and data licensing
- Harmonising and opening up data guidelines
- Updated Terms of References and recommendation for DIG chair

5.1.2 Data Governance

The ICES Data Centre and DIG, together with the relevant expert groups have been working on establishing governance groups for each of the main systems that support data flowing into/out of the advisory processes. These groups are/will work to a standard set of ToR's which encompass:

- Establish a governance framework setting out a forward looking plan, including objectives of [*Data Workflow*], responsibilities, processes and resources.
- Provide a platform for user feedback to [*Data Workflow*]. Appropriate actions to be taken with assigned responsibilities and resource requirements will be listed and prioritised
- Oversee and advise on the interpretation and prioritisation of recommendations for [*Data Workflow*]
- Oversee development of user guidance and training for [*Data Workflow*]

Dedicated governance groups have been established for DATRAS and SmartDots applications (Trawl data and Otolith reading respectively) while existing groups are or will be adopting the governance functions in other areas (e.g. SC-RDB for RDB/RDBES WGBYC for bycatch data).

In 2019, three new governance group resolutions are going to be presented for Acoustic Portal, TAF, and spatial fisheries data.

DIG designed a structured governance evaluation that allows individual data workflows to be evaluated for their maturity and capability. This approach asks 43 questions across 10 categories, with each question and answer also logging a maturity rating, identified improvements, and remedial actions. All 43 questions may not necessarily

be applicable to all data workflows or systems, but covers a broad base of best practise in data management.

The maturity ratings are solely used to compare categories internally within an evaluation to highlight areas that represents areas for improvement. The key outcomes of the process are dialogue based, and it is the subsequent improvements and actions that will deliver actual improvements.

Using the approach on the Transparent Assessment Framework provided a basis for the TAF project team to identify particular areas that were already performing well, and areas that could be strengthened. Often, improvements can be as simple as providing documentation for an approach or method, while at other times, concrete changes in approach may be required. As TAF is still in development, it is fully expected that the governance evaluation will be updated to reflect changes and improvements.

This year, DIG will progress a number of governance evaluations in collaboration with other expert groups and the ICES Data Centre:

- Spatial Fisheries Data workflow
- Marine environment database (DOME)
- Vulnerable Marine Ecosystems

Further systems will be examined for feasibility, or the process will be initiated, but might not complete within the year:

- Bird database (ESAS) application
- Bycatch Database

Each governance evaluation will follow a similar structure:

- 1) Initial evaluation, following the categories and questions
- 2) Reviewer scoring and identifying broad improvement areas
- 3) Share initial findings with developers and groups governing the data structure to reach consensus on the state/scoring and identified improvements
- 4) Governance structure identifies actions to prioritise improvements and takes forward the improvement programme
- 5) DIG revisits governance evaluation, specifically to see how categories/questions with identified improvements have been progressed (1–3 years later)

5.1.3 ICES Data Centre Accreditation

The issue of accreditation, a process where the overall ability of an institute is assessed objectively and independently against a predefined checklist of criteria, was highlighted in Bureau [Doc 2125](#) and discussed in Bureau in February in relation to a move to an overall quality assurance framework for ICES. This was followed up with a combined (ACOM, SCICOM, Data) document to ACOM “[Towards a Quality Assurance Framework for ICES Advice](#)”¹. From this, there were clear implementation tasks to move ICES, through its Data Management systems, towards an accreditation and to ensure that all advice products are based on data that adhere to the FAIR principals.

The Data Centre prepared a briefing on accreditation to aid the DIG discussion on which accreditation route to take in the first instance. Following the DIG meeting, a decision on accreditation route was reached:

It should also be noted that DIG identified ICES Data Management accreditation as a medium potential to disrupt in the tracker now used for following changes that may impact ICES data management. This means that there are some challenges in terms of staff resources required to meet this task, as well as opportunities in gaining recognition and increasing confidence in ICES data and advice products.

Overall there was agreement that either of the accreditation schemes would serve ICES well in preparing the evidence for processes. DIG also observed that the accreditation process itself focusses on the existing processes, and does not in itself guarantee best data management practises. But it initiates a programme of work that will identify areas in need of improvement and areas of strength – much like what has been initiated with the governance work. Going through a formal process provides clarity and a need to deliver – but it is equally important to use the information developed in the accreditation process to develop an improvement programme.

The final DIG decision is to start accreditation with the Core Trust Seal (CTS) process.

5.1.4 Next steps

The Data Centre is now starting to analyse in detail the requirements of the CTS and determine where it will need to improve or collate information in regards to answering the requirements. In short, to gain accreditation an institute would need to score 3 or above on each of the 16 requirements. The current self-assessment highlights that we have potentially 3 requirements where effort needs to be invested to bring ICES up-to-standard. The Data Centre is aware that not all data flows are at this standard, and much of the work now will be focussed on harmonizing documentation, workflows and references to ensure that everything that ICES Data Centre manages is in a consistent form. Further, the intention of the CTS is to have a continuous improvement in fulfilling the criteria, which requires that ICES consider an overall plan detailing how to improve the rating beyond the initial 3 year accreditation.

Based on this, ICES should expect to be in a position to apply for accreditation (for datasets managed within the Data Centre) in 2020.

5.1.5 Future challenges and opportunities

The ability to identify potential pressure or new tools that can provide effective data management solutions is important for ICES. DIG has initiated a future challenges and opportunities tracker, which will be reviewed regularly. Over the previous year, the initial horizon scanning exercise was turned into a more formal tracker that allow categorisation and evaluation of technologies and developments that might pose challenges or present opportunities for more efficient solutions – or both. During the meeting, DIG reviewed the initial entries, updated wording, categories and in some instances the potential impact, which is termed the potential to disrupt. Not all of the concepts tracked by DIG will necessarily come to fruition, and the register may not necessarily cover every conceivable technical challenge or opportunity for the future. But it is composed by the collective expert knowledge of DIG members, and the respective groups that these members also serve both within and out with ICES. Currently, DIG has identified 15 broad topics, most of which represents both opportunities and challenges. These are summarised in Figure 1. The DIG report to SCICOM for 2019 contains a more detailed discussion of the rationale of each topic.

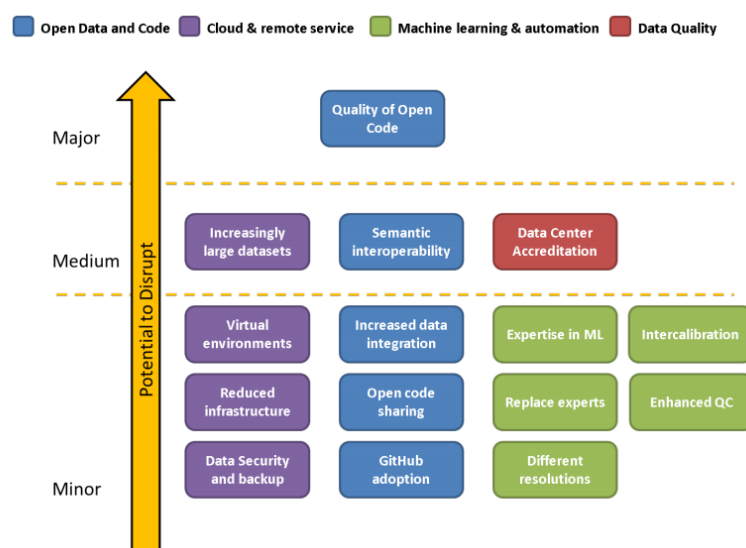


Figure 1. Future challenges and opportunities

Data Policy and licensing

DIG routinely performs a review of the ICES Data Policy. This is done to ensure that the data policy reflects current considerations and reflects changes in ways to access or work with data. There are now additional data policies that cover areas where the default open access cannot be provided due to the sensitive or commercial nature of the data being used in certain workflows. These data policies were also reviewed in order to ensure there is alignment and consistency in the use of terminology across the policies.

Looking ahead, DIG believes a separation of license and data policy will be better and clearer, and will also better align with current practises elsewhere. As a result, DIG will draw up an overview of existing open data licensing models and evaluate their benefits and drawbacks in the ICES context. This will also better align with aspects of the ICES Data Centre Accreditation.

5.1.6 Harmonising and opening up Data Guidelines

Through the last year, DIG has been defining a method for signposting and describing data guidelines, conventions, and standards. WGFAST has provided valuable input to this process on the basis of their experiences with working up metadata conventions and high definition data storage formats. The work started with a collection of 13 data guidelines that DIG have maintained in its previous composition as an expert group for oceanographic data management. Now the membership of DIG is wider, and more focussed on broader, strategic issues for all of ICES Data. So the decision was made to look for alternative expert groups and external organisations to become maintainers for these guidelines. Work will progress over the coming year to ask other groups if they are willing to look after the data guidelines, and the Marine Environmental Data and Information Network (MEDIN) in the UK have agreed to collaborate on maintaining data guidelines. The format for signposting data guidelines and formats is defined based on descriptive fields commonly used in open source code development.

It is envisaged that the existing webpage for data guidelines will be replaced with a table that lists the titles, maintenance status, link to most recent major version, and link

to a more detailed page that lists the full information about each guideline. This approach can subsequently be extended to include the WGFAST metadata and high definition data formats, and conceptually all other guidance developed to governance groups, other expert groups, and ICES Data Centre to document data guidance. However, the first step is to get the structure established and updated with the existing data guidelines over the coming year.

5.1.7 Updated Terms of References and recommendation for DIG chair

DIG updated its terms of references to reflect changes to new strategies and make more explicit the work to support and facilitate data governance work. The new terms of reference proposed are:

- a) Provide guidance and feedback to the ICES Data Centre
- b) Advise on data regulations and their impact on ICES Strategy, ICES Data Policies, and license considerations.
- c) Facilitate data governance by performing evaluations and encouraging dialogue between expert groups, governance groups, DIG, and the ICES Data Centre to adopt best practises in data management.
- d) Evaluate and monitor current and future challenges and opportunities in data management and new technologies for ICES.

Finally, the 3-year term of the current DIG chair is coming to an end in 2019. At the DIG meeting, recommendations from members were sought for a new chair. Given the current work on developing governance, and a lack of volunteers, the group recommended a one year extension of the current chair, Jens Rasmussen (UK). The current chair has indicated willingness to extend the chairmanship for the one year period, and the proposal was endorsed by SCICOM at the 2019 ASC.

5.2 Training Group (TG)

5.2.1 Introduction to Training Group

The Training Group develops the structure and content of the ICES training programme and then guides and supports the provision of training. 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 co-operating organizations.

5.2.2 Training in 2019

In 2019, seven open training courses were planned. Four are now completed.

- Template Model Building (TMB) for advanced fish stock assessment
28 January–1 February 2019, Halifax, Canada (31 participants)
- Marine Spatial Planning processes
18–22 February 2019, Copenhagen, Denmark (15 participants)
- Bio-Economic Management Strategy Evaluation using FLBEIA
25 February–1 March 2019, Copenhagen, Denmark (14 participants)
- Genetics in support of fisheries and aquaculture management
17–19 September 2019, University of Algarve, Portugal (18 participants)
- 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
- Introduction to mapping and spatial analysis with R
25–29 November, 2019, ICES HQ, Copenhagen, Denmark

The first four of these courses are complete and attracted 78 participants. Training Group will meet in October to select training courses for 2020.

5.2.3 Promotion of training courses

E-mails are sent to specific WGs and EGs in the ICES community, who may benefit from the courses. In addition, one course is featured in each of the ICES newsletters. Information on course offerings is 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.

Through participation in H2020 projects, ICES training is also 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.

ClimeFish: Co-creating a decision support framework to ensure sustainable fish production in Europe under climate change. ICES is contributing partner in provision of hands on training, to provide new ClimeFish tools.

All projects are offered the option to submit training course proposals online, which are then passed through the training course selection process. If the project is able to provide funding for training of project participants, ICES training can support the training activity, with handling applications, administration, SharePoint etc. This is to ensure that training activities, be it through projects or standard ICES training, adhere to the aim of cost neutrality.

Some training courses have been fully funded by projects, and have not been subject to the training group selection process.

LME Learn training courses: seeking to improve global ecosystem-based governance of Large Marine Ecosystems

ICES, NOAA and UNDP Cap-Net have jointly organised three training courses on Ocean Governance:

- For the West African Region 5-6 September in Dakar, Senegal
- For the Latin America and Caribbean Region 3-4 October Panama
- For the Asian Region 23-24 January 2019, China

5.3 Science Impact and Publication Group (SIPG)

5.3.1 Introduction to 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 (since September 2019) and has five external members and three members from the ICES Secretariat.

SIPG Terms of Reference

- a) Monitor publication output and provide advice to SCICOM, ACOM, the ICES Secretariat and network on increasing the reach and impact of ICES publications and science, including grey literature (EG reports).
- b) Catalogue and report on the types and quantity of published outputs facilitated by the ICES network
- c) Develop and apply methods to assess the impact of all types of publications generated by the ICES network.
- d) Develop descriptions of the societal impact of ICES science for reporting and outreach.
- e) Propose approaches for increasing the impact of ICES publications and identify target audiences for communicating science, advice, data and training products.
- f) Develop and recommend policies governing scientific publications as requested by SCICOM.
- g) Review and provide recommendations on Category 1 requests for ICES publications prior to SCICOM meetings and intersessionally.
- h) Review and provide guidance (to SCICOM, ACOM, the ICES Secretariat and network) on the evolution of Science publication and communication and the opportunities and risks it presents for ICES.

5.3.2 Progress in relation to terms of reference

1. Development of ICES bibliography (ToR a and b). An ICES bibliographic database has been established to record peer-review papers that result from activities conducted in expert groups and more widely under the auspices of ICES. This will have multiple functions, to include reporting on ICES impact, the provision of a web-based tool to search for peer reviewed papers produced by ICES groups and to publicise ICES outputs and impact.

During 2019, a restructuring of the database has been conducted in order to improve data collection and output possibilities. The database is currently being updated to include all data from 2016 to 2019. The next steps will be to: (i) extend the bibliography back in time, with an initial target of 2010, (ii) update how the bibliography database is shown on ICES website, and (iii) develop guidelines on how to provide new entries for the database to ICES Editorial office. Work in support of step (ii) will be coordinated with the development of the general ICES publication website (see below).

2. Development of ICES publications website (ToR a and b). The ICES publications website will be restructured in 2020, based on planning undertaken in 2019. The goals are to: (i) increase the visibility and accessibility of ICES own publications for both scientists and the general public; and (ii) collect and highlight publications produced by ICES EG and their impact.

3. Improving the visibility and assessing the impact of ICES own publications (ToR a, b and c). Through 2019 SIPG have been continuing to develop approaches to increase the visibility of, access to, and impact of ICES publications (Cooperative Research Reports (CRR), Techniques in Marine Environmental Sciences (TIMES) and identification (ID) Leaflets for plankton and diseases). In 2019, all ICES publications have been assigned DOI and had their associated metadata significantly expanded (e.g. addition of keywords). This will make it easier for users to find them, and make it easier for ICES to track their use when e.g. assessing impact. In support of this we are continuing to (i) improve ICES own publication websites (see above), and (ii) assess which additional platforms could be used for uploading and disseminating ICES own publications (e.g. listing in Scopus).

4. Further goals from 2020: In 2020 and subsequent years, we intend to (i) develop descriptions of the societal impact of ICES science for reporting and outreach (ToR a, c and e), (ii) work on identifying target audiences for communicating science, advice, data and training products (ToR a, c and e), (iii) review and provide guidance on the evolution of Science publication and communication and the opportunities and risks it presents for ICES (ToR e).

5.3.3 Review of ICES Publications

TIMES

The ICES Techniques in Marine Environmental Sciences (TIMES) Series offers peer-reviewed, open-access, detailed descriptions of state-of-the art methods and procedures relating to the marine environment. TIMES is intended for use at the laboratory bench, in the field, or on research vessels.

There has been one TIMES report published since the 2018 ASC, and 4 are in diverse stages of the publication process. A full report on the TIMES series is provided in Annex 3. Overall, since 2000, there have been many years in which no TIMES, or very few TIMES, were published. This pattern may partly be due to the use of TIMES by a narrow range of ICES EG, meaning the author base is small, the topic scope is narrow and the series not broadly well recognised.

Potential exists to broaden the scope of TIMES, opening it up to other ICES EG and a broader range of topics. For example, ICES Survey Protocols (SISP) and ICES User Handbooks could be incorporated to the series. SIPG and the new TIMES editor (Tatiana Tsagarakis, hired 2019) will assess different options with the target of achieving 4 – 5 TIMES published per year.

List of Published TIMES published in 2019

No.59 Biological effects of contaminants: Stress on stress (SoS) response in mussels. J. Thain, C. Martinez Gomez, and B. Fernandez Galindo. January 2019. 16 pp. C. Res. 2012/1/SSGHIE10

CRR

The Cooperative Research Report (CRR) Series is an outlet for ICES expert groups and ad-hoc groups to present syntheses of their work. All CRR are peer-reviewed and open access. The series editor is Emory Anderson.

The CRR series is very healthy, with a continued high number of reports proposed and published, covering a wide range of topics. There have been 8 CRR published since the 2018 ASC, 4 of which have been within the 2019 calendar year. A further 9 reports are in diverse stages of the publication process.

List of published CRR in 2019:

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

No.348 Data-limited diadromous species – review of European status. Editors: K. Wilson, L. Veneranta. 284 pp. C. Res. 2017/1/EPDSG07

No.347 Moving towards integrated ecosystem monitoring. Editor: I. de Boois. 34 pp. C. Res. 2016/1/SSGIEOM06

No.346 Handbook of fish age estimation protocols and validation methods. Editors: F. Vitale, L. W. Clausen, G. N. Chonchúir. 191 pp. C. Res. 2013/1/ACOM04

Plankton ID Leaflet Series

Plankton Identification (ID) Leaflets aid identification of various marine plankton species. They are peer-reviewed and open access. The series editors are Antonina dos Santos and Lidia Yebra.

The first Plankton ID Leaflet in over 15 years was published at the start of 2019. Six more leaflets are in diverse stages of the publication process, with two more anticipated to be published in 2019. Thus, the current Series Editors are on track with the goal of bringing the publication level back to 2-3 ID Leaflets published per year.

List of published Plankton ID leaflets in 2019

No.188 Oithona. Maria Grazia Mazzocchi. May 2019. 19 pp.

Diseases in Fish and Shellfish ID Leaflet Series

The Identification (ID) Leaflets for diseases in fish and shellfish provide diagnostic aids for identifying the most important diseases and parasites of fish and shellfish in the North Atlantic and adjacent seas. The series is peer-reviewed and open-access. The series editor is Neil Ruane.

The Series continues to be actively supported. There have been two Leaflets published in 2019, and four leaflets are currently in diverse stages of the publication process.

List of published Disease ID Leaflets in 2019

No.69 Piscirickettsiosis. Simon R. M. Jones. January 2019. 9 pp.

No.70 *Tenacibaculum maritimum*, causal agent of tenacibaculosis in marine fish. Revision of ID Leaflet No. 55 by Simon R. M. Jones and Lone Madsen. January 2019. 9 pp.

6 Strategic Initiatives

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

6.1.1 Introduction to SICCME

SICCME is a joint ICES - PICES strategic initiative that was established in 2011 to examine and evaluate consequences of long-term climate change and short-term climate variability on marine ecosystems across the northern hemisphere.

SICCME activities are contributing to both the ICES and PICES Science Plans. This strategic initiative is chaired by Drs. Jackie King (Canada, PICES), Shin-ichi Ito (Japan, PICES), Myron Peck (DE, ICES) and John Pinnegar (UK, ICES). A detailed, 3-year (Phase 3 – 2018-2020) plan was submitted to PICES and ICES at the end of March 2018. The plan included slight modifications and additions to the SICCME mission and activities in light of the success of Phase 2 (2015-2017), including identifying and aligning climate change research activities in regional nodes across the northern hemisphere and elsewhere.

Both Myron Peck and John Pinnegar will finish their term as SICCME Chairs at the end of 2019. From 2019 onwards the SICCME chairs, as endorsed by SCICOM in September 2019, are Christian Möllmann (Germany) and Geir Ottersen (Norway).

6.1.2 SICCME activities 2019

4–9 March 2019: Fourth Lead Author meeting for the IPCC Special Report on the Ocean and Cryosphere in a Changing Climate (SROCC), Kazan, Russian Federation. Two SICCME members selected to participate. 31 May 2019 final draft submitted to IPCC Technical Support Unit; 14 June-9 August, final government review; 20-23 September, 51st Session of the IPCC: approval of the Summary for Policymakers, and the underlying report.

11–13 March 2019. Scenarios Forum 2019, Denver Colorado (<https://www.scenariosforum2019.com/>). Session on “Scenarios for the Future Ocean”, co-conveners: Tyler Eddy (University of South Carolina), Jörn Schmidt (University of Kiel), Alan Haynie (NOAA), John Pinnegar (CEFAS). This session made extensive use of outputs from the ICES-PICES Workshop on Political, Economic, Social, Technological, Legal and Environmental scenarios used in climate projection modelling (WKPESTLE), 9th June 2018 (report now completed)..

25–29 March 2019. The Working Group on Integrative Physical-biological and Ecosystem Modelling (WGIPEM) met at the Institute of Marine Research, Bergen, Norway. Chair: Solfrid Sætre Hjøllø, Norway, and Marie Maar, Denmark. Discussed recent advances in biological-physical modelling approaches and how to make best use of complex models.

14–19 July 2019: IPCC WG II - AR6 2nd Lead Author Meeting (Kathmandu, Nepal). Attended by John Pinnegar (lead author – Small Islands chapter); Kirstin Holsman (lead author – North America chapter); Shin-ichi Ito and Mette Skern-Mauritzen (lead author – ‘Ocean and coastal ecosystems and their services’ chapter), Christian

Möllmann (lead author – ‘Europe’). Reviewed initial comments on ‘zero-order’ draft of AR6 report.

26–30 August 2019. The 3rd meeting of the ICES Working Group on Seasonal-to-Decadal Prediction of Marine Ecosystems (WGS2D) took place at ICES Headquarters in Copenhagen, Denmark. 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.

09–12 September 2019. ICES Annual Science Conference (ASC), Gothenburg, Sweden: SICCME was consulted by conveners of three theme sessions: Session A (Advances in habitat models to inform ecosystem-based management: From theory to practice), Session D (Assessing ecosystem vulnerability to multiple drivers and pressures), Session F (Management objectives, trade-offs and strategies in a changing ocean), and one of the networking sessions (Stakeholder involvement and social aspects of climate change adaptation in fisheries and aquaculture). In addition, two of the keynote presentations explicitly focused on climate change: Gretta Pecl - Climate-driven redistribution of ocean life and its implications for society; Cisco Werner - Re-examining physical-biological linkages in a changing ocean: what will we need to know by 2030?

6.1.3 Planned Activities, late 2019 and 2020

16–27 October 2019. PICES-2019 Annual Meeting, Victoria, British Columbia, Canada - Session S5: Trends in ocean and coastal ecosystems and their services and its future, co-chaired by Shin-ichi Ito (Japan), Angelica Peña (Canada), Kirstin Holsman (USA), Igor Yashayaev (Canada); Session S11 - Incorporating ecosystem variability and climate change into fisheries management: Progress and challenges for EBFM in the 21st century, co-chaired by Kirstin Holsman (USA).

20 October 2019: SICCME business meeting (at PICES annual meeting). During this event, the vision of the group through 2020 will be reviewed and updated including contributions to AR6 and preliminary, longer-term planning for contributions to AR7.

18–21 November 2019: John Pinnegar has been requested to serve as a panelist for a session on “Fisheries Management in the face of a changing climate” at the International Symposium on Fisheries Sustainability: Strengthening the Science-Policy Nexus, to be held at the Food and Agriculture Organization of the United Nations Headquarters in Rome, Italy.

6.2 Strategic Initiative on the Human Dimension (SIHD)

6.2.1 Introduction to SIHD

The Strategic Initiative on the Human Dimension (SIHD) aims to develop strategies to support the integration of social and economic science into ICES work. The human dimension encompasses the social, cultural, economic and governance issues of relevance to the vision and mission of ICES. The current SIHD chairs are Alan Haynie, Eva-Lotta Sundblad, and Jörn Schmidt.

6.2.2 SIHD network communication

SIHD network members are active in various ICES EG, linking work on social and economic aspects within and outside ICES. In addition to regular email communication, a new SIHD Forum was established for discussing topics such as the Roadmap (SIHD forward plan) and issues that arise during the year.

The SIHD Roadmap

To promote an ongoing discussion about how ICES can become a more active and influential contributor to social and economic science, SIHD co-chairs produced a document, “The SIHD Roadmap” and opened a SIHD Forum on the ICES website in September 2018. The roadmap contains information on planned activities for both the next two years and ideas about SIHD activities over the coming decade. SIHD update the Roadmap as priorities and activities evolve.

6.2.3 Recent SIHD Activities within ICES

SIHD co-chairs met following the SCICOM meeting in March 2019 and planned activities for the remainder of 2019. They also discussed how the SIHD ToR should be modified for 2020 and beyond.

To support ICES, SIHD has been active in supporting the development of new EG and coordinating and communicating with existing EG to support the ICES strategic and science plans, especially the new scientific priority ‘Sea and Society’. SIHD co-chairs have had regular meetings with the WGSOCIAL and WGECON chairs, and with prospective WGBESIO co-chairs and others to coordinate activities.

WGSOCIAL held its second meeting at FAO headquarters in Rome 2019, chaired by Lisa Colburn, Marloes Kraan and Amber Himes-Cornell. This EG is making progress on the development of social indicators with an immediate aim of contributing to the ecosystem and fisheries overviews. Data quality is not consistent across all regions.

WGECON held its second meeting in Paris June 2019 at the OECD. WGECON, chaired by Hazel Curtis, Olivier Thébaud, and J. Rasmus Nielsen. This EG has attracted a diverse group of economists from across ICES countries. They have identified data and models, skills and institutional arrangements that would be needed for ICES economists to provide impact assessments, advice on optimal benefits of commercial fishing and create models that member countries could populate with their own data and use to provide their own economic advice. A large number of the economists expressed interest in contributing to ICES IEA groups.

BESIO. A workshop was held November 2017 (WKSIED-BESIO) to clarify what economic, social, and institutional objectives of marine management are contained in national and European management documents. A follow-on EG would be useful to establish a framework for further work and regions. SIHD has established contact with two potential chairs for such an EG and work with ToRs is ongoing.

Viewpoint development. SIHD chairs participated in the WGECON meeting 2019 and discussed the development of a viewpoint with socioeconomic content.

WKCONSERVE Planning. Together with the SGIEA chair, the SIHD chairs planned a workshop on Challenges, Opportunities, Needs and Successes in including human dimensions in IEAs (WKCONSERVE). The workshop will assess the status of socioeconomic integration in the IEA groups and develop a roadmap for each IEA group on the next steps towards including socio-economic content. The workshop will be held at the ICES Secretariat 8-10 October, 2019.

WKECO3. SIHD chair Jörn Schmidt attended the Workshop on the design and scope of the 3rd generation of ICES Ecosystem Overviews (WKECO3), presenting SIHD

thoughts and experiences on what and how to best include socioeconomic aspects in ICES Ecosystem Overviews.

6.2.4 Activities outside ICES to promote ICES and SIHD

IPCC Special Report. SIHD chair Jörn Schmidt served as contributing author to chapter 5 of the IPCC Special Report on the impacts of global warming of 1.5 °C above pre-industrial levels.

PICES Annual Meeting Plenary Talk - October-November 2018 - Yokohama, Japan. SIHD chair Alan Haynie gave a plenary talk: "Reaching our audience: How do we better communicate interdisciplinary marine science?" Alan also attended the PICES HD Committee working meetings, presented SIHD activities, and discussed current and future opportunities for ICES/PICES human dimensions collaboration.

"Our Atlantic Ocean for Growth and Well-Being" - November 2018 - Cabo Verde. SIHD chair Jörn Schmidt attended the high-level event and presented on a Local Ocean Solution Hub (Dialogue Forum for local scientists and stakeholders with international scientists and stakeholders) and developed new links for ICES.

Swedish national ICES seminar - January 2019 - Gothenburg Sweden. SIHD chair Eva-Lotta Sundblad arranged a seminar for Swedish researchers, experts, and agency and ministry employees to promote ICES, and the processes leading toward ecosystem based management.

United Nations Regular Process for Global Reporting and Assessment of the State of the Marine Environment, including Socioeconomic Aspects - January 2019 - New York, USA. SIHD chair Jörn Schmidt attended the multi-stakeholder dialogue and capacity-building partnership event in support of the World Ocean Assessment and presented ICES work, especially work on Integrated Ecosystem Assessments and the Training Programme.

WKPESTLE, the ICES/PICES workshop on Political, Economic, Social, Technological, Legal and Environmental scenarios used in climate projection modelling, was organized by SICCME and SIHD chairs. The workshop discussed how to develop frameworks to guide scenario development as input for fisheries and ecosystem models. In addition, plans were made for a session on Ocean Scenarios for the Scenarios Forum in March 2019 in Denver, Colorado, US.

IMBER Open Science Meeting - June 2019 - Brest, France. SIHD chairs co-organized several SIHD-related sessions. The conference made a valuable contribution to interdisciplinary marine science and was a great display of the progress made in the field in recent years.

MARE conference - June 2019 - Amsterdam, Netherlands. This is the largest gathering of social scientists working in the marine realm. All sessions are relevant for SIHD and ICES and this year the policy day specifically linked to SIHD, WGSOCIAL and WGECON work and provided a good opportunity to increase the visibility of these activities within the scientific community and with stakeholders.

Meeting of the Group of Experts for the World Ocean Assessment - August 2019 - New York, USA. SIHD chair Jörn Schmidt attended a five-day workshop to work on the report for the 2nd cycle of the World Ocean Assessment.

ICES 2019 ASC Session: "Understanding humans within ecosystems: Innovative tools, strategies, and research." PICES co-sponsored the session.

6.2.5 Additional Planned Activities after September 2019

MSEAS symposium. To be held May 2020 in Yokohama, Japan. Work is underway to plan the second ICES/PICES MSEAS Symposium. SIHD chairs are co-convening several sessions and serving on the MSEAS scientific committee.

MSEAS Network. After the MSEAS symposium in 2016, efforts were undertaken to establish an international network on Marine Socio-Ecological Systems. A Memorandum of Understanding has been developed and is under discussion in NOAA, CSIRO, IFREMER, Kiel University and the Marine Institute in Galway. Further action will be taken at or before MSEAS 2020.

PICES Annual Meeting Sessions, Oct 2019. SIHD chair Alan Haynie is co-convening two sessions, “Creating More Effective Integrated Ecosystem Assessments (IEAs) in PICES Countries” and “Integrating economic and social objectives in marine resource management.”

The **Workshop on Global Ocean Social Sciences (WKGLOSS)**, chaired by Denis Bailly, France, Olivier Thébaud, France, and Jörn Schmidt, Germany, will be organized in collaboration with the Ocean University Initiative in Brest, France, on 5th and 6th November 2019 to identify central issues and conditions for the involvement of the social sciences in the UN initiative on the Decade of Ocean Sciences for Sustainable Development (2021-2030).

6.2.6 SIHD Leadership

The terms of chairs Eva-Lotta Sundblad and Jörn Schmidt will end at the end of 2019, so the search is underway for new SIHD chairs. Discussions are currently underway with several potential chairs who span economic and social science disciplines.

7 Resolutions database

ICES Secretariat has focused on developing a plan for handling ICES resolutions and better serving the needs of our community as identified at previous WGCHAIRS meetings and by SCICOM and ACOM. A new approach to developing and handling resolutions and the data they contain will help to brigade ICES science in a more consistent way, move towards a “one ICES” approach to developing and handling the web texts and terms of reference for expert groups, and ensure that data from the forms are easily harvested and can be used to search, manage and present the ICES work portfolio.

This plan for better handling resolutions involves a number of steps:

- 1) Review of the resolution form content
- 2) Selection of a new form platform
- 3) Development of a database to host the data collected from the resolution forms
- 4) Development of a searchable user-friendly interface to the database
- 5) Development of a processing workflow from the start of the drafting of the resolution through to the approval

The resolution form content is now out for review with the Secretariat, SG chairs and a number of EG chairs. After the review, the next step will be the production stage and testing of the form, and finally revision of the instructions for the completion of resolutions in the “Guidelines for ICES Groups”. The Secretariat is aiming for adoption of

the new form by all expert groups in January 2020, with detailed information provided at the WGCHAIRS meeting.

Several options have been considered for the new form platform and the pros/cons of some of these options have been presented and discussed. It was decided to use Adobe PDF for form creation because of the robustness of exportability and the usability of a PDF form on any platform. PDF has held up to strongly to these tests. Track changes on forms is not an option on all platforms evaluated (including Microsoft Word forms), but Adobe PDF has good commenting options which allow for feedback during resolution development.

The resolutions database will be developed using Microsoft Dynamics as this platform provides the necessary flexibility, is supported with in-house expertise and server resources, and does not require additional financial investment for a database platform.

The workflow process for handling resolutions will be the focus of Secretariat activity during the next months, and the plan is to work closely with the supporting officers and SG chairs to identify a well-defined path for authorship, review, approval, and archival of resolutions.

Microsoft PowerBI will be used for the user interface with the databases. This platform allows for the development of customized dashboards and interactive reports for different audiences (e.g., steering group chairs, SCICOM, ACOM, supporting officers, etc.). Such dashboards will be a hugely valuable tool for monitoring implementation of the Science Plan and for searching and reporting on activity across many EG.

8 Annual Science Conference 2019

8.1 ASC 2019 overview

The 2019 Annual Science Conference was held in Gothenburg, Sweden from Monday 9 September to Thursday 13 September (four days). The venue was The Swedish Exhibition and Congress Centre, Svenska Mässan, in Gothenburg.

The theme sessions, opening ceremony, open sessions and presentations took place in the purpose built, modern conference venue, with four lecture theatres used to run the 18 theme sessions, three network sessions, and several side events and workshops. The poster exhibit and session took place in the large, central hall, facilitating lots of networking and providing good visibility for the 103 exhibited posters.

8.1.1 Opening and Keynote speakers

The opening of the conference was held on Monday morning, facilitated by ICES General Secretary Anne Christine Brusendorff and President, Fritz Köster. The ICES community was welcomed to Gothenburg by Jennie Nilsson, Swedish Minister for Rural Affairs.

The Outstanding Achievement Award was awarded by Carl O'Brien to Ann Bucklin.

The opening session was followed immediately by the first opening session and panel debate; Science policy needs and challenges for achieving SDG14. The panel consisted of Elisa Morgera, University of Strathclyde, Glasgow, UK, Katherine Richardson, Sustainability Science Centre, University of Copenhagen, Denmark, Manuel Barange, Food and Agriculture Organization of the United Nations (FAO) and Vladimir Ryabinin, The Intergovernmental Oceanographic Commission of UNESCO. The panel was moderated by Jakob Granit, Swedish Agency for Marine and Water Management.

The second keynote was held on the Tuesday morning, The future of -fish and its role in securing food for a 9-billion world, by Manuel Barange, Food and Agriculture Organization of the United Nations (FAO).

The third was held on Wednesday morning, Climate-driven redistribution of ocean life and its implications for society, by Gretta Pecl, Centre for Marine Socioecology (CMS), Australia.

The fourth and final keynote was on Thursday afternoon, Re-examining physical-biological linkages in a changing ocean: what will we need to know by 2030?, by Cisco Werner, NOAA Fisheries, USA.

8.1.2 Poster session

The poster session was held on Tuesday evening 10 September, in the central H hall of the venue. It was well attended, and has received positive feedback.

8.1.3 Travel funds

10,000 DKK travel funds were allocated to 15 early career scientists. First-time participation at the ASC was especially encouraged.

8.1.4 Early Career Scientists

As well as the travel funds, we also offered a range of activities aimed at ECS participants, including (i) a breakfast meet-up chaired by Simon Jennings called “when, what, who” about how to get involved in the ICES community, (ii) a pop-up scientist event with Howard Browman speaking about how to get published, and (iii) our very popular mentor programme with eight mentor groups covering a range of subjects. In total 175 early career scientists attended the conference.

8.1.5 Conference programme and folder

The conference programme has been available online since May. There was a hard version of the conference programme as a pocket-sized folder. We did not make use of a designated mobile phone app, due to budget constraints.

8.1.6 Registration

The registration system opened in March. The conference fees are at the increased rate, following the SCICOM decision of 2015. Fees included a vegetarian lunch for four days. In total we had 763 registrations to the conference.

8.1.7 Abstracts

As per the decision of 2015, we did not require the submission of extended abstracts. Authors could, if required by their institute, submit an extended abstract or full paper.

The abstracts are available online as PDF files, by clicking on the titles in the timetables. They will all go online as part of the CM document collection.

Poster authors have been asked to submit their posters electronically in August, for inclusion in the abstract collection and later CM document collection.

8.2 Theme Session reports

Eighteen theme sessions were held at the 2019 ASC. Reports from the theme sessions will be linked to the titles below as they become available (all links are unlikely to be active before the 2019 Council meeting, but will be updated as theme session reports are submitted and edited).

8.2.1 Theme session A: Advances in habitat models to inform ecosystem-based management: from theory to practice

8.2.2 Theme session B: Marine aquaculture in a changing ocean

8.2.3 Theme session C: Machine learning in marine science

8.2.4 Theme session D: Assessing ecosystem vulnerability to multiple drivers and pressures

8.2.5 Theme session E: Integrating information on population structure and migration into fisheries stock assessment and management

8.2.6 Theme session F: Management objectives, trade-offs and strategies in a changing ocean

8.2.7 Theme session G: Understanding ecosystem structure and functioning through the use of traits

8.2.8 Theme session H: Drivers of sustainability in fisheries for non-quota and data-poor species

8.2.9 Theme session I: Understanding humans within ecosystems: Innovative tools, strategies, and research

8.2.10 Theme session J: Harmful algal blooms and jellyfish: Impacts on ecosystems and ecosystem services

8.2.11 Theme session K: New approaches to the understanding of energy transfer through the foodwebs

8.2.12 Theme session L: Fish adaptive strategies to changes in environment and fishing pressures

8.2.13 Theme session M: Quantifying human footprints, indicators and reference points for seabed impacts

8.2.14 Theme session N: Advances in data-limited assessment methodologies for marine and diadromous stocks

8.2.15 Theme session O: Vulnerable marine ecosystems (VMEs): key structural and functional elements in the deep-sea

8.2.16 Theme session P: Desirable and undesirable consequences of mixed fishery management. Effective strategies for reducing discards and choke effects while increasing overall quota utilisation

8.2.17 Theme session Q: Balancing the social, economic, and ecological impacts of small-scale and recreational fisheries

8.2.18 Theme session R: Oceanography and ecosystems in the North Atlantic: science and operational services

8.3 Network Session reports

Three network sessions were held at the 2019 ASC. Reports from the network sessions, will be linked to the titles below as they become available (all links are unlikely to be active before the 2019 Council meeting, but will be updated as network session reports are submitted and edited).

8.3.1 Global impacts of shipping

8.3.2 Stakeholder involvement and social aspects of climate change adaptation in fisheries and aquaculture

8.3.3 Natura 2000

8.4 Review of new session formats and options for future ASC

8.4.1 Guidelines for ICES Annual Science Conference

These guidelines are being developed to provide one source of essential information for anyone involved in the organisation and running of the ICES Annual Science Conference (ASC), with a focus on work conducted by ICES Science Committee and ICES Secretariat. The guidelines have been developed to keep essential information for anyone involved in the organisation and running of the ICES Annual Science Conference in one place and to ensure this information is subject to a defined and systematic review cycle. An advanced draft of version 2019-1 is being circulated for comment, with expectation this will be released later in Q3 2019 and updated twice per year thereafter. The development of these guidelines will ensure that any agreed changes to ASC arrangements and process are made promptly, in one place and will be accessible to all, rather than requiring reference to SCICOM papers, for example.

8.4.2 Session selection at the ASC

For ASC 2020 a modified process for selecting ASC theme and network sessions will be adopted to increase breadth of science coverage at ASC, to align with science plan and to provide opportunities for accepting excellent papers on any marine science topic (introduction of a contributed papers session). Further, to seek to achieve a gradual reduction in paper rejection rates, SCICOM recommended five rather than four parallel theme sessions would be held. There would also be a synthetic keynote to begin each day and we would seek to accommodate any poster that was offered (subject to scientific norms). These are progressive rather than radical changes because SCICOM recognise overall feedback on the ASC, albeit from participants rather than any potential participants who missed out, remains positive. Discussions on rejection rates and their effects would be better informed if we had information on whether the rejection of an individuals' paper is linked to non-attendance at the meeting.

SCICOM also took decisions to introduce a 'contributed papers' session at future ASC (to be convened by SCICOM members and to provide opportunities to submit work on any marine science topic relevant to our strategic and science plans) as well as to

modify the process for selecting theme and network sessions to ensure more equitable coverage of topics in the science plan by theme sessions. In future it will be recommended to accommodate five parallel theme sessions at the ASC and also to adopt the default assumption that all submitted posters meeting scientific norms should be accepted. Guidance on the ASC was signed-off at or shortly after the SCICOM meeting and will be included in the first edition of a new “Guidelines for ICES Annual Science Conference”.

The new process was applied to select sessions for the Copenhagen ASC

8.5 ASC 2020

The 2020 Annual Science Conference will be held at DGI-Byen, Øksne-hallen, in Copenhagen, Denmark, from Monday 7 to Thursday 10 September 2020 with five parallel theme session rooms available.

9 ICES Co-sponsored Symposia

The following symposia were selected by SCICOM for ICES co-sponsorship in 2019 and 2020:

9.1 ICES co-sponsored symposia held in 2019

- Shellfish - Resources and Invaders of the North
5–7 November 2019, Tromsø, Norway
- International Symposium on Fisheries Sustainability: Strengthening the Science-Policy Nexus
18–21 November 2019, Rome, Italy
- NASCO Symposium: Managing the Atlantic salmon in a Rapidly Changing Environment – Management Challenges and Possible Responses
3–4 June 2019, Tromsø, Norway
- Challenging the scientific legacy of Johan Hjort: Time for a new paradigm shift in marine research?
12–14 June 2019, Bergen, Norway
- Second International Science and Policy Conference on Implementation of the Ecosystem Approach to Management in the Arctic
25–27 June 2019, Bergen, Norway

9.2 ICES co-sponsored symposia to be held in 2020

- International Symposium on Plastics in the Arctic and Sub-Arctic Region
21–23 April 2020, Reykjavik, Iceland
- Oceans Past VIII Conference
10–13 May 2020, Bruges, Belgium
- Marine Socio-Ecological Systems (MSEAS 2020) - Navigating global change in the marine environment
25–29 May 2020, Yokohama, Japan
- World Fisheries Congress 2020

11–15 October 2020, Adelaide, Australia

All symposia are linked to the ICES science priorities as identified in the ICES Science Plan, and the symposia selected for co-sponsorship in 2019 and 2020 address six of our seven science priorities. Further details of symposia are provided in Annex 6.

Symposia	Science priorities						
	Ecosystem science	Impacts of human activities	Observation and exploration	Emerging techniques and technologies	Seafood production	Conservation and management science	Sea and society
Shellfish - Resources and Invaders of the North (2019)	*				*	*	
International Symposium on Fisheries Sustainability: Strengthening the Science-Policy Nexus (2019)		*			*	*	*
NASCO Symposium: Managing the Atlantic salmon in a Rapidly Changing Environment – Management Challenges and Possible Responses (2019)	*	*			*	*	
Challenging the scientific legacy of Johan Hjort: Time for a new paradigm shift in marine research? (2019)					*	*	
Second International Science and Policy Conference on Implementation of the Ecosystem Approach to Management in the Arctic (2019)			*			*	*
International Symposium on Plastics in the Arctic and Sub-Arctic Region (2020)		*	*				
Oceans Past VIII Conference (2020)		*				*	

Marine Socio-Ecological Systems (MSEAS 2020) - Navigating global change in the marine environment (2020)							*
World Fisheries Congress 2020 (2020)		*			*	*	*

9.3 Future handling of symposium resolutions

Following a decision taken at the September 2019 SCICOM meeting, proposals for symposia to be held in 2021 will be reviewed at the SCICOM March meeting in 2020. This approach, where all symposia proposals are reviewed at the same time on an annual basis, will also be followed in future. The approach will lead to more equitable treatment of submissions, as the previous process had favoured a 'first come first served' approach and the risk that available funds were allocated before all potential symposia had been considered.

The Secretariat/Communications will be working towards increasing the prominence of ICES support for Early Career Scientists via news articles and interviews with ECS attending ICES co-sponsored symposia.

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 OG	Science Impact and Publication Group (SIPG)	Simon Jennings, UK	Nils Olav Handegard, Norway
SCICOM SI	Strategic Initiative on the Human Dimension (SIHD)	Jörn Schmidt, Germany and Eva-Lotta Sundblad, Sweden	TBA
SCICOM SI	ICES-PICES Strategic Initiative on Climate Change Impacts on Marine Ecosystems (SICCME)	Myron Peck, Germany, and John Pinnegar, UK	Christian Möllmann (Germany) and Geir Ottersen (Norway)

Established Expert Groups

AFFILIATION	GROUP NAME	CHAIR – OUTGOING	CHAIR – INCOMING
EOSG	Working Group on Northwest Atlantic Ecosystem Observations (WGNWAEO)		Jonathan Hare, USA and Alain Vézina, Canada
EPDSG	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)
EPDSG	ICES-PICES Working Group on Impacts of Warming on Growth Rates and Fisheries Yields (WGGRFY)		C. Tara Marshall, UK (ICES), Paul Spencer, USA (PICES), Alan Baudron, UK (ICES) and John Morrongiello, Australia
FRSG	Working Group on Transparent Assessment Framework Governance (WGTAFGOV)		Nils Olav Handegard (Norway)
HAPISG	Working Group on Cumulative Effects Assessment Approaches in Management (WGCEAM)		Vanessa Stelzenmüller, Germany, Roland Cormier, Germany, and Gerjan Piet, the Netherlands
HAPISG	Working Group on Shipping Impacts in the Marine Environment (WGSHIP)		Cathryn Murray, Canada
HAPISG	Working Group on Offshore Wind Development and Fisheries (WGOWDF)		Andy Lipsky, USA; and Chair (TBD), Europe
IEASG	Working Group on Integrated Ecosystem Assessment of the Greenland Sea (WGIEAGS)		Jesper Boje, Denmark/Greenland, and Colin Stedmon, Denmark

Expert Groups that changed Steering Group

AFFILIATION	EXPERT GROUPS	OLD AFFILIATION (SG)	NEW AFFILIATION (SG)
	Working Group on Science to Support Conservation, Restoration and Management of Diadromous Species (WGDIAD)	Ecosystem Processes and Dynamics Steering Group (EPDSG)	Fisheries Resources Steering Group (FRSG)
	Working Group with the Aim to Develop Assessment Models and Establish Biological Reference Points for Sea Trout (<i>Anadromous Salmo trutta</i>) Populations (WGTRUTTA)	Ecosystem Processes and Dynamics Steering Group (EPDSG)	Fisheries Resources Steering Group (FRSG)
	ICES/NAFO/NAMMCO Working Group on Harp and Hooded Seals (WGHARP)	Human Activities, Pressures and Impacts Steering Group (HAPISG)	Fisheries Resources Steering Group (FRSG)

Change of Chairs

AFFILIATION	EXPERT GROUPS	CHAIR – OUTGOING	CHAIR – INCOMING
EPDSG	Working Group on Integrated Morphological and Molecular Techniques (WGIMT)	Naiara Rodriguez-Ezpeleta, Spain (outgoing co-chair)	Jasmin Renz, Germany
EPDSG	Working Group on Cephalopod Fisheries and Life History (WGCEPH)	Jean-Paul Robin, France (outgoing co-chair)	Ana Moreno, Portugal; and Daniel Oesterwind, Germany
FRSG	Herring Assessment Working Group for the Area South of 62°N (HAWG)	Susan Mærsk Lusseu, UK (outgoing co-chair)	Afra Egan, Ireland,
FRSG	Baltic Salmon and Trout Assessment Working Group (WGBAST)	Stefan Palm, Sweden	Martin Kesler, Estonia
FRSG	Working Group for the Bay of Biscay and Iberian waters Ecoregion (WGBIE)	Lisa Readdy, UK (outgoing co-chair)	No incoming, the Group will continue with one Chair.
FRSG	Working Group for the Celtic Seas Ecoregion (WGCSE)	Timothy Earl, UK (outgoing co-chair)	Mathieu Lundy, UK
FRSG	Working Group on the Biology and Assessment of Deep-Sea Fisheries Resources (WGDEEP)	Pascal Lorange, France (outgoing co-chair)	Ivone Figueiredo, Portugal
FRSG	Joint EIFAAC/ICES/GFCM Working Group on Eels (WGEEL)	Alan Walker, UK	Tbc
FRSG	Working Group Elasmobranch Fishes (WGEF)	Samuel Shephard, Ireland and Paddy Walker, the Netherlands	Jurgen Batsleer, The Netherlands and Pascal Lorange, France
FRSG	ICES/NAFO/NAMMCO Working Group on Harp and Hooded Seals (WGHARP)	Mike Hammill, Canada	tbc
FRSG	Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak (WGNSSK)	José De Oliveira, UK	Tanja Miethe, UK

AFFILIATION	EXPERT GROUPS	CHAIR – OUTGOING	CHAIR – INCOMING
HAPISG	Working Group on Marine Planning and Coastal Zone Management (WGMP CZM)	Matt Gubbins, UK (outgoing co-chair)	Catriona Nic Aonghusa, Ireland
HAPISG	Working Group on Ecosystem Effects of Fishing Activities (WGECO)	Jeremy Collie, USA; and Stefán Áki Ragnarsson, Iceland	Tobias van Kooten, NL and Brian Smith, USA
IEASG	Working Group on Ecosystem Assessment of Western European Shelf Seas (WGEA-WESS)	Steven Beggs, UK, and Eider Andonegi, Spain	Marcos Llope, Spain and Debbi Pedreschi, Ireland
IEASG	Working Group on Comparative Ecosystem-based Analyses of Atlantic and Mediterranean marine systems (WGCOMEDA)	Christian Möllmann, Germany, Marta Coll, Spain, Manuel Hidalgo, Spain, Hilmar Hinz, Spain	Sofia Henriques, Portugal, M. Cristina Mangano, Italy, Paris Vasilakopoulos, Italy and Romain Frelat, Netherlands
IEASG	Working Group on Integrative, Physical-biological, and Ecosystem Modelling (WGIPEM)		Sonja van Leeuwen, Netherlands
IEASG	Working Group on Integrated Assessment of the Norwegian Sea (WGINOR)		Anna Olafsdottir

2019 workshops

AFFILIATION	WORKSHOP NAME	CHAIRS	COMMENTS
ASG	Workshop on Emerging Mollusc Pathogens (WKEMOP)	Janet Whaley - Ryan B. Carnegie	
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 - Jann Thorsten Martinsohn	
EOSG	Workshop on Herring Acoustic Spawning Surveys (WKHASS)	Pablo Carrera	
EOSG	Workshop on Index Calculation based on DATRAS (WKICDAT)	Holger Haslob	
EOSG	Workshop on the development of practical survey methods for measurements and monitoring in the mesopelagic zone (WKMESOMeth)	Ciaran O'Connell - Gavin Macaulay	
EOSG	Workshop on Impacts of planned changes in the North Sea IBTS (WKNSIMP)	Kai Ulrich Wieland -	
EOSG	Workshop on the Realigning of the Ecosystem Observation Steering Group (WKREO)	Sven Kupschus, Matthias Kloppmann - Colm Lordan	
EOSG	Workshop on scrutinizing of acoustic data from the IESSNS survey (WKSCRUT2)	Jan Arge Jacobsen - Age Høines	
EOSG	Workshop on unavoidable survey effort reduction (WKUSER 2019) (Will meet in 2020)	Stan Kotwicki	
EOSG	Workshop on age validation studies of small pelagic species (WKVALPEL)	Kélig Mahé - Javier Rey - Pierluigi Carbonara	

AFFILIATION	WORKSHOP NAME	CHAIRS	COMMENTS
EOSG	Workshop on Whiting biological Quality Indicators (WKWHIQI) (Will meet in 2020)		
EOSG	Workshop on sardine (<i>Sardina pilchardus</i>) Age reading of otoliths (NE At-lantic and Mediterranean) (WKARAS 2)	Eduardo Soares - Pedro Torres	
EOSG	Workshop on Age estimation of Norwegian Spring Spawning Herring (<i>Clupea harengus</i>) (WKARNSSH)	Jane Godiksen	
EOSG	Workshop on Elasmobranchs maturity (WKSEL3 2018)	Maria Cristina Folles - Pierluigi Carbonara	
EOSG	Third Workshop on Optimization of Biological Sampling (WKBIOPTIM3)	Ana Cláudia Fernandes - Eirini Mantzouni	
EOSG	Workshop on Integrating human dimensions into the management of marine recreational fisheries (WKHDR)	Christian Skov - Kieran Hyder - Harry Vincent Strehlow	
EOSG	Third Workshop on Age Reading of European and American Eel (WKAREA3)	Françoise Daverat - Isabel Domingos - Kélig Mahé	
EOSG	Workshop on Scale, Otolith Biochronology Archives (WKBioArc)	Deirdre Brophy - Martha Robertson	
EOSG	Workshop on evaluating survey information Celtic Sea gadoids (WKESIG)	David Stokes	
EOSG	Workshop on Elasmobranchs maturity (WKSEL3)	Maria Cristina Folles - Pierluigi Carbonara	
EOSG	Workshop on Better Coordinated Stomach Sampling (WKBECOSS)	Izaskun Preciado - Stefan Neuenfeldt	
EOSG	Workshop on Elasmobranchs maturity (WKSEL3)	Maria Cristina Folles - Pierluigi Carbonara	
FRSG	Workshop on scoping of physical pressure layers causing loss of benthic habitats D6C1– methods to operational data products (WKBEDLOSS)		
FRSG	Workshop to evaluate and test operational application of human activities causing physical disturbance and loss to seabed habitats (D6C1-C4) (WKBEDPRES2)	Phillip Boulcott	
FRSG	Workshop on the design and scope of the 3rd generation of ICES Ecosystem Overviews (WKEO3)	Mette Skern-Mauritzen - Henn Oja-veer	
FRSG	Workshop on a Research Roadmap for Mackerel (WKRRMAC)	Carl O'Brien - Mark Dickey-Collas	
FRSG	Workshop on Data Limited Stocks of Short-Lived Species (WKDLSSLS)		
FRSG	Workshop on Designing an Eel Data Call 2 (WKEELDATA2)		

AFFILIATION	WORKSHOP NAME	CHAIRS	COMMENTS
FRSG	Workshop for the review of the scientific basis for a UK non-detriment finding (NDF) for the international trade in European eel, in relation to CITES legislation (WKEELNDF)	Eugene Nixon	
FRSG	Data Evaluation meeting for the Benchmark Workshop for Flatfish stocks in the North Sea and Celtic Sea (WKFlatNSCS)	-	
FRSG	Benchmark Workshop on sharing information on the Irish Sea ecosystem, stock assessments, and fisheries issues, and scoping needs for assessment and management advice (WKIrish6)	Daniel Howell - Matthew Lundy	
FRSG	Ninth Workshop on the Development of Quantitative Assessment Methodologies based on LIFE-history traits, exploitation characteristics, and other relevant parameters for data-limited stocks (WKLIFE IX)	Carl O'Brien - Manuela Azevedo	
FRSG	Workshop on Methodologies for Nephrops Reference Points (WKNephrops)	Michael Bell	
FRSG	Benchmark Workshop on Rockall Haddock had.27.6b (WKROCK1)	Helen Dobby	
FRSG	Second Benchmark Workshop on Rockall Haddock had.27.6b (WKROCK2)	-	
FRSG	Workshop for North Atlantic Salmon At-Sea Mortality (WKSalmn)	Gerald Chaput and tbd	
FRSG	Workshop on the Iberian Sardine Management and Recovery Plan (WKSARMP)	Manuela Azevedo	
FRSG	Workshop on the benchmark assessment and management plan evaluation for Icelandic haddock and saithe (WKICEMSE)	-	
FRSG	Workshop on North Sea Management Strategy Evaluation (WKNSMSE2)	José De Oliveira	
FRSG	Workshop on Science with Industry Initiatives (WKSCINDI)	Steven Mackinson - Jon Elson	
FRSG	Workshop on incorporating discards into the assessments and advice of elasmobranch stocks (WKSHARK5)	Paddy Walker	
FRSG	Workshop on Training for the Transparent Assessment Framework: North Sea and Celtic Seas (WKTAF-NSCS)	Arni Magnusson - Colin Millar	
FRSG	Benchmark Workshop on Baltic Cod (WKBALTCOD)	Johan Lövgren, Joakim Hjelm, Michele Casini	
FRSG	Workshop on the Ecosystem Based Management of the Baltic Sea (WKBALTIC)	Rüdiger Voss - David Reid	
FRSG	Workshop on catch forecasts from biased assessments (WKFORBIAS 2018)	Larry Alade - Christopher Legault	
FRSG	The second Workshop on guidelines for management strategy evaluations (WKGMSSE2)	Carmen Fernandez	
FRSG	Workshop on Estimation with the RDBES data model (WKRDB-EST)	Nuno Prista - Kirsten Birch Håkansson	

AFFILIATION	WORKSHOP NAME	CHAIRS	COMMENTS
FRSG	Workshop on Populating the RDBES data model (WKRDB-POP)	David Currie - Edvin Fuglebakk	
FRSG	Workshop on standardized data formats for input to assessment models (WKSTOCKADE)	James Thorson - Anders Nielsen	
FRSG	The joint ICES/Probyfish Workshop on identification of target and bycatch species (WKTARGET)	Youen Vermard	
HAPISG	Workshop on cumulative effects assessment approaches in management (WKCEAM)	Vanessa Stelzenmüller - Roland Cormier - GerJan Piet	
HAPISG	Workshop on Tradeoffs Scenarios between the Impact on Seafloor Habitats and Provisions of catch/value (WKTRADE2)	François Bastardie - Jochen Depestele	
HAPISG	Workshop on Global Ocean Social Sciences (WKGLOSS)	Denis Bailly - Olivier Thébaud - Jörn Schmidt	
IEASG	Workshop for the production of the Oceanic North East Atlantic Ecoregion Ecosystem Overview (WKABNJ)	Francis Neat - Odd Aksel Bergstad	
IEASG	Workshop for the production of the Azorean Ecoregion Ecosystem Overview (WKAZOREco)	Mário Rui Pinho - Maria de Fatima Borges	
IEASG	Workshop on Challenges, Opportunities, Needs and Successes in including human dimensions in IEAs (WKCONSERVE)	Alan Haynie - Jörn Schmidt - Mette Skern-Mauritzen - Eva-Lotta Sundblad	
IEASG	Second Workshop on integrated trend analyses in support to integrated ecosystem assessment (WKINTRA2)	Saskia Otto - Benjamin Planque	
IEASG	Workshop on Kattegat Ecosystem Modelling Scenarios with Stakeholder Participation (WKKEMSSP)	Erik Olsen - Andrew Kenny - Andrea Belgiano	
IEASG	Workshop on ecological valuing of areas of the Barents Sea (WKBAR)	Adriaan Rijnsdorp - Markku Viitasalo - Mariano Koen-Alonso	
IEASG	Workshop on methods to develop a swept-area based effort index (WKSABI)	Kai Ulrich Wieland	

2020 workshops (one off meetings)

AFFILIATION	WORKSHOP NAME	CHAIRS	COMMENTS
FRSG	Benchmark Workshop for Demersal species (WKDEM)	ICES Chair Daniel Howell - external Chair (tbc)	
FRSG	Benchmark Workshop for Flatfish stocks in the North Sea and Celtic Sea (WKFlatNSCS)	External Chair Meaghan Bryan - ICES Chair Timothy Earl	
FRSG	Benchmark Workshop on Greater Silver Smelt (WKGSS), chaired by	External Chair (tbc) and ICES Chair (tbc)	
FRSG	Benchmark Workshop on herring (<i>Clupea harengus</i>) in the Gulf of Bothnia (WKCluB)	Noel Holmgren	
FRSG	ICES-JRC Workshop on Model Ensembles for Stock Assessment and Advice (WKENSEMBLE)	Liz Brooks - C��il��n Minto - Ernesto Jardim	
FRSG	Workshop on guidelines and methods for the evaluation of rebuilding plans (WKREBUILD)	Martin Pastoors - Vanessa Trijoulet	
FRSG	Workshop on Atlantic chub mackerel (<i>Scomber colias</i>) (WKCOLIAS)	Alexandra Silva - Teresa G. Santamar��a	
FRSG	Workshop on the Ecosystem Based Management of the Baltic Sea (WKBALTIC)	Rudi Voss - David Reid	
FRSG	Workshop on the Review and Future of State Space Stock Assessment Models in ICES (WKRFSAM)	Noel Cadigan	
EPDSG	Workshop on Scallop Aging (WKSA)	David Palmer - Karen Vanstaen	
IEASG	Workshop on methods and guidelines to link human activities, pressures and state of the ecosystem in Ecosystem Overviews (WKTRANSPARENT)	Henn Ojaveer - Mette Skern-Mauritzen	
EOSG	Workshop on Age reading of Sea bass (<i>Dicentrarchus labrax</i>) (WKARDL2) (Will meet in 2021)	TBA	

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 (2019)	Number of countries (2019)
1	Working Group on Pathology and Diseases of Marine Organisms	WGPDMO	Ryan Carnegie, USA	2019	2021	12	9
2	Working Group on Social and Economic Dimensions of Aquaculture	WGSEDA	Gesche Krause, Germany	2018	2020	12	7
3	Working Group on Application of Genetics in Fisheries and Aquaculture	WGAGFA	Jann Martinsohn, Italy	2018	2020	38	9
4	Working Group on Scenario Planning on Aquaculture	WGSPA	Ben Halpern, USA	2018	2021	18	7
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	8	5
7	Working Group on Open Ocean Aquaculture	WGOOA	Bela Buck, Germany	2019	2021	10	8
8	Workshop on Emerging Mollusc Pathogens	WKEMOP	Ryan Carnegie, United States	2019	2019	16	10

	EG name	EG Acronym	EG Chair	Year start	Year end	Number attending (2019)	Number of countries (2019)
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	2019	Pending meeting	Pending meeting

Expert Groups under Ecosystem Processes and Dynamics Steering Group

	EG name	EG Acronym	EG Chair	Year start	Year end	Number attending (2019)	Number of countries (2019)
1	Working Group on Biodiversity Science	WGBIODIV	Christopher Lynam, UK, and Andrea Belgrano, Sweden	2019	2021	13	6
2	Working Group on Integrated Morphological and Molecular Taxonomy	WGIMT	Naiara Rodriguez-Ezpeleta, Spain, and Elaine Fileman, UK	2017	2019	17	7
3	Benthos Ecology Working Group	BEWG	Silvana Birchenough, UK	2018	2020	18	9
4	Working Group on Phytoplankton and Microbial Ecology	WGPME	Marie Johansen, Sweden and Rowena Stern, UK	2019	2021	12	8
5	Working Group on Crangon fisheries and life history	WGCRAN	Claudia Günther, Germany	2019	2021		
6	Working Group on Zooplankton Ecology	WGZE	Sophie Pitois, UK, and Lidia Yebra, Spain	2018	2020	36	14
7	Working Group on Oceanic Hydrography	WGOH	Paula Fratantoni, USA, and César González-Pola, Spain	2018	2020	22	13
8	Working Group on the Biology and Life History of Crabs	WGCRAB	Martial Laurent, France	2017	2019	pending meeting	pending meeting
9	Working Group on Resilience and Marine Ecosystem Services	WGRMES	Sebastian Villasante, Spain, and Andrea Belgrano, Sweden	2018	2020	10	4

	EG name	EG Acronym	EG Chair	Year start	Year end	Number attending (2019)	Number of countries (2019)
10	ICES IOC Working Group on Harmful Algal Bloom Dynamics	WGHABD	Eileen Bresnan, UK	2018	2020	20	13
11	Working Group on Cephalopod Biology and Life History	WGCEPH	Graham Pierce, Spain, and Jean-Paul Robin, France	2017	2019	pending report	pending report
12	Working Group on Fisheries-Induced Evolution	WGEVO	Bruno Ernande, France	2019	2021	pending meeting	pending meeting
13	Working Group on Operational Oceanographic Products for Fisheries and the Environment	WGOOFE	-	-	-	pending resolution	pending resolution
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
15	Working Group with the Aim to Develop Assessment Models and Establish Biological Reference Points for Sea Trout (<i>Anadromous Salmo trutta</i>) Populations	WGTRUTTA	Johan Höjesjö, Sweden, and Alan Walker, UK	2017	2019	pending report	pending report
16	Working Group on Seasonal-to-Decadal Prediction of Marine Ecosystems	WGS2D	Mark Payne, Denmark	2017	2019	pending report	pending report
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	N/A		34	13
19	OSPAR/HELCOM/ ICES/Working group on Seabirds	JWGBIRD	Ian Mitchell, UK; Nele Markonnes, Germany; Volker Dierschke, Germany	N/A		pending meeting	pending meeting
20	Workshop on Scallop Aging	WKSA	David Palmer, UK, and Karen Vanstaen, UK	N/A		pending meeting	pending meeting
21	ICES/ PICES Working Group on Small Pelagic Fish	WGSPF	Myron Peck, Germany (ICES), Ignacio Catalan, Spain (ICES), Ryan Rykaczewski, USA	2020	2022	pending meeting	pending meeting

	EG name	EG Acronym	EG Chair	Year start	Year end	Number attending (2019)	Number of countries (2019)
22	ICES-PICES Working Group on Impacts of Warming on Growth Rates and Fisheries Yields	WGGRAFY	(PICES), and Akinori Takasuka, Japan (PICES) C. Tara Marshall, UK (ICES), Paul Spencer, USA (PICES), Alan Baudron, UK (ICES) and John Morrongiello, Australia	2020	2022	pending meeting	pending meeting
23	ICES/ PICES Working Group on Ocean Negative Carbon Emission	WGONCE		2020	2022	pending resolution	pending resolution

Expert Groups under Human Activities, Pressures and Impacts Steering Group

	EG name	EG Acronym	EG Chair	Year start	Year end	Number attending (2019)	Number of countries (2019)
1	Working Group on Marine Benthos and Renewable Energy Developments	WGMBRED	Jan Vanaverbeke, Belgium, and Joop Coolen, the Netherlands	2019	2021	18	5
2	Working Group on Marine Renewable Energy	WGMRE	Marijke Warnas, the Netherlands	2017	2019	8	7
3	Working Group for Marine Planning and Coastal Zone Management	WGMP CZM	Matthew Gubbins, UK, and Andrea Morf, Sweden	2017	2019	pending report	pending report
4	Working Group on the Effects of Extraction of Marine Sediments on the Marine Ecosystem	WGEXT	Ad Stolk, The Netherlands	2017	2019	pending report	pending report
5	Working Group on Biological Effect of Contaminants	WGBEC	Juan Bellas, Spain, and Steven Brooks, Norway	2019	2021	19	9
6	Marine Chemistry Working Group	MCWG	Koen Parmentier, Belgium	2019	2021	13	9
7	Working Group on Marine Sediments in Relation to Pollution	WGMS	Maria Belzunce, Spain, and Claire Mason, UK	2018	2020	21	8

	EG name	EG Acronym	EG Chair	Year start	Year end	Number attending (2019)	Number of countries (2019)
8	Working Group on Economics	WGECON	Hazel Curtis, UK, Rasmus Nielsen, Denmark, and Olivier Thebaud, France	2018	2020	26	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	49	21
11	ICES/IOC/IMO Working Group on Ballast and Other Ship Vectors	WGBOSV	Lisa Drake, USA	2019	2021	48	15
12	Stock Identification Methods Working Group	SIMWG	Lisa Kerr, USA	2017	2019	pending report	pending report
13	Working Group on the value of Coastal Habitats for Exploited Species	WGVHES	Olivier Le Pape, France, and David Eggleston, USA	2019	2021	9	5
14	Working Group on Spatial Fisheries Data	WGSFD	Roi Martinez, UK, and Neil Campbell, UK	2019	2021	20	11
15	Working Group on Marine Habitat Mapping	WGMHM	James Strong, UK	2018	2020	4	3
16	Methods Working Group	MGWG	Arni Magnusson, ICES, and Christopher Legault, USA	2017	2019	pending report	pending report
17	Working Group on the History of Fish and Fisheries	WGHIST	Ruth Thurstan, Australia and Emily Klein, USA	2018	2020	8	3
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	pending meeting	pending meeting
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 meeting	pending meeting
21	Workshop on Cumulative Effects Assessment Approaches in Management	WKCEAM	Vanessa Stelzenmüller, Germany, Roland Cormier, Germany, and Gerjan Piet, the Netherlands	N/A		16	9

	EG name	EG Acronym	EG Chair	Year start	Year end	Number attending (2019)	Number of countries (2019)
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 meeting	pending meeting
23	Workshop on Tradeoffs Scenarios between the Impact on Seafloor Habitats and Provisions of catch/value	WKTRADE2	Jochen Depestele, Belgium, and François Bastardie, Denmark	N/A		24	7
24	Working Group on Shipping Impacts in the Marine Environment	WGSHP	Cathryn Murray, Canada	2019	2021	pending meeting	pending meeting
25	Working Group on Bycatch of Protected Species	WGBYC	Kelly Macleod, UK and Sara Königson, Sweden	N/A		20	12
26	ICES/NAFO Joint Working Group on Deep-water Ecology	WGDEC	Laura Robson, UK	N/A		21	9
27	Working Group on the Ecosystem Effects of Fishing Activities	WGECO	Jeremy Collie, USA, and, Stefán Áki Ragnarsson, Iceland	N/A		17	9
28	ICES/NAFO/NAMMCO Working Group on Harp and Hooded Seals	WGHARP	Mike Hammill, Canada	N/A		14	6
29	Workshop on Global Ocean Social Sciences	WKGLOSS	Denis Bailly, France; Olivier Thébaud, France; and Jörn Schmidt, Germany	N/A		pending meeting	pending meeting
30	Working Group on Offshore Wind Development and Fisheries	WGOWDF	Andy Lipsky, USA and Chair (TBD), Europe	2020	2022	pending meeting	pending meeting

Expert Groups under Integrated Ecosystem Assessments Steering Group

	EG name	EG Acronym	EG Chair	Year start	Year end	Number attending (2019)	Number of countries (2019)
1	Working Group on Comparative Analyses between European Atlantic and Mediterranean marine ecosystems to move towards an	WGCOMEDA	Marta Coll, Spain, Manuel Hidalgo, Spain, Hilmar Hinz, Spain and Christian Möllmann, Germany	2017	2019	11	6

	EG name	EG Acronym	EG Chair	Year start	Year end	Number attending (2019)	Number of countries (2019)
2	Ecosystem-based Approach to Fisheries Working Group on Ecosystem Assessment of Western European Shelf Seas	WGEAWESS	Steven Beggs, UK and Eider Andon-egi, Spain	2017	2019	17	7
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	18	8
4	Working Group on the Integrated Assessments of the Barents Sea	WGIBAR	Elena Eriksen, Norway and Anatoly Filin, Russia	2017	2019	23	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	Pending report	Pending report
7	Working Group on the Integrated Assessments of the Norwegian Sea	WGINOR	J. Óskarsson, Iceland, and Per Arneberg, Norway	2019	2021	pending meeting	pending meeting
8	Working Group on Integrated Assessments of the North Sea	WGINOSE	Andy Kenny, UK and Erik Olsen, Norway	2017	2020	8	4
9	Working Group on Integrative, Physical-biological, and Ecosystem Modelling	WGIPEM	Morgane Travers-Trolet, France and Marie Maar, Denmark	2019	2021	30	11
11	Working Group on Maritime Systems	WGMARS	Patricia M. Clay, USA and Johanna Ferretti, Germany	2017	2019	15	6
12	Working Group on Northwest Atlantic Regional Sea	WGNARS	Geret DePiper, USA and Robert Gregory, Canada	2017	2019	Pending report	Pending report
13	Working Group on SOCIAL indicators	WGSOCIAL	Lisa L. Colburn, USA, Amber Himes-Cornell, FAO, Marloes Kraan, the Netherlands	2018	2020	19	8
16	Workshop on integrated trend analyses in support to integrated ecosystem assessment	WKINTRA2	Saskia Otto, Germany, Benjamin Planque, Norway	2019	2019	Pending report	Pending report
17	Workshop on methods to develop a swept-area based effort index	WKSABI	Kai Wieland, Denmark	2019	2019	12	6

	EG name	EG Acronym	EG Chair	Year start	Year end	Number attending (2019)	Number of countries (2019)
18	<u>Workshop on Kattegat Ecosystem Modelling Scenarios with Stakeholder Participation</u>	WKKEMSSP	Andrea Belgrano, Sweden, Andrew Kenny, UK, and Erik Olsen, Norway	2019	2019	17	4
19	<u>Workshop on the design and scope of the 3rd generation of ICES Ecosystem Overviews</u>	WKEO3	Mette Skern-Mauritzen, Norway, and Henn Ojaveer, Denmark	2019	2019	26	9
20	<u>Workshop on ecological valuing of areas of the Barents Sea</u>	WKBAR	Mariano Koen-Alonso, Canada, Adriaan Rijnsdorp, the Netherlands, and Markku Viitasalo, Finland	2019	2019	14	6
21	<u>Working Group on Common Ecosystem Reference Points</u>	WGCERP	Mary Hunsicker, USA, Xiujuan Shan, China, Benjamin Planque, Norway, and Saskia Otto, Germany	2019	2021	pending report	pending report
22	<u>Workshop for the production of the Azorean ecoregion Ecosystem Overview</u>	WKAZOREco	Mário Rui Pinho, Portugal and Maria de Fatima Borges, Portugal	2019	2019	pending report	pending report
23	<u>Workshop for the production of the Oceanic North East Atlantic ecoregion Ecosystem Overview</u>	WKABNJ	Francis Neat, UK and Odd Aksel Bergstad, Norway	2019	2019	pending report	pending report
24	<u>Workshop on Challenges, Opportunities, Needs and Successes in including human dimensions in IEAs</u>	WKCONSERVE	Alan Haynie, USA, Jörn Schmidt, Germany, Mette Skern-Mauritzen, Norway, and Eva-Lotta Sundblad, Sweden	2019	2019	pending meeting	pending meeting
25	<u>Working Group on Integrated Ecosystem Assessment of the Greenland Sea</u>	WGIEAGS	Jesper Boje, Denmark/Greenland, and Colin Stedmon, Denmark	2020	2022		

Expert Groups under Ecosystem Observation Steering Group

	EG name	EG Acronym	EG Chair	Year start	Year end	Number attending (2018)	Number of countries (2018)
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	pending report	pending report
3	Working Group on Acoustic and Egg Surveys for Sardine and Anchovy in ICES Areas VII, VIII and IX	WGACEGG	Maria Santos, Spain and Mathieu Doray, France	2017	2019	pending meeting	pending meeting
4	Working Group on Atlantic Fish Larvae and Eggs Surveys	WGALES	Patrick Polte, Germany, Richard D.M. Nash, Norway	2019	2022	pending report	pending report
5	Working Group on Beam Trawl Surveys	WGBEAM	Holger Haslob, Germany	2017	2019	pending report	pending report
6	Baltic International Fish Survey Working Group	WGBIFS	Olavi Kaljuste, Sweden	2018	2020	21	10
7	The Working Group on Biological Parameters	WGBIOP	Pierluigi Carbonara, Italy, Cindy van Damme, Netherlands and Julie Davies, Denmark	2018	2020	pending meeting	pending meeting
8	Working Group on Commercial Catches	WGCATCH	Kirsten Birch Hakansson, Denmark, and Ana Ribeiro Santos, United Kingdom	2017	2019	pending meeting	pending meeting
9	Working Group on Electrical Trawling	WGELECTRA	Adriaan Rijnsdorp, NL, Maarten Soetaert, Belgium	2018	2020	pending report	pending report
10	Working Group on Fisheries Acoustics, Science and Technology	WGFAST	Richard O'Driscoll, NZ	2017	2019	93	21
11	ICES-FAO Working Group on Fishing Technology and Fish Behaviour (WGFTFB)	WGFTFB	Haraldur A. Einarsson, Iceland, and Pingguo He, FAO	2017	2019	120	23
12	Working Group on International Deep Pelagic Ecosystem Surveys	WGIDEEPS	Kristjan Kristinsson, Iceland	2017	2019	pending meeting	pending meeting
13	Working Group of International Pelagic Surveys	WGIPS	Bram Couperus, The Netherlands, and Michael O'Malley, Ireland	2019	2021	20	10

	EG name	EG Acronym	EG Chair	Year start	Year end	Number attending (2018)	Number of countries (2018)
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, 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	8	6
17	Working Group on Nephrops Surveys	WGNEPS	Kai Wieland, Denmark, Adrian Weetman, Scotland	2019	2021	pending meeting	pending meeting
18	Working Group on Recreational Fisheries Surveys	WGRFS	Kieran Hyder, UK and Keno Ferter, Norway	2017	2019	pending report	pending report
19	Workshop on Scale, Otolith Bio-chronology Archives	WKBioArc	Deirdre Brophy, Ireland, and Martha Robertson, Canada	2019	2020	pending meeting	pending meeting
20	Working Group on SmartDots Governance	WGSMART	Julie Coad Davies, Denmark and Jane Aanestad Godiksen, Norway	2018	2021	pending meeting	pending meeting
21	Workshop proposal: Integrating human dimensions into the management of marine recreational fisheries	WKHDR	Christian Skov, Denmark, Harry V. Strehlow, Germany, and Kieran Hyder, UK	2019	2019	pending meeting	pending meeting
22	Working Group on DATRAS Governance	WGDG	Ingeborg de Boois, Netherlands	2019	2019	5	4
23	Workshop on Better Coordinated Stomach Sampling	WKBECOSS	Izaskun Preciado, Spain, and Stefan Neuenfeldt, Denmark	2019	2019	pending report	pending report
24	Working group on machine learning in marine science	WGMLEARN	Ketil Malde, Norway, and Jean-Olivier Irisson, France.	2019	2021	19	11
25	Third Workshop on Optimization of Biological Sampling	WKBIOPTIM3	Ana Cláudia Fernandes, Portugal and Eirini Mantzouni, Greece	2019	2019	pending report	pending report
26	Working Group on Technology Integration for Fishery-Dependent Data	WGTIFD	Brett Alger, United States and Lisa Borges	2019	2021	30	13

	EG name	EG Acronym	EG Chair	Year start	Year end	Number attending (2018)	Number of countries (2018)
27	Working Group on Surveys on Ichthyoplankton in the North Sea and adjacent Seas	WGSINS	Norbert Rohlf, Germany	2019	2021	Pending	Pending
28	Workshop on Index Calculation based on DATRAS	WKICDAT	Holger Haslob, Germany	2019	2019	pending report	pending report
29	Workshop on scrutinizing of acoustic data from the IESSNS survey	WKSCRUT2	Jan Arge Jacobsen, Faroes and Age Høines, Norway	2019	2019	pending report	pending report
30	Workshop on Herring Acoustic Spawning Surveys	WKHASS	Pablo Carrera, Spain,	2019	2019	pending meeting	pending meeting
31	Third Workshop on Age Reading of European and American Eel	WKAREA3	Françoise Daverat, France, Isabel Domingos ,Portugal, and Kélig Mahé, France,	2019	2019	pending report	pending report
32	Workshop on the Realignment of the Ecosystem Observation Steering Group	WKREO	Sven Kupschus, UK, Matthias Kloppmann, Germany, Olavi Kaljuste, Sweden, and Colm Lordan, Denmark	2019	2019	pending meeting	pending meeting
33	Workshop on unavoidable survey effort reduction	WKUSER	Stan Kotwicki, US, Carl O'Brien, UK, and Wayne Palsson, USA	2020	2020	pending meeting	pending meeting
34	Workshop on evaluating survey information Celtic Sea gadoids	WKESIG	David Stokes, Ireland	2019	2019	pending report	pending report
35	Workshop on Impacts of planned changes in the North Sea IBTS	WKNSIMP	Kai Wieland, DK	2019	2019	14	7
36	Workshop on the development of practical survey methods for measurements and monitoring in the mesopelagic zone	WKMESOMeth	Ciaran O'Donnell, Ireland, and Gavin Macaulay, Norway	2019	2019	37	16
37	Workshop on age validation studies of small pelagic species	WKVALPEL	Javier Rey, Spain, Kelig Mahé, France, and Pierluigi Carbonara, Italy	2019	2019	pending meeting	pending meeting

Expert groups under Fisheries Resources Steering Group

	EG name	EG Acronym	EG Chair	Year start	Year end	Number attending (2019)	Number of countries (2019)
1	Arctic Fisheries Working Group	AFWG	Daniel Howell	2017		26	7
2	Herring Assessment Working Group for the Area South of 62° N	HAWG	Valerio Bartolino - Susan Mærsk Lusseau	2018	2020 - 2019	35	8
3	Inter-benchmark protocol on Sole (<i>Solea solea</i>) in divisions 7.f and 7.g (Bristol Channel, Celtic Sea)	IBP-Brisol	Noel Cadigan	2019	2019	7	5
4	Inter-benchmark Process for West of Scotland Cod in 6.a	IBPCod6.a	Poul Degnbol	2019	2019	11	3
5	Inter-benchmark of Hake (<i>Merluccius merluccius</i>) in subareas 4,6 and 7 and divisions 3.a,8a-b and 8.d, Northern Stock (Greater North Sea, Celtic Seas and the northern Bay of Biscay)	IBPHake 2019	Michel Bertignac	2019	2019	5	3
6	Inter-Benchmark Protocol for Herring in 6a,7bc	IBPher6a7bc	Richard Nash	2019	2019	10	5
7	Interbenchmark Protocol on assessment model changes for Cod (<i>Gadus morhua</i>) in	IBPNEACod 2019	Daniel Howell	2019	2019	7	4

	EG name	EG Acronym	EG Chair	Year start	Year end	Number attending (2019)	Number of countries (2019)
	subareas 1 and 2 (Northeast Arctic)						
8	Interbenchmark Workshop on the assessment of north-east Atlantic mackerel	IBPNEAMac	Niels Hintzen	2019	2019	30	10
9	Interbenchmark protocol on saithe (<i>Pollachius virens</i>) in subareas 4, 6 and Division 3.a (North Sea, Rockall and West of Scotland, Skagerrak and Kattegat)	IBPNSsai	Daniel Howell	2019	2019	6	4
10	Inter-benchmark Process on sardine in the Bay of Biscay	IBPSardine	tbc	2019	2019	Pending meeting	
11	Inter-benchmark Protocol for sole in the Eastern English Channel	IBPsol7d	Raphael Girardin	2019	2019	8	4
12	Inter-Benchmark Protocol on reference points for Western Horse mackerel (<i>Trachurus trachurus</i>) in Subarea 8 and divisions 2.a, 4.a, 5.b, 6.a, 7.a-c,e-k (the Northeast Atlantic)	IBPWHM	Andrew Campbell	2019	2019	Pending meeting	
13	Joint NAFO/ICES Pandalus Assessment Working Group	NIPAG	Ole Ritzau Eigaard - Brian Healey	2019 – 2018	2021 - 2019	Pending meeting	
14	Northwestern Working Group	NWWG	Kristján Kristinsson	2018	2020	19	4

EG name	EG Acronym	EG Chair	Year start	Year end	Number attending (2019)	Number of countries (2019)
Assessment Working Group on Baltic Salmon and Trout	WGBAST	Stefan Palm	2017	2019	26	9
Baltic Fisheries Assessment Working Group	WGBFAS	Mikaela Bergenius	2019	2021	33	9
Working Group for the Bay of Biscay and the Iberian Waters Ecoregion	WGBIE	Ching Villanueva - Lisa Readdy	2019 – 2017	2021 - 2019	22	6
Working Group for the Celtic Seas Ecoregion	WGCSE	Sofie Nimmegeers - Timothy Earl	2019 - 2017	2021 - 2019	28	5
Working Group on the Biology and Assessment of Deep-sea Fisheries Resources	WGDEEP	Elvar Halldor Hallfredsson - Pascal Lorange	2018 – 2014	2020 - 2019	21	8
Working Group on Science to Support Conservation, Restoration and Management of Diadromous Species	WGDIAD	Dennis Ensing - Hugo Maxwell	2018 - 2019	2020	7	4
Joint EIFAAC/ICES/GFCM Working Group on Eels	WGEEL	Alan Walker	2013	2019	41	17
Working Group on Elasmobranch Fishes	WGEF	Paddy Walker - Samuel Shephard	2017	2019	26	8
Working Group on Southern Horse Mackerel, Anchovy, and Sardine	WGHANSA	Alexandra (Xana) Silva	2018	2020	Pending meeting	

EG name	EG Acronym	EG Chair	Year start	Year end	Number attending (2019)	Number of countries (2019)
Working Group on Mixed Fisheries Advice	WGMIXFISH-ADV	Claire Moore	2019	2021	Pending meeting	
Working Group on Mixed Fisheries Advice Methodology	WGMIXFISH-METH	Claire Moore	2018	2020	15	7
Working Group on North Atlantic Salmon	WGNAS	Martha Robertson	2018	2020	30	11
Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak	WGNSSK	José De Oliveira	2016	2019	30	8
Working Group on Widely Distributed Stocks	WGWIDE	Gudmundur J. Oskarsson	2017	2019	Pending report	
Benchmark Workshop on Baltic Cod	WKBALTCOD	Johan Lövgren - Joakim Hjelm - Michele Casini	2019	2019	51	9
WK on Evaluation of certain provisions of a draft Baltic salmon MP	WKBaltSalMP	Stefan Palm - Timothy Sheehan	2019	2019	Pending meeting	
Workshop to scope the physical loss pressures on the seabed D6C1/C4- from methods to operational data products	WKBEDLOSS	Steven Degraer	2019	2019	19	11

EG name	EG Acronym	EG Chair	Year start	Year end	Number attending (2019)	Number of countries (2019)
Workshop to evaluate and test operational application of human activities causing physical disturbance and loss to seabed habitats (D6C1-C4)	WKBEDPRES2	Philip Boulcott	2019	2019	Pending meeting	
Benchmark Workshop on Celtic Sea Stocks	WKCELTIC	Jonathan White - Ana Ribeiro Santos	2019	2020	19	5
Benchmark Workshop for Demersal Species	WKDEM	Daniel Howell	2019	2020	Pending meeting	
Workshop on Data-limited Stocks of Short-lived Species	WKDLSSLS	Andrés Uriarte - Mollie Elizabeth Brooks	2019	2019	21	5
The second Workshop on Designing Eel Data Call	WKEELDATA2	Cedric Briand - Jan-Dag Pohlmann	2019	2019	8	3
Workshop for the review of the scientific basis for a UK non-detriment finding (NDF) for the international trade in European eel, in relation to CITES legislation	WKEELNDF	Eugene Nixon	2019	2019	7	5
Workshop on the design and scope of the 3rd generation of ICES Ecosystem Overviews	WKEO3	Henn Ojaveer - Mette Skern-Mauritzen	2019	2019	21	9
Benchmark Workshop for Flatfish stocks in the North Sea and Celtic Sea	WKFlatNSCS	Timothy Earl - Meaghan Bryan	2019	2020	Pending meeting	

EG name	EG Acronym	EG Chair	Year start	Year end	Number attending (2019)	Number of countries (2019)
Workshop on catch forecasts from biased assessments	WKFORBIAS	Larry Alade - Christopher Legault	2019	2019	Pending meeting	
The second Workshop on guidelines for management strategy evaluations	WKG MSE2	Carmen Fernandez	2019	2019	34	15
Benchmark Workshop on Greater silver smelt	WKGSS	tbc	2019	2020	Pending meeting	
Workshop on evaluation of the adopted harvest control rules for Icelandic summer spawning herring, ling and tusk	WKICEMSE2019	Morten Vinther – Jim Ianelli	2019	2019	8	4
Workshop on an Ecosystem-based Approach to Fishery Management for the Irish Sea	WKIrish6	Mathieu Lundy - Daniel Howell	2019	2019	Pending meeting	
Ninth Workshop on the Development of Quantitative Assessment Methodologies based on LIFE-history traits, exploitation characteristics, and other relevant parameters for data-limited stocks	WKLIFEIX	Carl O'Brien - Manuela Azevedo	2019	2019	Pending meeting	
Workshop on MSE development	WK MSEDEV	Daniel Howell	2019	2019	Meeting December	

EG name	EG Acronym	EG Chair	Year start	Year end	Number attending (2019)	Number of countries (2019)
Workshop on Methodologies for Nephrops Reference Points	WKNephrops2019	Michael Bell	2019	2019	Meeting December	
Workshop on North Sea Management Strategy Evaluation	WKNSMSE2	José De Oliveira	2019	2019	30	9
Workshop on Estimation with the RDBES data model	WKRDB-EST	Nuno Prista - Kirsten Birch Håkansson -	2019	2019	Pending meeting	
Workshop on Populating the RDBES data model (WKRDB-POP)	WKRDB-POP	David Currie - Edvin Fuglebakk	2019	2019	30	17
Stakeholder workshop to disseminate the ICES deep-sea access regulation technical service, and scope the required steps for regulatory purposes	WKREG	Stakeholder workshop to disseminate the ICES deep-sea access regulation technical service, and scope the required steps for regulatory purposes	2019	2019	Meeting in October	
Benchmark Workshop on Rockall haddock had.27.6b	WKROCK	Alexander Kempf - Helen Dobby	2019	2019	6	5
NEAFC Request for harvest control component of long-term MP for Rockall haddock	WKROCKMSE	Quang Huynh	2019	2019	6	5
Workshop on a Research Roadmap for Mackerel	WKRRMAC	Carl O'Brien - Mark Dickey-Collas	2019	2019	8	4

EG name	EG Acronym	EG Chair	Year start	Year end	Number attending (2019)	Number of countries (2019)
Workshop on methods to develop a swept-area based effort index	WKSABI	Workshop on methods to develop a swept-area based effort index	2019	2019	11	6
Workshop for North Atlantic Salmon At-Sea Mortality	WKSalm	Gérald Chaput - Niall Ó Maoiléidigh	2019	2019	24	8
Workshop on the Iberian Sardine Management and Recovery Plan	WKSARMP	Manuela Azevedo	2019	2019	17	3
Workshop on Science with Industry Initiatives	WKSCINDI	Steve Mackinson - Jon Elson	2019	2019	49	12
Workshop on incorporating discards into the assessments and advice of elasmobranch stocks	WKSHARK5	Paddy Walker	2019	2019	17	7
Workshop on standardized data formats for input to assessment models	WKSTOCKADE	James Thorson - Anders Nielsen	2019	2019	Pending meeting	
Workshop on Training for the Transparent Assessment Framework	WKTAF (Galway – Aberdeen)	Arni Magnusson - Colin Millar	2019	2019	24	2
The joint ICES/Probyfish Workshop on identification of target and bycatch species	WKTARGET	Youen Vermard	2019	2019	21	7

Annex 3: ICES publications 2019

Science Impact and Publication Group (SIPG) Members

SIPG Chair: Nils Olav Handegard

Former SIPG Chair: Simon Jennings

External members:

Frederic Serchuk - former National Marine Fisheries Service (NMFS), US

Tara Donaghy - Department of Fisheries and Oceans (DFO), Canada

Morgane Le Gall - Bibliothèque La Pérouse (IFREMER), France

Jan Jaap Poos - Wageningen University (WUR), Netherlands

Antonina dos Santos - Instituto Português do Mar e da Atmosfera (IPMA), Portugal

Secretariat:

ICES Editor – Ruth Anderson; ICES Editorial Assistant – Ffion Bell; ICES Technical Editor – Søren Lund

TIMES since 2000

The ICES Techniques in Marine Environmental Sciences (TIMES) Series offers peer-reviewed, open-access, detailed descriptions of state-of-the art methods and procedures relating to the marine environment. TIMES is intended for use at the laboratory bench, in the field, or on research vessels.

Summary and potential room for improvement

TIMES publishes at very low levels overall.

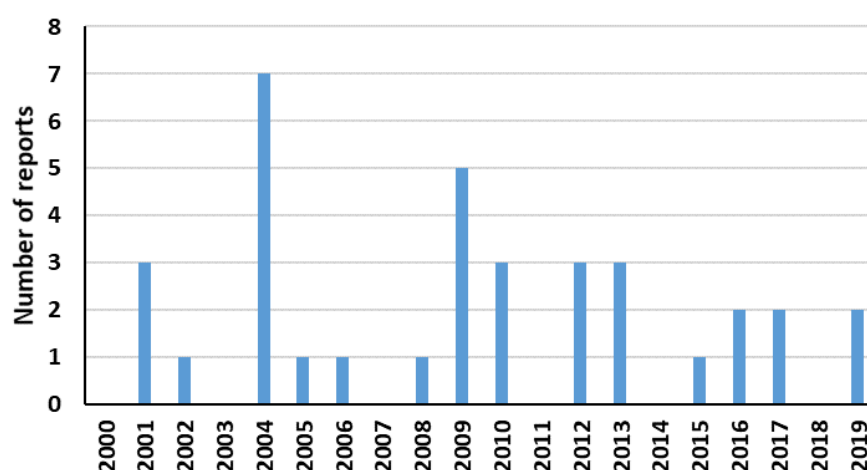
TIMES has historically only been used by a narrow range of ICES WG. This has resulted in a relatively narrow topic scope focused mainly on chemical and biological measurements. The two most frequent key-words are sediments and contaminants.

We should consider:

- A target publication level of 4-5 issues per year.
- Broaden the description of TIMES and advertise it as a publication outlet for other steering groups. TIMES is an ideal outlet for handbooks, protocols, guidelines and best practice manuals.
- Increase the visibility/appeal of TIMES. This will take place in line with the work on all other ICES publications (described in detail below)

Publication levels

The series started in 1987. Since 2000, there have been 34 TIMES reports.

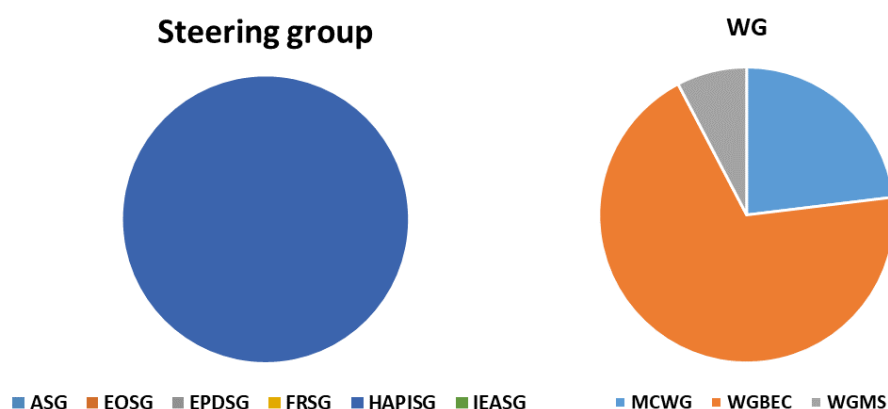


The TIMES Series publishes at very low levels overall. Most years the number of published reports are below levels where having a hired series editor is really warranted, including 6 years with no publications at all.

Proposed aim: raise the number of publications consistently to ca. 4–5 per year.

Authorship by ICES WG

Which WG produced the report can only be tracked since 2012 (17 reports). However, older report likely also mainly group within these WG. There is a very obvious current and historic author base for TIMES.



Authorship by author, country and institution since 2000

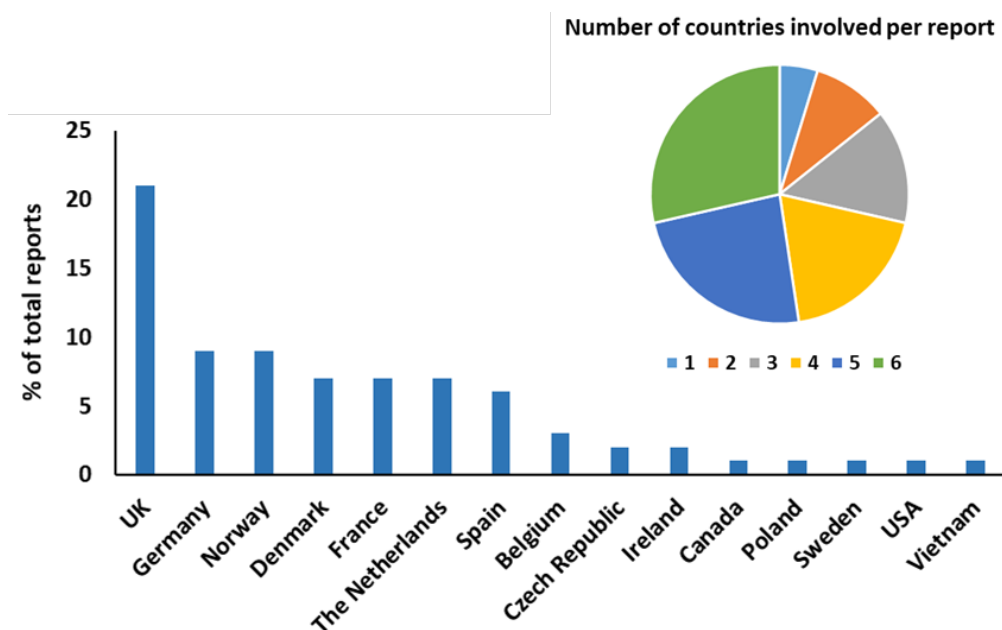
Authors: 132. Only 12% authors have authored more than 1 TIMES report.

Author institutional affiliation: 43 institutions. Top three: Cefas (16 reports), Marine Scotland (7 reports) and IFREMER (7 reports).

84 % of institutions have only been involved in one report. 80 % of reports resulted from the collaboration of 2+ institutions

Countries: 15. The UK clearly dominates the author base. More than half of ICES member countries have published few or no TIMES reports.

Reports tend to be the product of large international collaborations (4+ countries), or national efforts (authors belong to only 1 country).



Impact

We don't currently have a way of reliably measuring how much TIMES reports are used by the scientific community, inside or outside of ICES. Informal enquiries have created a general impression that TIMES is not well known outside of ICES.

Aim: Increase visibility and use of TIMES, and concurrently establish ways of tracking usage.

Already achieved: TIMES reports have been assigned a doi and their metadata has been expanded to improve how easy they are to find in ICES library.

Next steps: (i) update the TIMES website to make it more useful to readers and potential authors; and (ii) assess which additional platforms could be used for uploading and disseminating TIMES (e.g. listing in Scopus, and/or ICES publications sites on Researchgate or Academia).

Annex 4: Science highlights

Science highlights are used to draw attention to the most impactful and societally relevant science from our ICES network. Highlights serve to raise awareness of the breadth and impact of our scientific activity and expertise and to demonstrate the importance of our science for understanding marine ecosystems and securing their sustainable use. Ideally, the highlights are newsworthy because they are based on a very recent or forthcoming finding and supported with accessible images and a short biography of the scientist(s) conducting the work. Highlights are used to promote ICES science on the web and in printed and spoken communication targeted to the network and beyond. Highlights are, for example, used by the Communications Team in ICES and by communications teams in national laboratories to develop stories, news releases and tweets on work in ICES network. Science highlights are directly solicited by the ICES Communications Team or provided via a SharePoint interface. In 2020, fixed-term working groups will also be asked to identify highlights in the interim and final e-evaluation forms.

ICES Secretariat have been leading the development of several topical science highlights series. Each series involves 5+ expert groups, and the contribution from each group is short format - one paragraph and a corresponding figure. ICES will aim to publish 3-4 of these well-defined topical series per year.

The first series in this new format "[Maintaining the continuity of long-term data sets](#)" was published in mid-July 2019 with 8 expert groups participating:

The second series "The future of aquaculture" is currently in progress, and we anticipate publication towards the end of 2019.

The third series in this new format is the "The changing Arctic" and contributions are being solicited and ICES is seeking to garner bottom-up support for the topic.

The fourth series is currently under development, and will focus on ICES work related to the societal outcomes of the United Nations Decade of Ocean Science.

In addition to these well-defined topical series, the Secretariat are also developing three ongoing series for broader participation by expert groups that we plan to introduce at the next WGCHAIRS meeting. These will be ongoing series with broad themes, so that most expert groups should be able to participate in at least one of these series. The proposed three topics are:

- Biodiversity – a showcase of the species that ICES groups study, from the microscale to the macroscale.
- In the field – unifying current stories that convey the broad range of ecosystems where ICES works and the technology that our groups use in the field.
- In Other Words – revival of an old series that was devoted to clarifying important terms and phrases used in the ICES community.

We will also be adding more highlights focused on our early career support. This will be especially useful in the summer before the 2020 ASC, as this will serve to highlight both our ECS support and promotion of the ASC. These stories will be unified with

repeated banner styling, include highlights of the scientific work, and can be used for both ASC and to highlight other ECS support that ICES provides for other co-funded symposia.

Annex 5: Benefits of engaging with ICES Expert Groups

It is essential to continue to attract new participants into our expert groups, and in particular to effectively reach out to scientists and institutes that have not previously been part of the ICES community. For these reasons, SCICOM undertook a project to define the benefits of engaging with ICES. The benefits identified are described in this Annex. The material that has been created was used in handouts at the 2019 ASC and will be added to the updated ICES website in 2020. The material has been complemented with a series of personal stories about how scientists benefitted from their engagement in ICES, as developed by ICES Communications.

Benefits of joining an ICES expert group

What are expert groups?

Expert groups are international groups of scientists who work together to develop scientific ideas and run and review scientific analyses. Expert groups are at the heart of ICES and play a critical role generating the science and analyses that further understanding of marine ecosystems and provide the basis of ICES advice on the state and sustainable use of our seas and oceans.

What will you do in expert groups?

In expert groups you will work with other scientists from a range of institutes and countries to develop scientific ideas and run and review scientific analyses. The direction of your work will be guided by a series of pre-agreed questions and tasks known as terms of reference. Activities in the groups include solving scientific questions; reviewing scientific work conducted inside and outside the group; data collation, analysis and interpretation; developing and applying methods; and writing up and reviewing the groups' activities for papers and reports. You may also contribute to planning future activities and meetings of the group, and developing proposals or events linked to the expert group. Your contributions to the group are guided by the chair, based on your expertise and interests.

How do you join an expert group?

Please contact the current chair(s) of the expert group that interests you, or contact the ICES secretariat, and they will guide you.

Who can join an expert group?

Members of expert groups are predominantly scientists from ICES member countries, but scientists from other countries are often welcomed. These are scientific groups, so everyone who joins should act with scientific independence, integrity, and impartiality. ICES strives to be an inclusive organization, and expert groups have an important role increasing opportunity and providing mentorship, so group members are recognised for their expertise, behaviours, and contributions, rather than their affiliations.

How might you benefit from joining an expert group?

The four main benefits of engaging in an ICES expert groups come from the opportunities they provide to strengthen your science, develop your networks, increase the impact of your work and learn new skills. The ICES community also benefits from new expert group participants because you bring a greater diversity of ideas and approaches, grow the scope of the ICES community and ultimately strengthen marine science and advice.

Strengthening your science

Expert groups help you to develop scientific ideas, learn new methods and approaches, provide international review and scrutiny of your science and understand state-of-the-art in many areas of marine science. Going forward you may have opportunities to steer the direction of future work of these international groups, perhaps supporting the development of new collaborations or events.

Developing your networks

Expert groups working in your areas of interest help you to quickly build an international network of collaborators, which will often simplify the development of future projects and funding proposals as well as providing career opportunities. More widely, by being part of ICES, you connect to a broad marine science community spanning 20 member countries and beyond.

Publishing your science

Expert group members often publish together. Outputs include reports co-authored by group participants and published in the “ICES Scientific Reports” series, as well as peer reviewed papers, ICES Co-operative Research Reports and code or technical publications. Many expert groups make specific commitments to publish in their terms of reference.

Increasing your impact

One of ICES main roles is to provide advice on meeting conservation, management and sustainability goals. The national and international recipients of this advice often have direct responsibility for management of human uses of the seas and oceans. Expert groups provide the science on which this advice is based, so the science done in your expert group can have substantial societal impact.

Learning new skills

Expert groups provide many opportunities to mentor, and to be mentored, and to exchange ideas and skills with a diverse international group. Expert groups provide opportunities to present, develop and defend scientific work in a collaborative, respectful and rewarding working environment, and to understand the wider significance of any step in knowledge development.

Annex 6: ICES co-sponsored symposia

Year	Date	Title	Resolution no	Venue	Conveners	Co-sponsors	Support/Comment	publication	ICES SUPPORTS & work order
2020									
2020	11-15 October	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, AFMA, IMAS	Financial support of €10,000 to fund travel support for early career scientists. ICES IT support	The WFC2020 International Program Committee Chairs are currently exploring options for publishing proceedings from the Congress.	Julie Kellner & Anna Davies (1071-49)
2020	25-29 May	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)
2020	10-13 May	Oceans Past VIII Conference	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); Support an ECS networking event during the	IJMS not requested	Julie Kellner & Malene Eilersen (1071-50)

Year	Date	Title	Resolution no	Venue	Conveners	Co-sponsors	Support/Comment	publication	ICES SUPPORTS & work order
							conference (€2,000) and; Subsidise travel costs for two keynote speakers to attend from underrepresented countries further afield (€2,000)		
2020	21-23 April	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 (10-71-45)
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 the SCICOM chair and the new Fisheries Resources Steering Group	IJMS not requested	Julie Kellner, Anna Davies & Malene Eilersen (1071-47)

Year	Date	Title	Resolution no	Venue	Conveners	Co-sponsors	Support/Comment	publication	ICES SUPPORTS & work order
							chair that will be attending the symposium. Financial support of €10,000.00 has been approved by SCICOM for early career scientists.		
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. IT Support: Secretariat support setting up a web page, handling abstract submissions and registration of participants, as well as general support for the symposium.	IJMS requested	Julie Krogh Hallin, Henrik Larsen, & Terhi Minkkinen (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 possibly other sponsors (NOAA , PAME, AMAP,	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/Comment	publication	ICES SUPPORTS & work order
						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		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