Council Meeting 2019

October 2019

Del-Doc 3.3

Agenda item 3.3

Supporting the implementation of the ICES Strategic plan 2020-2024: Equity Investments

Council is requested to consider and approve this proposal for investing funds from equity in the organization, in support of the implementation of the ICES Strategic Plan.

Council should note:

- *Investments in the further development of systems (Transparent Assessment Framework, Regional Database etc) related to quality assured production of advice are an essential support to the continuation of work in the Secretariat, facilitating the work of the Community in this area, and prioritized in the forthcoming Advice Plan*
- *That a cost share, between ICES and advice requesters, is suggested for all equity investments, in the order of 55% to be covered by ICES and 45% to be covered by intergovernmental advice requesters. This cost sharing arrangement will be part of the negotiations in connection with revisions of MoUs/negotiations of new agreements*
- *That investments to support various meetings, travels, training (ICES/PICES Early Career Scientists Conference, support to Strategic Initiatives, etc)s, and infrastructure scoping, is in line with the Science Plan, and will support the work of the community in delivering the plan*
- *That the proposal is based on the estimated equity, following the auditing of the 2018 accounts, as well as taking into account earlier decisions to allocate funds from equity until 2022.*

Council is invited to give the General Secretary a mandate to negotiate the suggested share key with IGO advice requesters, in the current work on updating existing and developing new MoUs

Summary

In 2019 ICES launched a new rolling strategic plan, as well as an elaborated Science Plan and an Advisory Plan is forthcoming. As a whole, these plans are ambitious and will demand a great deal of effort from the ICES community to deliver. Delivering on these plans will also require resources beyond what is currently available within the planned investments and funding streams available to ICES. For this reason, the ICES Coordination Group have developed a prioritized list of areas, and specific deliverables that would benefit from a strategic investment from ICES equity, which have been considered and supported by Bureau.

Priorities

A brief summary of the main priorities, grouped by the Strategic Plan headings.

Strategic plan/Science plan, Working together – building a more comprehensive and influential network – and consideration of our CO2 footprint:

> International collaboration is a fundamental part of ICES mission, and has been emphasized with the UN observer status, work in the Arctic and new legal instruments in Areas Beyond National Jurisdiction (ABNJ), it is therefore paramount to build on existing and new relationships to support this. Through continuation of the 2017 – 2019 allocation for Strategic Initiatives, including climate change and the human dimension and including funds to cover ICES representation in meetings, e.g. chairing sessions at PICES annual conferences.
>
> Ensuring that new experts are appropriately skilled and entering the ICES network has been a continuous challenge. Therefore, investment in building capacity in the network is key. By the development of a conceptual approach to the training course work, in cooperation with European and North American Universities, and through co-funding of the 2022 ICES/PICES Early Career Scientist Congress, ICES will attract Master and PhD Students into the network. For existing activities, and as a contribution to minimizing the carbon footprint of the ICES community, training investments will be made in remote meetings for chairs and facilitators, as well as a review of our remote meeting capacity.

Advisory plan (AP), Assuring quality **(AP.1)** and Sharing Evidence **(AP.4**):

> Continue the development of a comprehensive ICES quality management system for advice including implementing Regional Data Base and Estimation System (RDBES), Transparent Assessment Framework (TAF), etc. that will, where possible, ensure that all advice products are based on data that adhere to the FAIR[1] principles. This activity will support the preparation of the ICES advisory system for an international quality accreditation and sharing evidence **(AP.4)**;
>
> In dialogue with clients, design and develop a user friendly and dynamic web platform for ICES advice. Develop web-based advice content that includes several levels/layers (incl. popular advice, forecast options, full advice); and also enables presentation of advice in an effective and consistent format across platforms.

1 https://www.force11.org/group/fairgroup/fairprinciples

Table 1. Resources required

Negotiations with advice requesters during 2020, aiming for share key; ICES 55% and IGO advice requesters 45%, according to the document "Temporary calculations of costs for providing advice". All figures are presented in Danish Kroner. The annual costs will be shared based on a rolling (past) 5-year average of the equity investments divided according to the 55/45 principle. See table 4 (p. 12)

Reference to Advisory Plan (AP)	Reference to table 2, Deliverables (Del) and timing	**Human Resources**	**2020**	**2021**	**2022**	**2023**	**2024**	**Total**
AP.1 Quality Assurance	**Del 1-6**	**Developer** Computer scientist with proven experience in software development life cycle;	433,000	433,000	433,000	433,000	-	1,732,000
		Developer Computer scientist with proven experience in software development life cycle;	433,000	433,000	433,000	433,000	-	1,732,000
AP.4 Sharing Evidence	**Del 7-9**	**Technical Project Manager** Technical science background with proven project management experience		434,000	434,000	-	-	868,000
		Technical Science Stock assessment expertise with strong coding, automation and technical knowledge	605,000	605,000	605,000	605,000		2,420,000
		SUB TOTAL	**1,471,000**	**1,905,000**	**1,905,000**	**1,471,000**	-	**6,752,000**

Reference to Science Plan (SP)	Reference to table 2, Deliverables and timing	Activities; Meetings, Travel, Training and Infrastructure	**2020**	**2021**	**2022**	**2023**	**2024**	**Total**
	Del 10	4th ICES/PICES Early Career Scientist Congress (co-funding: ECS travel support – competitive awards, invited speakers and representatives)	-	-	500,000	-		500,000
	Del 11 and 13	Support to Strategic Initiatives, incl. developing cooperation with strategic partners (e.g. PICES, CIESM, IOC, CBD NAFO, new RFMOs) - co-chairing event sessions, participation in workshops, expert panels etc	175,000	175,000	175,000	175,000	175,000	875, 000
	Del 12	Bring academic leaders from ICES member countries together to develop multidisciplinary, multi-institutional coursework, research opportunities and scientific personnel exchanges which will build capacity for meeting future science-based advisory needs. Initial steps will include 1-2 workshops. Deliverable will be a general curriculum with specific course offerings.	100,000	100,000	300,000			500,000
	Del 14	Training for chairing, running, and supporting remote meetings	50,000	50,000	50,000			150,000
		SUB TOTAL	**325, 000**	**325, 000**	**1,025, 000**	**175, 000**	**175, 000**	**2, 025,000**
	Del 14	Report on review of remote meeting facilities at ICES, and recommendations	75,000	-				75,000
		SUB TOTAL	**75,000**	**-**	**-**	**-**	**-**	**75,000**
	Total Equity Requested							**8,852,000**

Table 2 Deliverables and timings

Del	Description	2020	2021	2022	2023	2024
QA and QC of Fisheries independent and dependent data						
1	Assist acoustic survey groups in using the ICES TAF for their abundance indices estimates that are used in stock assessments					
2	Align the DATRAS (biotic) and the Acoustic (biotic) format					
3	Redesign and new functionality on DATRAS web portal, including an updated data screening facility					
4	Fully operational ICES Regional Database (RDBES) with a regional estimation system such that statistical estimates for stock assessment can be produced from detailed sample data in a transparent manner					
5	Incorporate detailed data on Bycatch and PETS AND/OR Recreational data (to be determined by SC-RDB)					
QA and QC of Assessment						
6	200 unique stocks available in TAF					
7	Managed through TAF, functioning system and QA process to enable transparent documented reviews of data and code behind stock assessment results					
Dissemination of Advice						
8	Publish a web-based advice that includes several levels/layers (incl. popular advice, forecast options, full advice); and enables presentation of advice in an effective and consistent format					
9	Ecosystem overviews based on principles of web-based advice, using automation, FAIR principles and scripting for a consistent and recurrent product					
Cooperation and capacity building in ICES network						
10	Successful delivery of ICES/PICES Early Career Scientists Conference					
11	Successful arrangement of Regional Workshop North Atlantic under the UN Decade of Ocean Science					
12	Delivery of a general curriculum with specific course offerings. at European and North American Universities areas as initial steps in developing multidisciplinary, multi-institutional coursework, research opportunities and scientific personnel exchanges which will build capacity for meeting future science-based advisory needs.					
13	First approach to global ocean prediction frameworks through ICES/PICES collaboration under SICCME					
ICES in a sustainable future						
14	Implementation of CO_2 footprint reduction plan					

Annotations to deliverables

QA and QC of Fisheries independent and dependent data (Del 1-5)

For fisheries independent data, the deliverables will be closely monitored and reviewed by governance groups WGDG (for DATRAS trawl survey data), and the acoustic governance group which is proposed to be established in the Autumn of 2019. For fisheries dependent data, with the aim of having the new RDBES as the only ICES data management system, the deliverables will be tracked by the SC-RDB working group. These deliverables are seen as part of addressing in part the issues highlighted in the ACOM document[1] "Towards a Quality Assurance Framework for ICES Advice". Some of the most substantial corrections to advice have been due to either errors in estimations, or estimations that are not fully calculated/documented within the system. In both cases, the deliverables described here will reduce the likelihood of such errors in the future. In addition, bycatch and recreational data have been dealt with in a fragmented way, and there is a strong desire both from the working groups delivering assessments, ACOM and SC-RDB to address these consistently through the RDBES.

QA and QC of Assessment (Del 6-7)

For TAF, a governance group will be proposed to be established in 2019. Engagement from assessment scientists, advice stakeholders, data aggregators and statistical specialists (among others) will be intrinsic to the running of TAF. The first deliverable to be overseen by this governance group is to achieve the goal of having all annual stock assessments working from within TAF, currently there are 99 assessments in TAF representing ca. 70 unique stocks. This deliverable relies on many aspects of TAF development, such as, ease of use of the system, utility of the system, availability of suitable training materials, and improvements to user workflow. As such, this deliverable targets a wide range of aspects of TAF development.

Both the "Towards a Quality Assurance Framework for ICES Advice" document and the Quality Assurance Framework that is described within this highlight the critical need to go beyond documenting and reproducing in a transparent way. Providing a formal framework and controlled process in which reviews of data and code can be documented will provide more formal quality control and assurance of both data and code behind ICES stock assessments. This would mean that all code used in ICES stock assessments would be subject to review and a quality stamp. Until now, this has been less coordinated or assumed to be intrinsic to the way an assessment group reviews its work, however this needs to be captured in a defined process and a workflow that ensures data and code are reviewed.

Dissemination of Advice (Del 8, 9)

Highlighted in the Advisory plan (Sharing Evidence AP.4), deliverable (8) touches on two aspects to an effective web presence for advice dissemination – a visible and easy to use platform, and engaging and dynamic content. In dialogue with clients, design and develop a user friendly and dynamic web platform for ICES advice (either through the ICES website, or in parallel). Furthermore, develop a web-based advice that includes several levels/layers (incl. popular advice, forecast options, full advice); and also enables presentation of advice in an effective and consistent format. The ecosystem overviews are moving from expert qualitative

[1] http://community.ices.dk/Committees/Bureau/2019/Bureau_meeting_257_June/Meeting_docs/2019-06_Bur_Doc_2134_Quality_Assurance_Advice.pdf

compilations to data driven quantitative assessment of the ecoregions.
This suite of products will greatly benefit from the processes and technical developments in deliverable 8, and therefore moving ecosystem overviews to this platform is a key goal (deliverable 9).

Cooperation and capacity building in ICES network (10-13)
4th ICES/PICES Early Career Scientist Congress: the fourth edition of the conference will be organized by ICES, PICES and the hosting organization (tbc). The allocation supports early careers with travel grants, based on competitive awards. It will also support invited speakers and representatives. The SICCME chairs are yet to be confirmed, therefore the scope of this deliverable might change, depending on the new SICCME ToRs – to be agreed by the new chairs and presented to SCICOM in March 2020.

ICES in a sustainable future (Del 14)
Based on current trends and requests from the ICES community, the CO2 footprint reduction plan will include feasibility analysis of effectively combining face-to-face and remote participation in ICES meetings. Individual groups and committees need to be equipped with tools and knowledge to run their meetings, ICES should consider advantages and potential disadvantages of relevant investments to make this possible.

Background details

Advisory plan (AP), Assuring quality (AP.1) and Sharing evidence (AP.4)

ICES is investing extensively in the development of systems and tools to ensure that the scientific advice outputs, Ecosystem and Fisheries overviews to name a few, are built on data (both input and output) that have been quality controlled, and are made available to the assessment process and any client scrutinization. The advice clients have recognized and appreciate this effort, and although there are ongoing challenges, such as looking at the underlying statistical models used in assessment, the development is going in the right direction. At the same time, advice clients are pressing for more tools, such as dynamic forecasting through a web interface, and different ways to package and visualize the advice (such as via a map viewer). This places a greater demand on ICES to produce advice through structured and linked content that can be served up across web platforms – pdf documents will no longer alone satisfy the advice and stakeholder communities.

The funding for these developments has so far come from a variety of sources, including ICES equity, EU Commission special requests, EU Commission Grant Agreement, and Horizon 2020 projects. With the revision of all of the new and existing client agreements, the role of QA – and the systems that are needed to provide it, are all being suggested by ICES to be included in the revised MoU's/Grant agreements.

The challenge remains in how to apportion development costs (which precludes maintenance and hosting) of these systems to the clients. We are therefore now in a situation where existing funding for development of these systems will be exhausted by the end of 2019/beginning of 2020. The development plan of all of these systems goes beyond 2019, thus funding must be found to continue these essential developments. Table 3 Key ICES systems to support Advice production, highlights four of the major systems/frameworks that are used in Advice production, where ICES is gaining some of the biggest improvements in quality assurance and the reduction in corrections of advice (once fully implemented) will be the result. For each of the systems a timeline from 2020 to 2024 is described where we demonstrate the current funding situation and how this will be phased to a cost sharing through client agreements starting in 2020.

The human resources would be on a 2+2 year contract to mitigate the risk of the planned scaling of development costs being included in client agreements not being accepted, or accepted on the timeline proposed. This is the principle that was used for the equity funding for the TAF developments, ensuring that Bureau have a mid-point review of the activities against the deliverables and can give input to changes in resourcing/priorities to ensure delivery over the 4 years.

Table 3 Key ICES systems to support Advice production

System	2019	2020	2021-2024
RDBES	ICES Equity + DG MARE (funding will be used by end of 2019)	Proposed ICES Equity and Included in client frameworks through cost sharing agreement)	Proposed ICES Equity and Included in client frameworks through cost sharing agreement)
TAF	ICES Equity	ICES existing Equity (funding used by March) Proposed ICES Equity and Included in client frameworks through cost sharing agreement)	Proposed ICES Equity and Included in client frameworks through cost sharing agreement)
Acoustic Portal	H2020 (funding will be used by July). Some bridging possible with H2020 MEESO project	Proposed ICES Equity and Included in client frameworks through cost sharing agreement)	Proposed ICES Equity and Included in client frameworks through cost sharing agreement)
DATRAS	DG MARE	Proposed ICES Equity and Included in client frameworks through cost sharing agreement)	Proposed ICES Equity and Included in client frameworks through cost sharing agreement)

Working together – building a more comprehensive and influential network, including attracting a new generation of experts:

Cooperation with strategic partners, and through the ICES Strategic Initiatives

ICES has been working to build strategic partnerships for many decades, recognizing that ocean science goes beyond national borders. This is part of the ICES mission, and has also been emphasized with the recently acquired UN observer status.

A number of regularly occurring and new arrangements will provide important opportunities for cooperation with strategic partners.

To follow-up the IOC initiated UN Decade of Ocean Science, and the first global meeting in Copenhagen in May, a number of regional workshops will be arranged, one of them for the North Atlantic. Canada has expressed its interest in arranging the North Atlantic Regional Workshop, as has EC DGRTD. ICES has also stated that we are interested in contributing, and in this way ensure that our Strategic, Science, and Advisory plans will be reflected. The regional workshop has been scheduled for January 2020.

With the warming of the ocean, and the potential for expansion of Boreal fish stocks outside their traditional stock area, it is important to compile all information using the same approach and format. ICES has already developed the Ecosystem Overviews, which has been used for the Icelandic Waters, Norwegian Sea, Barents Sea, and which is planned for the Central Arctic Ocean and the Eastern Greenland Waters. With the recently concluded *Agreement to Prevent Unregulated High Seas Fisheries in the Central Arctic Ocean* it will be important to deliver an almost complete overview of the adjacent sea areas to the Central Arctic Ocean from the North Atlantic gateway and offer a suggested format for inclusion of adjacent sea areas from the North Pacific gateway. This will require cooperation with NAFO for the western Greenland waters, with the Russian Federation for the Russian waters, and with PICES for the North Pacific gateway.

In order to manifest the importance of the Ecosystem Overviews, information on climate change and climate change scenarios (species distribution, vulnerability of fish stocks to climate change, and impact on spawning areas from fishing activities), as well as socio-economic impacts will be included. Furthermore, once climate change knowledge achieved through expert groups, workshops and symposia has been synthesized, first approach to global ocean prediction frameworks through ICES/PICES collaboration under SICCME will be taken. This will include standardised ensemble projections of global fisheries and marine ecosystem models under various emission scenarios and a comparative analysis of marine ecosystem responses to climate change. The study will constitute basis for state-of-the-art recommendations to global bodies such as IPCC (with key challenges in scenario development for ocean and coastal systems) and IPBES (with ecosystem-based management strategies and biodiversity scenarios).

For these reasons, requested funds from equity will also continue to support the ICES Strategic Initiatives, including climate change and the human dimensions, to support their Chairs in coordinating efforts and implementing their work plans.

To ensure that we attract a new generation of scientists to the ICES network, we will once again, together with PICES co-organize the 4th Early Career Science Conference in 2022. Similar to the past events the requested funds from equity will be used to cover the costs of the venue, invited speakers, and travel grants for participants (approx 200-250 people).

The equity allocation will also support ICES representation in meetings of strategic importance – supporting on-going science collaboration with long-standing partner organizations like PICES, IOC-UNESCO, CIESM, NAFO, as well as new ones. ICES is asked not only to be represented at these events, but to co-chair sessions and man expert panels. In this way, funding will be available for the ICES community for these assignments.

Furthermore, a conceptual approach to the training course work will be built and tested in 2022, involving European and North American Universities, to be able to offer Master and PhD students courses within ICES core areas. And in this way both attract new and skilled experts to the ICES work.

Strengthening remote meeting and collaboration

Background/ rationale: Communication and collaboration are central to functioning of marine science and advice and also for ICES as an institution. We aspire to be a world-class marine science organisation. We need to ensure we can effectively support communication and collaboration, and that people will continue to engage with our network in coming decades. Against this background, some scientific groups are starting to seriously discuss best practice / restrictions on travel on environmental grounds. Some institutes reporting on GHG emissions, and targets may well be forthcoming. There are societal expectations that groups working on and knowledgeable about climate should be doing their bit if other parts of society are to follow. Individual marine scientists are already commenting on excessive travel requirements to do simple tasks. There are, in some cases, growing national expectations that organisations addressing climate are actively considering it in their own behaviours (credibility risk). Longer term (decades) possibilities of institutional restrictions on air travel, taxation of air travel.

To move towards developing world-class remote meeting facilities and practices- so ICES is, and will remain, the go-to marine science community whether meeting in person or remotely. To establish working practices that put us ahead of the curve and can be used to demonstrate ICES is making a serious contribution to the need to maintain effective communication and collaboration and drive world-class marine science while considering environmental implications of our work. To ensure remote engagement with expert groups meeting in person in Copenhagen is simple and effective and attractive- for both the remote participants and the group meeting with them. To equip expert groups with the knowledge and support to run effective meetings with a mix of in-person and remote attendees.

Mechanisms for effective remote engagement, review of available systems (and options for modifying or supplementing existing systems based on consideration of their strengths/ weaknesses), approaches and costs, projections of demand, and establishing view from ICES community. To consider appropriate balance of in- person and remote meetings and when in-person is most necessary. To consider ICES role as a hub for such meetings. To also consider benefits of better remote meeting systems for maintaining and increasing contact with existing partners and increasing global engagement (ie beyond current ICES member countries). Then decision point to look at pros/ cons of investment and level of investment.

Development of Equity

Table 4. Development of Equity from 2019 to 2024, if all the investments from table 1. are approved, and IGO advice requesters charged 45% of the equity investments, based on a 5-year equity average.

	In total (5 Y)	Aver. Per Year
Average 2015 - 2019	10,012,060.00	2,002,412.00
Member states 55%		1,101,326.60
IGO 45%		**901,085.40**
Average 2016 - 2020	10,795,402.00	2,159,080.40
Member states 55%		1,187,494.22
IGO 45%		**971,586.18**
Average 2017 - 2021	13,292,402.00	2,658,480.40
Member states 55%		1,462,164.22
IGO 45%		**1,196,316.18**
Avarege 2018 - 2022	14,879,402.00	2,975,880.40
Member states 55%		1,636,734.22
IGO 45%		**1,339,146.18**
Avarege 2019 - 2023	14,789,372.00	2,957,874.40
Member states 55%		1,626,830.92
IGO 45%		**1,331,043.48**
Avarege 2020 - 2024	13,221,372.00	2,644,274.40
Member states 55%		1,454,350.92
IGO 45%		**1,189,923.48**

Figure 1. Development of Equity with and without the proposed cost share key (IGO 45%)