DATA AND INFORMATION GROUP (DIG)

VOLUME 5 I ISSUE 4

ICES BUSINESS REPORTS

ICES INTERNATIONAL COUNCIL FOR THE EXPLORATION OF THE SEA
CIEM CONSEIL INTERNATIONAL POUR L'EXPLORATION DE LA MER

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

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

ICES Business Reports

Volume 5 | Issue 4

DATA AND INFORMATION GROUP (DIG)

Recommended format for purpose of citation:

ICES. 2025. Data and Information Group (DIG). ICES Business Reports. 5:4. 46 pp.
https://doi.org/10.17895/ices.pub.29381780

Editors

David Currie

Authors

Mehdi Abbasi • Suzy Angelus • Örjan Bäck • David Currie • Ingeborg de Boois • Taco de Bruin
Côme Denechaud • Laura Hanley • Mark Hebden • Neil Holdsworth • Nasrullah Iqbal
Henrik Kjems-Nielsen • Cecilia Kvaavik • Luca Lamoni • Michael Liddel • Maria Makri • Hong Minh Le
Hans Mose Jensen • Iago Mosqueira • Chris Moulton • Periklis Panagiotidis • Hjalte Parner
Carlos Pinto • Clare Postlethwaite • Jens Rasmussen • Joana Ribeiro • Sjur Ringheim Lid • Helge Sagen
Nori Shoji • Vaishav Soni • Adrian Tait • Nikki Taylor • Rob Thomas • Laura Uusitalo
Harriet van Overzee • Adriana Villamor • Christian von Dorrien • Malin Werner • Marcin Wichorowski
Oliver Williams • Lucia Zarauz

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

Contents

i Executive summary

The meeting of the ICES Data and Information Group (DIG) was convened to progress and finalize ongoing actions to support all data-related work at ICES. Several key areas were advanced during the 2025 meeting, including data governance group self-evaluation, the ICES Data Plan, training, best practices, and the license for using preliminary catch statistics data.

Data governance groups have been key in improving how ICES data is managed, and representatives from the groups were invited to the meeting to: i) encourage communication; ii) highlight progress; and iii) identify any areas where DIG and the governance groups can help each other on shared outcomes. DIG also highlighted a self-evaluation tool and encouraged the groups to make use of it. The Working Group on DATRAS Governance (WGDG) presented a completed example and provided feedback to enhance the tool.

Work began to support the forthcoming ICES Data Plan, specifically proposing several metrics to include in the plan.

DIG also discussed the topic of ICES data calls that request preliminary catch data—the use of these data is restricted, but there is currently no restricted data license that applies to them. A recommendation was made to allow countries to indicate which specific data (if any) is confidential. A new restricted data license for these data was drafted.

The need for data training for expert group chairs and early-career scientists has previously been identified. During the meeting, DIG began to outline the topics that should be covered in this training.

In 2024, DIG endorsed the biological plankton data guidelines on the Ocean Best Practices System (OBPS). OBPS has now proposed a new process for recognizing the ability of selected organizations, such as ICES, to self-endorse their practices and guidelines. DIG has now reviewed this proposal.

ii Expert group information

Expert group name	Data and Information Group (DIG)
Expert group cycle	Annual
Year cycle started	2024
Reporting year in cycle	1/1
Chair	David Currie, Ireland
Meeting venue and dates	20–22 May 2025, Copenhagen, Denmark (41 participants)

1 Introduction

Data and Information Group 2025 report

The 2025 annual DIG meeting was held from 20–22 May at ICES Headquarters in Copenhagen, Denmark. The ICES Secretariat facilitated online participation via Microsoft Teams.

The following terms of reference were addressed during this meeting:

a) Provide guidance and feedback to the ICES Data Centre;
b) Advise on data governance within ICES, and identify any changes required and their impact;
c) Facilitate best practice in data management by providing guidance to expert groups, engaging in dialogue, and supporting the ICES Data Centre CoreTrustSeal accreditation;
d) Evaluate and monitor challenges and opportunities in data management, technology, artificial intelligence, and cybersecurity; and
e) Engage with the ICES community and beyond, to encourage knowledge sharing about data management.

Several key areas were advanced during the 2025 meeting, including governance group self-evaluation, the ICES Data Plan, training, and licensing for preliminary catch statistics data.

2 Recommendations

2.1 Recommendations to DIG

The following recommendations to DIG were considered during the meeting: the ICES Recommendations database was updated with DIG comments.

Number	Year	Source	Recommendation	DIG 2025 Comments
12	2025	WGDG	It is recommended that a spatial overview (in a clickable map) of stock assessment in different ICES areas becomes available, so it is easy to check during a survey which end-users may be affected by, e.g. survey effort reduction or change of sampling grids in an area (from WGBEAM report 2025 paragraph 6.2.2). This is especially useful for multispecies surveys (e.g. IBTS, BIFS, BTS, DYFS, SNS) and also for assessment groups responsible for many stocks (e.g. WGEF, WGNSSK).	DIG agrees this could be a useful tool. The Data Centre can provide guidance on the best way to implement it.

2.2 Recommendations from DIG

The following recommendations from DIG have been identified and have been added to the ICES Recommendations database.

Recommendation	Recipient	Section from the report
DIG recommends that: Data governance groups complete the Data Governance Self-Evaluation Tool. The purpose of this tool is to highlight areas where data governance is strong as well as areas where it can be improved. It is intended to help guide the future work of the data governance groups.	WGAcousticGov, WGJCDP, WGRDBBESGOV, WGSFDGOV, WGSMART, WGELFADG	Section 3.1
DIG recommends that: a) ICES Data Centre make the changes necessary to allow preliminary catch statistics data submitters to identify which rows of the data (if any) are confidential. b) A new restricted data license for preliminary catch statistics is adopted. c) ACOM review what the impacts of the new restricted data license will mean for the catch data published on advice sheets.	ICES Data Centre, SCICOM, ACOM	Section 5, Annex 2

3 Data governance groups

Data governance groups have been a great success story in improving the management of ICES data, and a session was dedicated to them during the 2025 DIG meeting. The aims of the session were: i) to promote the governance self-evaluation tool, and ii) to encourage communication between governance groups, and to identify any areas where DIG and the governance groups can help each other. Each governance group was also asked to make a short presentation.

During the meeting, it was identified that, in addition to attending the DIG meeting, it would be helpful for governance group chairs to engage in dialogue. It was proposed that doing this during the WGCHAIRS meeting could be an ideal moment to avoid introducing new meetings.

Action: DIG chair to arrange a data governance group chair meeting during WGCHAIRS.

3.1 Data Governance Self-Evaluation tool

Starting in 2014, DIG has developed and refined a checklist of topics to evaluate data management and governance of systems or work processes. The relatively comprehensive list encompasses several highly relevant issues for data management and aligns with the internationally recognized Data Management Association's body of knowledge.[1] These topics have been combined into a series of questions that are implemented in an Excel spreadsheet, known as the Data Governance Self-Evaluation Tool. For each question, a score is assigned between 1 (worst) and 5 (best):

1. Poorly controlled and reactive process (figure it out as you go along, no documentation);
2. Reactive but characterized process (e.g. done it several times, but not well documented);
3. Defined: proactive and tailored (documented, specified; a repeated process);
4. Quantitatively managed: measured and controlled (reporting, process for change management, change requests logging, etc.)
5. Optimizing processes: monitoring and analysing to implement improvements (proactive identification of bottlenecks, performance, etc.)

Questions are grouped within the following topics:

- Architecture and Governance
- Data Development
- Database Operations
- Data Security
- Reference and Master Data Management
- Data Discoverability
- Document and Content Management
- Metadata Management
- Data Quality Management
- Compliance with FAIR principles

It is useful to examine imbalances between these scores, i.e. topics where the score is higher or lower than average. It is most helpful to look at the relative scores within an evaluation rather than comparing scores between groups. It is intended to help prioritize future actions, not to rank or grade data governance groups.

[1] https://www.dama.org/cpages/body-of-knowledge

In 2024, it was acknowledged that only a few governance groups had used the self-evaluation tool. It was thought that a reason for this could be that the tool appears too complex and time-consuming. To overcome the hurdles and facilitate wider application, a DIG subgroup prioritized the questions according to their importance and significance. This approach enables the most important questions to be answered first.[2] It was decided that the questions should not be significantly altered to retain backwards compatibility for those groups that had already used the tool.

Once an updated Excel spreadsheet was prepared, the Working Group on DATRAS Governance (WGDG) agreed to complete it. They had already completed the template in a previous year, so it was thought that this would be a valuable exercise to highlight improvements over time.

The chairs of the data governance groups were invited to the 2025 DIG meeting, and the self-evaluation tool was presented to them. It was highlighted that it was meant to be relatively quick to complete and works best when done in dialogue with the Data Centre.

Following this general presentation, members of WGDG presented their completed version and gave feedback on the tool. One key point was that they felt the supporting text within the template needed improvement.

[2]ICES. 2024. Report of the Data and Information Group (DIG). ICES Business Reports, 4:9. 45 pp. http://doi.org/10.17895/ices.pub.26969044

ICES Data and Information Group (DIG)

Data Governance assessment template

Evaluation for system:	Database of Trawl Surveys (DATRAS)
Evaluation perfomed by (people/group):	6
Evaluation date:	12/05/2025

This template contains questions for each of the following topics:

Architecture and Governance	Completed
Data Development	Completed
Database Operations	Completed
Data Security	Completed
Reference and Master Data Management	Completed
Data Discoverability	Completed
Document and Content Management	To Do (1)
Metadata Management	Completed
Data Quality Management	Completed
Compliance with FAIR principles	Completed

Figure 1. WGDG self-evaluation (1).

Evaluation

DIG Governance Framework Evaluation

Category	Min	Max	Avg	Improvements	Actions
Architecture & Governance	2	4	3.0	5	3
Data Development	1	4	2.8	4	4
Database Operations	4	5	4.3	4	1
Data Security	5	5	5.0	0	0
Reference & Master Data	4	4	4.0	2	1
Data Discoverability	3	4	3.7	3	2
Document & Content	4	4	4.0	1	1
Metadata	2	5	3.4	3	4
Data Quality	2	3	2.7	2	2
FAIR	2	4	3.1	6	7

	Average Score	Improvements	Actions
Overall		30	25

Figure 2. WGDG self-evaluation (2).

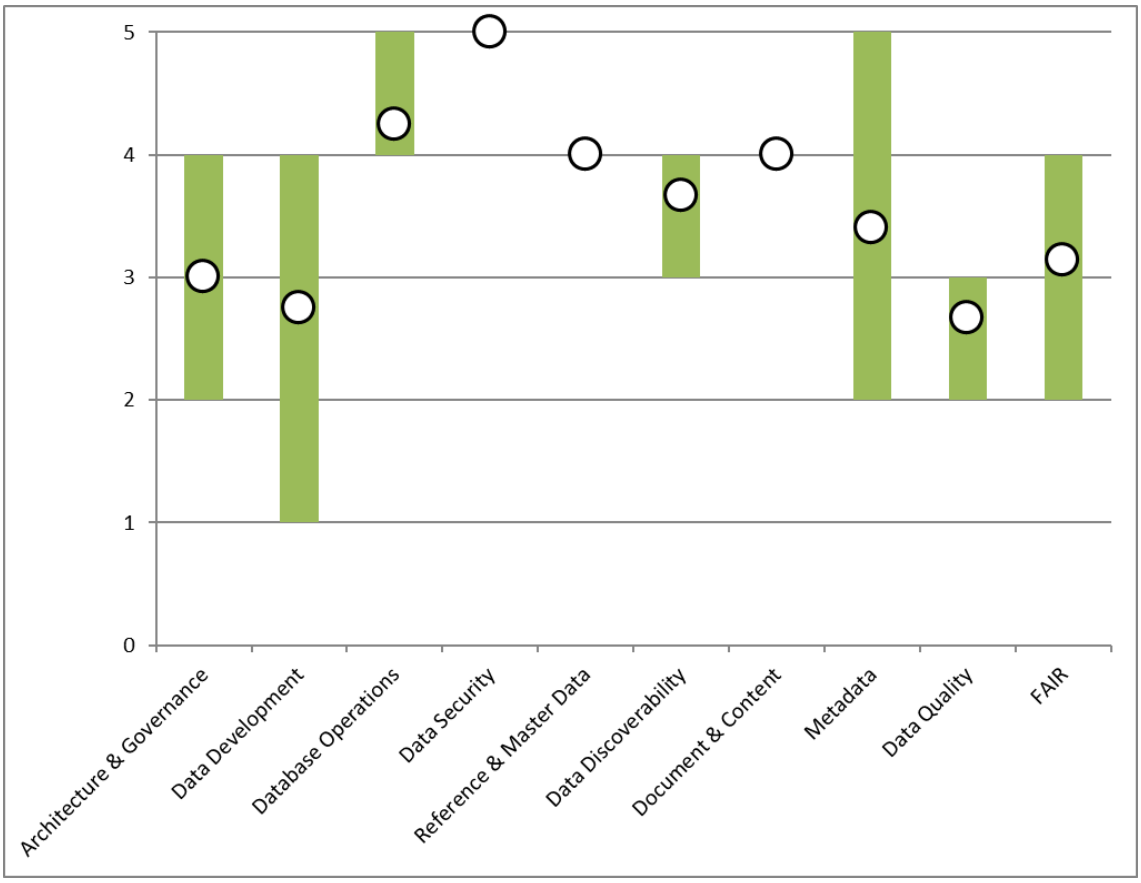


Figure 3. WGDG self-evaluation (3).

During the presentation and subsequent discussions, the following points were also made:

- *For new systems, "Database operations" questions are unlikely to score a 5.*
- *Potential new question: Does the Data Centre have the resources?*
- *It is good to see the tool used and a large number of actions and improvements identified*
- *It can be a struggle to understand the different data life-cycle stages, which might have various levels of governance (some differentiation would be helpful).*
- *It helps to start using the tool.*
- *The improvements identified are the most important things.*
- *It has helped to structure the WGSFDGOV group work. It seemed complicated to use at first. Its purpose is not to judge groups but to help them.*
- *Data flow diagrams would help people to understand processes. A consistent structure for SharePoint would help.*
- *Input data quality is key.*
- *Versioning of data products: calculated products can be wrong even if input data are right*
- *Did it help to have a DIG member in the group for the first evaluation? Yes, but for the second evaluation, other members of WGDG did most of the work.*
- *It is crucial to enhance the supporting text.*
- *This is not a formal judgment, but instead it is a self-help tool.*
- *The separation of data submission and data products is more system-specific; this is meant to be a universal tool.*
- *Should we record the previous score in an extra column?*
- *Ratings: It is possible to have long arguments about these; this is a universal tool, so it will not address system-specific questions.*

Action: DIG should improve the supporting text within the self-evaluation tool.

Once this is done, DIG should speak with the other data governance groups and recommend that they use this self-evaluation tool within the next year. DIG will make a recommendation to the relevant groups to this effect.

3.2 Working Group on Acoustic Trawl Data Portal Governance (WGAcousticGov)

A summary of the latest updates is available in the data portals section on the ICES website.[3] Hjalte Partner from the ICES Data Centre presented a new development related to data validation. When new or modified QC checks are introduced, all files are re-validated (including previous submissions) and the submitters get an automated e-mail. This process has now been improved to show the rows of data that need to be reviewed at the top of the validation report; this is now available for both data downloaders and submitters. It is suggested that other databases might consider a similar arrangement.

It was pointed out that for legacy data, the demands might become too difficult to fix over time as new developments occur. However, it was explained that older data not passing new or modified checks is just for information for data downloaders and submitters; it will mean the data quality is known, and possible data quality issues are highlighted. Initial feedback from users is that this new way of presenting the information is useful for identifying data issues.

3.3 Working Group on DATRAS Governance (WGDG)

The Working Group on DATRAS Governance has filled in the newest version of the governance evaluation framework and presented it. The framework is meant for evaluating the maturity of the system and formulating actions and potential improvements.

In 2024/2025, WGDG finalized the text of the DATRAS user handbook, which is almost ready for release (foreseen third quarter 2025); the group's Q&A doc is also to be reviewed. The main challenge for this group is to find a new chair by the end of 2025.

Within the group's future plans, a current topic of interest is to explore if stock and survey areas can be made visible along with the species data when viewing DATRAS.

3.4 Working Group on Transparent Assessment Framework Governance (WGTAFGOV)

The governance group on the transparent assessment framework (WGTAFGOV) has focused on developing templates for moving analyses into TAF and setting guidelines for reviewing the code available in TAF. The governance group worked together with the RDBES group in two workshops, developing TAF codes for the raising of data in RDBES. The group also tries to stimulate stock assessment groups to start working from TAF directly, instead of developing code first and then moving it to TAF. The challenge, however, remains effective communication to the groups using TAF; the group is focused on providing more training and improving networking via "TAF ambassadors".

[3] https://www.ices.dk/data/data-portals/Pages/Acoustic-DB-news-and-updates.aspx

Future plans include the "TAF-cademy awards" network session at the 2025 ICES Annual Science Conference,[4] supporting the launch of the new TAFXplorer (see section 10); and an improved TAF database and API.

3.5 Working Group on Governance of the Regional Database & Estimation System (WGRDBESGOV)

The governance group on the Regional Database and Estimation System (WGRDBESGOV) is attended by representatives from ICES Member Countries, the EU Regional Coordination Groups and ICES Data Centre. In addition, the Commission and end-users are also invited. Plans are directed around the replacement of the InterCatch system and the use of RDBES data in ICES advice production by 2027. Both EU countries and non-EU countries contribute to the RDBES; however, when the EU requests data, it will only receive data from EU Member States. The RDBES "core group", which supports the RDBES development, also contains participants from both EU and non-EU countries. There remains a lack of agreement across data submitting countries on what level of RDBES data should be published/shared; advice is being sought on the interpretation of the EU regulations, so this is an ongoing topic. An update of the data licence will also await the results of the data confidentiality work. Detailed data access in 2025 will be restricted to selected users, and they will have to sign a confidentiality document. For non-EU Member Countries, they will continue to access the data as part of ICES, rather than as part of the EU.

As it is a concern from data providers if the system is ready by 2027, the governance group was asked what the mitigation measures will be, and if any other communication channels could be used. The governance group indicated that support will be provided to countries through ICES Working Groups and Workshops. The governance group has set the ambition to produce estimates for 8 selected stocks by the time of the 2026 annual plenary meeting. Although it seems that the majority of countries are up and running for submission, it is very important to have metrics on implementation, especially for communication to the ICES Council. It is recommended to make the metrics publicly available on the webpage, as is currently the case for TAF. It is important to keep all current RDBES data submitters on board and also to keep working with those who have not yet done so.

3.6 Working Group on Spatial Fisheries Data Governance (WGSFDGOV)

Work continues to improve data flows from collection to product creation for the VMS/Logbooks data call; this includes consolidating the C-Square spatial grid with ICES statistical rectangles. The group's plans include: improving quality control points; introducing validation across data calls; and mapping the data flows of i) where data are coming in from, and ii) which data are used to create different products. The VMS data flow schematic is due for review (by the ICES Data Centre), so it would be useful for the WGSFDGOV Chair to be involved in that. There can be risks of getting data at finer resolution for VMS data due to sensitivities; these need to be discussed with data submitting countries, and ensure there is appropriate data handling of this detailed data concerning these sensitivities.

[4]https://www.ices.dk/events/asc/2025/Pages/The_TAF_cademy_Awards.aspx

3.7 Working Group on SmartDots Governance (WGSMART)

WGSMART is devoted to developing, overseeing, and advising on the improvements needed to make SmartDots a fully functional tool for age reading, maturity staging, and egg/larvae identification exchanges, workshops, or training exercises. SmartDots is a platform for quality assurance of key biological parameters used as input for stock assessments. The focus of the group is to prioritize and address recommendations, issues and requests for improvements from end-users. The group currently has 31 members.

This past year has seen the publication of new software and API versions with additional functionalities built on user feedback. In part, these include temporary local storage of images for faster loading times, a revamp of the growth graphs allowing multiple graphs to be produced, and the addition of keyboard shortcuts. The SmartDots API, developed and maintained for ICES, uses existing open-access code that is widely available for institutes within or outside ICES that desire to build their own internal API. Database and API building documentation are maintained and shared to streamline the onboard process, and the working group has successfully assisted multiple institutes.

WGSMART members are, as part of the standard work of the group, able to undertake smaller bug-fixing or software developments and produce newsletters or training materials. Larger developments, however, such as the previous development of the maturity, eggs and larvae modules, require external funding, of which there is limited availability. The group is currently awaiting the outcome of a funding application to EU CINEA, after unsuccessfully looking for funding directly to DGMARE and UK. This funding proposal targets the development of the new reference collection and training modules, quality of life features, incorporation of ageing error in stock assessment and the potential integration of machine learning initiatives.

3.8 Working Group on the Joint Cetacean Data Programme (WGJCDP)

WGJCDP are relatively new to ICES as a group; new ToRs have been adopted for 2025–2027, which focus more on data availability rather than on data products. The group continues to work on developing data validation guidance. They are engaging with the UN Ocean Decade to try to promote industry data flows. They also have implemented a system of deferred access to ensure it is an option within the database. This allows data to be restricted where needed by providers (to facilitate industry data flow) and is due to be "launched" and advertised more widely soon. The group has also been working with Ocean Best Practices to undertake a maturity assessment for the standard. This has already scored highly, and one last element remains to get it to the top rating. Future work on the standard will strive to improve compatibility for digital aerial survey data, improve support documentation, and take the first steps towards integrating acoustic data into the database.

3.9 Working Group on Egg and Larvae and Fecundity and Atresia Database Governance (WGELFADG)

The primary focus of the group in 2024 was to draft a data management plan; in 2025, the focus will be on data submissions and developing a TAF repository. There has been some reluctance from some submitters on the benefits of making data open via this route, but this is improving over time. The governance questionnaire has not been started yet by this group (there are 2 systems within the scope of this group, which adds more complexity).

3.10 Working Group on Oceanographic Data Governance (WGOceanDataGov)

WGOceanDataGov is the newest data governance group, the resolution only just approved at the time of writing. It plans to review and resolve any issues with data providers and users on the connections between the ocean data and data product resources. They are seeking broader contributions to this group from across the community, from both the submitter and the user side. It was suggested to utilize contacts in both the SICCME and cross-ICES/PICES groups. The group aims to compile a catalogue of oceanographic data products and conduct a review and prioritization of developments on the portal. In future years, they intend to provide updated user documentation for the portal. The amount of work that will be needed from each group member will depend on the group size and the scale of the ambitions for delivery.

4 ICES Data Plan

When ACOM and SCICOM were established as two of the four ICES pillars in 2015 (Data and Secretariat being the others), the original idea was to have one strategic plan with four implementation plans (each pillar). Although these were drafted, only the Science and Advice plans were published as stand-alone plans, while the data plan was integrated within these two.

The ICES Strategic Plan is now being reimagined. The overall idea for the new Strategic Plan cycle is to focus on one strategy, with supporting implementation plans. The consequence is that a separate Data Plan will now be drafted.

Timeline:

- May 2025: Metrics of success for plan defined
- January–March 2026: Stakeholder input
- June 2026: Bureau reviews strategy
- October 2026: Council approves strategy
- January 2027: ICES strategy launched to coincide with 125th Anniversary

At DIG 2025, a subgroup worked in two sessions on the content for the plan and proposed a number of metrics. The draft Focus Areas within the Data Plan are currently:

- Resilience of data infrastructure;
- Developing and adopting standards and best practices;
- Building and maintaining strategic partnerships
- Adapting to policy;
- Exploiting information technology;
- Data literacy, capacity and skills.

Proposed metrics would then relate to one or more of these focus areas.

Action: The documents will be taken forward by an intersessional subgroup. The links to the working documents and the composition of subgroup can be found in https://github.com/ices-eg/DIG/issues/787

5 Preliminary catch statistics

ICES aims to update the data calls template and guidance so that there is clear labelling of which licenses apply to the data that is being requested. Preliminary catch data (see data call) are problematic as they are currently restricted but do not fall within any of the existing licences. These data are requested to feed assessment working groups in the spring assessment period (landings aggregated by country, year, fishing area, and species). Eurostat publishes the official statistics (which are more detailed) later in the year; the gap between the availability of preliminary catch statistics and official catch statistics has decreased over the years. The Eurostat data submission process allows countries to mark specific data as confidential; this data is not made publicly available.[5] Preliminary catch data are used in stock assessments for several stocks. In many cases, they are also used to record the history of commercial catches in most of the advice sheets.

Two possible solutions to this were identified:

1. Create a new restricted data license to cover these data specifically.
2. Make the data publicly available (under a "CC-by" license).

Since the catch data of many countries is subject to restrictions, the second solution was ruled out, and the creation of a new license for the preliminary catches was discussed. The need to allow a confidentiality flag in the submission (and use) of the data stems from cases where values infringe statistical confidentiality, e.g. when only a small number of boats are fishing in one area.

A new data license for preliminary catches was drafted (see Annex 2), stating that data are available for use by ICES groups, advice requesters, or parties granted direct access by the licensor. It was proposed that a confidentiality flag would be allowed in the data submissions to mark confidential data (this follows the Eurostat model). If the license comes into effect, this confidential data will not be published in any future advice sheets or relevant data products. Follow-up with ACOM is needed to consider the consequences of a restricted data license on the publication of advice.

Action: The DIG chair will liaise with ICES Data Centre, SCICOM, and ACOM. This will be tracked using GitHub issue https://github.com/ices-eg/DIG/issues/778

[5] Ireland, Latvia, and Portugal have made use of this confidentiality indicator in their EUROSTAT submissions.

6 Training

There have been requests from SCICOM to provide data training for chairs (via the WGCHAIRS training portal[6]) and early career scientists (ECS). As an example, we have seen over the last few years that many scientists working with data lack a good understanding of data policies and licensing. DIG should raise awareness of these topics and provide guidance on best practices; there is an opportunity to encourage early engagement rather than addressing problems later.

The new portal for chairs was presented during the DIG meeting, and a subgroup was established to initiate the planning process for determining the types of training materials that could be beneficial to provide (for both chairs and ECS). The subgroup developed a set of ideas for generating the training, as well as possible topics that could be of interest to new chairs and ECS to engage with. It is important to note that the training will be specific to ICES data and not general training in the usage of marine data, as there are other good resources available for that.

To make sure that training material will be created and kept up to date, it was suggested that a dedicated group of members from both ICES Data Centre and DIG will work intersessionally on this topic.

Types of training material that can be created with low effort:

- Video snippets created based on presentations on data
- Set up links to topics already covered in other locations
- Short texts highlighting important topics
- Reach out to Expert Groups that might have training material already
- Set up an FAQ

It is suggested that a sample of these types of training materials should be created before next year's WGCHAIRS meeting, and that chairs attending the meeting will be asked to give feedback on the available training materials.

Topics that could be covered (lower effort/prioritized topics at the top of the list)

- Data licensing
  - Create a short text on why data licensing is important, link to existing licenses at ICES
- Where to find data at ICES
  - Link to ICES data portals
- How to provide data to ICES
  - Link to Best practices for data management https://doi.org/10.17895/ices.pub.25435903.v1
- How to get access to GitHub/TAF
  - Wiki page available
- Data profiling tool
  - Short video introduction from presentation being done for working group
- Ethical use of AI
  - Existing PowerPoint slides available
- Link to external training
  - As an example, oceanteacher.org
- Infographic on data life cycle in ICES – from data to advice

[6] https://icesit.sharepoint.com/sites/WGCHAIRSTraining/SitePages/human-resource-home.aspx

- Data for Advice in ICES
- Data for Science in ICES
- Data security
- Data roles
- Version control of data
- Infographic on connections between data portals and governance groups

The working group tasked with creating the first version of the training material will consist of Laura, Cecilia, Joana, Clare, David and Sjur.

Action: The DIG subgroup will continue to work with the ICES Secretariat to develop these ideas. This will be tracked on GitHub issues https://github.com/ices-eg/DIG/issues/676 and https://github.com/ices-eg/DIG/issues/674

7 Data guidelines

ICES data guidelines were introduced in 2001 to support and promote expert science. The guidelines are published in the ICES library, as a series, allowing metrics to be accessed, including measurement of their use. Over the past five years, the guidelines have benefited from expert review and have either been updated or retired, as appropriate.

In 2024, DIG conducted a maturity assessment of three of the ICES data guidelines in conjunction with OBPS. In May 2024, an ICES DIG member assessed the maturity of the remaining ICES data guidelines, with the majority being recognized as "better practice". Two guidelines that have been retired are recognized as "good practice", as are two guidelines that ICES DIG have not found suitable reviewers for. In 2024, ICES followed the OBPS endorsement process and endorsed the Biological Plankton Data guidelines: https://doi.org/10.17895/ices.pub.25151648

OBPS would like to streamline this endorsement process and has proposed a process for streamlining endorsement where organizations can self-endorse. The intention is for this process to be co-designed by OBPS, ICES, and other organizations. The goal is to have a standard approach to endorsement so that it has the same meaning globally, irrespective of the organization endorsing. OBPS would like a letter of agreement between ICES and OBPS in which ICES move forward with endorsement of ICES guidelines via a standardized approach.

During the meeting, a subgroup reviewed the draft approach:

> **"1. rigorous and transparent community review process whereby comments are invited, adjudicated and actioned by the author(s) and where these actions have been verified by the endorsing organization;**
>
> **2. has been successfully used by multiple institutions;**
>
> **3. be available and identifiable within the OBPS repository;**
>
> **4. have an update or maintenance plan for the future;**
>
> **5. if relevant, includes description of estimating uncertainty or heterogeneity of a quantity;**
>
> **6. follow recommendations for metadata standards and file formats for archiving in international data centres".**

DIG strongly advises that, in parallel with this work on self-endorsement, OBPS should invest in increasing the level of community usage of the practices within OBPS. The full potential of OBPS will only be reached when everyone in the community is using and citing OBPS practices. OBPS can and should put more emphasis on encouraging scientists and publishers to use the practices in OBPS. It is regular community use of the practices in OBPS that will ultimately indicate widespread community endorsement of them. Initiatives such as working with publishers to mandate citing practices in OBPS when publishing scientific papers should be explored.

A key concern raised by the subgroup was the difficulty in providing evidence that the guidelines are being used. A proxy for this could be download metrics, but this is complicated by OBPS providing direct download of a copy of the guidelines.

During the plenary discussions on this topic, some members of the group expressed doubt about the utility of self-endorsement of guidelines - they thought that incorporating some element of external review would be more effective.

Specific comments from the subgroup on the OBPS "Template for Endorsing Records" proposal are included in Annex 3.

Action: Clare, Dave, and Neil will follow-up with OBPS – this will be tracked in GitHub issue https://github.com/ices-eg/DIG/issues/678

8 Data session at ICES ASC 2026

In September 2026, the Annual Science Conference (ASC) heads to Brest, France, bringing together the ICES community and the global marine science world for a week of connection, collaboration, and cutting-edge science https://www.ices.dk/news-and-events/news-archive/news/Pages/asc26_session_call.aspx. ICES is currently accepting proposals for theme sessions and network sessions, which should be accessible to a broad audience of marine scientists.

During the DIG meeting, a subgroup brainstormed ideas for potential data-related sessions and developed the following concept.

AI-ready data and products – impact on science and advice

Conveners: talk to DSTSG and WGMLEARN about the possibility of convening this as a joint session with DIG.

Teasers (both created by AI):

> **"Join us for a thought-provoking session on "AI-Ready Data and Products - Impact on Science and Advice!" Discover how the synergy between AI and high-quality data are reshaping the landscape of scientific inquiry and advisory frameworks. From cutting-edge research methodologies to ground-breaking applications, explore the future of innovation powered by AI-ready data. Don't miss the opportunity to network with leading experts and contribute to the conversation on optimizing data for AI-driven advancements in science!"**
>
> **"How is AI reshaping marine science and advice? This session dives into the power of AI-ready data—structured, standardized, and primed for advanced analytics. Explore how interoperable, FAIR data and innovative products are driving breakthroughs in forecasting, ecosystem assessments, and decision-making. Join us to discover real-world applications, share best practices, and tackle the challenges of building data infrastructures that bridge science, technology, and policy."**

Description:

As a community, we are getting closer and closer to using AI in both the scientific and advisory processes within our institutes and in ICES. With this theme session, we would like to invite everyone who is on the verge of implementing AI in their normal operations or who is starting to think about doing it.

The session will have three different focus areas:

1. How to achieve AI-ready data
2. Using AI as the standard operation in data analysis, quality control and other data-related work
3. How will AI-ready data and having AI as part of standard operations impact the trust of future science and advice? This could include ethical, psychological and legal aspects.

Focusing on the whole value chain of ICES advice from data collection to the finished science-based advice, this session would like to welcome both practical presentations related to data as well as thought-provoking talks on the impact that our modern society has on stakeholders' trust in ICES.

Action: DIG chair to contact DSTSG and WGMLEARN chairs about the possibility of a joint session proposal. This will be tracked in GitHub issue https://github.com/ices-eg/DIG/issues/786

9 Other DIG work

This section summarizes the work done to progress a number of other DIG activities.

9.1 Round-up of completed tasks

Data Policy update (https://github.com/ices-eg/DIG/issues/527)

Following discussions, we agreed to harmonize the terms and definitions used in:

- ICES code list https://vocab.ices.dk/?codetypeguid=82ad7124-5482-4319-8870-bc97293dafca (updated)
- Data Policy (updated and published https://doi.org/10.17895/ices.pub.8883)
- Best Practices Handbook (outstanding)
- Restricted data licenses (outstanding)

Guidelines on Reference Management Best Practices (https://github.com/ices-eg/DIG/issues/278)

The guidelines were published in April 2025 https://doi.org/10.17895/ices.pub.28724003

Governance group for Oceanographic Data (https://github.com/ices-eg/DIG/issues/654)

The resolution was posted to the approval forum on 11/4/25 with a deadline for comments of 22/4/25. No comments were received, so we can consider it as approved. Rob Thomas is setting up the group. Several members of DIG have been invited to join the group.

ICES cyber-security workshop (https://github.com/ices-eg/DIG/issues/677)

The workshop was held at the end of April - see Section 13 of this report for more details. DIG intend to discuss operational cyber security measures on an annual basis and agreed on the need to strike the right balance between security and usability of systems. Security benefits of cloud technology were also briefly discussed. DIG acknowledged that the cloud offers additional elements of built-in security, but the underpinning architecture is still an important consideration when assessing risk.

Data Calls guidance (https://github.com/ices-eg/data-calls/issues/74)

The Data Call guidelines were published in January 2025, and have subsequently been updated to incorporate further changes to the data calls template https://doi.org/10.17895/ices.pub.28163492.v3

Data Profiling tool guidance (https://github.com/ices-eg/DIG/issues/475)

The guidelines were published in January 2025 https://doi.org/10.17895/ices.pub.28204268.v1

9.2 Ongoing activities

This section contains updates from a number of ongoing DIG activities.

9.2.1 Challenges and opportunities

https://github.com/ices-eg/DIG/issues/450

Part of DIG's remit is to evaluate and monitor current and future challenges and opportunities in data management. The DIG Challenges and Opportunities tracker is implemented in GitHub

(https://github.com/orgs/ices-eg/projects/6/views/1) so that it can be viewed externally. Entries are split between "challenge" and "opportunity" and scored according to likelihood and impact. This allows a severity rating to be calculated for each item: minor, medium and major

The next steps for each entry depend on the severity:

- Major: Include summary of challenge/opportunity in DIG reports and briefing to SCICOM. DIG to make recommendations for action if necessary
- Medium: Include summary of challenge/opportunity in DIG reports. DIG to make recommendations for action if necessary
- Minor: monitored by DIG

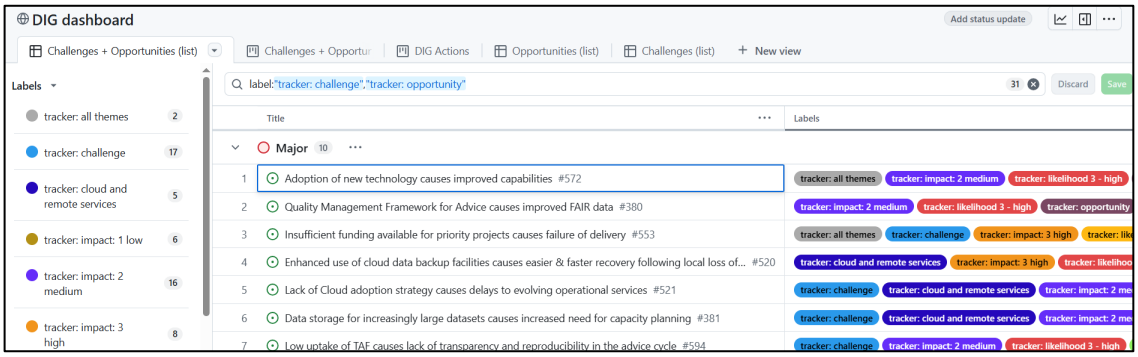


Figure 4. DIG Challenges and Opportunities tracker (https://github.com/orgs/ices-eg/projects/6/views/1)

DIG have been monitoring challenges and opportunities for a number of years however we have not systematically linked the groups actions to these entries. Doing this will be a good way to show how DIG are taking advantage of / mitigating for the various challenges and opportunities that have been identified. Also, if we find there are lots of DIG tasks that can't be linked to an existing challenge or opportunity, then it could be a sign that perhaps we are missing some challenges/opportunities.

The DIG actions and the challenges/opportunities are managed using GitHub issues. During the February 2025 online DIG meeting, we tried to link actions using a feature in GitHub which allows each issue to be linked to a parent issue. Although this seemed promising initially, its main drawback is that each action could only be linked to a single challenge/opportunity. Intersessionally, the DIG chair explored an alternative linking method– within a GitHub issue, you can mention another GitHub issue, and this allows you to link any number of issues together.

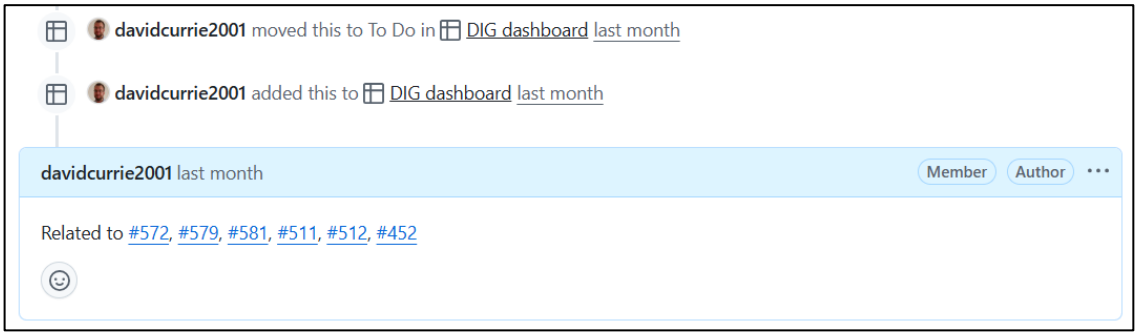


Figure 5. Example of linking GitHub issues (https://github.com/ices-eg/DIG/issues/786)

The downside of this method is that you can't easily display the linked issues on the Challenges/Opportunities tracker. To resolve this problem a Shiny app has been developed which allows anybody to filter the challenges/opportunities and see which issues have been linked to them. The code is in development and is available at

https://github.com/davidcurrie2001/DIG_Challenges A test version of the app has been deployed to https://dc2001.shinyapps.io/DIG_Challenges/ and is described below.

The first page gives some useful information about the app:

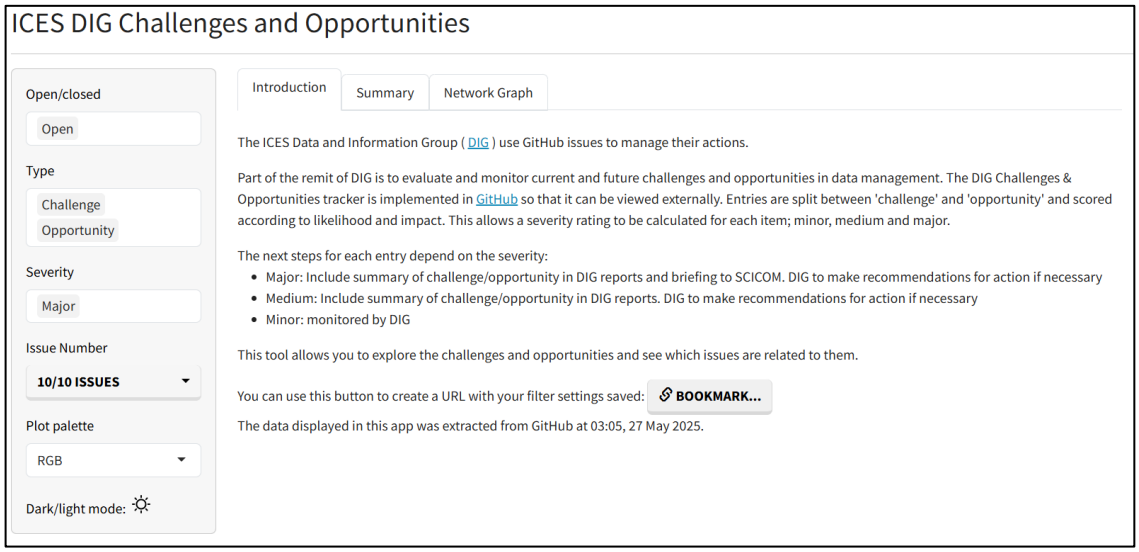


Figure 6. Challenges/Opportunities app - page 1

The second page shows the opportunities/challenges based on the filter values selected, the links to the related issues, and a summary of the number of related issues.

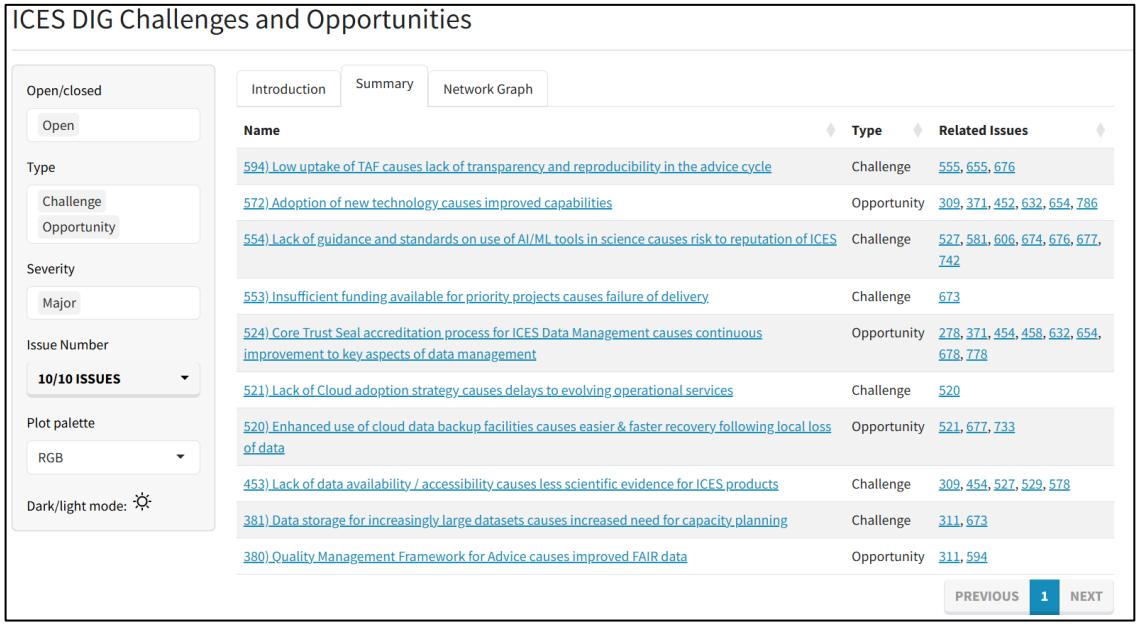


Figure 7. Challenges/Opportunities app - page 2 (a).

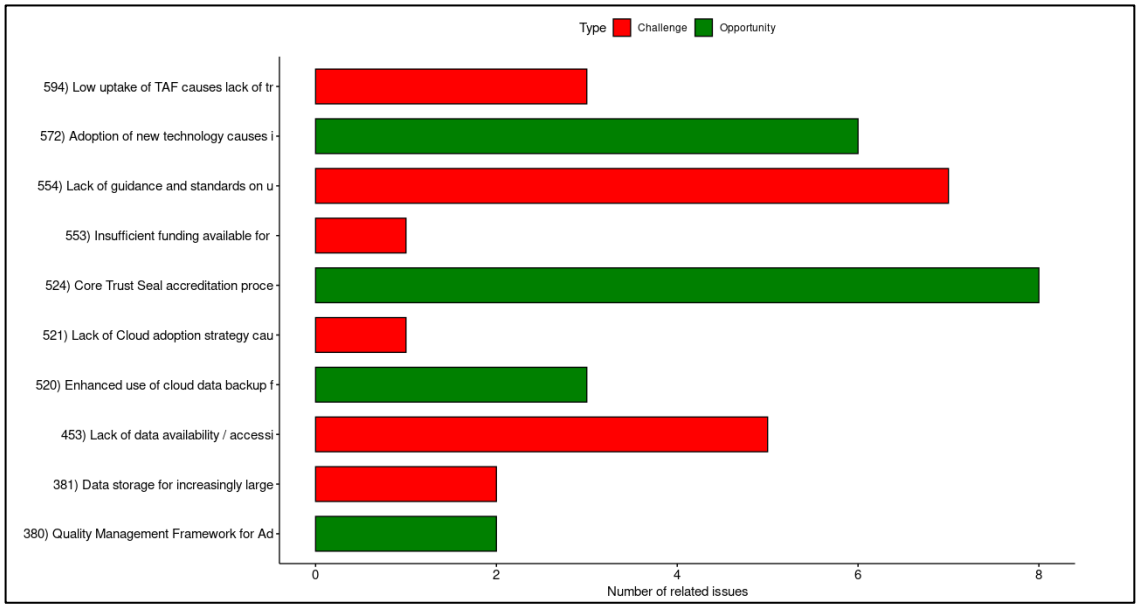


Figure 8. Challenges/Opportunities app - page 2 (b).

The third page shows a network graph of the challenges, opportunities and related issues.

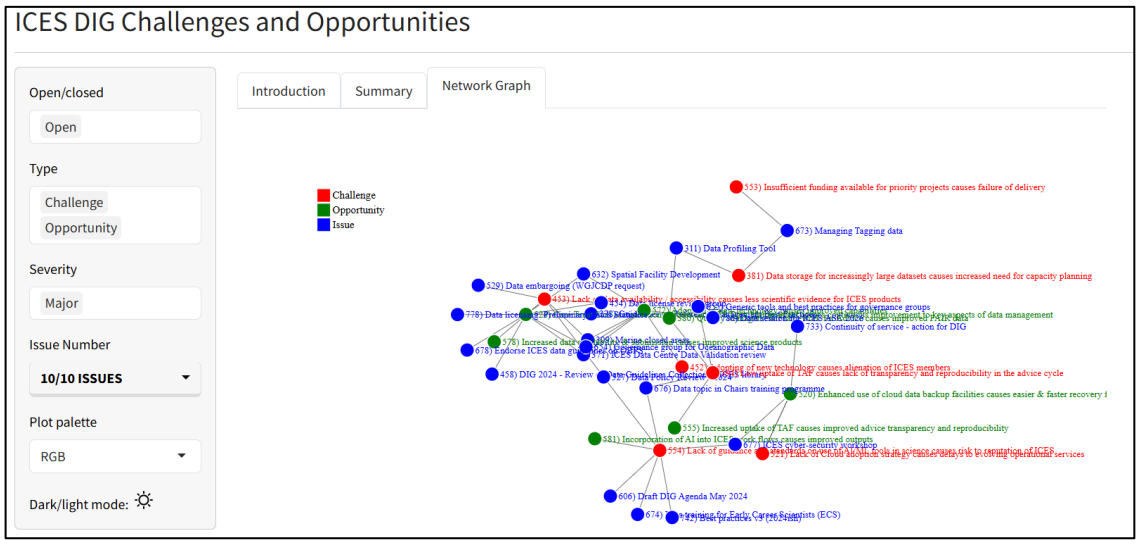


Figure 9 Challenges/Opportunities app - page 3

There was a discussion about the app, and some questions were raised.

- Who is the app's intended audience?
  - Although the app is publicly available, its main audience is intended to be DIG members – it might also be of use when talking to SCICOM about challenges and opportunities.
  - This is useful for DIG, and it might be useful for others, but it requires a bit of knowledge of how DIG works. If we want it to be a messaging tool, then we probably need to do something a bit more end-user-friendly.
  - Any thoughts on what we need to do if we were to use this to communicate outside DIG?
- Was it designed with security in mind?
  - The app uses publicly available data from GitHub, and uses GitHub "Repository secrets" to manage the token required for API access (https://docs.github.com/en/actions/security-for-github-actions/security-guides/about-secrets)
  - Anyone with the link can use the app – this is not a problem since the DIG GitHub repo is open, so it shouldn't have any information which is not open.
- Other comments:
  - The major and medium challenges/opportunities have been linked to issues; the minor ones are not linked at the moment.
  - The data in the app is updated once a day using an automated process.

We agreed that we will request that ICES host the app; to do so we will follow the process described in the "ShinyApps hosting and publication" guideline (https://doi.org/10.17895/ices.pub.22695898.v1).

The guidance on how to record DIG Challenges/Opportunities will be updated before it is published to include the information on how to link issues.

9.2.2 Implications of EU Data Governance Act

https://github.com/ices-eg/DIG/issues/763

There was not time to discuss this topic during the meeting, DIG will discuss it during their next online meeting.

9.2.3 Data Profiling Tool

https://github.com/ices-eg/DIG/issues/528

The Data Profiling Tool (DPT – https://www.ices.dk/data/tools/Pages/Data-profiler.aspx) was created following ICES community feedback to support and guide experts to evaluate data/data products that are not managed by the ICES Data Centre in a structured way when used to produce or underpin ICES advice. Guidelines on how to use the tool were published in January 2025 https://doi.org/10.17895/ices.pub.28204268.v1

During the meeting it was highlighted that there was only one submission through the DPT in 2024, and none so far in 2025. It was thought this lack of submissions was due to the departure of a key member of ACOM leadership who had been promoting the DPT.

Joana Ribeiro from the ICES Data Centre is planning on presenting the tool to Working Group on the Integrated Assessments of the Barents Sea (WGIBAR) and will encourage them to use it. It was also agreed that a metric around DPT submissions should be considered for the ICES Data Plan.

9.2.4 Data paper for IJMS

https://github.com/ices-eg/DIG/issues/675

A subgroup of DIG is working on a paper to be submitted to the ICES Journal of Marine Science (IJMS) "Celebrating a century of marine science" themed set https://academic.oup.com/icesjms/pages/ices-journal--celebrating-a-century-of-marine-science The subgroup agreed that "100 years of ICES Data Management in 10 Objects/Events/People" was a promising topic. This would allow them to focus on a few interesting stories and make the paper more interesting to read. They can also use pictures of unusual objects to make the paper more visually appealing, and choose objects from the whole spread of the 100 years' timeline. This is not an exhaustive history of data management but it instead concentrates on 10 key data stories.

As well as the paper there is a Shiny app being developed to show an interactive timeline of the different events, groups, and activities: https://dc2001.shinyapps.io/DIGTimeline/

Prior to the meeting Ruth Anderson and Nikki Furmanek from the ICES Secretariat investigated the archives and found a number of interesting pieces of data management history including data published in books, micro-fiches, floppy disks, and CD-ROMS. The subgroup were able to take photos of these items for use in the paper.

Comments:

- The deadline for submissions is **3 November 2025**.
- There are plenty of stories and many ideas of who to talk to and try to interview but we can't have everything in this paper.

9.2.5 DIG Infographic

https://github.com/ices-eg/DIG/issues/680

During our May 2024 meeting, we held a subgroup session thinking about the next 3 years of our work. Some of the comments included:

- "DIG need to improve visibility within ICES community. Need to focus on why DIG exists;"
- "Demonstrate impact of DIG: Infographic on what DIG has delivered and supported ~last five years;

With this in mind, during the September 2024 online DIG meeting we split into subgroups and answered the following question: "*What are the top 3 things that DIG has done for the ICES community?"*. The subgroups came up with the following top items:

Activity	**Benefit to ICES**
Data Profiling Tool (DPT)	Off-the-shelf uptake by institutes Increased QA for ICES Advice products Raised awareness of data management Visibility of data being used
(Data) Governance Groups	Provides another level of QA Expert Groups are freed up to work on their area of competence Focal point for content and technical governance Forum for cross-cutting issues (solve once, rather than duplicate effort)
Data Policy and Licensing (CC BY, restricted licences etc.)	Clarity for data providers and users Separation of specific use (via license) makes it more user friendly Alignment to other data management practices/organizations
Documentation of process and guidance: CoreTrustSeal Accreditation, Data Guidelines, Best Practices in Data Management	Data literacy for the organization
Supporting national to international data flow initiatives	Ensuring evidence is available for the advisors to collate and provide, and underpin and meet mandated assessment processes. Stronger consistent foundations in progress.
Restoring ICES Databases and checking security following cyber attack	Reputational and trustworthiness of ICES Science, and mitigate each contributing organizations security (avenue lesson learned shared).
Defining and governing the ICES Data Policy	Shared common approach 'vision'. A simple view of the role and approach we all share and work towards.
Outlining Data Profiling Approach and Tooling	as a shared initiative to build in trustworthiness of Data Products used for advisory purposes
Knowledge sharing on best practices, approaches and legal requirements, across member state organizations	Consistent approaches across ICES. Clarification streamlines
Outline and streamlines foundational guidance and tooling for data enablement across wider ICES	Enablement, guidance and training outlines for others to follow

Activity	Benefit to ICES
Collaboration to agree common language for technical aspects	Enablement regardless of nationality, organization, background and expertise
Engagement across organizations	Strengthens and gives weight to internal organizational data activities also
Raising awareness and visibility of the wider and indeed widening diverse data community all working in collaboration scientists to shared goals	Community benefits, knowledge share, cross-collaboration, reduce risk of duplications, better focus resource and time to shared priorities
Best Practices for data management document.	Providing guidance to the community. Providing consistency and justification of decisions/principles.
Data Profiling Tool	Already in use in overviews. Helps create dialogue with data users, and helps educate about what data management aspects are important.
Data's Den network session	Community outreach and awareness as well as a bit of fun
Data Policy and Data Licensing split	Consistency in policy and licenses. Have provided clearer what ICES obligation are and what other people can do with the data. Standardized "other" licenses have helped guide discussions.
Strengthening and supporting governance groups	A more matured governance process for many ICES data system.
Data Guidelines into OBPS	Wider audience and broader dissemination.
Established the Governance Working Groups WG Roles definition - culture of governance QC as part of the best advice and evidence ICEs can provide	to relieve expert WG with governance/QC duties and focus more in their ToR activities.
DIG, as a group, are a diverse group from multiple backgrounds and scales of working. Clear linkages with global initiatives and view across the data landscape	ICES Community can work within specialisms and direct questions back to DIG for technical input and application of best practices centrally, to benefit wider community
Establishment and exposure of frameworks, and standardized processes. including for data submission, licencing etc.	Financial benefit. Collaboration through best practice, coming together with common framework to work forward not having to start from the beginning each time.

The DIG chair identified 4 major themes from these activities:

- Governance,
- Planning,
- Engagement,
- Best Practices.

After meeting with the ICES communications team and the head of the Data Centre the Communications team agreed to help start the process to create a DIG infographic. Working from some initial ideas created by the DIG chair the following 2 options have been created:

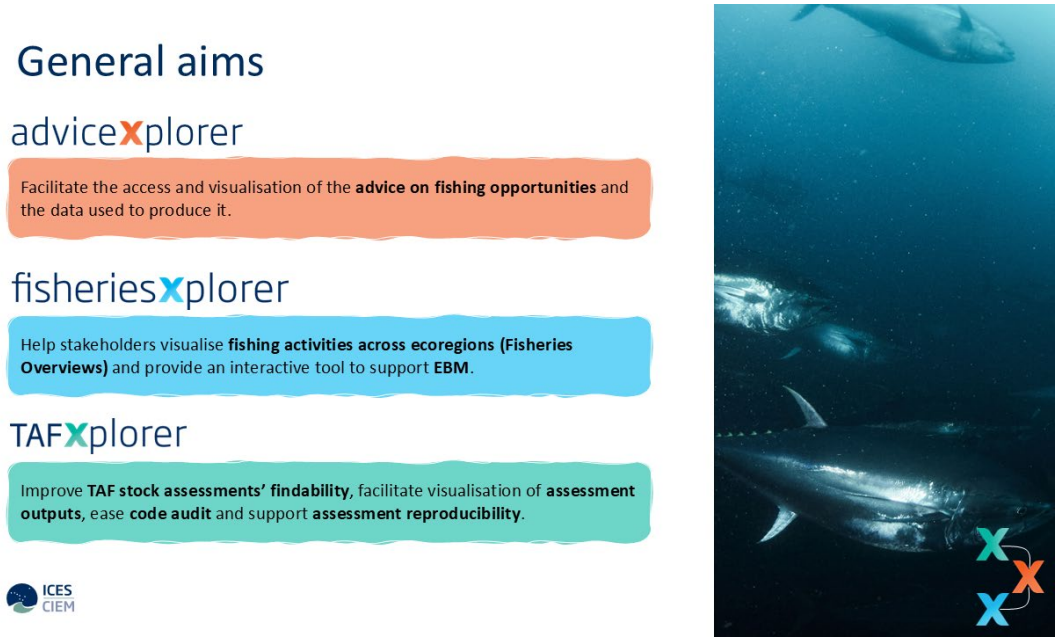
We will continue to develop the infographic, in particular, there should be a strong link between the infographic and the metrics used in the Data Plan (see Section 3).

10 Updates from the ICES Data Centre

ICES Data Centre presented updates on a number of ongoing activities and these are summarized below.

10.1 Xplorers

This presentation introduced the ICES Xplorers, a suite of interactive, web-based applications developed by ICES to enhance accessibility and visualization of fisheries assessment data and advice. Built using R's Shiny framework, these tools aim to support a wide range of stakeholders—from policymakers to stock assessors—by offering customizable, always-up-to-date interfaces that integrate seamlessly with ICES databases and services. The apps facilitate exploration from regional overviews to detailed stock assessments, improving transparency, reproducibility, and user engagement. Launched between 2023 and 2025, the initiative also addresses challenges like app maintenance, content migration, and user adoption, with ongoing outreach and training efforts to support implementation.



10.2 ICES Spatial Facility

The ICES Spatial Facility is currently undergoing a complete redesign. It is over 10 years old, and some of the technologies supporting it are no longer maintained. This update also presents an opportunity to align the platform with current user needs.

To better understand what is important to users—and what is not—we distributed a survey to our community. The survey closed at the end of May, and the next step is to analyse the collected data and identify key focus areas for development.

Once this analysis is complete, development of the new portal will begin with those goals in mind. It is to be hoped, by the end of the year, a working version of the portal will be available for internal testing and feedback.

Regarding technology, ICES holds a non-profit license from Esri, which they plan to leverage in this redevelopment effort. The progress can be followed on GitHub: https://github.com/ices-eg/DIG/issues/632

10.3 ICES Data Validation Framework (DVF)

The ICES Data Validation Framework (DVF) is designed to provide a centralized, scalable, and extensible platform for validating scientific datasets submitted to the ICES Data Centre. The framework addresses the current fragmentation of validation tools—such as DATSU, Acoustic, and RDBES-specific applications—by unifying them into a cohesive system.

DVF supports a range of input formats, including CSV, JSON, XML, and more. It produces detailed validation reports highlighting errors and warnings. The solution employs modern, cloud-native technologies to deliver high performance, modular validation logic decoupled from underlying databases, and distributed deployment on Azure.

Phase II of the project focused on analysis and prototyping, delivering key outputs such as a requirements specification, sample datasets, a domain model, and a GUI prototype for user interaction.

Phase III, now in progress, is centred on developing DVF Version 1.0. Core features include:

- Support for rule and schema definitions using JSONPath, XPath, SQL, and API-based validation
- Template and rule reusability
- Dataset versioning
- Distributed, scalable processing on Azure

Development of Phase III began in June 2025, with a beta release expected by February 2026, and full production deployment planned for the end of 2026.

The DVF is designed for future extensibility, allowing seamless integration of additional validation engines and support for evolving data and schema standards.

10.4 AI update

Artificial Intelligence (AI) and its use at ICES were presented by Neil Holdsworth, Head of Data and Information. Polls among the ICES Secretariat in March 2025 indicated varied levels of AI agent usage in daily work, uses of AI agents included generating text (like meeting minutes), translating text, correcting text (checking styles, language), summarizing text (findings of reports), generating images, generating audio, and creating/correcting code/scripts. Conversely, awareness of responsible AI principles appears to be limited, as a poll revealed many participants were unsure of the principles[7].

Focus should be placed on critical considerations for responsible AI use. These include the need for human accountability, underscored by disclaimers like those advising against relying on AI for professional advice. Reliability and accuracy are important concerns, with research indicating that language models can perform worse when relevant information is located in the middle of the input text ("lost in the middle"). Data leakage is a particularly significant risk, illustrated by the issue of exposed GitHub repositories being accessible via Copilot and Samsung banning generative AI use after sensitive code was uploaded. While AI can offer impressive efficiencies, there

[7] One example of AI principles by Microsoft

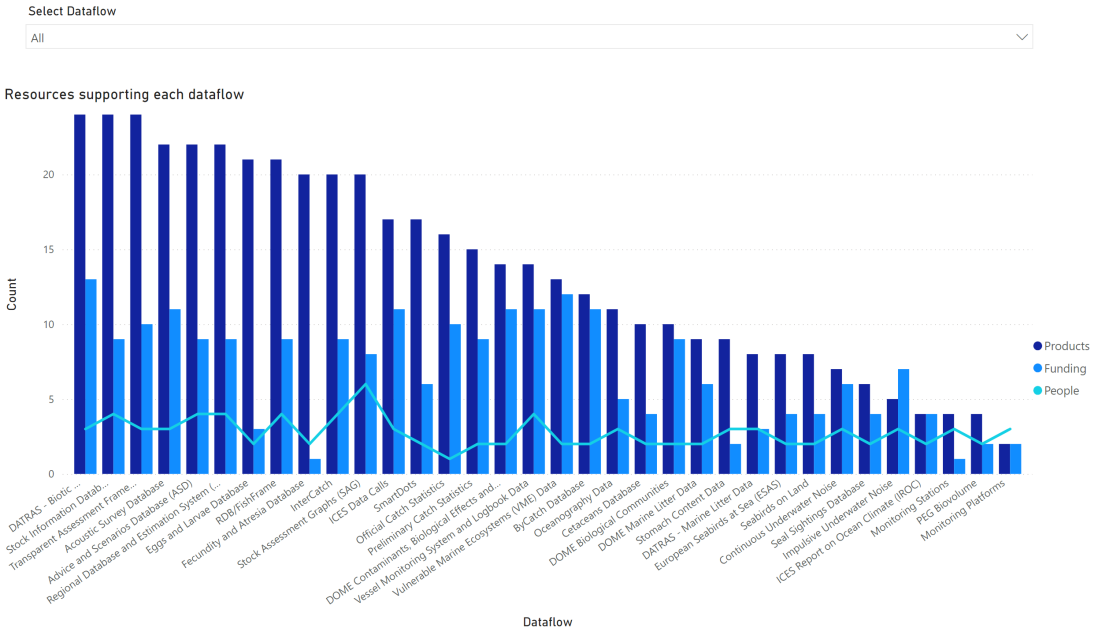
are also deficiencies, like a single ChatGPT query consuming substantially more energy than an equivalent Google search.

Legislation for AI, such as the EU AI Act, is becoming relevant, requiring transparency for generative AI, including disclosing AI-generated content and publishing summaries of copyrighted training data. Planning for AI integration at ICES involves tying AI use to business objectives and focusing on processes and people rather than solely on software platforms. A planned workshop (WKAAII) in September 2025 aims to catalogue and prioritize AI use cases, as well as review and adapt existing ICES policies and guidelines to incorporate responsible AI considerations.

10.5 ADDA dashboard

The presentation introduced the Advice and Data (ADDA) PowerBI dashboard, which focuses on resource mapping across the two departments. This dashboard is designed to visualize ICES dataflows and data products that contribute to projects and advisory outputs. It provides a comprehensive view of how information flows through the system and highlights the human and financial resources that support these processes. By offering this overview, the dashboard facilitates understanding of the impact of organizational changes, clarifies roles and responsibilities, and promotes effective collaboration toward shared objectives.

Looking ahead, future development will involve enhancing the data model by integrating more detailed funding information, not only categorizing funding types but also including financial values. This dashboard is to be published in a user-friendly report format for easy access and reference.



10.6 CoreTrustSeal accreditation

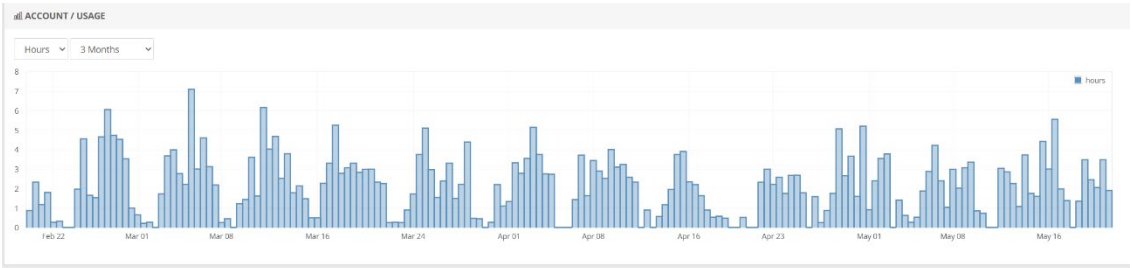
ICES gained its CoreTrustSeal (CTS) accreditation renewal in April 2024, after over a year and three review cycles. Most of the feedback on the application was quite minor and easily applicable, but there was one sticking point – the Continuity of Service requirement. The only official reference to what happens to ICES data holdings in the unlikely case of the dissolution of ICES is in the Rules of Procedure, where it states that ICES holdings would be transferred to a similar

repository. While the CTS board suggested that contracts are put in place to guarantee the transfer of data in case of ICES dissolution, the most likely outcome is that formal agreements with one or more repositories are created instead. The Data Centre requested that DIG members answer a quick questionnaire on what is their institutes' strategies to continuity of service. As of the date of the meeting, 5 entries were received. During the meeting it was agreed that the form would be slightly modified and sent out again.

10.7 Shiny app hosting review

A few apps developed by ICES staff are now live but the ICES community has not proposed any new Shiny apps for ICES to host. Some apps might have been relevant, but they ended up being published outside ICES at other national institutes. Starting a dialogue between the app developers and the Data Centre at the earliest point is the best way to ensure things run smoothly.

The Shiny apps hosting environment has been running without any problems.



Application	Hours
advicexplorer	348.43
neafc-catch-explorer	18.58
taf-dashboard	8.53
DATRAS-data-mining	0.25
seabass-catch-allocation-tool	10.58
Total	386.37

11 Updates from March 2025 SCICOM meeting and DSTSG Chair

11.1 March 2025 SCICOM meeting

The DIG chair presented selected highlights from the SCICOM meeting in March 2025.

SCICOM agreed to set up the DEI Operational Group, appointed a chair, and a resolution will be completed shortly. SCICOM noted that there has been good cooperation between this group and the Council and Secretariat DEI groups.

SCICOM supported the AI subgroup setting up a workshop to 1) define how responsible AI principles can be implemented in existing ICES guidance and policies, and 2) develop a prioritization of use cases for AI in ICES, define who will be responsible for the use cases, and how to measure their effectiveness in implementation.

SCICOM took note of a list of upcoming challenges including:

- The situation in the US;
- Offshore renewable energy;
- Indigenous knowledge;
- Ecosystem restoration and conservation;
- the new Common Fisheries Policy (CFP)

Opportunities for 2025 included:

- Numerous EU marine-oriented project calls;
- Opportunities to expand collaborations with PICES, especially on offshore renewable energy (ORE) and Indigenous Knowledge;
- Stronger relationships with HELCOM and OSPAR.

A special session was focused on charting a path for Strategic Initiative on Climate Change Impacts on Marine Ecosystems (SICCME) in future.

EcoHubs

The HAPISG Chair, introduced the agenda item on merging working groups, highlighting that some groups are facing challenges related to low membership and uncertain future directions. Key reasons for these struggles could include:

- A decline in community interest.
- Shifts in scientific focus.
- Lack of institutional support.
- Changing policy priorities.
- Proliferation of expert groups (EGs) and *ad hoc* workshops.

To address these challenges, the concept of EcoHubs was proposed.

EcoHubs would serve as collaborative platforms where groups with related scientific Terms of Reference (ToR) could merge or coordinate their efforts, fostering stronger engagement and impact. The successful merger of the Marine Chemistry Working Group and the Working Group on Marine Sediments was presented as a case study. The combined group is now more impactful, engaged, and contributing to multiple scientific and policy products. A comprehensive, objective and transparent review of working group activities, ToR, and participation, using newly available tools, was deemed necessary.

DIG

DIG had reviewed the Data Policy and proposed a number of minor changes. SCICOM approved the updated Data Policy on the SCICOM forum.

The DIG chair discussed the DIG Challenges and Opportunities tracker (https://github.com/orgs/ices-eg/projects/6/views/1) - selected major opportunities and major challenges were highlighted.

ICES Operational Group on Science Programming, SCIPROG

SCICOM Chair and Harald Hasler-Sheetal, Science Professional Officer, introduced SCIPROG, a new SCICOM operational group under development. The group will serve as a coordinating body for science programming and its goal is to ensure that ocean research, especially topics central to the ICES community and strategic plan stay in focus and get funding.

SCIPROG objectives are:

- Strengthen the scientific coordination of future funding for marine research/research programme.
- Enhance the policy relevance of funding programmes.
- Amplify the strategic benefits of project participation by ICES, Member Countries, and other partners.

Chairs Training Programme

Álfrún Sigurdardóttir, ICES Secretariat Communications and Publications Team Lead, presented the WGCHAIRS training programme website. SCICOM was invited to give feedback and to volunteer to assist with the development of new WGCHAIRS modules.

Communications

The ongoing work on the communications strategy was emphasized, with efforts directed at improving engagement tracking and analytics to enhance outreach effectiveness. ICES Secretariat Communications and Publications Team Lead shared that the CMS system of ICES website is reaching its end of life in July of 2026, necessitating a transition to a new system soon. Planning is underway to determine the best path forward for the website.

11.2 Data Science and Technology Steering Group (DSTSG) Chair

Laura Uusitalo (DSTSG Chair) described recent activities in the DSTSG. This included the Working Group on Application of Genetics in Fisheries and Aquaculture (WGAGFA) moving to DSTSG from the Aquaculture Steering group - they still they intend keeping in touch with the aquaculture group as well, but they felt that DSTSG aligns better with their interests. There are three upcoming workshops related to RDBES and one related to TAF.

Questions following the DSTSG update:

- What are trends in the DSTSG? How should we capture that? How should it be reflected in the ICES Data Plan?
- What about AI-ready data? Machine Learning-ready data? What is it?
- Most likely to be included in the WGMLEARN terms of reference in the coming term.

12 National presentations

Since there have been a number of new members joining DIG we decided to make space in the agenda to hear some information about national data activities. The plan is to invite around three members to present each year so that we have covered all DIG members by 2027.

12.1 IMR

Sjur Ringheim Lid from IMR gave a presentation centred on their digital division named HI Digital and how they structure work related to marine data. The division currently being revised and is as of spring 2025 consisting of five different departments, namely the IT department tasked with IT operations, the Norwegian Marine Datacentre tasked with data management, Digital Development tasked with software development, Data Platform tasked with setting up a unified data platform and the AI and Analysis department providing support with regards to AI and analysis for the institute.

The basis for the new organization was the new digital action plan that builds on IMR's strategy for the years 2024-2028, available using the following link http://hi.no/resources/HI-strategi-en-delig-engelsk-PDF.pdf. It focuses on digital transformation and building a unified digital eco-system that will be fit for both science and advice.

DIG was given a high-level overview of the action plan. Interested parties are welcome to contact Sjur Ringheim Lid from IMR for a more detailed view on the ongoing activities related to this work.

12.2 SLU

Malin Werner gave an update on data-related activities at SLU Aqua in Sweden, including:

a) getting all staff aware of pros and cons of AI in their work,
b) safe delivery of fishery-dependent data between our national agencies,
c) cooperation with SMHI on transferring CTD data collected at surveys on the research ship Svea to national and international databases,
d) development and use of quality controlled electronic registrations systems in on-board sampling and surveys,
e) adaptation of the national database and sampling to RDBES, and
f) general data security work.

12.3 NIOZ/Ocean Decade/International Polar Year

Taco de Bruin gave an update on data-related activities at NIOZ, in particular the history of the Netherlands National Ocean Data committee. This was established in 1997 but became dormant around 2015 – it is now being relaunched.

Taco also discussed the UN Ocean Decade, its scientific challenges, and the structural elements supporting its data aspects, including the Decade Coordination Office for Ocean Data Sharing, and the corporate data group. The Data Coordination Group is currently working on the draft Data Strategy Implementation Plan, aiming to make it more digestible and practical for users.

Taco highlighted the upcoming International Polar Year (2023-2033), emphasizing the need for putting a data system in place before it starts, and the involvement of various data management groups in its planning.

13 Cybersecurity

Neil Holdsworth provided an overview of the ICES WK Cyber Workshop https://www.ices.dk/community/groups/Pages/WKCYBER.aspx held May 2025, co-chaired by David Currie and Neil Holdsworth, with multinational representation.

ICES WK Cyber event in 2024 impacted the Data Centre's operations during the event, with both the working groups and the data provision, there being two main ICES platforms in a hybrid environment (cloud and on-premise), with SQL Server database and SharePoint for document management and wider etc. The ICES e-mail system was not affected directly during the event, but a number of institutes from ICES Member Countries chose to block e-mails originating in ICES as a precautionary approach.

The workshop highlighted the need for better documentation, stakeholder engagement, and supply and delivery chain management. There was a focus on data footprint, particularly file content management and storage and requirements aspects of the use/user ICES community, including the need for ongoing reference to legacy data holdings and versions.

The draft recommendations from the workshop were:

- Council and Bureau take an active role in cybersecurity by requiring regular reporting on key cybersecurity metrics to gain clear visibility into ICES cyber risk exposure.
- A focus on cyber training across the ICES community should be promoted by Council, allowing good practice for cybersecurity.
- Reducing the file content storage footprint of ICES by implementing clear retention policies alongside automated file management for efficient storage.
- Improving preparedness of communications for cyber incidents by developing and practicing an information systems incident response plan with relevant participants.
- Adopting a 'secure by design' philosophy by implementing standard operating procedures (SOP) for security assessment of all critical Information Systems projects.
- Adopting the CIS Controls framework, or equivalent, as a comprehensive view of cybersecurity, and establish a baseline of implementation maturity.

Communication challenges were noted, especially by UK institutions, which were unable to contact ICES during the event. 'Secure by Design' implementation and accreditation exercises were emphasized, with the CIS controls framework likely to be adopted. The Microsoft Secure Score was used for benchmarking, showing reasonable progress but room for improvement. The meeting stressed the importance of balancing cybersecurity with usability and collaboration. Challenges included varying levels of cybersecurity focus among institutes and the impact of changing authentication methods and migrating data centre applications to the cloud.

Despite difficulties, potential benefits such as improved performance and scalability were noted and improved awareness at management and executive levels. It has highlighted risks and behind-the-scenes operations and maintenance to management, where the IT budget data is important beyond the services on which most are focused, demonstrating that hidden IT aspects are just as important. Communication plans for upcoming changes were discussed, emphasizing the need for secure user access and policy adherence.

Participation at the workshop was valued by DIG and there were discussions on attendance reflecting that organizations directly responsible for their security had more active involvement, while other institutes had intermediaries joined though still valued contributions.

The workshop has also proposed a new three-year working group to provide continuity in this work.

14 Future DIG meetings

The next DIG online meetings will be held on Wednesday 8 October 2025 and Tuesday 17 February 2026.

The 2026 DIG meeting will take place over 4 calendar days: Tuesday 19 May–Friday 22 May 2026. It will be a hybrid meeting held at the ICES Secretariat building in Copenhagen and online.

Annex 1: List of participants

Name	Institute	Country (of institute)	E-mail
Mehdi Abbasi	ICES		mehdi.abbasi@ices.dk
Suzy Angelus	Centre for Environment, Fisheries and Aquaculture Science	UK	suzy.angelus@cefas.gov.uk
Örjan Bäck	SMHI Göteborg	Sweden	orjan.back@smhi.se
David Currie (Chair)	Marine Institute	Ireland	david.currie@marine.ie
Ingeborg de Boois	Wageningen Marine Research	Netherlands	ingeborg.deboois@wur.nl
Taco de Bruin	Royal Netherlands Institute for Sea Research	Netherlands	Taco.de.Bruin@nioz.nl
Côme Denechaud	Institute of Marine Research	Norway	come.denechaud@hi.no
Laura Hanley	Centre for Environment, Fisheries and Aquaculture Science	UK	laura.hanley@cefas.gov.uk
Mark Hebden	British Oceanographic Data Centre	UK	mahe@noc.ac.uk
Neil Holdsworth	ICES		neilh@ices.dk
Nasrullah Iqbal	ICES		nasrullah.iqbal@ices.dk
Hans Mose Jensen	ICES		hans.jensen@ices.dk
Henrik Kjems-Nielsen	ICES		henrikkn@ices.dk
Cecilia Kvaavik	ICES		cecilia.kvaavik@ices.dk
Luca Lamoni	ICES		luca.lamoni@ices.dk
Hong Minh Le	Royal Belgian Institute of Natural Sciences	Belgium	hmle@naturalsciences.be
Sjur Ringheim Lid	Institute of Marine Research	Norway	sjur.ringheim.lid@hi.no
Michael Liddel	NOAA National Marine Fisheries Service	USA	michael.liddel@noaa.gov
Maria Makri	ICES		maria.makri@ices.dk
Iago Mosqueira	Wageningen Marine Research	Netherlands	iago.mosqueira@wur.nl
Chris Moulton	OSPAR Commission		chris.moulton@ospar.org

Name	Institute	Country (of institute)	E-mail
Periklis Panagiotidis	ICES		Periklis.Panagiotidis@ices.dk
Hjalte Parner	ICES		hjalte@ices.dk
Carlos Pinto	ICES		carlos@ices.dk
Clare Postlethwaite	Marine Environmental Data and Information Network	UK	cfpo@noc.ac.uk
Jens Rasmussen	Marine Scotland Science	UK	jens.rasmussen@gov.scot
Joana Ribeiro	ICES		joana.ribeiro@ices.dk
Helge Sagen	Institute of Marine Research	Norway	helge@hi.no
Vaishav Soni	ICES		Vaishav@ices.dk
Nori Shoji	NOAA National Marine Fisheries Service	USA	noriko.shoji@noaa.gov
Adrian Tait	Marine Scotland Science	UK	adrian.tait@gov.scot
Nikki Taylor	Joint Nature Conservation Committee	UK	Nikki.Taylor@jncc.gov.uk
Rob Thomas	Marine Institute	Ireland	Rob.Thomas@Marine.ie
Laura Uusitalo	Natural Resources Institute Finland	Finland	laura.uusitalo@luke.fi
Harriet van Overzee	Wageningen Marine Research	Netherlands	harriet.vanoverzee@wur.nl
Adriana Villamor	ICES		Adriana.villamor@ices.dk
Christian von Dorrien	Thünen-Institute of Baltic Sea Fisheries	Germany	christian.dorrien@thuenen.de
Malin Werner	Swedish University of Agricultural Sciences	Sweden	malin.werner@slu.se
Marcin Wichorowski	Institute of Oceanology	Poland	wichor@iopan.pl
Oliver Williams	Centre for Environment, Fisheries and Aquaculture Science	UK	oliver.williams@cefas.gov.uk
Lucia Zarauz	AZTI	Spain	lzarauz@azti.es

Annex 2: Draft Restricted Data License for Preliminary Catch Statistics

Definitions

a) **Licensor** means the individual(s) or entity(ies) granting rights under this License.
b) **You** means the individual or entity exercising the Licensed Rights under this License.
c) **Licensed Rights** means the rights granted to You subject to the terms and conditions of this License
d) **Restricted Data** means data within the Database that is classified as not publicly accessible as determined by the data owner
e) **Public Data** means data within the Database that is classified as publicly accessible as determined by the data provider;
f) **Data Provider** means the organization and/or individual that controls/organizes access to the data
g) **Data owner** means the organization and/or individual that retains the ownership rights for the data
h) **Databases** means the data repository or data portal where the data reside.
i) **ICES Advice Requester** means an organization or country that has signed an agreement with ICES to provide management advice services;

Scope

This license applies to anyone granted licensed rights to use restricted data uploaded into the databases. Public data access rights are described in the ICES Data Policy. DOI 10.17895/ices.pub.8883

License Grant

Full access to use restricted data are granted to the following:

a) an ICES group with related Advice terms of reference;
b) an ICES advice requestor, where data have been provisioned under a data call from the ICES advice requestor;
c) Anyone given a direct grant of rights by the Licensor(s)

License Conditions

a) Correct and appropriate data interpretation is solely your responsibility.
b) You must not expressly or otherwise imply ICES substantiation of your work, results, conclusions and/or recommendations.
c) You are obliged to inform ICES of any suspected problems in the data.
d) Data provided to you shall not be kept on your computer/database upon completion of the task related to the term of reference.
e) You shall treat the data that are marked as restricted as confidential and the transmission or sharing of these data are not allowed

f) You shall ensure that data products derived from the data adhere to the confidentiality rules detailed in the latest ICES datacall for preliminary catch data.

Attribution

These data should be cited as per guidance provided in the ICES Data Policy.

Disclaimer of Warranties and Limitation of Liability

a) Unless otherwise separately undertaken by the Licensor, to the extent possible, the Licensor offers the Licensed Material as-is and as-available, and makes no representations or warranties of any kind concerning the Licensed Material, whether express, implied, statutory, or other. This includes, without limitation, warranties of title, merchantability, fitness for a particular purpose, non-infringement, absence of latent or other defects, accuracy, or the presence or absence of errors, whether or not known or discoverable. Where disclaimers of warranties are not allowed in full or in part, this disclaimer may not apply to You.
b) To the extent possible, in no event will the Licensor be liable to You on any legal theory (including, without limitation, negligence) or otherwise for any direct, special, indirect, incidental, consequential, punitive, exemplary, or other losses, costs, expenses, or damages arising out of this Public License or use of the Licensed Material, even if the Licensor has been advised of the possibility of such losses, costs, expenses, or damages. Where a limitation of liability is not allowed in full or in part, this limitation may not apply to You.
c) The disclaimer of warranties and limitation of liability provided above shall be interpreted in a manner that, to the extent possible, most closely approximates an absolute disclaimer and waiver of all liability.

Annex 3: Review of OBPS Template for Endorsing Records

(The DIG subgroup comments on this OBPS template are in bold italics.)

Entities providing endorsement under an Letter of Agreement (LOA) with the Ocean Best Practices System (OBPS) are asked to follow the template for their endorsement documentation:

We believe it would be rather difficult and time-consuming to get an amendment to the existing Letter of Agreement (LoA) that ICES has in place with IOC. It is probably not appropriate to have a LoA with an individual ICES Group – there are 160 expert groups in the network. A more practical arrangement would be to make an addendum to the 2012 letter of cooperation, or a separate agreement between the ICES Secretariat and OBPS, which would be less bureaucratic.

We propose adding an additional section to explicitly state which practice is being endorsed and the score achieved using the OBPS maturity assessment.

Section 0
- Name of practice - We recommend explicitly stating which practice is being endorsed at the top of the form.
- Maturity score - As self-endorsement is only suitable for practices that have already undergone the maturity assessment and scored greater than 4, we recommend explicitly referencing the maturity model, stating that the practice has been assessed using the maturity model and recognized as better or best practice (including the score).

Section 1 – Endorsing entity description

· Entity name

Clarification needed. Is a legal entity required here? For the ICES data guidelines, the endorsing entity would need to be the ICES Data and Information Group, which is not a legal entity.

· Other partnering / supporting entities

This is fine, we would consider including ICES expert groups involved with the review of the guidelines or the author of guidance.

Section 2 – Endorsement documentation
· Date submitted for endorsement acceptance
· Endorsed Practice document citation (creators, year, title, publication details, number of pages, and persistent identifier - eg. DOI, URI)
Clarification needed. Are OBPS expecting this to be the ICES DOI and URI? Or the links in OBPS. NB if not already the case, we recommend that OBPS should be pointing to the ICES DOI.

Section 3 – Endorsement process description used for the document:

1. have completed a rigorous and transparent community review process whereby comments are invited, adjudicated and actioned by the author(s) and

where these actions have been verified by the endorsing organization;
This is fine – it covers the main review undertaken by ICES DIG.

2. has been successfully used by multiple institutions;
Clarification needed. Please clarify that the multiple organizations that comprise ICES DIG satisfy these criteria. What sort of evidence do you anticipate for this? NB This is hard to prove for ICES data guidelines because of the open access to our guidance. Although we can track numbers of downloads, we do not always know when the guidance has actively been used.

3. be available and identifiable within the OBPS repository;
Propose significant amendment. Although we strongly advocate for practices to be included on OBPS, we don't believe that this should be part of the self-endorsement. Maintenance and up-keep of OBPS identifiers/infrastructure is outside ICES DIG control. We strongly encourage this to be replaced with "the practice is published and openly available".

4. have an update or maintenance plan for future;
This is fine

5. if relevant, includes description of estimating uncertainty or heterogeneity of a quantity;
Propose removal - Although this is relevant to the ICES data guidelines, we feel that this level of detail is not appropriate to the endorsement process. This clause feels much better aligned with the maturity assessment. Where relevant, this is something that should be covered under "Practice includes process for quality assessment (.15)"

6. follow recommendations for metadata standards and file formats for archiving in international data centers;
Propose removal - Although this topic is highly relevant to the work of ICES DIG, we again feel that this level of detail is not appropriate to the endorsement process. This one feels much better aligned with the maturity assessment. Where relevant, this is something that should come under better practice.

Section 4 – Closing matter
· Authorizing signature, title, date
· Additional references

Annex 4: Current challenges and Opportunities

Part of the remit of DIG is to evaluate and monitor current and future challenges and opportunities in data management. The DIG Challenges and Opportunities tracker is implemented in GitHub so that it can be viewed externally: https://github.com/orgs/ices-eg/projects/6 Entries are split between 'challenge' and 'opportunity' and scored according to likelihood and impact. This allows a severity rating to be calculated for each item; minor, medium and major.

The next steps for each entry depend on the severity:

- Major: Include summary of challenge/opportunity in DIG reports and briefing to SCICOM. DIG to make recommendations for action if necessary
- Medium: Include summary of challenge/opportunity in DIG reports. DIG to make recommendations for action if necessary
- Minor: monitored by DIG

Here are the current major and medium challenges and opportunities.

Major opportunities

Adoption of new technology causes improved capabilities	https://github.com/ices-eg/DIG/issues/572
Quality Management Framework for Advice causes improved FAIR data	https://github.com/ices-eg/DIG/issues/380
Enhanced use of cloud data backup facilities causes easier and faster recovery following local loss of data	https://github.com/ices-eg/DIG/issues/520
Core Trust Seal accreditation process for ICES Data Management causes continuous improvement to key aspects of data management	https://github.com/ices-eg/DIG/issues/524

Medium opportunities

Open code sharing causes increased transparency, efficiency and confidence in ICES products	https://github.com/ices-eg/DIG/issues/579
Increased data availability and submission causes improved science products	https://github.com/ices-eg/DIG/issues/578
Incorporation of AI into ICES work flows causes improved outputs	https://github.com/ices-eg/DIG/issues/581
Semantic interoperability of data causes improved potential for connecting up data across disciplines	https://github.com/ices-eg/DIG/issues/512

Hosting pre-existing ICES community developed applications causes improved visibility and sustainability	https://github.com/ices-eg/DIG/issues/514
Licencing standardization causes increased FAIRness of ICES data	https://github.com/ices-eg/DIG/issues/575

Major challenges

Insufficient funding available for priority projects causes failure of delivery	https://github.com/ices-eg/DIG/issues/553
Lack of Cloud adoption strategy causes delays to evolving operational services	https://github.com/ices-eg/DIG/issues/521
Data storage for increasingly large datasets causes increased need for capacity planning	https://github.com/ices-eg/DIG/issues/381
Low uptake of TAF causes lack of transparency and reproducibility in the advice cycle	https://github.com/ices-eg/DIG/issues/594
Lack of data availability / accessibility causes less scientific evidence for ICES products	https://github.com/ices-eg/DIG/issues/453
Lack of guidance and standards on use of AI/ML tools in science causes risk to reputation of ICES	https://github.com/ices-eg/DIG/issues/554

Medium challenges

Lack of verification and testing of software code causes impact on ICES advice outputs	https://github.com/ices-eg/DIG/issues/551
Lack of data collection causes less scientific evidence	https://github.com/ices-eg/DIG/issues/451
Lack of familiarisation with Machine Learning techniques and tools causes less efficiency and risks to scientific integrity	https://github.com/ices-eg/DIG/issues/511
Data used by ICES without an appropriate license causes discrepancies in proper use	https://github.com/ices-eg/DIG/issues/513
Increased automation causes reduction in supply of expertise	https://github.com/ices-eg/DIG/issues/515
Increased data need causes more demand on originators	https://github.com/ices-eg/DIG/issues/522
Changes to GitHub usage conditions causes loss of key system	https://github.com/ices-eg/DIG/issues/525
Regionally specific training datasets causes lack of transferability for wider uses	https://github.com/ices-eg/DIG/issues/517

Annex 5: Resolutions

1

Resolutions for Operational Groups

Data and Information Group (DIG)

2024/OG/SCICOM01 The **Data and Information Group** (DIG), chaired by David Currie*, Ireland, will meet online on 19 February 2025 and from 20–22 May 2025 at ICES Secretariat, Copenhagen, Denmark, to:

a) Provide guidance and feedback to the ICES Data Centre;
b) Advise on data governance within ICES, and identify any changes required and their impact;
c) Facilitate best practice in data management by providing guidance to expert groups, engaging in dialogue, and supporting the ICES Data Centre CoreTrustSeal accreditation;
d) Evaluate and monitor challenges and opportunities in data management, technology, artificial intelligence, and cyber-security;
e) Engage with the ICES community, and beyond, to encourage knowledge sharing about data management.

DIG will report by 28 June 2025 to the attention of the Science Committee.

Supporting Information

Priority	The Data and Information Group provides ICES with solicited and unsolicited advice on all aspects of data management including technical, data policy and data strategy and user oriented guidance. This operational group flies the flag for ICES in setting standards for global databases. It also provides an important interface for oceanographic, environmental, and fisheries data management in ICES, and promotes good data management practice

Scientific justification	**Term of Reference a)** Direct interfacing with the ICES Data Centre around priorities and general best practise recommendations enables the Data Centre to receive both solicited and unsolicited advice on solutions and practises from a broader international community. **Term of Reference b)** It is important for the data users to be engaged in identifying priorities for data governance within ICES. DIG acts as a focal point for the data governance groups as well as the wider ICES community. DIG works with the ICES Data Centre to define and improve the data governance framework within ICES. This includes reviewing the ICES Data Policy, data licenses, and recommending changes where required. **Term of Reference c)** DIG will ensure that data governance and best practices in data management are promoted in the ICES community. DIG also supports the CoreTrustSeal accreditation obtained by the ICES Data Centre. As the multi-disciplinary use of data, and the complexity of that data are both increasing this work will become increasingly important in the coming years. **Term of Reference d)** By reviewing and monitoring current and future activities, DIG can proactively advise ICES and specifically DSTSG on emerging issues. Utilising the experience of the group and combining it with the operational knowledge of the ICES Data Centre, the potential benefits and challenges can be identified and their impact presented. In particular, the impact of Artificial Intelligence techniques on ICES work, and supporting ICES to become more cyber-secure are key topics in 2025. **Term of Reference e)** Effective data and information management is an essential foundation for digital transformation and DIG acts as a focal point for these topics within the ICES community. DIG aims to build a culture around data – this includes engaging data providers and users, and sharing knowledge.
Resource requirements	The resource required to undertake additional activities in the framework of this group is negligible.
Participants	The Group is expected to be attended by some 15–30 members, with good international and topical coverage
Secretariat facilities	Meeting facilities, organization and facilitation of Teams meetings (frequency and participants depending on topics to be discussed). Participation of ICES Data Centre
Financial	No financial implications.

3

Linkages to advisory committees	ACOM (indirect)
Linkages to other committees or groups	As Data is an important topic for most groups under SCICOM and ACOM, this group links to a large number of groups, although often indirect.
Linkages to other organizations	There are linkages with relevant international bodies and programmes like SeaDatanet AISBL, EMODNet, IOC and its Working Committee on International Oceanographic Data and Information Exchange (IODE), OSPAR, and HELCOM.