

ICES Quality Action Plan

1 Purpose

To inform about the nature of advice errors and outline a Quality Action Plan ICES has prepared

To discuss whether ACOM should always correct errors or can margins of tolerance and fall-back positions be established.

To reiterate the need for sustainable solutions for advice production

2 Background

Document 3 outlines the changes to headline fishing opportunities advice in 2024 due to errors. Since 2019 ACOM introduced several quality assurance mechanisms to trap errors at different stages in the assessment and advice production process. These include technical & drafting guidelines, enhanced expert group scrutiny, benchmarking and the benchmark oversight group (BOG), peer reviews, working group audits, increased advice drafting group scrutiny and audits, improved communications between ADGs, ACOM and the EGs, formalised data calls, data validation tools, improved databases (RDBES, surveys, SAG, SID, ASD etc.) and tools, the transparent assessment framework (TAF) etc. In general, these have reduced the number of detectable errors.

The ICES quality assurance framework includes continuous process improvement. This involves reviewing all errors and developing solutions to prevent repeats of similar errors in the future. ICES has been actively monitoring and reporting advice errors since 2019 and ACOM leadership have classified the errors into different types (Table 1). Some of these errors are controllable by ICES (e.g. reference point errors, text and copy paste errors), others may not be fully controllable (e.g. input data errors) and others are very difficult to identify and control (e.g. model errors and coding errors).

The increase in errors detected in 2024 is attributable to a number of factors. In particular, where other scientists rerun the assessment or forecasts and cannot reproduce the same results. This highlights the need for an increased focus on reproducibility but also on complexity and capacity. Some of the assessment and forecast models are highly complex, this limits the expertise pool within the community capable of reviewing, rerunning and checking the models. This is a real challenge for ICES since on the one hand best available science often entails using complex integrated and/or stochastic models, and on the other hand we need to ensure reproducibility and transparency. ACOM is committed to allowing innovation but also to ensuring that the advice is operational.

ICES is acutely aware of the impact of such errors on the perception and credibility of ICES advice. We also regret the impact these errors have on the border fisheries system especially the fishing sector and management authorities. ICES is committed to minimising our error rate as much as possible and being open and transparent around communication of errors.

Table 1 Fishing opportunities advice error or issue types detected over time.

Advice error or issue types	2019	2020	2021	2022	2023	2024
No ACOM Consensus	1					1
Reference Points Error			1			
Text error in advice				1	2	1
Typo/Copy Paste Error					1	1
Assessment Model Error	1					1
Assessment Settings or code Error			1		1	1
Calculation error	1		1	1	1	
Forecast Model Error						1
Forecast Settings or Code Error	1		1	1	1	3
Input Data Error (Fishery Data)			2	4		
Input Data Error (Survey)	1	2	4	2	2	3

3 Improvements to processes

ACOM leadership have identified a number of improvements to process in 2025 that will help with quality assurance. These include:

- Stricter adherence to deadlines for data calls
- Stricter adherence to deadlines benchmarks
- Periodically externalize the audits to early career review
- Enhanced consistency checks between Advice sheets/SID/SAG/ASD

The lived experience is that failing to meet deadlines in process has significant downstream consequence for quality assurance. Many of the stocks where errors have occurred in the past, or stocks which have generated additional unforeseen workload to fix errors before advice release, can be linked back to processes where deadlines were missed, and the system was under pressure. Stricter adherence to deadlines could mean that ICES fails to deliver advice in a particular year or that benchmark processes are postponed.

ICES has very effectively used early career reviews in the past to check assessments, reproduce assessments or assist with importing stocks into TAF. The ICES secretariate will try to re-establish some external early career reviews in 2025.

In addition, the ICES secretariate is developing a new tool to identify inconsistencies between databases. This will facilitate identification of inconsistencies that need to be resolved and provides an additional new quality check.

4 Improvements to Benchmark Preparations

In 2024 ACOM decided to give approval for benchmarks 2 years in advance of the anticipated application of their results. This longer timeline should allow for better planning of benchmarks and a less rushed and pressured process that can be better resourced and planned.

It should also help to ensure that the results of the benchmarks are available earlier to allow proper oversight of the results by the benchmark oversight group (BOG) and ACOM. There will be stricter adherence to timelines that are laid out in the guidelines which should also help to ensure that the processes are not rushed.

In 2025 BOG guidelines are being revised to increase the detail around what is expected to be covered in benchmarks, what should be included in the report and what is expected of reviewers.

In addition, the new timeline for the full benchmark process will be better described in the guidelines. This will also include certain 'decision points' where the risk to the benchmark results will be evaluated. For example, the status of working documents will be checked in advance of the benchmark workshop. If progress indicates that the working documents will not be ready then the workshop could be delayed or moved to the next year.

5 Strengthen TAF

During benchmarks there should be more of a focus on standardisation and simplification. The majority of ICES stock assessments are carried out using 4 main assessment methods (Table 1). The used of standardised, simplified quality assured templates in TAF for those methods will greatly enhance quality assurance from 2025.

Table 1. Assessment methods for category 1-2 stocks as recorded in the Stock Information Database (SID) in 2024.

Assessment Method	Category 1	Category 2	Category 3	Total
SAM	46	0	2	48
SPiCT	0	15	4	19
SS	20	0	1	21
UWTV	15	0	0	15
Other Models	29	2	2	33
Total	110	17	9	136

ICES has identified four main improvements that will be progressed with the stock assessment community in 2025.

- Code audits and standardisation post benchmark
- Implement standard diagnostic and quality control templates in TAF
- Automate outputs from TAF to other databases
- Continue to drive uptake of TAF by stock assessors through training and providing resources and support
- Guidelines will be developed to assist experts in auditing stock assessments conducted using TAF templates.

6 Expert group checks

Several of the errors in the headline advice during 2025 were identified by experts in WKMIXFISH when they replicate short-term forecasts using specific mixed-fisheries tools. In 2024, this replication took place just before the mixed fisheries advice meeting in October. Therefore, if errors are discovered, it is already late in the year and can be challenging to reissue the advice in time for TAC setting at the end of the year.

As replication of the STF is not a mixed fisheries task itself, in 2025, it will be integrated into the assessment working groups as a quality check to ensure errors

are caught promptly. Initially, this will only apply to stocks considered in mixed fisheries but next year it will be expanded to all category 1 and 2 stocks.

A detailed review or audit of all stock assessments is nearly impossible due to the complexity of many assessments, limited availability of expertise and the amount of work required. Therefore, a risk assessment approach will be used to determine which stocks require a thorough audit of data compilation and assessment processes.

Briefly, the following actions will be taken:

- In 2025, replicate of the short-term forecast, for mixed fisheries stocks, as part of the assessment working groups or immediately after them, to identify errors before the advice is released.
- Starting in 2026, expand replication of the short-term forecast to include all category 1 and 2 stocks.
- Where possible implement an independent full rerun of the assessment and forecast
- Identify stocks that require a thorough audit of the data compilation and assessment process using a risk assessment approach.

7 ACOM initiatives

ACOM is responsible for and oversees all ICES advice. It is important that ACOM reinforces a culture of quality assurance throughout the advice production stage. In 2025 ACOM will launch a new Advisory Plan, three of the Priority Areas include actions to strengthen the quality of ICES advice (Assuring quality, Process innovation and efficiency, Building capacity and resilience).

ACOM should also ensure, with Council, institutes and requesters, that ICES assessment and advisory process are adequately resourced. Quality issues are often linked to under resourced or poor managed process.

ACOM leadership has commenced a process of integration and simplification of ICES guidelines. In 2025 the higher-level guidelines will be integrated. Further work on Technical Guidelines will also commence.

8 Action Plan summary

The 10 point action plan is summarised below:

- 1) Stricter Adherence to Deadlines in Process (especially data calls & benchmarks)
- 2) Improved benchmark process and planning
- 3) Code audits and standardisation post benchmark
- 4) Implement standard diagnostic and quality control templates in TAF and automate outputs from TAF to other databases
- 5) Ensure that the majority of stock assessments are carried out with benchmark approved methods in TAF.

- 6) Where possible implement an independent full rerun of the assessment and forecast
- 7) Audit Risk Assessment & triage the stocks that need attention & periodically externalize the audits to early career reviews
- 8) Integrate and simplify guidelines
- 9) Consistency checks between Advice sheets/SID/SAG/ASD
- 10) Implement the new Advisory Plan & promote a culture of quality assurance

Mapping the action plan back to the error type we see that some errors could be addressed directly through multiple actions. Some of the actions such as 2 and 8 indirectly affect quality by improving and simplifying process.

Advice error or issue types	Action Plan
No ACOM Consensus	10
Reference Points Error	9
Text error in advice	10
Typo/Copy Paste Error	10, 9
Assessment Model Error	5
Assessment Settings or code Error	3, 5, 6, 7
Calculation error	6
Forecast Model Error	5, 6, 7
Forecast Settings or Code Error	3, 5, 6, 7
Input Data Error (Fishery Data)	1, 3, 4, 10
Input Data Error (Survey)	1, 3, 4, 10

9 Implications for MIACO

Firstly, it is important that MIACO are aware of the actions ICES is planning to strengthen the quality assurance framework.

Secondly, the way ICES fishing opportunities advice is currently communicated with “pseudo” precision (i.e. to the nearest tonne) does tend to exaggerate the error rate. Many of the corrections to ICES headline advice are relatively small, well within the margin of error of the stock assessments and forecast and may not impact on the management outcome. For example, an overshoot or undershoot of catches or observation error on catches in the assessment model may well be larger than the advice error. In this context, a dialogue around the ACOM policy of correcting all errors “as soon as possible” would be useful. Correcting errors no matter how small puts a significant burden on the ICES experts and may add work to the management authorities.

Thirdly, ICES is discussing with MIRIA whether a fall-back positions when advice for stocks cannot be delivered due to missed deadlines or other unforeseen issues is needed (Action Point 1).

Finally, resourcing of the ICES system, particularly through the provision of experts and the support of key infrastructure is essential to ensure that ICES advice

is fit for purpose. Moving to multi-annual assessments and advice (Doc 5c) could free up resources to better quality assure the advice. The longer benchmark timeline allows for better planning and alignment of resources. Establishing sustainable mechanisms to properly resource ICES databases and tools going forward should also be discussed.