

Theme Session P – External Independent Peer Reviewing – achievements and failures

Convenors: Pierre Pepin (Canada), Martin Pastoors (ICES), and Paul Keizer (Canada)

Peer review is highly pertinent in the worldwide climate of rigorous evaluation of science-based policy. ICES is currently engaged in a potential restructuring programme that is intended to bring it more into line with customer requirements for advice that is cross-cutting fisheries, environmental, and system needs. Concern is often expressed about the independence of review of science proposals and results, as well as the accuracy of reports that appear in the primary literature. The Theme Session invited contributions from different areas of the world, including areas not traditionally associated with ICES, where the science underpinning management advice is subjected to different levels of external scrutiny and (peer) review.

The Theme Session attracted 9 papers and one poster presentation; three of the presentations explored the world of peer-review in scientific publications and grant applications while the remaining papers and poster considered various elements of the peer-review of scientific advice. All of the papers were of a high quality that stimulated a lively and interesting discussion. The poster paper explored the usefulness of external peer review of stock assessment surveys.

Regardless of the purpose of the peer review it is always a challenge to find good reviewers. There is a relatively small pool of good reviewers and the demand for their services is increasing. Good reviewers make a big commitment to complete thorough reviews and to meet editors' deadlines. There is perhaps a bias in this pool of reviewers towards the more wealthy countries where research funds and the number of researchers is greater. The system also favours researchers and reviewers whose first language is English. But in almost all cases researchers tend to wear many hats, researcher, adviser, reviewer, so it is difficult but critical to seek independence of the reviewers. As the competition for research funds increases there is a tendency to make inflated claims in grant applications and the introduction and discussion section of scientific papers. Reviewers must be mindful of this tendency. One presentation suggested that limiting scientific papers to methods and results, but at what cost?

Peer review is an integral part of the process most scientific journals use to ensure that only scientifically sound papers are accepted and those that do not adhere to the standards of scientific rigor are rejected. However this process is far from perfect. Even under the most rigorous of processes used by the best primary journals there is still a 20% probability that a bad paper will be accepted while the probability of rejecting a good paper is less than 10%. Editors must be mindful of the attempts of some reviewers to force their opinion upon another author through the review process. Adopting a process where the names of reviewers are made known to authors can reduce the likelihood of this. However there is also support for a double-blind system where both the authors and reviewers names are not revealed. New technology is now assisting editors in one aspect of their work. Editors now have access to computer software that aids in detecting many attempts at plagiarism but there is no alternate to the peer review process for detecting "bad" science.

Many funding agencies and scientific research programmes rely upon peer review to make decisions in competitions for research funds. When reviewing research proposals, in addition to the usual concerns faced by reviewers they also have to be mindful of the tendency for self-promotion in these grant applications in order to influence decisions. Funding agencies must be particularly very careful in ensuring the independence of reviewers from any national or institutional pressures. In Spain a parallel review process is used where proposals are

individually peer reviewed and at the same time they are also rated against competing proposals. The results of these parallel assessments are provided to an independent evaluation committee that makes the funding decisions. While this process has worked well since being implemented in 1995 it is proving less effective today. Research proposals are becoming larger and more complex to meet the demands for a multi-disciplinary or team approach and they cannot be effectively reviewed by individual scientists.

The cost of the reviews was a component of the presentations concerning the Centre for Independent Experts (CIE), a system for independent and expert reviews of the science necessary for the management of marine fisheries resources that are under the purview of the National Oceanic and Atmospheric Administration Fisheries in the USA. Since the cost of reviews continues to increase and is presently at about \$17 000 per review the CIE has evaluated the effectiveness of the reviews. Using a variety of metrics to measure the competency of the reviewers it was concluded that the CIE was meeting its goal of providing expert reviews. In Canada fisheries advice is provided by the Canadian Science Advisory Secretariat (CSAS). The CSAS also has a broader mandate than the CIE in that it provides scientific advice for all aspects of the mandate of Fisheries and Oceans Canada. The complexity of some of the advice provided creates a significant challenge to assemble the necessary expertise to provide a comprehensive critical review. The consensus approach to providing advice places a great demand upon the chairs of the advisory meetings.

Many of the presentations addressed the need for transparency in the review process. The Canadian experience with stakeholder participation in the advisory process under CSAS has been very positive but strict rules of participation have to be adopted and enforced. The experience of the CIE has also been positive. Thus there was a positive response to the call for greater transparency in the ICES Advisory Services. A regular system of public reviews would enhance transparency and credibility of the advice while not compromising the scientific rigor of the advice. Public reviews help to increase the awareness of scientists to the scope of concerns of the general public while also providing an opportunity to communicate and collaborate with other scientists. In ICES there are additional challenges due to number of countries involved in drafting and reviewing the advice with a limited pool of scientific experts. The process of drafting advice needs to be well separated from the review process and the chair of the review should be from a country that is not impacted by the advice. More importantly the chair has to recognize the impact that language and ethnic differences in debating styles will have on the review process.

Summary

There was a lively discussion at the end of the session where it was emphasised that advice cannot be provided in a risk-free environment; we will make mistakes both in rejecting good advice and accepting bad advice. This also applies to the peer review of scientific publications and grant applications. But it is important that there are processes in place that detect the mistakes and that adjustments are made to prevent the same mistakes happening again.

There are many challenges to the peer review process as the reviews increase in complexity and number. It is therefore critical that efficient use is made of the limited number of good reviewers that are available. For example, it is important that very clear goals and objectives are provided to the reviewers. For the review of grant applications and scientific advice consideration should be given to using a process similar to the pre-screening by subject editors that many journals use. There may be a need to establish some type of "reviewer" resource management system to ensure that the review system is not overburdened and this becomes unreliable.

No alternative to the peer review process was suggested for ensuring and evaluating the quality of primary publications and grant applications. The challenges associated with

maintaining a high quality review of scientific advice are increasing as the volume and complexity of the requests for advice increase. Undoubtedly there will be mistakes made in giving advice but the costs of not giving advice or of waiting until the advice is “perfect” are too great. We must strive for an advisory system that provides a rigorous review of scientific advice in a timely manner. Monitoring systems must also be in place to detect and correct mistakes and evaluate the impact of the advice being provided.