

Uncertainty and objectivity in fisheries management:

comment on Jon Nevill's submission to the Commonwealth's inquiry into fisheries legislation 2012.

Prof. Craig Johnson, University of Tasmania,

25 September 2012.

While Australia does well by global standards, there is room for improvement in fisheries management despite the well meaning intentions of many charged with the task.

However we need to acknowledge at the outset that managing fisheries will always be difficult – and therefore interesting – given that:

- There is always scientific uncertainty – data are rarely 'perfect' or sufficient, and so interpretation is usually open to debate.
- Management decisions are inevitably a compromise across scientific / environmental, economic, social, and sometimes political imperatives, and while ever there are fisheries there will be debate about where the balance should be in that compromise.
- Related to the second point is that it is necessary for managers to engage with many stakeholders, including the industry who often are called on to fund (or contribute to fund) work that underpins decisions. Thus, there is potential for lines to blur between the roles of industry and managers, industry and scientists (particularly when one funds the other, removing the independence that should exist between the two), and managers and scientists.

My professional concern in all this is that scientific advice must be as objective and transparent as is possible, i.e. without bias and delivered as impartially as possible, and without fear or favour. That is what will give us the best chance of ensuring a healthy, sustainable and profitable industry in the long term, alongside healthy and properly functioning marine ecosystems.

As you point out, this is not always the case, and some scientists – whether through 'omission, exaggeration, misplaced context, or straightforward error' – behave more as advocates for industry rather than neutral and objective purveyors of information / advice. Others can be identified as playing the advocacy game at the other end of the spectrum. Part of the problem is that because of uncertainties in the information base, *if an individual wishes to do so*, it is relatively easy to shift the balance of interpretation one way or another in a way that doesn't leave it open to obvious criticism of direct distortion of fact. In this way it is relatively easy to have opinion dressed up as scientific evidence. It is much better to be open and up-front about the extent and nature of the uncertainties and outline clearly the reason for a particular interpretation given the acknowledged uncertainty. Unfortunately this drive for clarity and objectivity in the science is, in some cases, lacking at best and there is deliberate obfuscation / blurring at worst.

My opinion about the supertrawler? A problem with the mackerel fishery at the moment is that the fishery uses smallish boats that fish inshore, and because of the oil content of the fish and thus the rapidity of it spoiling, by the time the catch is landed it is suitable only for aquaculture feed, or pet food, or similar. This is environmentally unsound in (1) concentrating fishing near the coast, and (2) losing fish protein biomass that is perfectly suitable for human consumption. The latter should be unacceptable; catching 1 kg of fish (that are perfectly suitable for human consumption) in one area to make fish food to grow less than 1 kg of fish somewhere else (note the implied carbon cost in transport etc.) has to be seen as an archaic and environmentally unacceptable practice. Using large ships able to fish in any waters (thus spatially distributing the effort) and processing the catch for human consumption as soon as it comes on board (i.e. as a high quality food product) has to be the way of the future. Of course, one has to get the fisheries management right too (sensible quotas, spatial management etc.), but this applies to any fishery irrespective of the nature of the vessels.

Incidentally, on your question of statistical power, power is technically related to Type II error, not Type I. In this context the problem with fisheries is that too much attention is given to Type I error (the classical approach) whereas the real risk lies with Type II error.