European Fisheries and Aquaculture Research Organisations

EFARO General Assembly 2017, 17 May 2017 Brussels.

Public summary of the Seminar 'Smart data collection for the future monitoring of the sea'

On may17th, 2017 EFARO organised a one-day seminar on Smart data collection for the future monitoring of the sea. Aim of the seminar was to set the agenda on the future of marine data collection and smart use of marine data in Europe.

The future need for advice by The EU commission, Ms Hélčne Clark (Director DG MARE).

Over the years marine data collection has changed from 'evidence based policy' to 'scientific advice'. The need for best available scientific advice is increasing as our (EU) ambition in the ocean is increasing. This development requires careful attention as we do want to explore our seas and oceans both for the present and future generations, reserve biodiversity, avoid climate change and pollution and manage fish stocks in a sustainable way.

This development presents some challenges for better scientific advice: set priorities and establish a global coherent strategy/approach. The commission made an internal centre of competence on scientific advice and data collection and needs suggestions on strengths and weaknesses in scientific advice from the end users (i.e. EFARO).

Currently the next framework programme (FP9) is being developed, with an articulated program for fisheries. EFARO is asked to share its input.

The new Data Collection Framework needs adjustments to simplify the data collection, achieve better utilisation of the data, improve dissemination of data, regional focus, promote a more integrated approach (DCF and MSFD).

Session 1: The Future of Data Collection in Marine Science

Advanced technologies for smart data collection: recent developments and future opportunities. Mr Bill Karp, NOAA Fisheries Scientist Emeritus, USA
Challenges in the USA are quite similar as faced in EU. Mr Karp gives an outline of current fishery (in)dependent data collection methods and ecosystem monitoring methods in the USA. These are followed by examples of innovative techniques and cooperation to collect data. He presents a framework to set priorities in data collection and survey design. A consequence that needs attention is that there is an exponential data growth, how to process this? It needs investments in IT systems.

Fishing vessels as scientific platforms. Saša Raicevich Institute for Environmental Protection and Research (ISPRA, Italy).
Mr Raicevich presented the development and consequences from single stock assessment to the ecosystem approach, including the needed science, policy drivers and data gaps. Some examples of the use of fishing vessels as scientific platforms (pros and cons) and what is needed to foster the use of fishing vessels as scientific platforms. The conclusions are that fishing vessel are (already) successfully used as scientific platforms. There is room for enhancing this adoption allowing better/different data to be collected on several fisheries/ecosystem components. Technical and scientific development is needed to facilitate this. As is an ad hoc governance system of data collection and use. Fishermen engagement is essential to make these efforts effective.

The 'game changing' options to the future of data collection are:
Better access to existing fishing data, inclusive idea, developing a regional dimension to access data, truly different responsibilities for fishermen to collect data. None of these are 'technical innovations' and might be less costly than we thought before.

Session 2: Smart data use

"Prediction of fish recruitment and species distribution using high quality satellite products in combination with Bayesian networks" Mr Jose Antonio Fernandes. (AZTI, Spain)
Big data is different sources of data
Big data is much data
Big data is also how to analyse the amount of data

Mr. Fernandes showed some key examples on the use of big-data.
- Big data in sampling: automatic classification of sampling
- Big data for forecasting under high uncertainty and management needs
- Big data applied to aquaculture spatial planning

And some results (proof of concepts) Besides biologists/fisheries scientists it needs data scientists and data engineers. When you do not use big data wisely there is a dark side to big data. Yet in potential high value of big data.
Although there are quite some challenges to address there are already results that show that solutions are possible.

Marine Big Data and Data Governance Mr. Martin Pastoors (Pelagic Freezer trawlers Association, The Netherlands)

What is big data? To Mr. Pastoors it is 'clever use of multiple sources and sensors'. He talks with fishermen regularly and found out that fishing vessels collect data and do science but do not collect the data for that purpose. Massive amounts of information is hence available. The challenge is to make it attractive for the fishermen to share this information. But then the ultimate question is: what do they get in return! Provide information in return to the fishermen. They do see the need to share the data, they do not sit on the data. Big data does not come by itself, it requires work ...and social investment.

Results of the cooperation between fishermen and scientists often only lead to a scientific publication, with minor attention to the benefits of the fishermen who provided the data. When there is a high incentive for the fishermen to share data, this is done automatically (and fast).

The best options for 'smart data use':

- Very valuable resources being able to use it with imagination and make it readily visible
- limited resources and limited data collection, let the industry collect more data and let us analyses it. Bring this further.
- we need to learn without using fish.
- collaboration is the most important thing we need to improve. Work together.
- make the database of ICES open access, and fully analyse the data. We need to priorities this at all institutes (i.e. EFARO members). Open access of survey data also needed and in a short time after the survey.
- Do we interact more with industry and how. There is a need but there is no money to work on. Industry can collect a lot of data but it needs some kind of protocol: what is the data used for, is it going to use for science, can we trust the data. Is it independent, is not part of the existing science structure for DCF.
- Level playing field is important to improve.

It is noted that these options are relatively short term targets.

In four rounds the participants discussed four issues of Smart data collection for the future monitoring of the sea'

- Novel technology in Marine Science
- Safety and security of big data approaches in Marine Science
- Governing the Future of Data Collection in Marine Science
- From Data to information, quo vadis Marine Data collection?

Many issues were highlighted in the deliberations. In general the meeting concluded that in order to be SMART with marine data collection is that we are sitting on a very valuable data collection. With limited resources in the future to collect, even more, data collaboration with the industry is a logical step forward. In addition a challenge lies in developing systems that collect information without using fish. A further priority would have to be to make collected data subject to open access and use all collected data to get a full analysis.

As for the cooperation with the fisheries sector on data collection, this was seen as a major step forward. However, issues of data collection and control and the creation of a level playing field were mentioned. In addition there is a need to develop a kind of protocol: what is the data used for, is it going to use for science, can we trust the data. Is it independent, is not part of the existing science structure for the DCF. In relation to this, opening up the current survey data is also direly needed.

All the issues mentioned and discussed during the day will be used by EFARO to prepare a position on the issue of Smart data collection for the future monitoring of the sea.