



Common Fisheries Policy Reform.

Fisheries monitoring via the use of Fisheries Electronic Log Books and Geographical Information Systems (GIS)

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Common Fisheries Policy (CFP) reform can nowadays be greatly assisted by electronic, computer-based aides that record in detail a boat's location and its fishing activity. This means that compliance with quotas can be accurately recorded and logged and this information can, in turn, be used to manage fish stocks and their related quotas with a great deal of accuracy and finesse. These electronic aides – Fisheries Electronic Log Books and Geographical Information Systems (GIS) – are therefore key tools in CFP reform, and this article explains the nature and usefulness of these new tools.

MARINET members and the public will be aware that over the last five or six decades stocks of commercial marine fish have been collapsing at a more-or-less exponentially increasing rate, though of course the rates of collapse are now decreasing because many fish stocks have almost disappeared. Collapses have usually been caused by overfishing, which itself has occurred through poor fisheries management and in many cases lack of adequate data. Somewhat belatedly fishery authorities are slowly realising that these stock collapses need to be tackled if we wish to maintain future fisheries at sustainable levels.

The rates at which authorities have reacted vary greatly. For instance Japanese, USA, Icelandic, New Zealand and Australian authorities have reacted relatively quickly, whereas Canadian and especially European (EU) authorities have been very slow to act. This slow reaction means that the EU has for too long been using fishery management measures that have long been abandoned elsewhere, e.g. allowing huge subsidies for fleet expansion (now thankfully curtailed) and supporting measures that encourage excessive discarding of fish at sea.

The principal fishery management measures currently being introduced are Marine Spatial Planning (MSP) and an Ecosystems Approach to Fisheries (EAF). On land, many countries have long realised that in order to best manage their use of land, strong terrestrial planning regulations are required. Until 1947 in the UK, for instance, the formal planning procedures we now regard as

essential and routine did not take place with the result that people could more or less do what they liked, where they liked. Nowadays we realise that strict planning controls are necessary in order to prevent 'spatial anarchy'. Marine Spatial Plans (MSPs) are the marine version of planning controls.

Through the use of MSPs a country can manage its Exclusive Economic Zone (EEZ), which extends out to 200 nautical miles from the coast, in such a way as to allow competing users of marine resources to manage their activities in a sustainable way. Fishing activities are 'zoned', though in most cases it is other activities such as wind farms, aggregate extraction, marine protected areas, main shipping lanes, etc, that are confined to specified areas, and fishing can often take place in much of the remaining marine area.

The Ecosystem Approach to Fisheries (EAF) implies that fisheries are better managed by making sure that the whole of a fishery ecosystem is 'in balance' (can be sustained), rather than by the managing of individual fish stocks.

However in order to secure better management, it is important that fishery authorities can monitor what is happening in their marine areas. In many parts of the world fisheries monitoring barely occurs. Where it does occur it has been a difficult and expensive activity, often involving naval patrols, on-board observers, etc, and where no monitoring occurs there is undoubtedly a huge amount of illegal fishing.

For some time shipping has been monitored electronically by Vessel Monitoring Systems (VMS), i.e. the practice whereby larger fishing vessels are equipped with a system that relays their position (at selected time intervals) to communications satellites which, in turn, transmit these locations to the fishery authorities. However VMS¹ is only able to record where a vessel has been, though it can also deduce if fishing is occurring by the speed that the fishing boat is estimated to be moving.

Fishery electronic logbooks are much more useful to the authorities than VMS. A ship equipped with these logbooks is able to not only record its movements but is also able to activate the software when it starts a trawl-tow and, whilst the tow is in progress, the ship can log its exact route and then capture its location at the end of the trawl-tow. Then, when the nets are emptied and the fish are sorted and weighed, this data can be allocated to the tow track. All of this fishing data, along with data on the vessel name, vessel type, nets used, home port, crew numbers, etc, can be captured in the logbook and then emailed to the authorities.

World-wide quite a few fishery authorities have been using **electronic logbooks** for some time, and they are now becoming mandatory in the EU in 2011 for all commercial fishing vessels of over 15 metres fishing in EU waters, and in 2012 they will apply to all vessels over 12 metres. Thus with the information available from electronic logbooks EU fisheries management will be able to become far more precise, and illegal activity will be quickly apparent.

Electronic logbooks can also be linked to **Geographical Information Systems (GIS)**. GIS is essentially a computerised mapping system. Thus, if any form of data is geo-referenced (has a grid reference or some other location reference such as a postcode) then it can be accurately mapped. GIS has been extensively used for every imaginable human activity, but its use as an aid to mapping in fisheries has been more limited because, unlike on land where most mapped features are fixed, in the marine environment all the fish species constantly move, as does the marine environment itself.

¹ The full range of vessel monitoring systems recognised by the EU is shown at http://ec.europa.eu/fisheries/cfp/control/technologies/index_en.htm

Geographical Information Systems can be used to solve problems in natural ecosystems which occur when the ecosystem becomes ‘unbalanced’. A good example, from the land-based use of GIS, is the deforestation of a tropical rain forest. Deforestation not only squeezes out natural habitats for plants and animals, but also increases carbon dioxide emissions through forest burning, and this is now causing the climate to change in areas such as the Amazon and South East Asia. GIS has proved to be an excellent tool for establishing the relationships between the various components of an ecosystem, thereby allowing for their proper management.

A wide range of **fisheries-based uses for GIS** have recently been developed. For example, it is now possible to map and record the complete profile of a catch – i.e. the species caught, the quantity caught, along with the time and location of where it was caught. As a result GIS is fast becoming an essential tool in both fisheries management and fisheries research, largely because it has both an analytical and mapping capability. The types of fishery related uses for GIS include:

- marine habitat mapping and analysis;
- establishing preferred habitats for individual species;
- resource analyses, including stock assessments;
- ecosystems modelling and management;
- monitoring of any management and enforcement policies;
- marine zoning and marine reserve allocation;
- where best to restock the seas;
- showing fishing fleet deployment and amount of effort per unit area.

CFP reform has given us the opportunity to start doing this essential work, and to employ these new tools - **Fishery electronic logbooks** and **Geographical Information Systems**. However although CFP reform has given us this opportunity, there is no guarantee that these tools will be adopted. The reality is that we are confronted by the legacy of history, and this means that we must not forget the damage that has already been done to the size and lost potential of our fisheries due to continuous over-fishing, and the serious obstacle of the antagonism that has grown up between fishermen and their managers.

It will take calm heads and clear thinking to install, and thus reap, the benefits of new scientific tools and capabilities. Let us hope that all parties, the fishermen and the EU government, will have the sense and courage to do so.