North, South, East, West

**The Geographic Information System (GIS) can prove
to be an indispensable tool in the hands of fishermen**

The knowledge of a maritime fisheries territory that is generated through a mapping tool like the Geographic Information System (GIS) could well prove to be an ace in the hands of fishermen. European fishers, for instance, are taking up cartography to defend their rights. In Brittany, France, fishers who occupy maritime territories, although they do not legally possess them, have been able to "oppose" occupation by other parties, thanks to their application of GIS.

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Geomatics (a hybrid of geography and computer science) enables data to be processed and geographic information to be diffused. Though GIS data is normally represented as two dimensional, it is possible to transform the information gathered into three dimensions by incorporating time series data to facilitate negotiation and decisionmaking. Fishers must be better able to claim their user rights as professionals in an equal manner with new, often extremely powerful, entrants. Geonumeric information on activities in a maritime territory considerably strengthens the hands of interested parties in a negotiation; it is urgent that every grassroots fishers' structure owns a GIS tool, in a manner

adapted to their socio-economic contexts.

Breton fishers, who produce half of France's marine fish catch, were confronted with a problem in 2009 when the Minister for Environment called for plans for the future siting of marine renewable energy structures in coastal waters. Spatial representation of sea going fishery activities was poorly included in these projects, with significant consequences for the fishers, given the persuasive capacity of industrial wind farm operators. Consequently, in 2010, the Breton Regional Marine Fisheries and Aquaculture Committee (CDPMEM29), a body representing and elected by the fishers, decided to put in place a cartographic fisheries system.

In order to counter the proposals to set up wind farms at sea, the fishing community needed to spatialize and make an inventory of coastal fisheries activities in Brittany. Their work revolved around two main issues: investigations by the fishermen, and the design of a database to centralize all the information analyzed by the GIS.

Rich data

The objective was to obtain an easy to use GIS, rich in data obtained from the different fishery activities around Brittany. The fact of showing the fishery reality to within one metre to research bureaus or to government administrations, who had previously been the sole repositories of "knowledge", has permitted a rebalancing of debates and to some extent forced them to respect fishers and their "human" rights. As a result, the Brittany Regional Sea Fisheries and Aquaculture Committee and

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the Departmental Committees decided to undertake a more ambitious programme for the 2010-2015 period. The main thrust is to put all fisheries activities in the region under GIS, especially in the context of the establishment of marine protected areas (MPAs), the development of marine offshore renewable energy projects, the massive extraction of gravel and sand, the dumping of waste from land into the sea, and the development of offshore industrial aquaculture.

The computer based system SIPêche has been developed by and for the Breton fishermen. Apart from enabling them to defend their fishing territories, this tool allows them to make the profession better known to the rest of the population. Over time, the system has become harmonized with the method developed by the neighbouring Regional Fisheries Committee of the "Pays de Loire". It has also been made compatible with the French State Fisheries Computerized System and with the cartographic systems of the International Council for the Exploration of the Sea (ICES). All codes of species and names come directly from the Food and Agriculture Organization of the United Nations (FAO).

The Brittany Regional Fisheries Committee has gradually sought to authenticate its SIPêche project by linking up with scientists from the National Scientific Research Centre (CNRS), the largest public-funded French scientific research body, and the Geography University in Nantes. This co-operation is expected to lead to the creation of a scientific interest group, GIS VALPENA, which will bring together several regional fisheries committees and scientists.

Across the world, a movement from the land to the sea has witnessed a new stage in the colonization of the oceans through sea-based activities, thanks to high technology and generous funding. The world's population is expected to reach between 9 and 10 bn by 2050; many of them already live along the coast, adding to the pressures on the sea and

Transferring vessel data to GIS by SIPêche Project staff, whose background of 'fishermen-engineers' is not common, but is proving very effective

its resources. The sea is now the new frontier, coveted by everyone, from conservationists to multinationals. As a result, in future, fishermen will find their spaces increasingly reduced.

To deal with this existential challenge, fishing communities and their organizations have few answers that are fit for purpose. GIS provides a tool for fishers to better defend their point of view, and is an important additional asset. We cannot afford to neglect it to help ensure the 'human rights' of fishing communities, wherever they may be.

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