Norwegian technology to help French shellfish production

Shellfish cultivation is a large and important industry in Normandy in France, but space is at a premium in the region's busy coastal areas. The project "Spatial Information System for Aquaculture in Normandy and Norway (SISQUONOR)", funded by the French-Norwegian Foundation, is applying virtual technology from Norway to help French shellfish producers to identify optimal locations for new cultivation operations.

"Selecting the proper location for new facilities is important for Norwegian and French aquaculture alike," asserts project manager Øivind Strand of the IMR. "Selecting the proper location for new facilities is important for Norwegian and French aquaculture alike," explains SISQUONOR's Norwegian project manager Øivind Strand of the Institute of Marine Research (IMR). "In Norway, we have been working for some time now on devising tools to help us to collect and analyse information, and provide input on coastal spatial planning for aquaculture. What we are doing now is transferring the knowledge involved in using this tool to French conditions."

Systems from petroleum industry
One of the institute's tasks is to advise the aquaculture management authorities, and a key part of this is identifying the best areas for aquaculture. This is where geographic information systems (GIS) prove valuable.

"The idea is to collate information and communicate it via maps, for example to indicate the relative suitability of various areas for aquaculture by different shading," Dr Strand continues. "GIS tools can retrieve information from different databases and display it on a map. The petroleum industry has further developed this kind of tool to include virtual technology, enabling them to make choices on the map system directly on-screen and get an immediate response."

Like a computer game
The GIS tool being tested in Normandy is called AkvaVis, originally initiated by Hordaland county in a 2007 project designed to create a dynamic planning tool for the coastal areas.
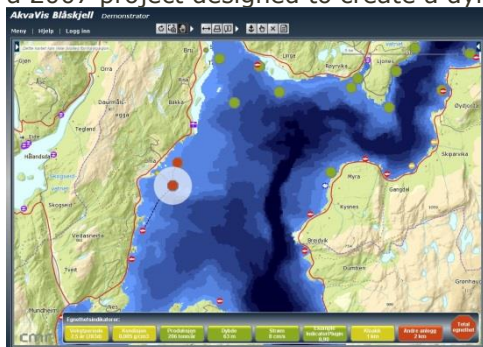
The AkvaVis tool assesses the suitability of a potential aquaculture site when the location is entered into the map.

"There is a great deal of fragmented information out there in the various directorates, regulatory bodies and municipal master plans," says Anne Ansnes Hageberg, a researcher at Christian Michelsen Research (CMR). "The objective of the SISQUONOR project is to develop an Internet-based map program that has access to this vast amount of data and can bring up whatever is relevant for the user – an interactive smart map that is always updated."

"With the AkvaVis tool, one can pull up information relating to the suitability of a potential aquaculture site by entering it anywhere in the map for assessment," adds Dr Strand. "In communication with all the data, the tool immediately integrates information and indicates how suitable the facility is at that exact location. In this way, one can move the facility around and get new information about potential sites. In principle, it's almost like a computer game."

AkvaVis was developed in collaboration between CMR, which developed the actual software, and the IMR, which provided environmental impact models as well as essential data and expertise about the coastal areas and sustainability perspectives.

Challenging French conditions

The AkvaVis developers are well on their way to finish a first operational version for Norwegian conditions, and the significant potential for application in aquaculture-related planning is attracting attention internationally. Under the FNS-funded SISQUONOR project, the developers are now collaborating with the French Institute of Research for the Exploitation of the Sea (Ifremer) on adapting AkvaVis to French conditions. The activities are being carried out in parallel by Norwegian and French teams.

French shellfish producers face significant challenges. "Annual production of shellfish in the Normandy region is around 43 000 tonnes, but the industry faces several challenges. Virus and disease outbreaks, overexploitation and usage conflicts with fishing activities are chief among these. Because of this, it is important to help end-users with spatial planning of the shellfish cultivation," says Aline Gangnery of Ifremer, project manager on the French side.

"The project aims at developing a demonstrator which can help to identify potential new areas where shellfish cultivation could take place, as well as optimise existing areas through better spatial organisation. To accomplish this, different environmental and regulatory factors must be taken into account, such as physical characteristics of the area, available food for shellfish, marine protected areas, and other activities. Indicators of suitability are based on a combination of all these factors."

Different factors to consider

The first demo version of AkvaVis for Normandy was set up in September, ahead of schedule. But as Ms Hageberg points out, it is no small task to adapt the software to a different country and industry.

"Everything is a bit different in France," she says, "and there are other parameters that are important. In Norway it is easier to find suitable sites farther out to sea, but then it is the wind and waves that present a challenge. In France, access to a food supply is more critical – since the shellfish are not fed, their nutrition has to come from the local waters, which limits the number of suitable sites. Access to and collection of data varies, too. We hope to have a functioning beta version ready during the spring."

"Advice regarding aquaculture management needs to be reliable," emphasises Dr Strand, "so the IMR considers this an ambitious tool that must be thoroughly quality-assured. It's also important to stress that this is a decision support tool – there are other factors that weigh into the ultimate decision of where to place a new facility. In any case, the application of the concept to different environments for other users and with other designs has given us valuable experience – all of which helps us to do an even better job in Norway."

Hoping for more collaboration
SISQUONOR is the fourth project on which the IMR, CMR and Ifremer have collaborated, and Dr Gangnery is very pleased with the benefits.

Key personnel in the SISQUONOR project together in Normandy. From left: Øivind Strand, Anne A. Hageberg, Romain Le Gendre, Coralie Picoche, Aline Gangnery and Cedric Bacher. "The cooperation is excellent. This success is due to our strong complementarity on scientific aspects as well as our shared understanding. I hope we can continue our cooperation with an EU project based upon the know-how developed through SISQUONOR."

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