



Increasing Industrial Resource Efficiency in European Mariculture NEWSLETTER

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IDREEM SMEs starting up IMTA pilot operations across Europe

After the first year of activity the IDREEM consortium is now entering the core phase of the project, the implementation of IMTA pilot-scale operations. In the last twelve months research organizations and SMEs have worked together to elaborate experimental protocols to monitor and evaluate the performance of integrated multi-trophic aquaculture concepts applied in different locations across Europe. Below is a brief summary of what is being developed at the various IMTA sites.



Left: The GIFAS site in Oldervika where the IMTA pilot will be implemented.

In Norway, Bioforsk – the Norwegian Institute for Agriculture and Environmental Research, works together with GIFAS, a privately held company which provides trial facilities for fish farmers. The set-up of the IMTA pilot operation is still being developed and regulatory and technical issues are being addressed; however it is expected that trials will compare monoculture of Atlantic Salmon against multicultures of salmon and kelp, mussels and red algae.



Left: Experimental cages for IMTA operations at Seawave Fisheries.

In Cyprus, the site in Vasiliko Bay managed by Seawave Fisheries with the scientific support of MER – Marine Environmental Research – began experimenting with bivalves in summer 2013, with small-scale mussel deployment near the farm (seabream and seabass) at different depths. Larger scale deployment of mussels and oysters is expected by early 2014. Experiments with sea urchins and sea cucumbers are also planned for 2014.



Above: grey mullets grown in underwater cages at Suf Fish Farm.

In Israel the University of Haifa and Suf-Fish farm will implement an IMTA concept based on two finfish species. The initial experimental design integrates mullets under seabream cages in the Mediterranean. At Suf-Fish, grey mullets (*Mugil cephalus*) are experimentally grown for their ability to survive on a diet of detritus and because they are endemic to the area. Moreover studies have proven mullets improved the geochemical status of sediments in experimental net cages, deployed below a gilthead seabream (*Sparus aurata*) fish farm in the Red Sea.



In Ardcastle Bay, Scotland, IMTA systems are being implemented by Loch Fyne Oysters Ltd. (with scientific support provided by SAMS), with longlines placed in proximity to Atlantic Salmon (*Salmo salar*) cages in order to grow sea urchins, queen scallops, seaweeds, oysters and mussels. Viking Fish Farm at Ardtoe is a land-based aquaculture facility and will set up two IMTA raceways to grow pacific oysters (*Crassostrea gigas*) and European flat oysters (*Ostrea edulis*). In order to maximize productivity, the IMTA system will be housed in a pre-existing poly-tunnel which will create a micro-environment suitable for oysters' growth. Above: oysters in SEAPA basket grown at Loch Fyne Oysters.



In Italy the IMTA operations will be carried out by AQUA s.r.l. with the support of the University of Genova, at their cages growing sea bass. Two species of oysters were chosen, namely pacific oyster (*Crassostrea gigas*) and European flat oyster (*Ostrea edulis*), as they are both high-end products. Previous studies indicate that oysters grow better in IMTA systems than in monoculture. Left: lanterns growing oysters at AQUA farm in Italy



In Bantry Bay and Kenmare Bay near Cork, Ireland , longlines of seaweeds (*Alaria esculenta*) are grown at a distance of 50 and 30 m from existing salmon cages. Daithi O'Murchu Marine Station is monitoring biomass growth in both sites; the first results have shown algal biomass has nearly doubled in weight between April and June 2013. Left: longlines of seaweeds harvested in Bantry Bay.

First Annual IDREEM Project Meeting



University of Genoa DISTAV (Dipartimento di Scienze della Terra, dell'Ambiente e della Vita) in Santa Margherita Ligure, Italy hosted the first annual IDREEM Project Meeting on October 8-10 2013. Partners came from all over Europe to attend the three-day meeting to discuss the first results of the IMTA projects in various sites. Workshops were also held regarding environmental data collection and data flow between closely-related work packages. These workshops

are essential to obtaining accurate results for the project.

Two members of the Project Advisory Board were present to observe and contribute useful insights regarding the project. Shawn M. Robinson of Fisheries and Oceans Canada and Max Troell of The Beijer Institute of Ecological Economics in Sweden had an interactive session with the partners in order to give their suggestions about proceeding to the next stages of the project.

Report about IMTA stakeholders analysis

For aquaculture, and in particular Integrated Multi-trophic Aquaculture (IMTA) to realise its potential, it must be socially acceptable; IMTA success will depend on satisfying key stakeholders. As part of a process towards understanding stakeholder attitudes towards IMTA, a stakeholder analysis has been undertaken in each partner country undertaking a pilot scale IMTA operation. The analysis has included investigating the social context and history of engagement within which stakeholders operate in each country; identifying the relevant stakeholders, and indeed the key stakeholders in terms of power and influence; and assessing the relationships between stakeholders.

This report by Karen Alexander - SAMS, provides the methods used in the stakeholder analysis and the results of the study by country as well as a cross-country comparison/synthesis.

Results of the interviews showed that levels of stakeholder engagement within the aquaculture industry fluctuate between countries, and where more stakeholder engagement takes place this is often because the regulatory process requires it. Businesses likely have neither the time nor the money to undertake work which is not required by regulation or believed to be necessary. This is a clear area of interest for the IDREEM project and opportunity for future discussion with stakeholders in terms of building a constituency around IMTA development and improving community support. A complementary aspect is engagement of consumer-related stakeholders, in particular those involved in certification and other 'soft' regulation. Market receptiveness to IMTA is key to its expansion and therefore distinguishing the environmental advantages of IMTA over the products of monoculture needs to be considered.

Based on the results of these interviews the following recommendations for further action were identified:

- IMTA operators should continue to monitor and engage with key stakeholders, particularly those identified as 'players' in the analysis;
- Building a constituency or 'base of support' will be critical for moving IMTA forward through all phases of the supply chain and to the consumer. Resources should be focused on maintaining the interest of 'subjects' and increasing their engagement (ie. moving them towards becoming 'players');
- Stakeholder engagement will strategically improve information sharing, innovation, and potentially generate new resources for IMTA development.

IMTA – Longlines at Loch Fyne Oysters



Since the beginning of the IDREEM project, the Scottish Association for Marine Science (SAMS) has been working with the Scottish Salmon Company (SSC) and Loch Fyne Oysters (LFO) on an IMTA site at Ardcastle, situated on Loch Fyne, a large sea loch on the west coast of Scotland.

Progress developing the site has been rapid thanks to the hard work of LFO, and by early 2013 a series of ten 300m longlines were in place to the south of the existing salmon farm. At the end of January, SAMS provided rope seeded

with young *Alaria esculenta* kelp plants, which were outplanted successfully. LFO

undertook a successful harvest of the first crop from the site in the spring of this year, with production manager David Attwood (centre) seen with the kelp.

IDREEM partner Daithi O’Murchu Marine Research Station featured on Euronews Futuris and Horizon2020



One of IDREEM’s partners, Daithi O’Murchu Marine Research Station (DOMMRS) has recently been featured in two programmes, namely Euronews *Futuris* and Horizon 2020. The reports focus on a project DOMMRS is coordinating - MABFUEL, investigating the use of algae as biofuel. In these videos, you will see seaweed lines which are also used for IDREEM.

The seaweed farm situated in Bantry Bay, Ireland grows seaweed up to a length of 2-3 metres. In the first clip IDREEM researchers Julie Maguire and Freddie O’Mahony explain the benefits of seaweed farming and describe how it can act as a sort of “nutrient mop”. Some interesting information about seaweed: Seaweed doesn’t require any fertilizer but grows fast (growing to full size in 6 months). Seaweeds help clean the sea of excessive nutrients and are also tasty to eat! The second clip shows some seaweed sampling being done in Bantry Bay, where one of the IDREEM IMTA sites is located. Watch the videos at: <http://tinyurl.com/nzpcuf9> and <http://tinyurl.com/ph3anly>

Events

February 9-12, 2014 - Seattle, USA

Aquaculture America 2014

June 22, 2014 - June 27, 2014, Sydney - Australia

5th Congress of the International Society for Applied Phycology 2014

October 14-17, 2014, San Sebastian - Spain

Aquaculture Europe 2014

IDREEM PARTNERS



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