

**New Sustainable Aquaculture  
Techniques in the Atlantic Area  
(Irish Region)**

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# NEW SUSTAINABLE AQUACULTURE TECHNIQUES IN THE ATLANTIC AREA REGION (IRISH REGION)

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As part of the programme of work including in Work Package Six of the Access2Sea project, Action Four involved Project Partners undertaking to research and analyse new aquaculture techniques being developed in their regions. This research is aimed at fostering a more sustainable industry by facilitating the dissemination of techniques which could be of value in addressing the needs of companies in other territories of the Atlantic Area Region.

The following two new sustainable aquaculture techniques were identified by the Irish Partners of the Access2Sea Project, WestBIC & Údarás na Gaeltachta:

1. The Smarter Aquaculture project was identified from the activities of the Technology Software & System Research Group (TSSG) at Waterford Institute of Technology, Ireland
2. Modular Recirculating Aquaculture System which was developed at the Dublin Institute of Technology School of Engineering.

## 1) Smarter Aquaculture

Smarter Aquaculture is targeted at the Aquaculture sector and is focused on building on developing a multi-tenanted, cloud-based system where aquaculture users can upload, store, and analyse key farm production data. Smarter Aquaculture uses environmental factor forecast information and the aquaculture data and analyses it to predict and inform decision-making to optimise costs, minimise waste & maximise return.

Smarter Aquaculture is building the results of the Horizon 2020 project [AquaSmart](#) which saw the development of a cloud-based data analytics and benchmarking platform focused at Mediterranean species such as sea bass and bream. Smarter Aquaculture is extending this work in a number of ways:

- Platform capability extended to more contexts including onshore sites such as pond/ river and different species (e.g. salmon, trout),
- Intelligent meta data mapping system for easy on boarding and data uploads,
- Recognise environmental data (weather, tidal) and build models to predict impact on production KPIs,
- Use sensor data collection where feasible

- APIs to facilitate mobile data upload.

Smarter Aquaculture is a micro services based analytics platform focused on the issues facing the aquaculture industry. Building on the results of the Horizon 2020 project AquaSmart (<https://tssg.org/projects/aquasmart/>), Smarter Aquaculture is aiming to provide the following thus broadening the scope of the platform developed under AquaSmart:

- Build a historical repository of relevant environmental data (tide, weather, forecast) from sources such as MADIS (<https://madis.ncep.noaa.gov/>) and Copernicus (<http://marine.copernicus.eu/>)
- Application of machine learning techniques including regression models and time-series analysis to time series data collected from sensors, correlating with environmental data
- Application of analytics to producers in an Irish context, specifically fresh water trout, but also encompassing a dialogue with the salmon industry

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From: <https://tssg.org/projects/smarter-aquaculture/>

## 2) Modular Recirculating Aquaculture System

AquaFarm is a novel modular recirculating aquaculture system (RAS) that enables low cost farming of aquatic species in high density. The system is an above ground, modular shelving system where tanks are stacked and easily accessed with each sliding out as required. RASs are self-contained aquaculture systems that require minimal water exchange due to the internal recycling of water using both biological and mechanical filters. RASs overcome the constraints imposed by temperate climates and other environmental factors by providing a controlled, predictable and bio-secure environment for the culture species.

AquaFarm offers a lower cost and more ergonomically efficient RAS than existing commercially available systems. This type of system provides a flat pack alternative for farmers and food producers who wish to develop an aquaculture business of any scale. It can deliver a scalable modular model to the agrifood market that will allow existing aquaculturalists to diversify at a lower cost. It will also enable farmers and other food producers to diversify into marine aquaculture on a small scale. Novel aspects of the system include its portable self-cleaning tanks, modular framework, recirculation system and primary solids filtration system. Secondary fine solids filtration, aeration, pH control, water monitoring, data logging and alarm messaging systems are included within the primary solids filtration system.

From: <http://dit.technologypublisher.com/files/sites/dit-technology-to-license---aquafarm.pdf>



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