

UK Aquaculture Initiative

The UK Aquaculture Initiative supports high-quality, innovative research and research translation within the growing UK Aquaculture community.

This cross-Research Council initiative aims to strengthen the research community to further support the long-term needs of the UK aquaculture industry through interdisciplinary research, research translation, and the provision of training.

BBSRC and NERC are working with Cefas, Scottish Government, AFBI, the Food Standards Agency and Food Standards Scotland to bring together diverse expertise, skills and facilities to deliver innovative approaches to solving the challenge of building a healthy, safe and sustainable UK aquaculture sector.

21

Research projects funded in 2014

£11M

invested in aquaculture research and translation by BBSRC and NERC between 2014 and 2018

£590M

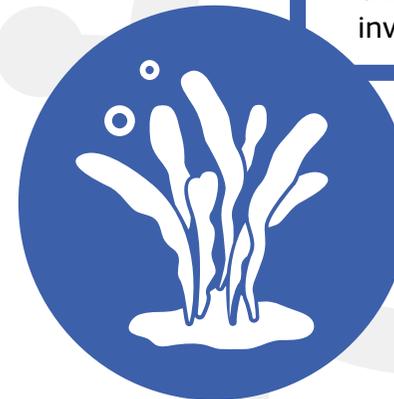
Value of aquaculture to UK in 2012

1898

People employed by Scottish Aquaculture sector in 2012

Key Impacts

- A 2014 funding call aimed at capacity building in the UK aquaculture research base invested £5.8M in 21 projects. Out of 72 scientists, 15 were new to aquaculture.
- The second phase of the Initiative will link the research base to industry. A UK Aquaculture Network will support knowledge exchange and inform a major investment in 2017.



New technology to improve shellfish safety

Research led by Dr Matt Mowlem at the National Oceanography Centre, Southampton, is using 'lab on a chip' technology to enhance food safety in the UK.

Shellfish naturally accumulate harmful toxins and pathogens from their environment. This accumulation can reduce yield and others can cause food poisoning if consumed.

Mowlem's research uses 'lab on a chip' technology to enable rapid analysis of seawater to detect levels of *E. coli* and can be used by a person on-site or through a deployable sensor.

The data can be used by producers or researchers to identify the origin of harmful microorganisms so that they can limit the potential damage to the shellfish crop and ensure the shellfish are safe for public consumption.

€300M

Value of shellfish caught by UK fishing vessels

60 minutes

Data will now be available by lab on a chip in under an hour

70%

Of UK cultivated shellfish stocks are exported

€246K

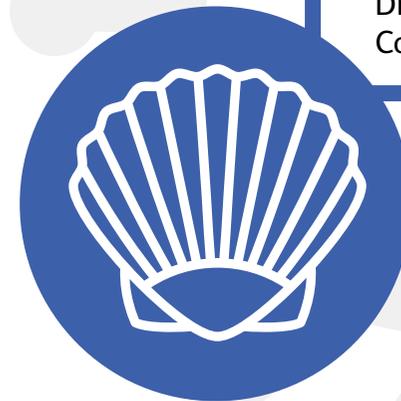
Value of NERC-BBSRC grant that supports this research

Key Impacts

- Innovative new technology to improve the speed and accuracy of shellfish pathogen detection.
- 'Lab on a Chip' technology enables scientists to identify how shellfish become contaminated and help farmers improve their yield.

"Our new technology uses state of the art molecular analysis methods and can be used in the field by non-specialist end-users."

Dr McQuillan, Researcher
Co-Investigator



New technology to generate and improve vaccines for use in aquaculture

At the University of Aberdeen, researchers led by Dr Helen Dooley are developing proteomic technology that will enhance scientists' understanding of finfish immune responses when testing new vaccines.

The cost to the finfish aquaculture industry due to infectious diseases is over \$1Bn globally, highlighting the importance of vaccine development. Proteomic technology will improve the vaccine development process, ultimately reducing yield loss.

The new proteomic technology monitors key immune factors involved in protection, such as the levels of antibodies in the blood.

The use of this technology will accelerate vaccine development, protecting aquaculture against disease not only in the UK but worldwide.

25%

UK Government target to grow aquaculture production by 2020

£191k

Value of NERC-BBSRC grant that supports this research

150K

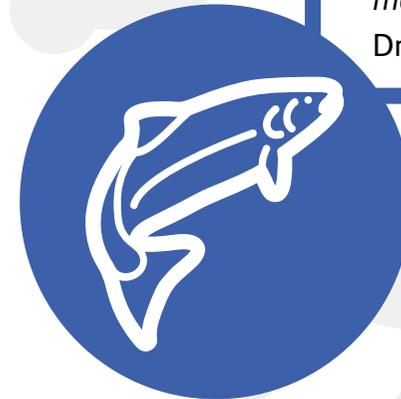
Tonnage of salmon produced each year by UK aquaculture, all of which require protection from disease

Key Impacts

- An accurate and complete understanding of immune responses
- Reduced time taken to improve existing and developmental vaccines.

“Our approach offers a much deeper view of the fish immune response compared to current testing protocols, while reducing the number of animals required by more than 80%.”

Dr Dooley, Principal investigator



Decision-support tools for profitable and sustainable UK shellfish aquaculture

Risks and Opportunities for Sustainable Aquaculture (ROSA) is a new project, led by Dr Icarus Allen at the Plymouth Marine Laboratory, to develop the UK's capability to predict the risks and opportunities for sustainable shellfish aquaculture in a changing environment. ROSA will take state-of-the-art ecosystem and fisheries models and combine them to provide a practical tool for growers, managers and regulators to support the ongoing development of the shellfish aquaculture sector across the UK.

The tool will help users to optimise 'farm site selection' and 'culture practice' according to other spatial users and constraints, such as pollution closures, existing lease sites, mooring fields, and critical habitats. The system will also include a risk and benefit analysis to support planning.

This proof of concept project will focus on two key species *Mytilus edulis* and *Crassostrea gigas* and lay the foundations for future developments that can be extended to both shellfish and finfish aquaculture.

€35.6M

The total value of shellfish aquaculture production in the UK in 2014.

€228k

Value of the BBSRC-NERC investment in ROSA.

13,000 tonnes

The amount of mussels the Scottish shellfish sector is aiming to produce by 2020.

Anticipated Impacts

- A new desktop system to help growers and managers understand the risks and opportunities within UK shellfish aquaculture to support profitability and sustainable management.
- Training for users in how to get the most out of the tool.
- A road map will be developed to guide the development of the model system to meet future industry needs.

"This is an exciting new modelling approach that has the potential to underpin the sustainable expansion of aquaculture both in the UK and worldwide"

Jerry Blackford – Co-Investigator

Visit www.rosa-marine.uk for more information.

