Setting the stage: what is precision aquaculture?

Dr. Sara Barrento

Swansea University
Centre for Sustainable Aquatic Research

Application of Sensors in Precision Aquaculture

25 May 2021

Aquaculture

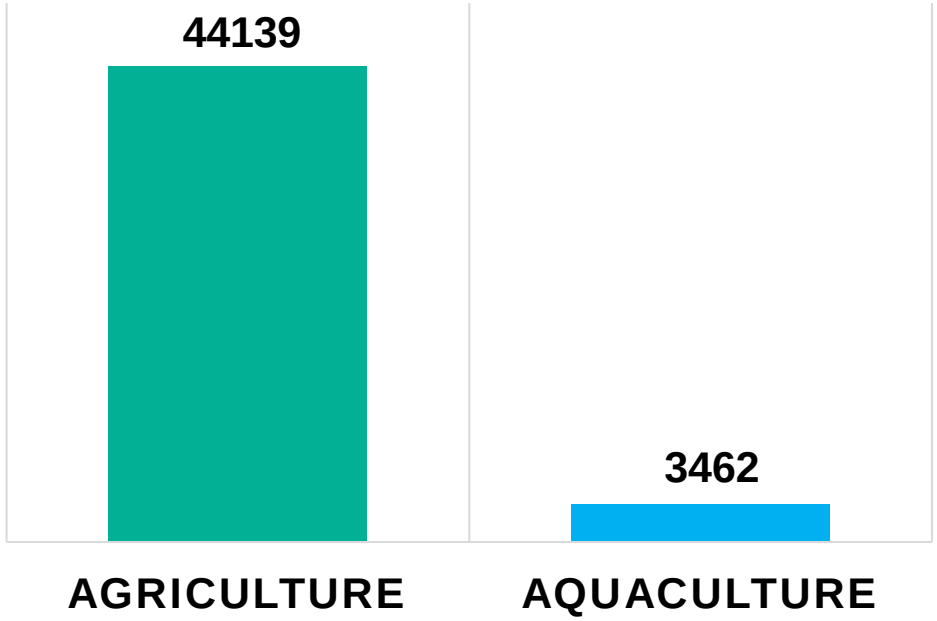
The farming of aquatic organisms

- Fish
- Molluscs
- Crustaceans
- Aquatic Plants
- Amphibians …

Precision aquaculture

The acquisition and interpretation of data about the aquatic environment and farmed species through sensors that can provide **decision support for farm operations**.

Precision farming is not a new concept



Number of Review articles, Research articles and Book chapters retrieved from Science Direct search 2015-2021

Challenges

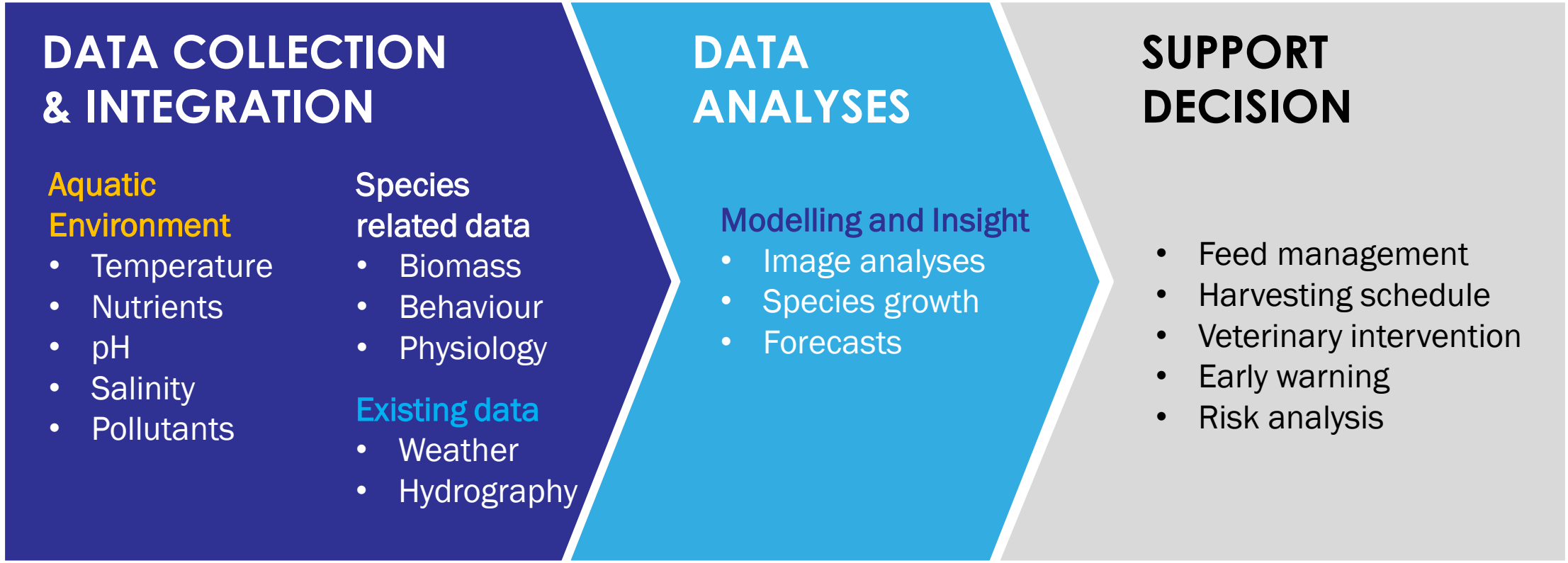
- Harsh environment
- Access can be impeded by weather
- Power and connectivity
- Large range of spatial scales

Precision Aquaculture

The motivation…

Farms are getting bigger and moving offshore	Pressure from consumers and regulators	New real-time sensor technologies

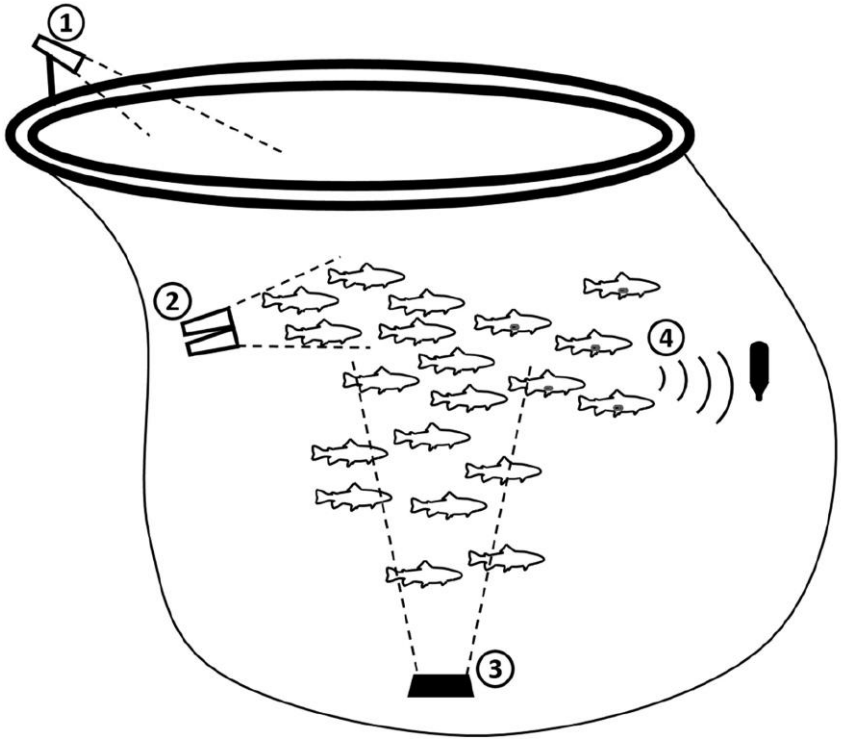
Precision aquaculture: the framework



Observe Interpret Decide and act

Precision Aquaculture

What does it look like?



1. Surface camera
2. Stereo video
3. Sonar
4. Acoustic telemetry

5 - Water quality probes
6 – Local weather station
7 – Satellite-based monitoring

Real Time Monitoring

Føre et al. 2018
Biosystems Engineering
Volume 173, September 2018, Pages 176-193

Precision aquaculture: moving forward

Sensors need to be:

- robust
- low-cost
- capable of underwater and in-air wireless connectivity
- high level of Interoperability

Data Management

Models need to be robust

Security and sovereignty of data is critical to exploit technology in an ethical and commercially sustainable way.

Thank you

Dr Sara Barrento
s.i.barrento@swansea.ac.uk