



BIM

Ireland's
Seafood
Development
Agency



An Roinn Talmhaíochta,
Bia agus Mara
Department of Agriculture,
Food and the Marine



EUROPEAN UNION
This measure is part-financed
by the European Maritime
and Fisheries Fund

The use of remote monitoring technologies for assessing water quality.

Bord Iascaigh Mhara

- Supporting the Irish seafood sector
 - Technical expertise
 - Business support
 - Funding
 - Training
 - Promotion of responsible environmental practice

Business Units

- Skills Development
- Corporate Services
- Economic and Strategic Services
- Development and Innovation
- Seafood Technical services

Seafood Technical Services

- Fisheries Conservation
- Sustainability and Certification
- Regional Development North
- Regional Development South
- Aquaculture Technical

Aquaculture Technical

- Finfish.
 - Salmon
 - Trout
- Shellfish
 - Mussels
 - Oysters
- Seaweed
 - *Alaria*
 - *Laminaria*
 - *Palmaria*



The reason to care?

€180-200 million per annum

2,000 employees

Operating in an uncontrolled environment.

The very recent past!

- Very little environmental data
- Data occurred where projects took place
- Massive swaths of the coastline not monitored
- Historical

What does the plant or animal need?

Oysters – Salinity, Temperature, Food, Oxygen

Finfish – Temperature, Oxygen, Turbidity, Salinity

Algae (seaweed) – Temperature, Turbidity

Avoid extremes?

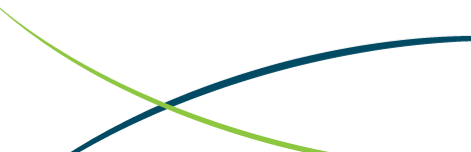
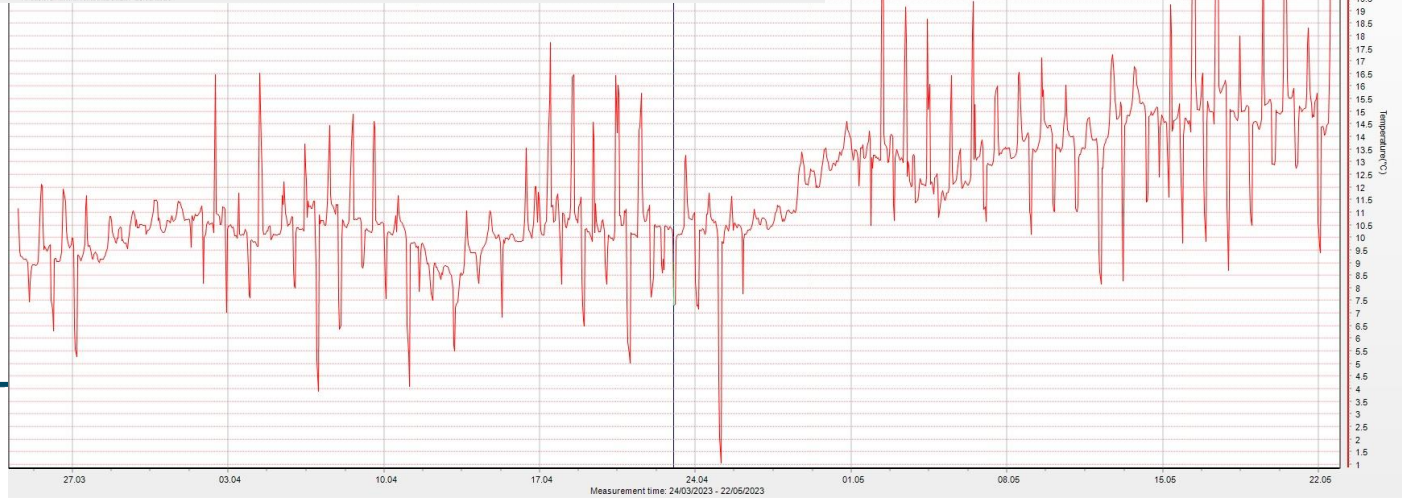
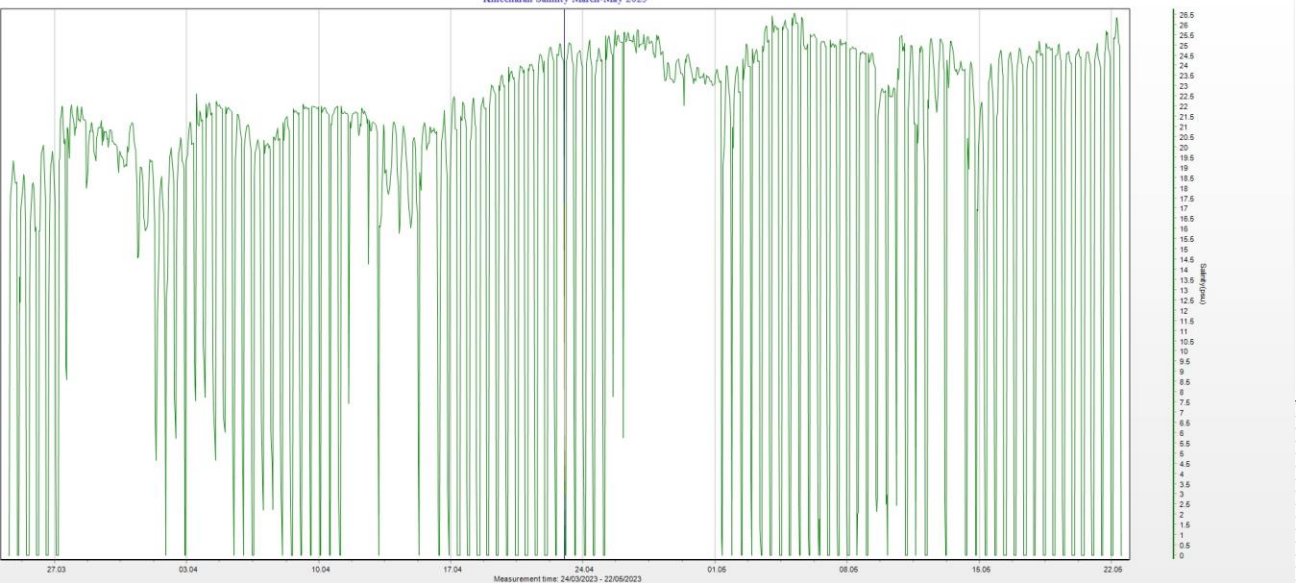
Shellfish?

Unexplained mortalities?

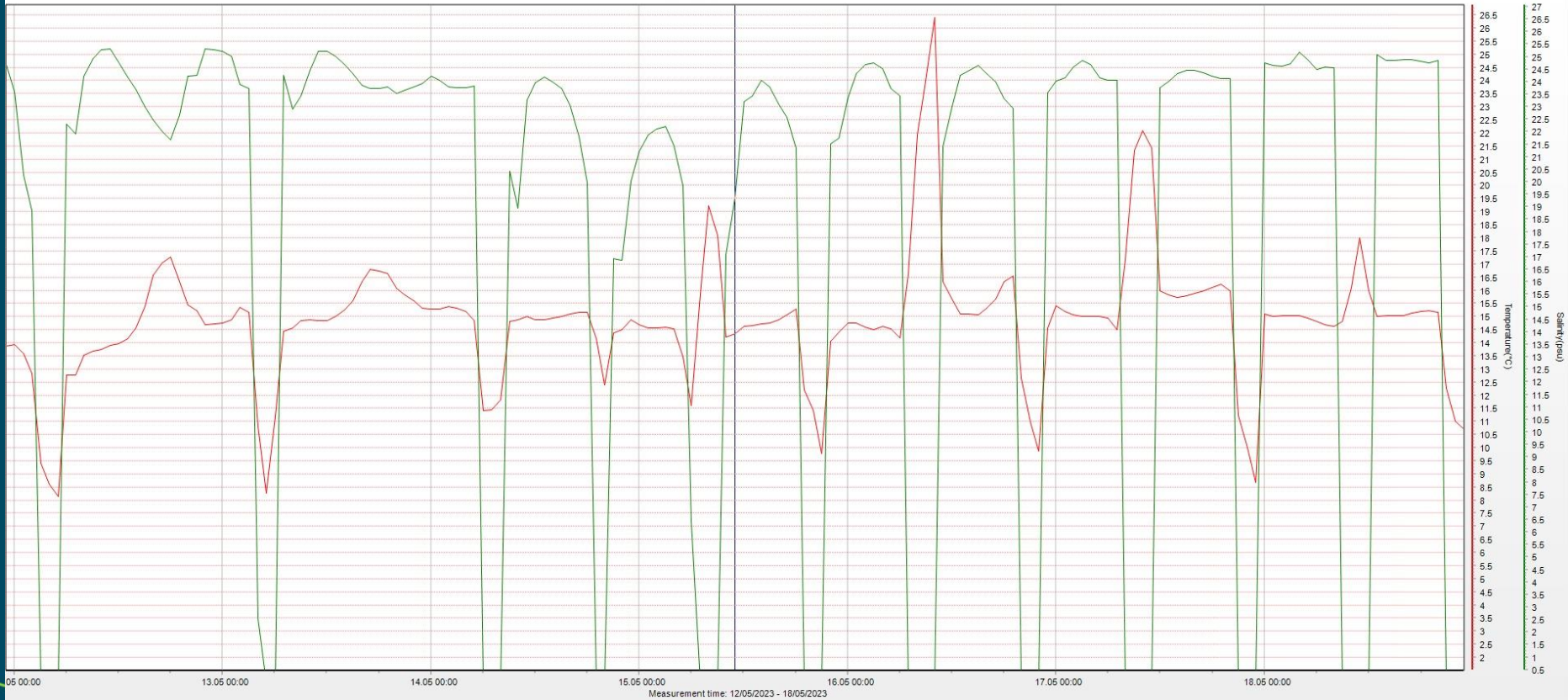
Deployed Star Oddi CTD's

- Salinity
- Temperature
- Depth

Sensors received and data downloaded



Killeenaran12 - 18 05 2023

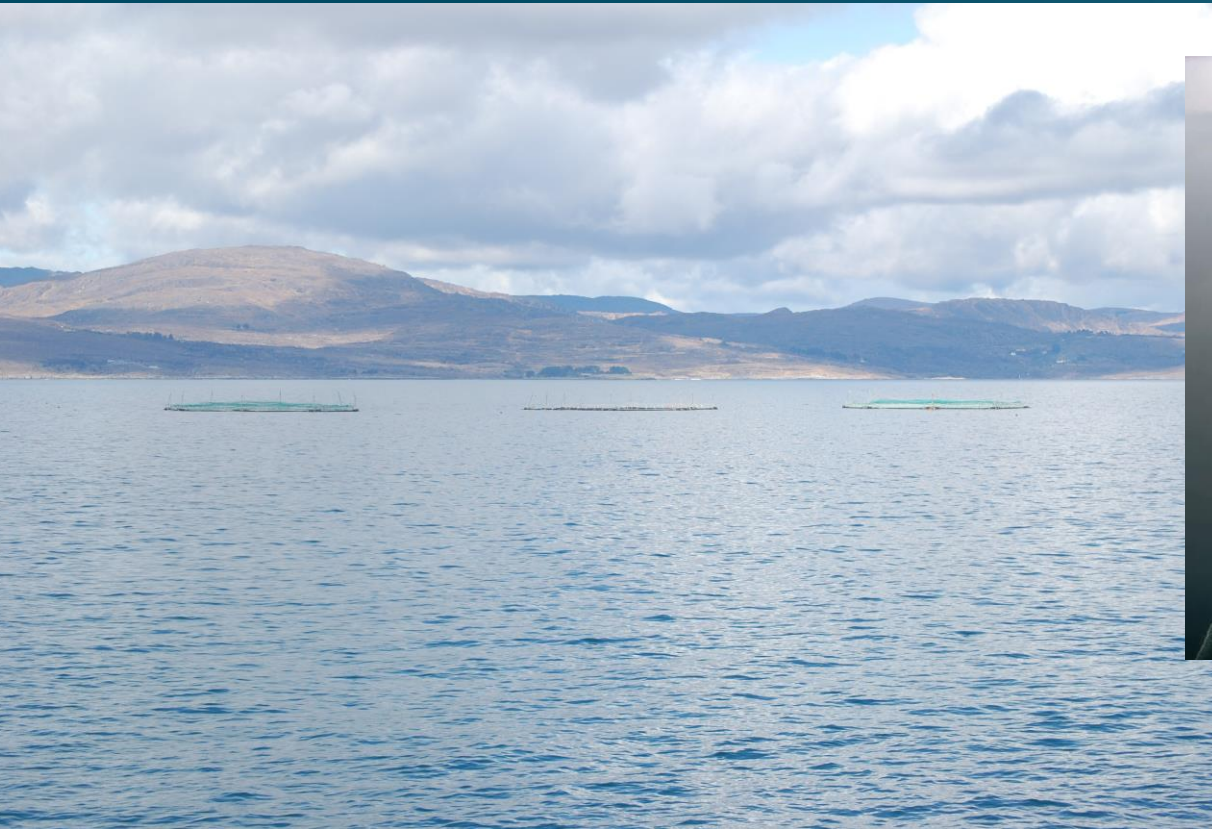


Measurement time: 12/05/2023 - 18/05/2023

The benefits?

- Advantages – we could see some environmental data
- Disadvantage - too late to make husbandry decisions
- What impact does this have?

Finfish



What is our reason to care?

- 1,000kg of Salmon is worth over €10,000
- 1,000kg feed costs €2,500kg
- Maximize resource efficiency
- Unexplained mortalities
- Fish health and welfare
- Insurance requirements

Efforts to date

- Oxyguard cabled systems
 - Large sites
 - Cut wires
 - Power availability
 - Poor off site connectivity
- Oxyguard wireless systems
 - Battery replacement
 - Electrolyte and membrane DO
- Innovasea wireless
 - We didn't have full capability – our mistake!
 - But based on its success.

Procurement methodology

- Compose a tender for release on etenders.gov.ie
- Self contained, self powered sensor array
- Must record at least 5 parameters
 - Oxygen, Salinity, Temperature, turbidity, a measure of chlorophyll
- Must come with comms system, accessible in real-time
- Alarming the system must be enabled
- Mooring system must be supplied for a variety of site types

The result



- 2m diameter buoy with mooring assembly
- In situ - Aquatroll sensor
- Marine navigation light, with fencing and alarm
- Communications system active anywhere on the coast
- Alarms capability – various thresholds
- Accessible via an online portal that is password protected

The Metrics

Oxygen

Food metabolism requires oxygen

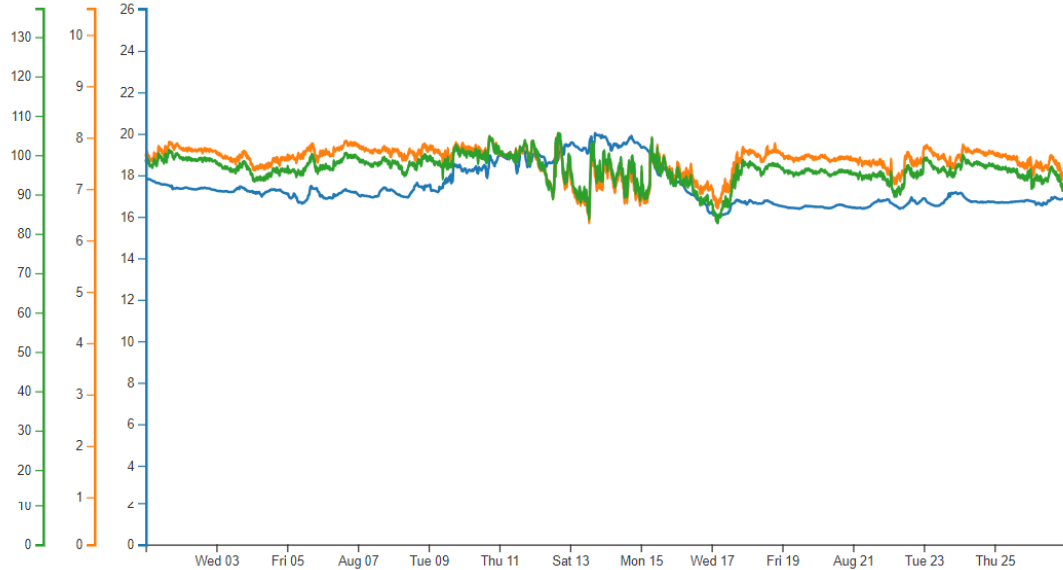
Feeding in low oxygen concentrations result in sub optimal feed use, increased feed conversion ratios and reduced competitiveness

Alarmed to alert farm operatives about current conditions

Remediation strategy?



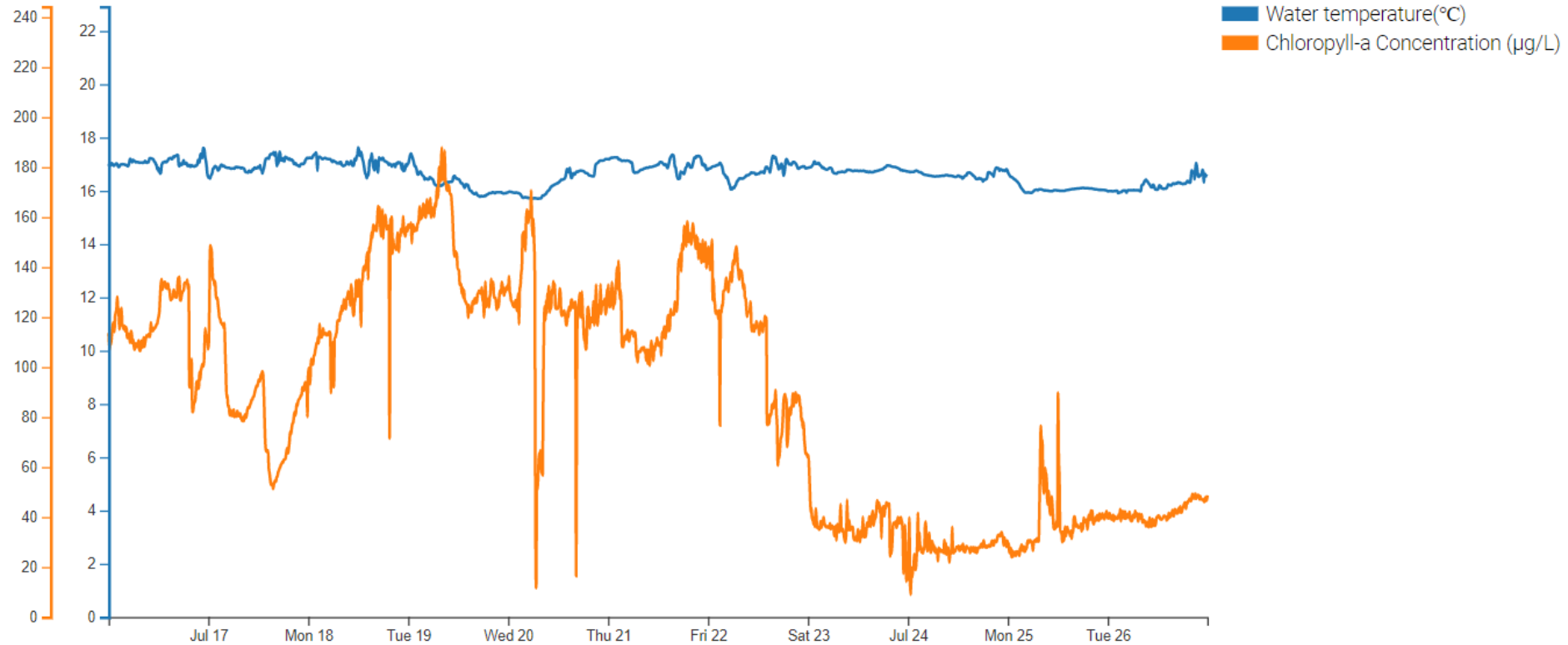
Upwellers and Thermoclines



■ Water temperature(°C)
■ Dissolved Oxygen Concentration (mg/L)
■ Dissolved Oxygen Saturation (%)



Chlorophyll a concentration and Water temperature July 2022



Non-permanent barriers



Thanks

Questions?

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