



ACIG

Intelligent fish farming

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AQUACULTURE'S 3 MULTI MILLION-POUND PROBLEMS



1 SEALICE & PREDATION

Farms have no connected means to track predation levels and efficacy of lice treatments

2 ACCURATE BIOMASS DATA

Farms have no connected means to assess, manage and judge the efficacy of lighting and feeding regimes on fish growth

3 HUMANE SLAUGHTER

Farms have no connected means to assess, manage and judge the welfare benefits of improved slaughter solutions

WELFARE IMPROVING TECHNOLOGIES IN KEY CUSTOMER ACCOUNTS

Electrification and digitization brings farmers insight and visibility to stakeholders

PROTECT



GROW



HARVEST



DATA





THE PROBLEM OF SEALICE

THE PROBLEM



Norway, Chile, UK and North America are **85%** production of salmon – all regions have severe lice issues



Sea lice costs on average **€1.15Bn/year** to the industry



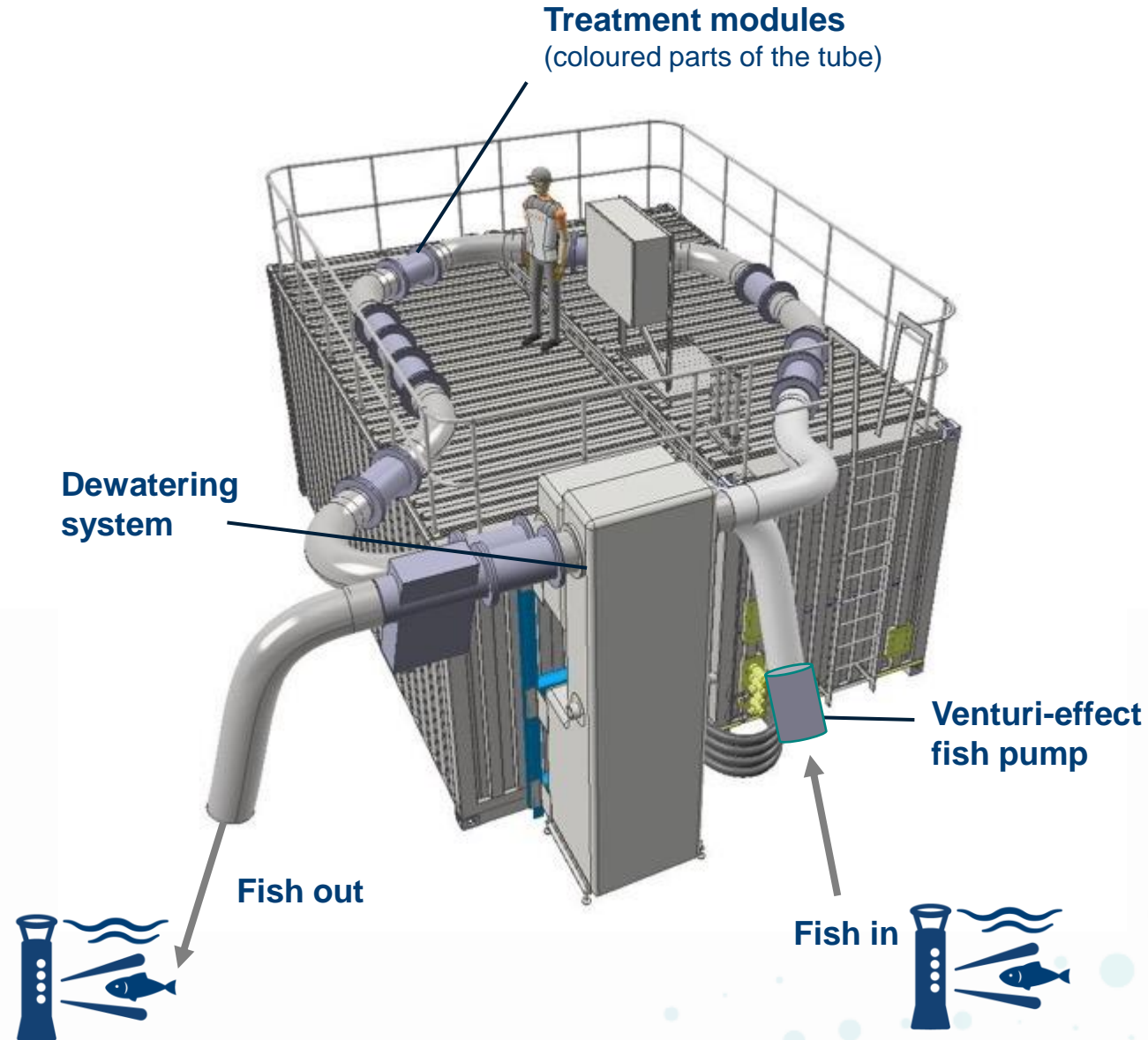
Current technologies **negatively impact welfare** of fish (Norwegian Food Safety Authority) and chemical treatments (e.g. Hydrogen peroxide) have led to widespread **resistance** in lice



In **2019**, Norway, Chile, Scotland and Canada spent **€653m** on lice control measures. Fish Health Inspectorate (2020) 2017-2019, over **2.6 million fish mortalities** included 'treatment' in the explanation



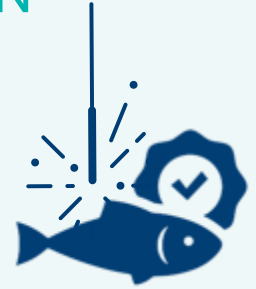
THE SOLUTION



UNIQUE DESIGN



Low pressure pump



Low pressure waterjets



Low voltage electric fields



Lice cameras

USER BENEFITS

- ① Highly efficient
- ② High fish welfare
- ③ Flexible, containerized
- ④ Low-cost
- ⑤ Sustainable
- ⑥ Connected & Validated





THE PROBLEM OF PREDATION

THE PROBLEM



Seal shooting

No longer permissible to shoot seals, unless they are trapped in nets.



The impact of predation

The salmon killed by seals would have fetched a market price of **£12,253,743** in **2020** and a further **£8,436,987** in the **eight months of 2021** to end of August, a total lost revenue of **£20,690,730** (Fish site Nov 2021)

NO PERFECT SOLUTIONS

DESPITE IMPROVED TECHNOLOGIES



Double nets



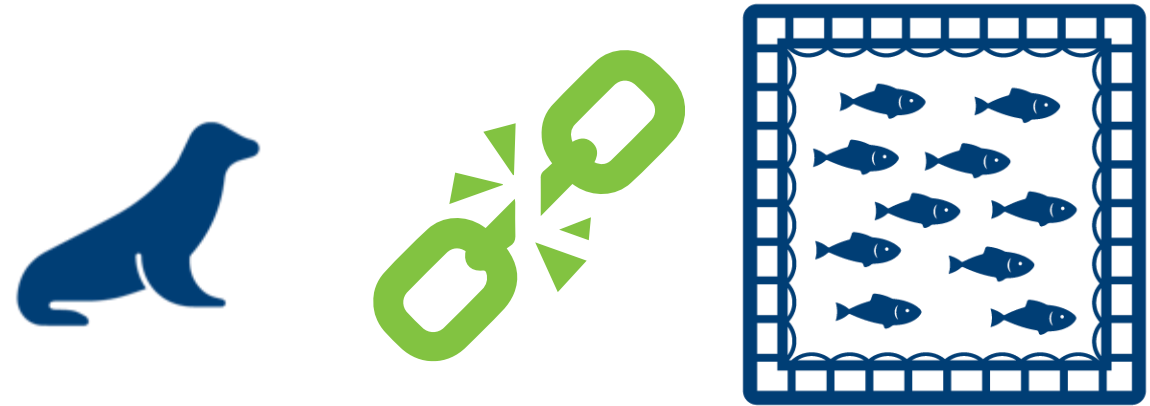
Reinforced Nets



Traditional Acoustic barriers



OUR SOLUTION:
BREAK THE
CYCLE OF
PREDATION

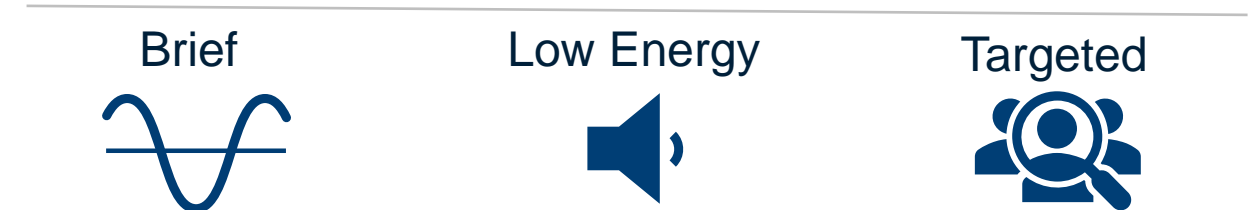
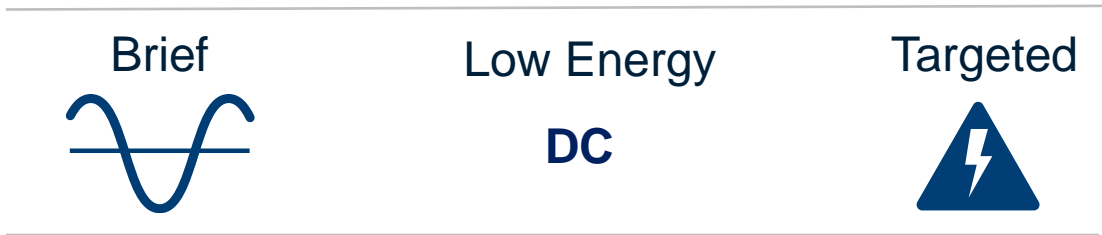


Learning can be reversed through conditioned
avoidance behaviours

STARTLE RESPONSE
ACOUSTIC & ELECTRIC

INTELLIGENT TOOLS

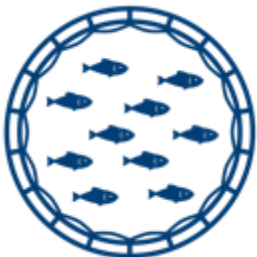
LONG TERM EFFECTS



E-FENCE



E-NET



E-FISH

E.S.R.

A.S.R.



MID



LOW



ACE INTELLIGENT DETERRENTS



**E.S.R.
E-Fence**



**A.S.R.
Low
Frequency**



**E.S.R.
E-Fish**

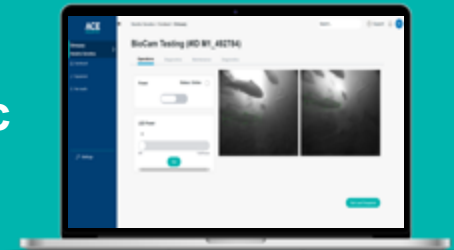


**A.S.R.
Mid
Frequency**



**TRIGGER
A.I Camera**

**Ace Aquatec
Portal**





THE PROBLEM OF INACCURATE BIOMASS DATA

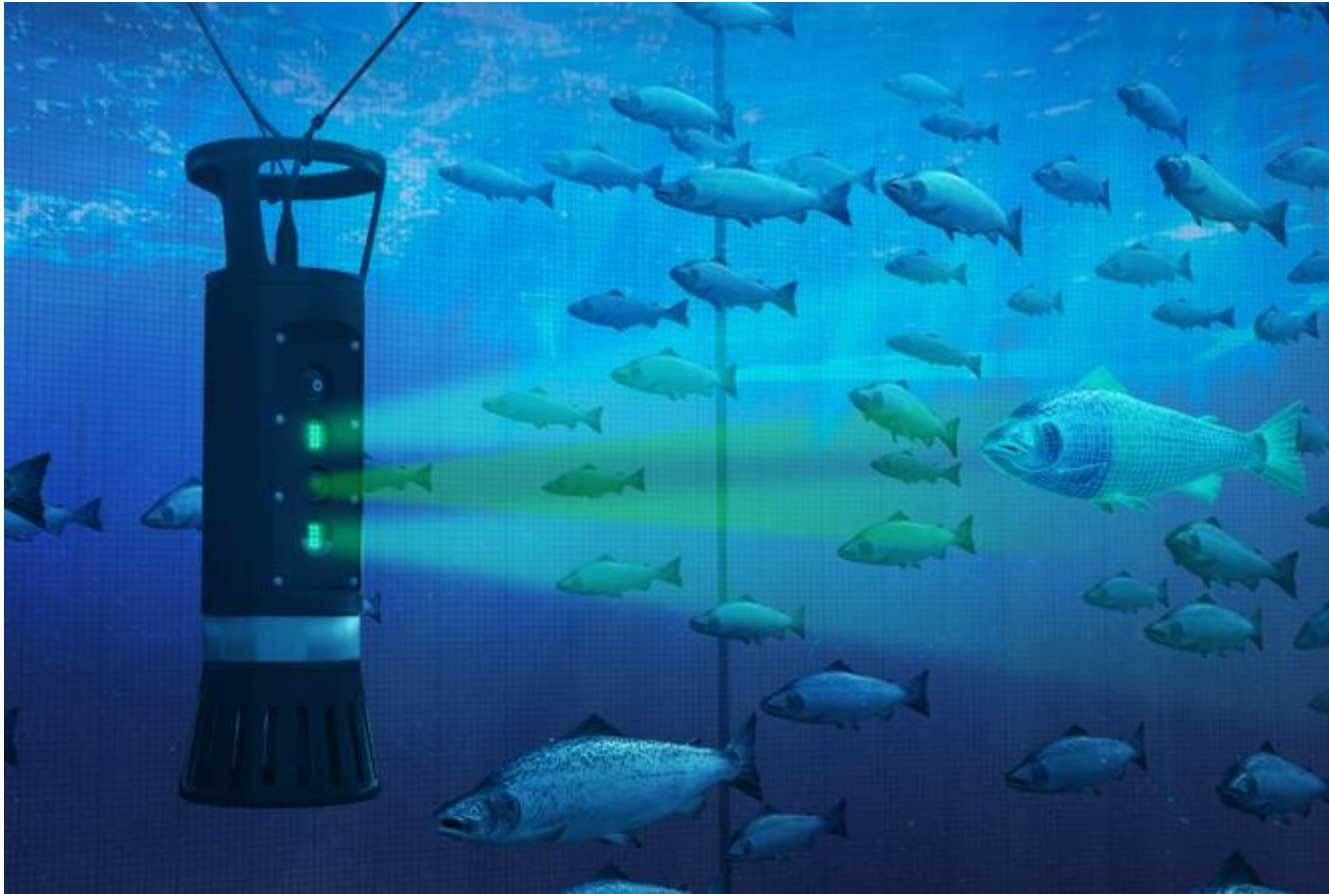
THE PROBLEM

Fish data

- ① **£11.4B** – top four countries' economies.
Scotland 2019 **13%** of the harvest was lost.
- ② Hand weighing is around **95% accurate**,
Vaki frames are variable
- ③ Poor Data: **40%** of mortalities have no listed cause of death.

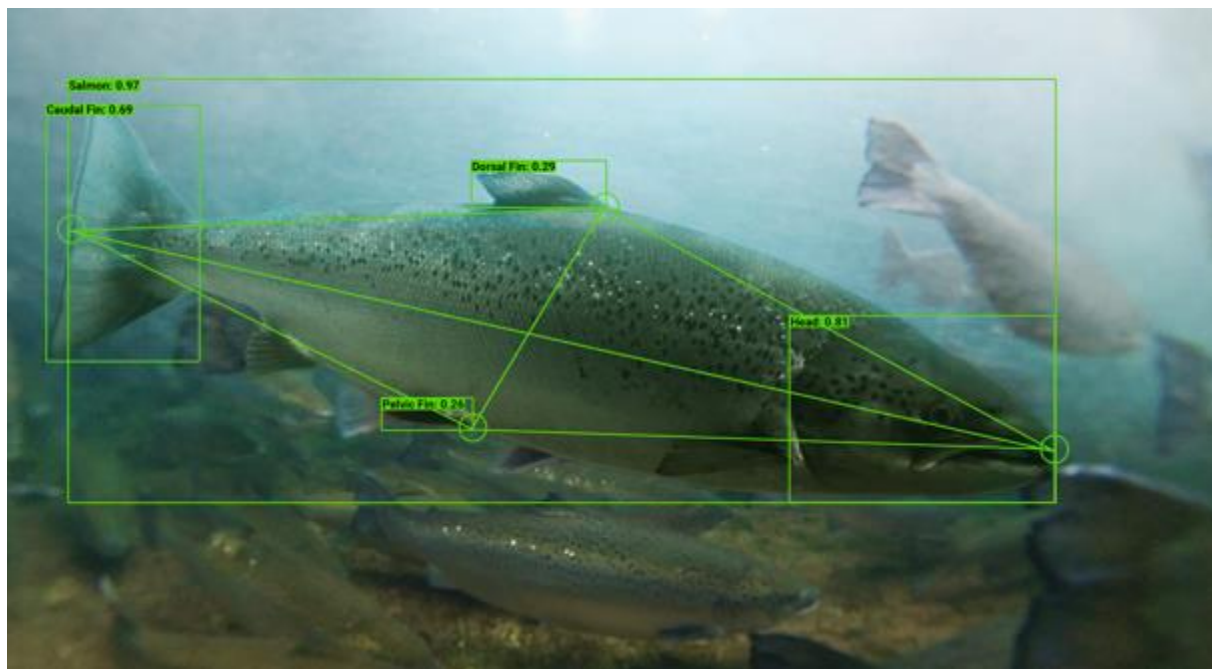


THE SOLUTION

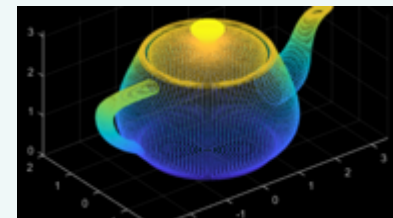


How the Ace-Biomass works

- ① Stereo triangulation
Cloud point of cloud
- ② A.I. tags the fish
Segmentation determines the contours.
- ③ Accurate weight distribution
Accurate weight averages



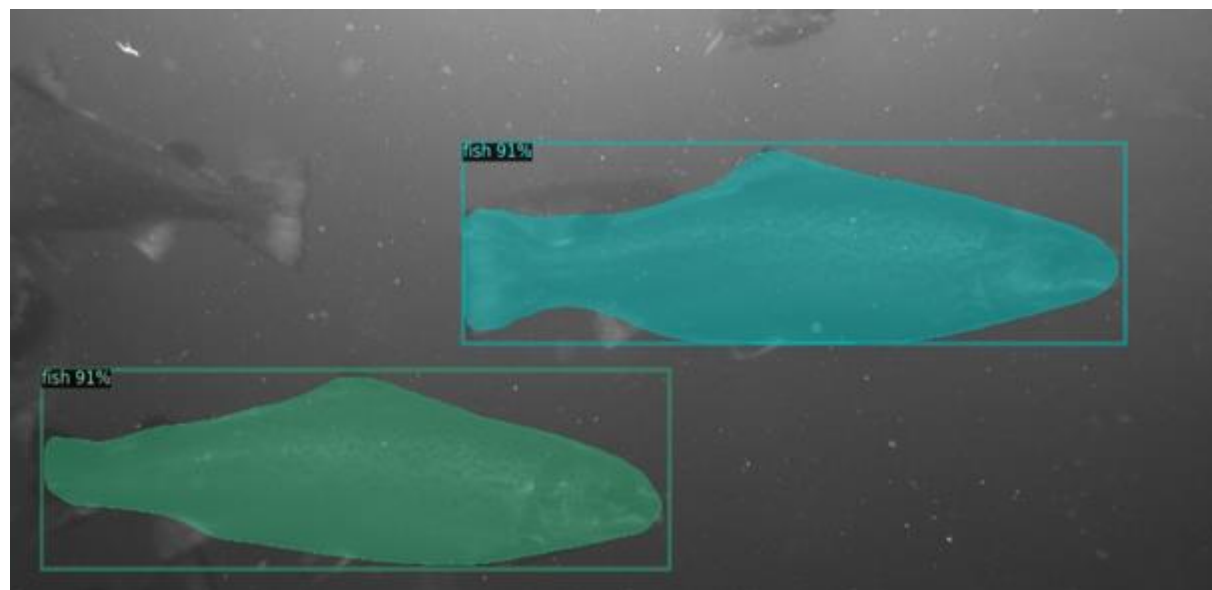
How it's unique



Underwater point of cloud



Auto tagging of fish

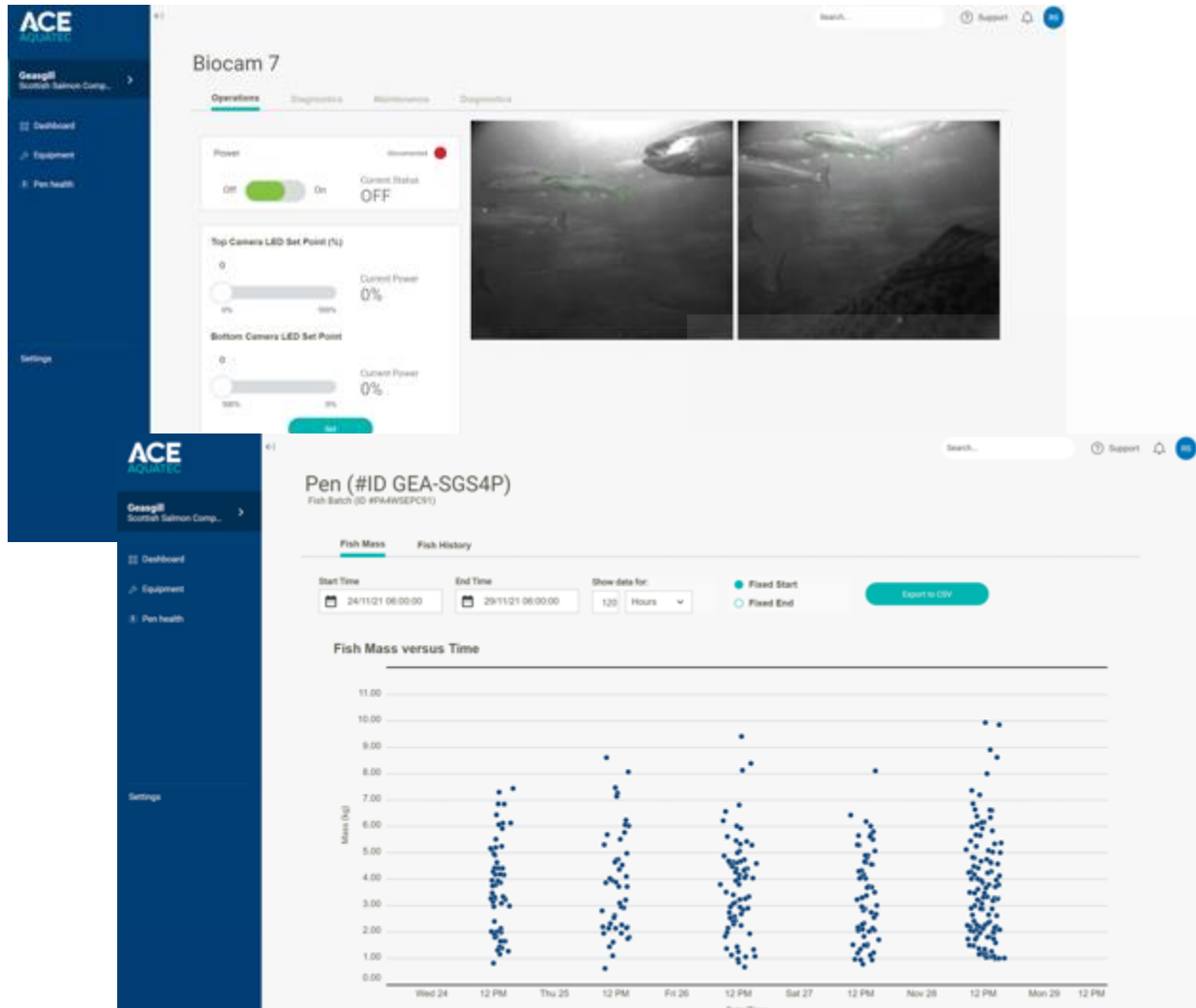


insights via portal



Data from cage to harvest

THE PORTAL



How the Portal works

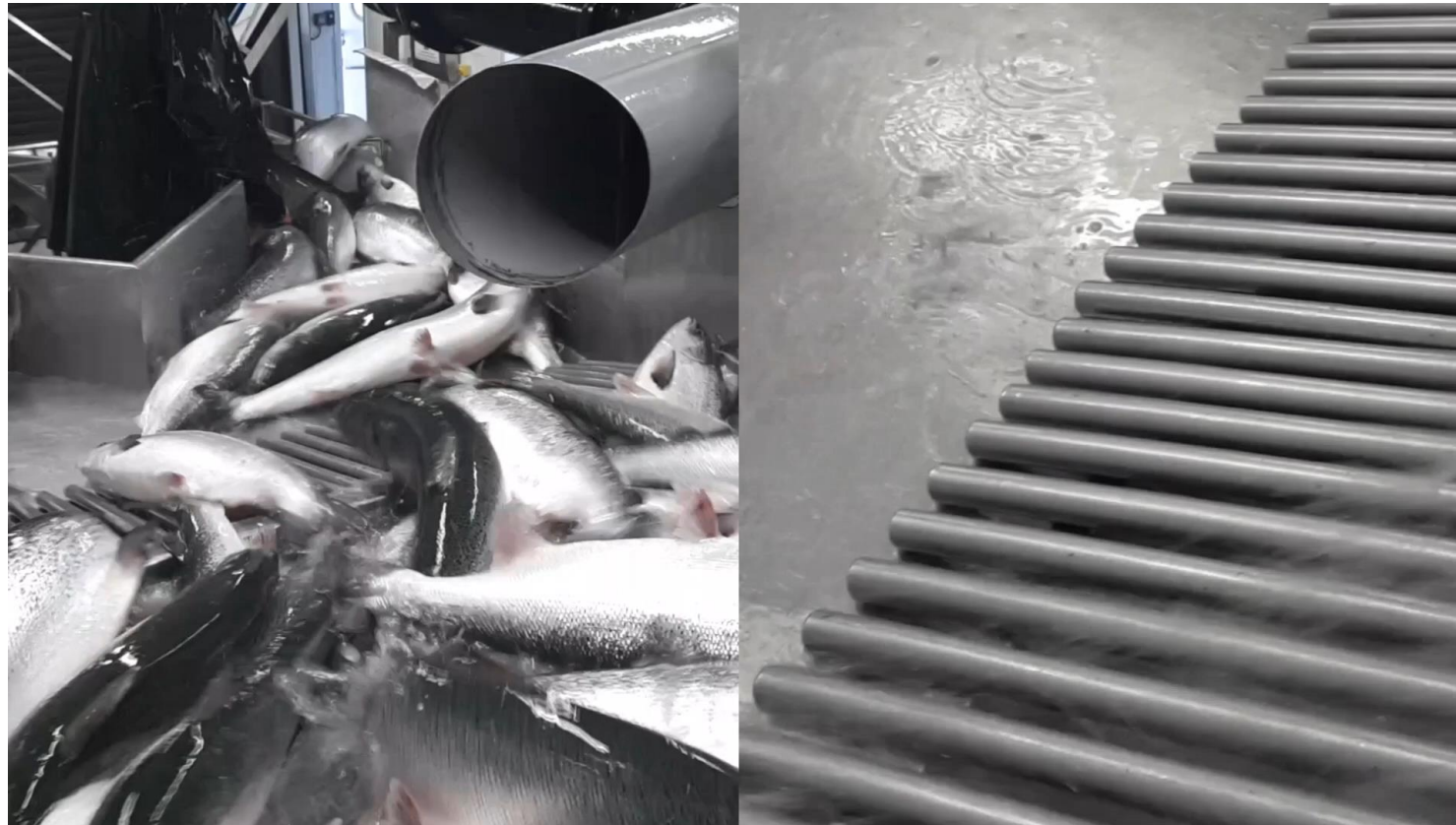
- ① Edge machine learning
- ② Heights, length and weight.
- ③ Weight trends for cage, site or company.



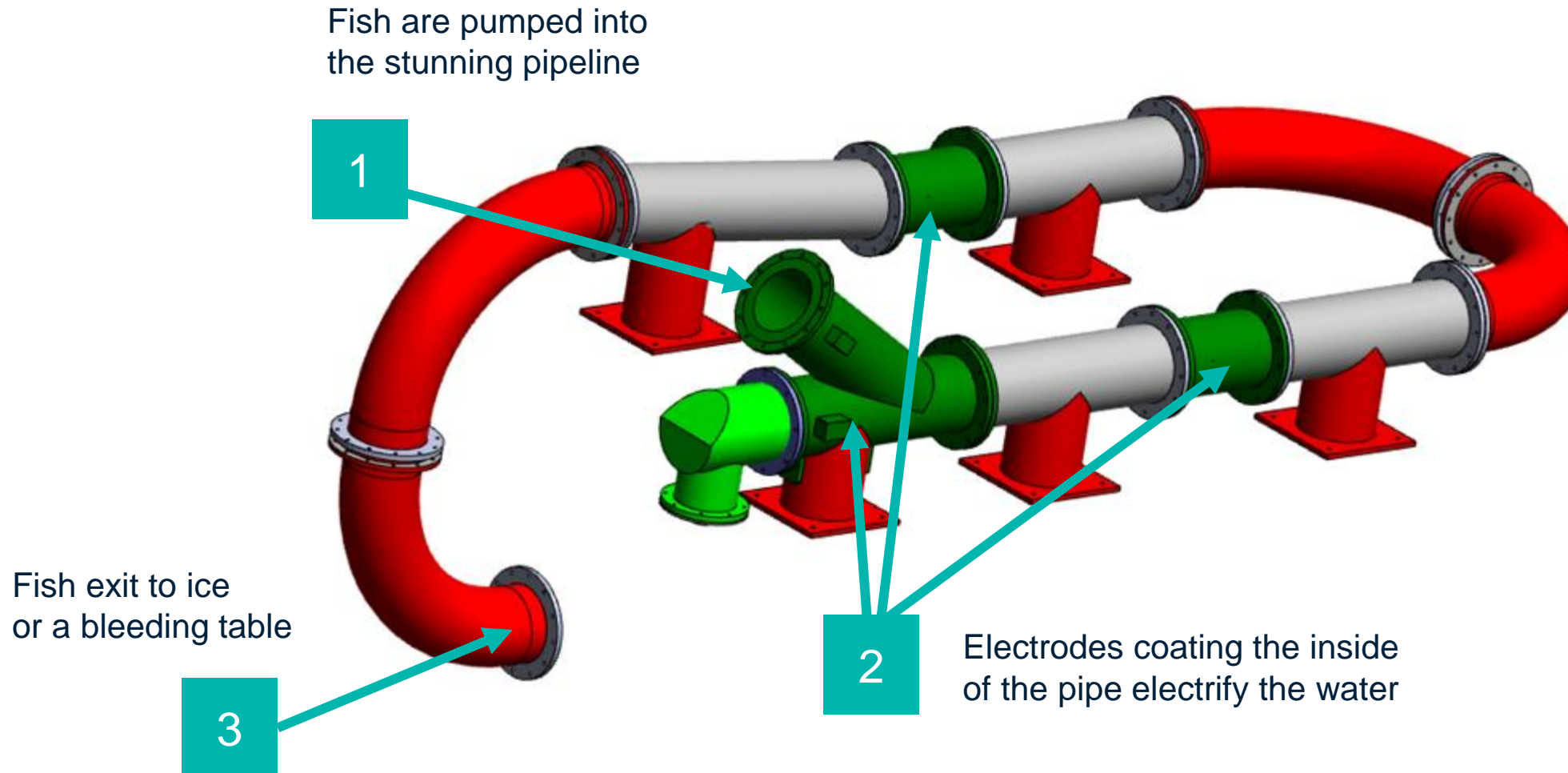
THE PROBLEM OF INHUMANE SLAUGHTER

STUNNING PROBLEMS

Stress & Variability



HOW IN-WATER ELECTRIC STUNNING WORKS



OUR INNOVATIONS REDUCE RISK AT HARVEST



FOUR KEY BENEFITS

with animal welfare at the heart



SOLVING CRITICAL AND **TIMELY PROBLEMS**

Buyers	Farmers	Pressure
 Humane slaughter	 No solution	<div>    </div> <p>ASC, BAP, HAS, EU, supermarkets, NGOs (Compassion in world farming)</p> <p>Supermarkets</p> <p>Freedom Foods, ASC, BAP,</p>
 Accurate biomass	 Imperfect solution	
 No parasites	 Imperfect solutions	
 Bycatch	 No solution	

THANK YOU

REIMAGINING SUSTAINABLE AQUACULTURE