

Optimising Water Chemistry for Intensive Production of Rainbow Trout in Recirculating Aquaculture Systems (RAS)

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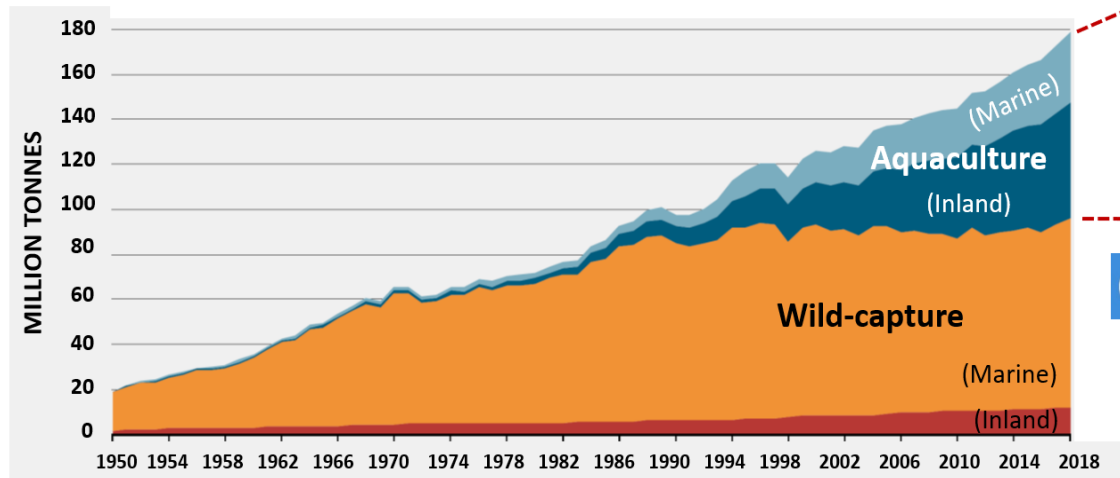


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Why does water chemistry matter?

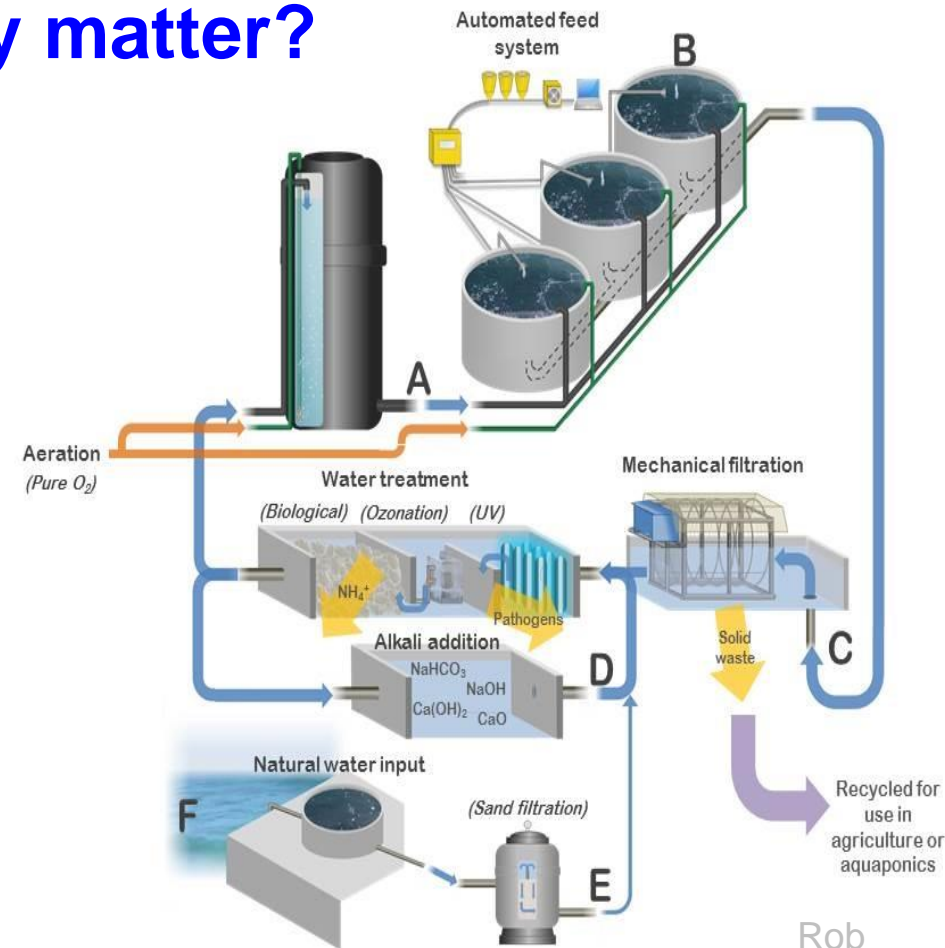
World Capture Fisheries v. Aquaculture Production (FAO 2018)



UN & FAO:
Aquaculture needs
to double
production by 2050



- 98% water savings with RAS compared to flow-through systems
- CO₂ can reach levels 12-75x higher than atmospheric
- Farms may combat low pH by adding alkalis such as calcium oxide
- What is optimum water chemistry? Interaction with trout health (including nephrocalcinosis)?



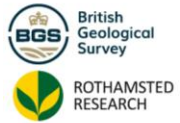
Rob Ellis

RAS:

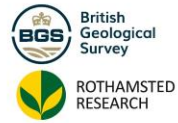
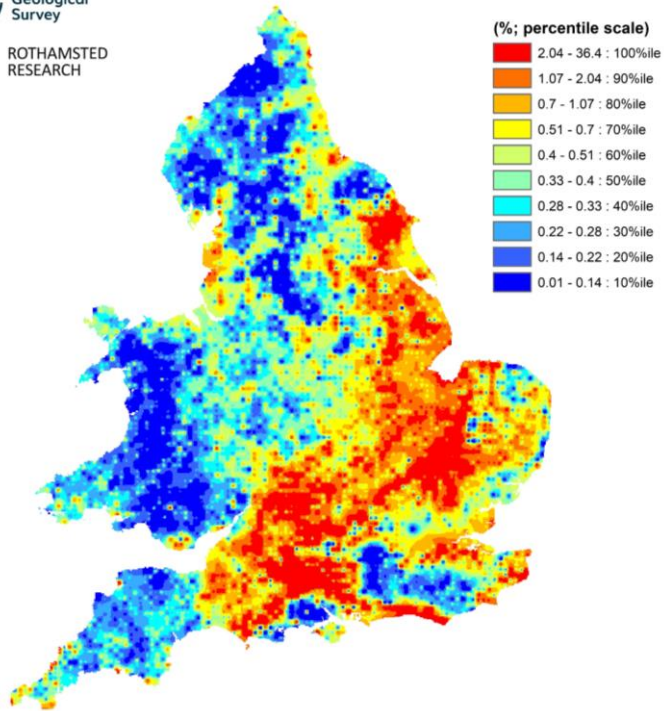
- ↓ Water use
- ↓ Environmental impact
- ↑ Biosecurity
- ↑ Environmental stability

What are we going to do?

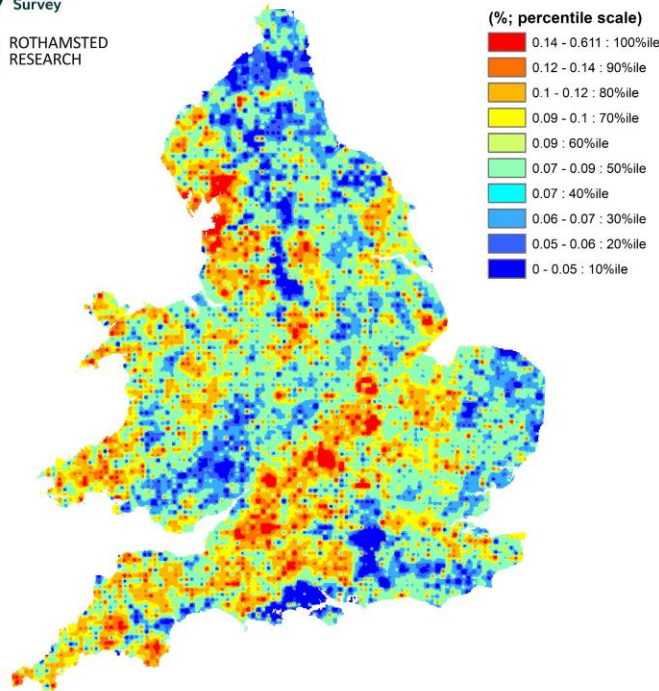
Huge variability in freshwater chemistry across UK



Calcium (Ca)



Phosphorous (P)



White calcium mineral deposits (nephrocalcinosis)



Kidney

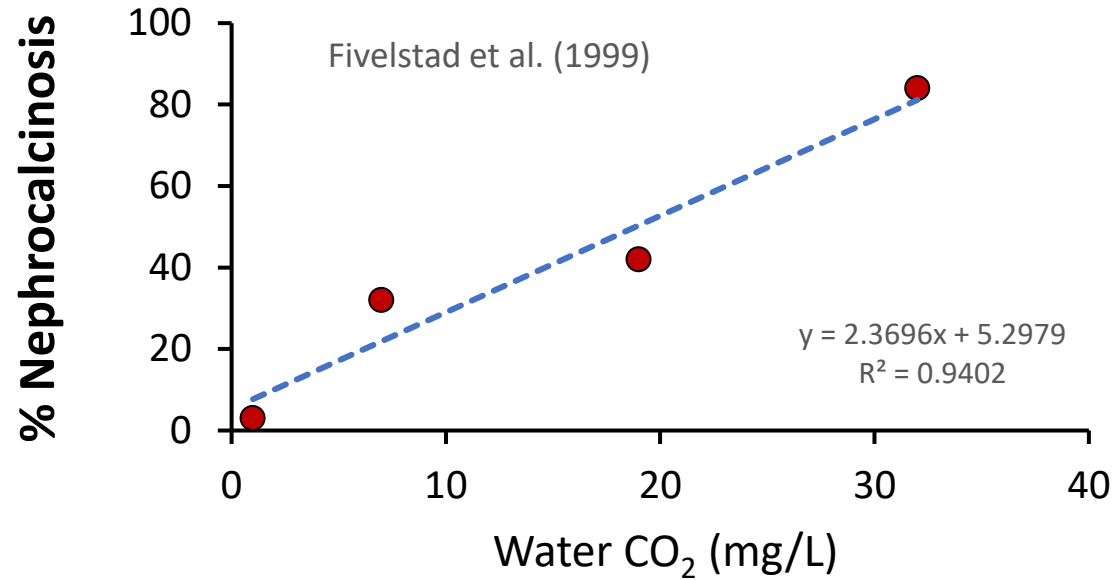
- Experiments to discover relationships between water chemistry and diet on trout health and performance



- Survey water chemistry of UK rainbow trout farms

- Creation of novel sensors (aquaculture-relevant) e.g. calcium

Outcomes of the research



1. Assess water chemistry in RAS and non-RAS systems from UK rainbow trout farms
2. Produce guidance from lab based physiology experiments with rainbow trout

3. Creation of a novel calcium sensor

4. Communicate data through scientific papers, conferences, industry disseminations and social media



Thank You

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