

# POMS update including vaccination to prevent diseases

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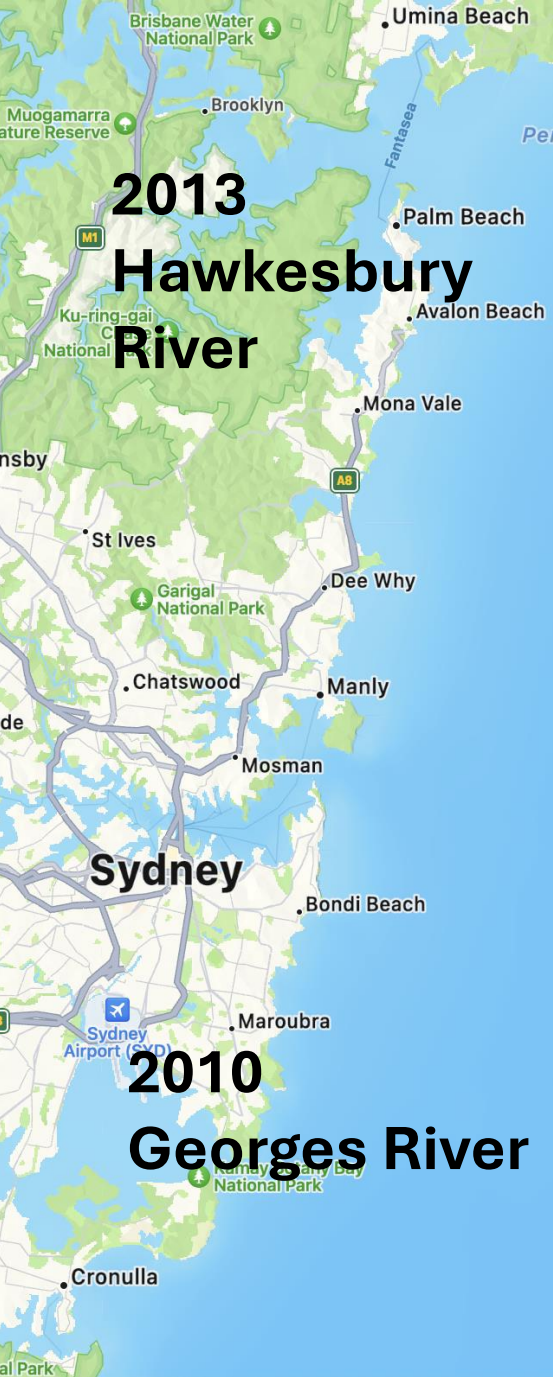
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# Introduction

- POMS is still a risk 14 years after it emerged in Australia
- 12 year breeding program delivered partial resistance
- What do we know about POMS?
- What are the options to avoid it?







Each estuary has different types of POMS virus

There are at least 3 separate sources

based on DNA sequences

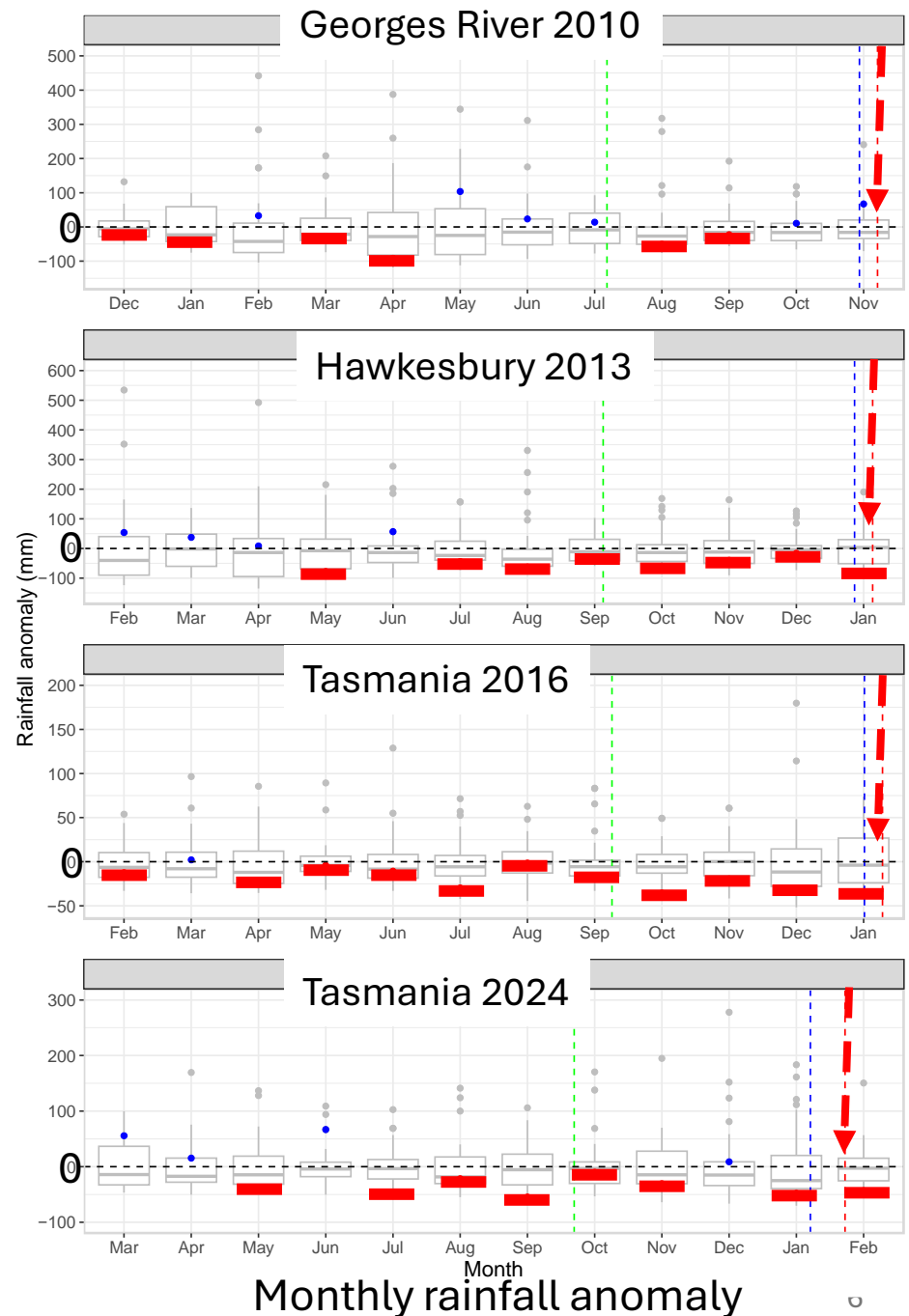


# Implications

- environmental introduction on currents and tides or local emergence, rather than biosecurity failure, explains all new POMS outbreaks in Australia
- biosecurity **will not necessarily prevent** new estuaries becoming infected
- industry-wide solutions are required
  - Breeding program
  - Hatchery – biosecurity
  - Grower - husbandry
  - Vaccination – looks promising

# What triggered the first POMS cases in each estuary?

- low rainfall in preceding 12 months
- reservoir of viruses in wild shellfish
- intensive oyster culture conditions
- unknown factors



Research outcome

# Managing risk - hatcheries

- POMS virus travels in plankton
- 5 micron seawater filtration prevents POMS in spat
- hatcheries exceed this specification



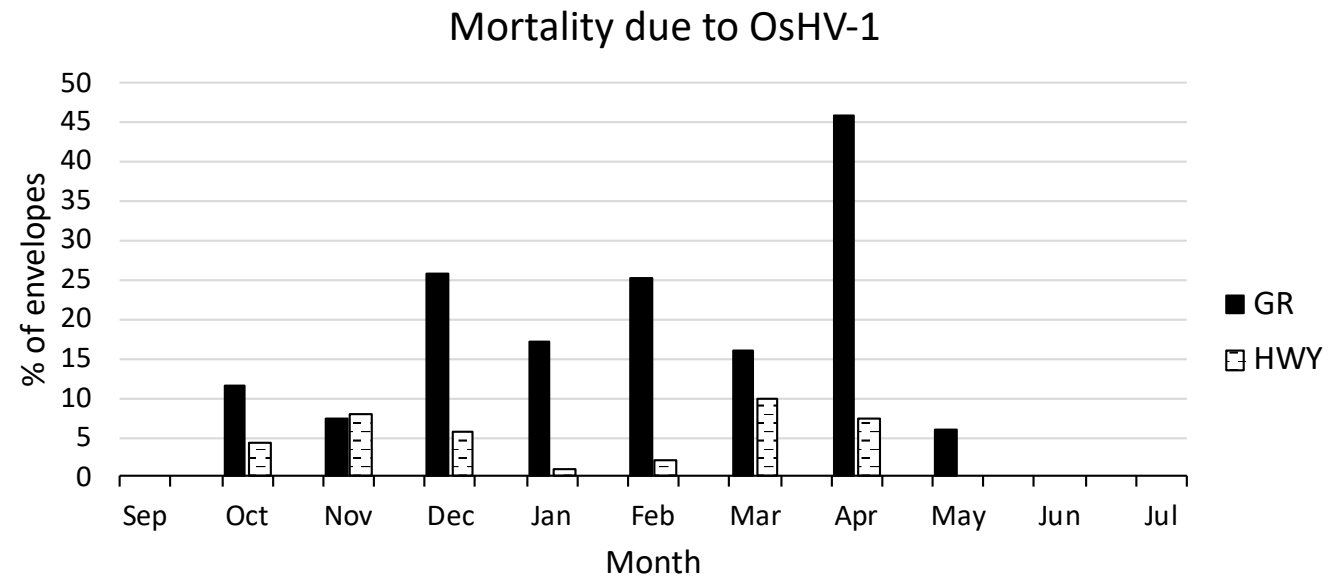
# Managing risk – growers

## Seasonal window of infection

Research outcome

- 5 year study
- 15 locations
- Georges & Hawkesbury rivers

Earliest date	Latest date
<b>28-Oct</b>	<b>14-May</b>



# Managing risk – growers

## Using the seasonal window

- one-stage - deploy spat April, sell front runners January
- two-stage –use safe location in summer (eg Clyde) then move to Hawkesbury
- both options worked well in 2023-2024



# Managing risk – growers

## Raise growing height

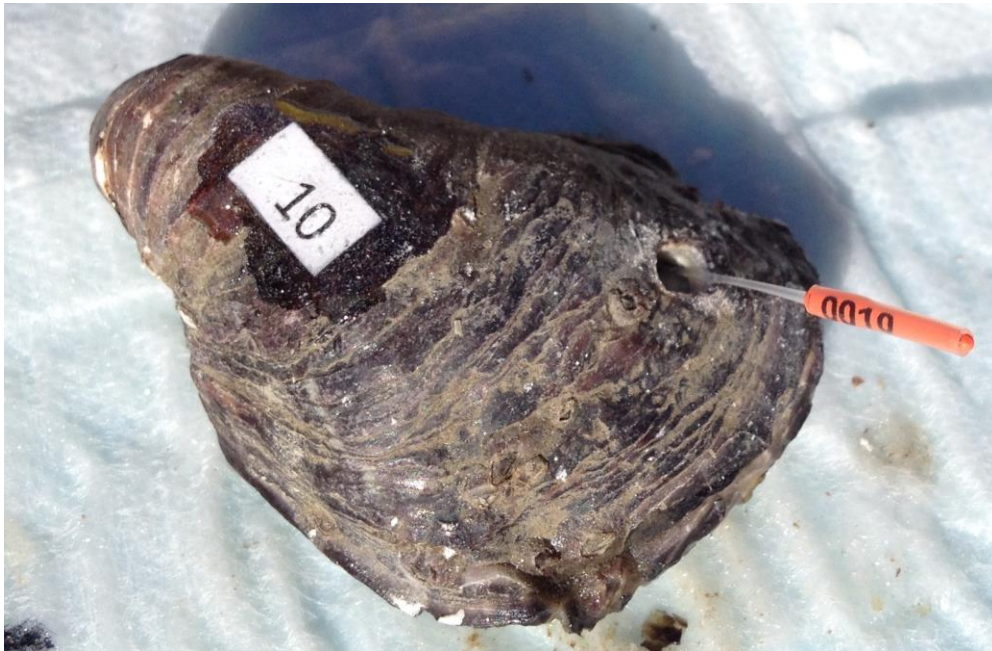
Reduces mortality by 30-50% but only in adult oysters



# Natural immunity to POMS

- some oysters survive repeated POMS attacks
- they gradually eliminate the virus
- they survive injection with live virus

Tagged individual oysters watched for years

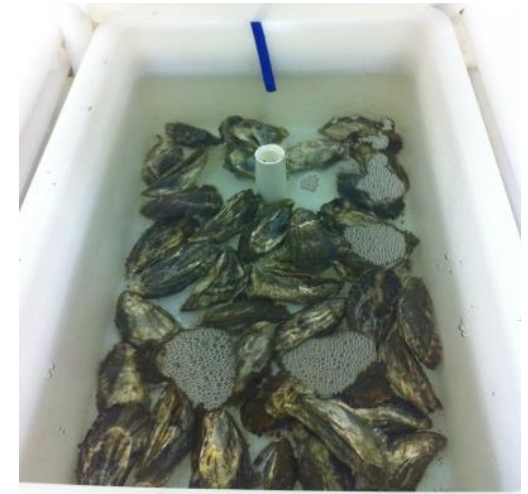


# Mechanism of natural immunity

- it occurs after exposure to POMS at low water temperature in spring
- there is little virus around then
- only some oysters get exposed, develop immunity

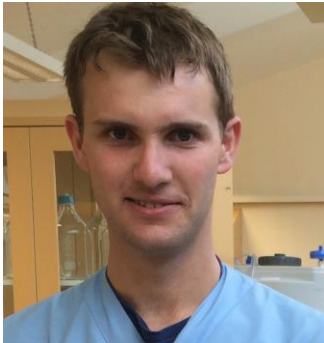
We then demonstrated this in the lab

- it raised the possibility of vaccination



# POMS vaccination

- oysters were vaccinated by injection
- survival was tested by injecting a lethal dose of virus
  - 52% survival using heat-killed vaccine
  - 77% survival using live-virus vaccine
- greater survival will be achieved by optimizing the protocol



Max de  
Kantzow

This work was completed in 2018, reported to FRDC and published on-line in PhD theses and papers “spat conditioning, immune priming or immunization”

# What is happening overseas?

- 2021 **France** - international patent - POMS vaccine
- 2024 **France** - 100% POMS protection injectable vaccine
- 2024 **China** - successfully vaccinated Pacific oysters against *Vibrio* by immersion
- 2024 **#New Zealand #Science & Technology**

**New Zealand's Cawthron  
Institute Receives \$1M Grant for  
Groundbreaking Oyster Vaccine**

Source: BNN

# Next steps – Australia?

Will Australia innovate and engage in systematic R&D?

- optimise POMS vaccine
  - composition and delivery (immersion, in-feed)
- extend concept to
  - vibrio, QX
  - food safety microbes
- extend concept to other shellfish
  - pearl oysters
  - flat oysters
  - abalone



# Acknowledgements



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## Oyster growers

Bruce Alford, John Stubbs, Rob Moxham, Steve Jones, Bob, Len & Ted Drake, Robert Hill, Leon & Angela Riepsamen



Shellfish Culture  
TASMANIA

## Research team

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