Supplementary materials 1

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Participant Information Statement

Understanding the risks associated with climate change on infectious diseases affecting the seafood industry

Researchers

Principal Investigator

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Co-investigators

Professor Joy Becker

Professor in Aquatic Animal Health and Production, School of Life and Environmental Sciences, University of Sydney

Dr Francisca Samsing

Senior Lecturer in Intensive Animal Production and Health, School of Veterinary Science, University of Sydney

Dr Georgia Macaulay

Research Associate, School of Life and Environmental Sciences, University of Sydney

Ms Lynne Hayes

Research Assistant, School of Agricultural, Environmental and Veterinary Sciences Charles Sturt University and Gulbali Institute

You are invited to participate in a research study investigating the risks associated with climate change on pathogens affecting the seafood industry. Please note that to participate in the research you must be over 18 years old.

The study is being conducted by the researchers listed at the top of this document.

Before you decide whether you wish to participate in this study, it is important for you to understand why the research is being done and what it will involve. Please take the time to read the following information carefully and discuss it with others if you wish. Please ask questions about anything that you don't understand or want to know more about.

What is the purpose of this study?

The overall aim of the project is to evaluate the change in the risks associated with climate change on infectious diseases affecting the Australian seafood industry. This project will focus on infectious diseases that could negatively impact the supply of barramundi, edible oysters and prawns from Australian aquaculture.

Why have I been invited to participate in this study?

We are inviting representatives of peak industry associations for barramundi, edible oysters and prawns and other expert stakeholders involved in these aquaculture industries.

What does this study involve?

If you decide to take part in this study, you will be asked to:

1. Read through preliminary information (10 mins) and participate in an industry specific semi structured interview (estimated 60-90 mins). The interview is designed to draw on your unique knowledge base, and you're welcome to skip any questions that you don't feel comfortable answering.
2. Following the interview, we may contact a smaller group of participants for the purpose of attending a follow-up online meeting (about 60 minutes) where specific components of the study will

be discussed further. This would be either individually or in a small group and while we may not include all participants, we want you to know how much we value your contributions.

3. Once the results are known, you will be invited to attend a short online meeting (about 30 minutes) where the outcomes of the project activities will be presented.

The study involves up to three activities; however, you can withdraw at any stage. Given the size of the Australian aquaculture industry and the nature of the job roles, it is expected that some experts may be invited to participate across more than one industry. This will be entirely your choice.

The research team will audio record the interview and follow up meeting for the purposes of ensuring accuracy of information. Notes may also be taken by members of the research team, and we will use the auto transcript feature of recordings to assist with transcription.

Are there any risks and benefits to me in taking part in this study?

Participation in this study should involve no physical discomfort.

It is possible that some of the study content may cause discomfort for some participants as it relates to your industry and/or livelihood. If you do not wish to participate in any part of the study, you may stop immediately. We will follow up to check that you are ok and can provide information on appropriate support services.

We expect that, if required, you will discuss your involvement in this research with your organisation and obtain any necessary internal approvals.

Your data will be de-identified before reporting. Information and comments from participants will only be attributed by:

Job title - e.g. farm manager, owner, vet, worker, government representative, expert on (*specific topic*)

State - if appropriate

Industry - barramundi, prawn or oyster.

How is this study being paid for?

This study is funded by the Fisheries Research and Development Corporation (FRDC) (Project ID: 2022-029).

Will taking part in this study cost me anything, and will I be paid?

To show our appreciation of your contribution, all participants will receive an honorarium of $600, which is in line with Australian standard of reviewing a PhD thesis. This will be provided in the form of a direct payment into your nominated bank account after completion of the data collection.

What if I don't want to take part in this study?

Participation in this research is entirely your choice. Only those people who give their informed consent will be included in the project. Whether or not you decide to participate is your decision and will not disadvantage you. There are no consequences for those who decide not to participate.

What if I participate and want to withdraw later?

Being in this study is completely voluntary and you do not have to take part.

Your decision will not affect your current or future relationship with the researchers, nor do we anticipate your decision will affect your relationship with the FRDC.

If you decide to take part in the study and then change your mind you can withdraw at any stage. If you choose to withdraw, we will not collect any more information from you.

Information provided through the interview can be removed from the data set up to two weeks after it has been submitted.

You may also request that your data be removed up to one week after the follow-up meeting. Please be aware that due to the nature of group discussions, it may not be possible to definitively identify all individual contributions and as such, we cannot guarantee that all individual data will be removed.

How will my confidentiality be protected?

While your identity will be known to the research team and amongst those who participate in the follow-up meeting, you will not be individually identified in any formal or informal reports or publications. We will be reporting broad industry categories of participants. At the start of the follow-up meeting, we will encourage confidentiality amongst participants, but we cannot guarantee it.

All information collected from you will be stored securely and only accessed by the researchers unless you consent otherwise. All recordings and data will be stored online on password protected computers and software platforms. Data will be retained for at least 5 years after final publication at Charles Sturt University and the University of Sydney.

What will happen to the information that I give you?

A one-page executive summary of the project outcomes will be emailed to participants.

The information will be de-identified, collated, and a report generated for the FRDC, which may be publicly available. The study may also be published in an appropriate scientific journal and/or presented at relevant conferences. While there are no immediate plans for additional research, by agreeing (consenting) to participate in the current study, you are allowing us to use the data collected for future research projects. This could be an extension of this project or something that is in the same general research area. This is known as extended consent.

What should I do if I want to discuss this study further before I decide?

If you would like further information, please contact:

Professor Joy Becker E: joy.becker@sydney.edu.au 02 9351 8883

Professor Marta Hernandez-Jover E: mhernandez-jover@csu.edu.au P: 02 6933 2086

Who should I contact if I have concerns about the conduct of this study?

Charles Sturt University's Human Research Ethics Committee (HREC) has approved this research. Reciprocal approval has also been obtained from the Human Research Ethics Committee of The University of Sydney.

If you have any complaints or reservations about the ethical conduct of this project, you may contact the Committee through the Research Integrity Unit via the following contact details:

The Presiding Officer
Human Research Ethics Committee
Research Integrity Unit
Locked Bag 588
Wagga Wagga NSW 2678
Phone: (02) 6933 4213
Email: ethics@csu.edu.au

Any issues you raise will be treated in confidence and investigated thoroughly, and you will be informed of the outcome.

Consent form

Charles Sturt University
Gulbali Institute
Agriculture Water Environment

THE UNIVERSITY OF SYDNEY

Participant Consent Form

Understanding the risks associated with climate change on infectious diseases affecting the seafood industry

Researchers

Principal Investigator

Professor Marta Hernandez-Jover. BVSc, MSc, PhD. Professor Veterinary Epidemiology & Public Health, School of Agricultural, Environmental and Veterinary Sciences, Charles Sturt University and Gulbali Institute
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Research Associate, School of Life and Environmental Sciences, University of Sydney
Ms Lynne Hayes
Research Assistant, School of Agricultural, Environmental and Veterinary Sciences Charles Sturt University and Gulbali Institute

I agree to participate in the above research project and give my consent freely.

- I understand that the project will be conducted as described in the Participant Information Statement, a copy of which I have retained.
- Where required, I have discussed participation in this study with my supervisor/employer.
- I understand that in this study I will be required to participate in a semi structured interview, and, if required participate in a follow up online meeting.
- I consent to the audio recording of the interview and meeting.
- I understand that I am free to withdraw from this study at any time and that my data may be removed as described in the Participant Information Sheet.
- I have been informed that the confidentiality of the information I provide will be protected and will only be used for purposes that I have agreed to.
- I have had the opportunity to have questions answered to my satisfaction.

Participant Name
Signature
Date

Charles Sturt University's Human Research Ethics Committee (HREC) has approved this research. Reciprocal approval has also been obtained from the Human Research Ethics Committee of The University of Sydney.
If you have any complaints or reservations about the ethical conduct of this project, you may contact the Committee through the Research Integrity Unit via the following contact details:
The Presiding Officer | Human Research Ethics Committee |Research Integrity Unit
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Pre-interview information

Aim

- The overall aim of the project is to evaluate the change in the risks associated with climate change on infectious diseases affecting the Australian seafood industry. This part of the project will focus on diseases that could negatively impact the supply of edible oysters from Australian aquaculture.
- This semi-structured interview is intended to gain information from your unique knowledge base. For this reason, it is very important that you answer questions based on your best knowledge. As outlined in the PIS, you do not need to answer every question.
- This expert elicitation process is one data source that will inform the qualitative risk assessment. We are also scoping the literature for information regarding how climate change may impact both oysters and pathogen biology.

Pathogens

In consultation with Oysters Australia, we prioritised a list of aquatic pathogens for risk assessment. The interview will focus on the pathogens listed below:

- ***Vibrio harveyi:*** is an opportunistic marine bacterium. Often part of the normal oyster microbiota, environmental stressors can trigger *V. harveyi* pathogenicity. In Australia, *V. harveyi* outbreaks have been linked to acute oyster mortality events.
- ***Prorocentrum minimum*****:** is a dinoflagellate that can form harmful algal blooms in estuarine and coastal environments. *P. minimum* produces toxins and has been implicated in oyster mortalities in Australia.
- ***Karenia* spp.**: is a genus of marine dinoflagellates (12 species) that can form HABs. Several species in the *Karenia* genus produce toxins that are harmful to human health. HABs of *Karenia* spp. can cause harm to farmed oysters via oxygen depletion and can impact reproduction.
- **QX disease:** *Marteilia sydneyi* is a protozoan parasite that infects Sydney Rock Oysters and causes QX disease. The parasite infects the oyster's digestive system and can cause mortality.

Interview structure

- The interview is separated into four sections. In sections 1-3, we will discuss the current and future risk of pathogens identified as priority by OA in farming regions.
- Specific farming regions were prioritised in consultation with the Oysters Australia. They are:
    - South Australia (Coffin Bay region)
    - New South Wales (Narooma Region)
    - Tasmania (Norfolk Bay Region)
- Current climate refers to present-day climatic conditions (summary of past ~5 years)
- Future climate (2040): Predicted 2040 climate conditions for specified geographic areas. The year 2040 was selected as expected climate impacts are considered 'locked in' by CSIRO climate experts, regardless of climate policy intervention.
- In section 4, we will discuss potential risk adaptation strategies for the oyster industry and have time for open questions.

Risk estimation

For each question in section 1-3, we will ask for you to qualitatively estimate likelihood of a disease event caused by the pathogens in each farming region. Please refer to Table 1 for qualitative descriptors of likelihood used in Biosecurity Australia, 2009

Table 1. Qualitative descriptors of likelihood

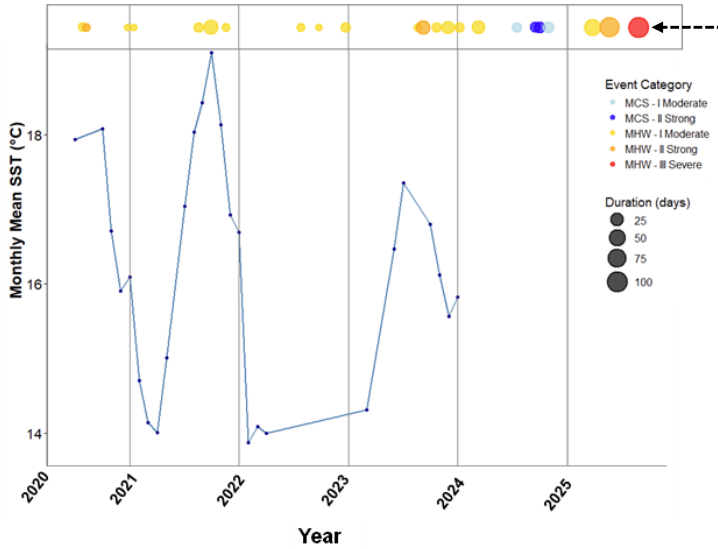
Likelihood	**Descriptive definition**	**Probability ranges**
High	The event would be very likely to occur	0.7 to 1
Moderate	The event would occur with an even probability	0.3 to 0.7
Low	The event would be unlikely to occur	0.05 to 0.3
Very low	The event would be very unlikely to occur	0.001 to 0.05
Extremely low	The event would be extremely unlikely to occur	0.000001to to 0.001
Negligible	The event would almost certainly not occur	0 to 0.000001

Climate scenarios

In collaboration with CSIRO, we have summarised current climate data for the three farming regions using national databases, focussing on climate data that influence oyster health and biology. 2040 predictions were provided by CSIRO.

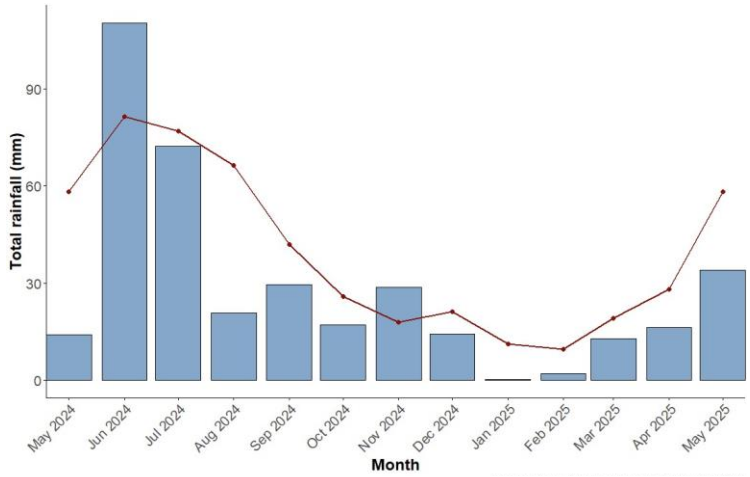
Current climate Coffin Bay region (SA)

Sea temperature and marine heat waves



Blue line = monthly average sea surface temperature (SST) (top 10 m) for coastal region of Coffin Bay (data available for 2020-2023). Marine heatwave events (MHW) from April 2020-April 2025 are represented by dot with severity (dot colour) and duration (dot size). Marine cold spells (MCS) are represented by blue dots.

Rainfall



Total monthly rainfall recorded at Point Avoid, Coffin Bay station in the past year (May 2024-2025) compared to historic average at Coffin Bay station (1984-2014) (red line).

Recent MHW associated with significant HAB event in SA

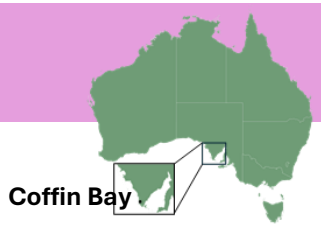
Sea salinity and pH

Average salinity 35.5 ppt

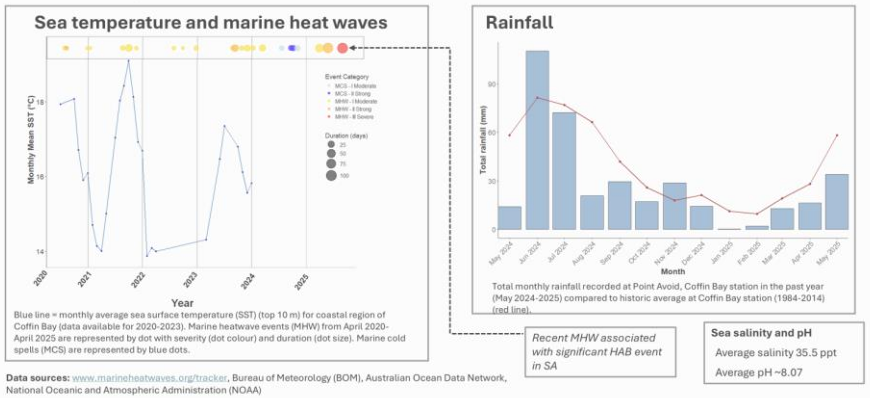
Average pH ~8.07

Data sources: www.marineheatwaves.org/tracker; Bureau of Meteorology (BOM)Australian Ocean Data Network, National Oceanic and Atmospheric Administration (NOAA)

2040 climate Coffin Bay (SA) region



Current climate Coffin Bay region (SA)



Sea temperature and marine heat waves

- SST increase by ~0.5 °C
- MHWs will be more frequent and severe
- 1 % drop in dissolved oxygen

Rainfall

- 7-12% decrease in rainfall at an annual level

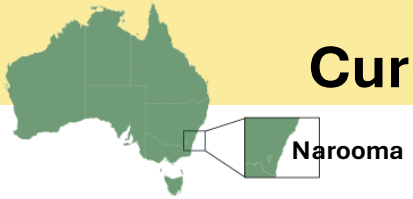
Primary productivity

- Variable across models: between 3% drop and 3% increase

Sea salinity and pH

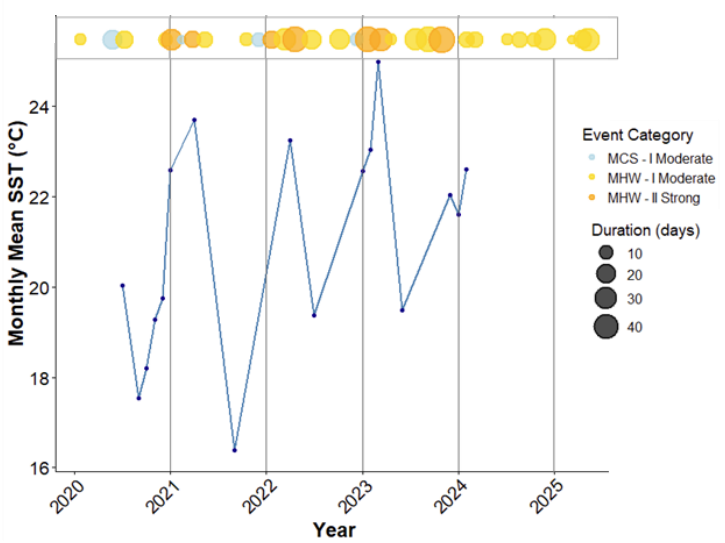
- <1% decrease in salinity
- 36% more acidified

Data source: CSIRO



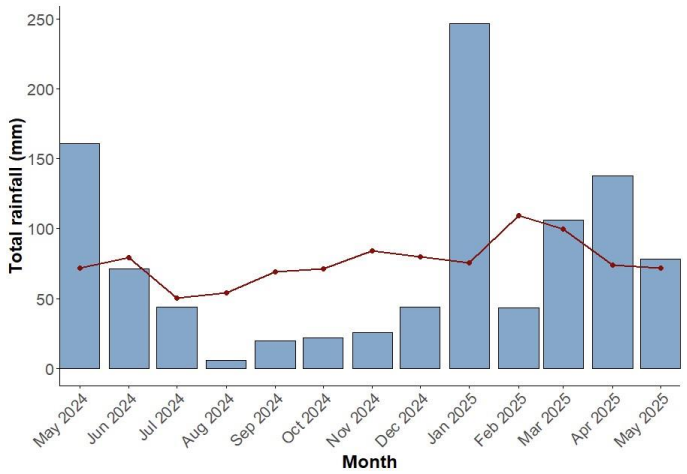
Current climate Narooma region (NSW)

Sea temperature and marine heat waves



Blue line = monthly average sea surface temperature (SST) (top 10 m) for coastal region of Coffin Bay (data available for 2020-2024). Marine heatwave events (MHW) from January 2020-May 2025 are represented by dot with severity (dot colour) and duration (dot size). Marine cold spells (MCS) are represented by blue dots.

Rainfall



Total monthly rainfall recorded at Narooma station in the past year (May 2024 - 2025) compared to historic average (1984-2014) (red line).

Sea salinity and pH

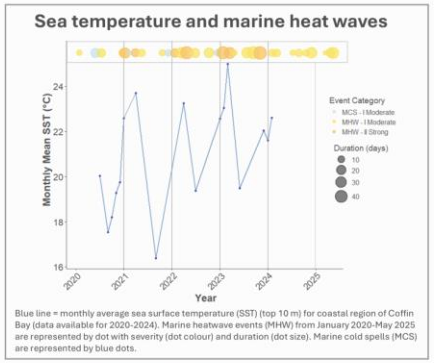
Average salinity 35.2 ppt

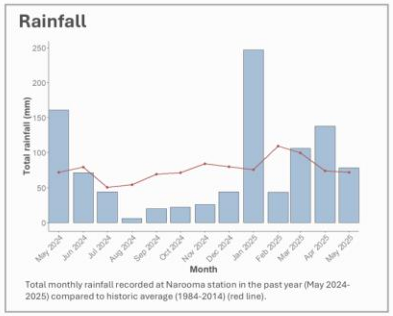
Average pH ~ 8.075

Data sources: www.marineheatwaves.org/tracker; Bureau of Meteorology (BOM)Australian Ocean Data Network, National Oceanic and Atmospheric Administration (NOAA)

2040 climate Narooma (NSW) region

Current climate Narooma region (NSW)





Sea salinity and pH
Average salinity 35.2 ppt
Average pH ~ 8.075

Data sources: www.marineheatwaves.org/tracker, Bureau of Meteorology (BOM), Australian Ocean Data Network, National Oceanic and Atmospheric Administration (NOAA)

Sea temperature and marine heat waves

- SST increase by ~0.9 °C
- MHWs will be more frequent and severe
- 2.5% drop in dissolved oxygen

Rainfall

- 10-15% increase in rainfall at an annual level

Primary productivity

- 10% decline in phytoplankton primary production

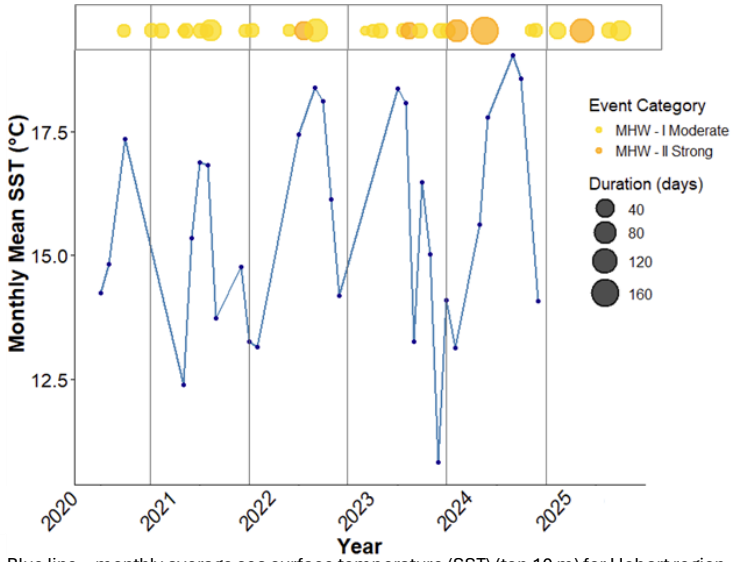
Sea salinity and pH

- <1% decrease in salinity
- 36% more acidified

Data source: CSIRO

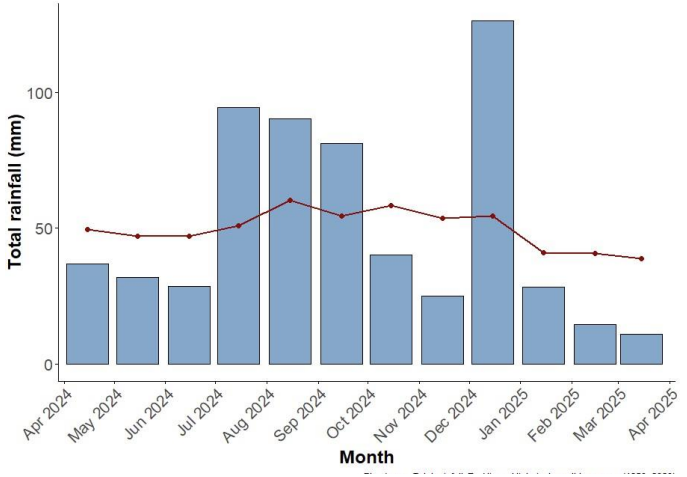
Current climate Hobart/Norfolk Bay region

Sea temperature and marine heat waves



Blue line = monthly average sea surface temperature (SST) (top 10 m) for Hobart region. Marine heatwave events (MHW) from January 2020-May 2025 are represented by dot with severity (dot colour) and duration (dot size).

Rainfall



Total monthly rainfall recorded at Hobart Airport (April 2024-2025) compared to historic average (1950-2025) (red line).

Sea salinity and pH

Average salinity 35.5 ppt

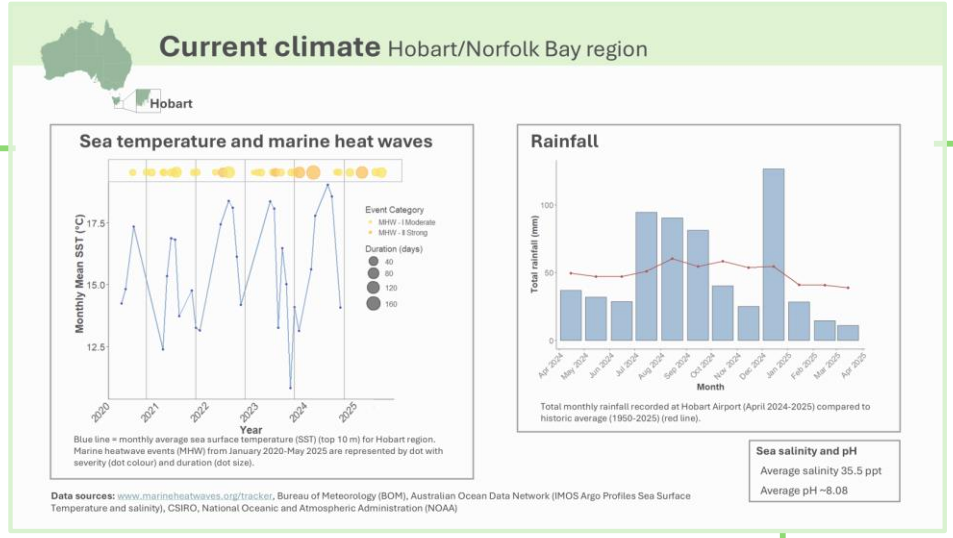
Average pH ~8.08

Data sources: www.marineheatwaves.org/tracker; Bureau of Meteorology (BOM)Australian Ocean Data Network (IMOS Argo Profiles Sea Surface Temperature and salinity), CSIRO, National Oceanic and Atmospheric Administration (NOAA)

2040 climate Hobart/Norfolk Bay region

Sea temperature and marine heat waves

- SST increase by ~0.9 °C
- MHWs will be more frequent and severe
- 2.5% drop in dissolved oxygen



Rainfall

- likely about the same at an annual scale (some models say minor drop of about 5%, others minor increase)

Primary productivity

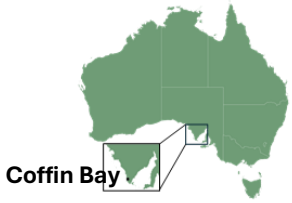
- 10-15% decline in phytoplankton primary production

Sea salinity and pH

- <1% increase in salinity
- pH drop by 0.1, 30% increase in acidity

Data source: CSIRO

Coffin Bay, South Australia
CURRENT climate

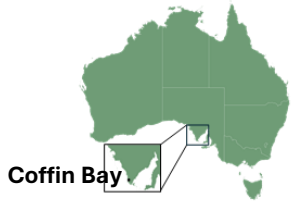


Q1 (A) Given the current climate scenario, what do you think is the likelihood of a significant *Vibrio harveyi* disease event affecting farmed Pacific oysters in Coffin Bay within the next 12 months?

Likelihood	Descriptive definition	Probability ranges
High	The event would be very likely to occur	0.7 to 1
Moderate	The event would occur with an even probability	0.3 to 0.7
Low	The event would be unlikely to occur	0.05 to 0.3
Very low	The event would be very unlikely to occur	0.001 to 0.05
Extremely low	The event would be extremely unlikely to occur	0.000001 to 0.001
Negligible	The event would almost certainly not occur	0 to 0.000001

Confidence
High
Medium
Low

Coffin Bay, South Australia
CURRENT climate

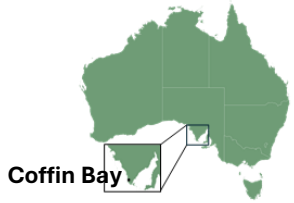


Q1 (B) Given the current climate scenario, what is the likelihood of a *Prorocentrum minimum* harmful algal bloom occurring within the next 12 months that would have a significant impact on Pacific oyster health or aquaculture production?

Likelihood	Descriptive definition	Probability ranges
High	The event would be very likely to occur	0.7 to 1
Moderate	The event would occur with an even probability	0.3 to 0.7
Low	The event would be unlikely to occur	0.05 to 0.3
Very low	The event would be very unlikely to occur	0.001 to 0.05
Extremely low	The event would be extremely unlikely to occur	0.000001 to 0.001
Negligible	The event would almost certainly not occur	0 to 0.000001

Confidence
High
Medium
Low

Coffin Bay, South Australia
CURRENT climate

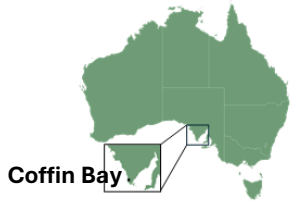


Q1 (C) Given the current climate scenario, what is the likelihood of a *Karenia spp.* harmful algal bloom occurring within the next 12 months that would have a significant impact on Pacific oyster health or aquaculture production?

Likelihood	Descriptive definition	Probability ranges
High	The event would be very likely to occur	0.7 to 1
Moderate	The event would occur with an even probability	0.3 to 0.7
Low	The event would be unlikely to occur	0.05 to 0.3
Very low	The event would be very unlikely to occur	0.001 to 0.05
Extremely low	The event would be extremely unlikely to occur	0.000001 to 0.001
Negligible	The event would almost certainly not occur	0 to 0.000001

Confidence
High
Medium
Low

Coffin Bay, South Australia
2040 climate

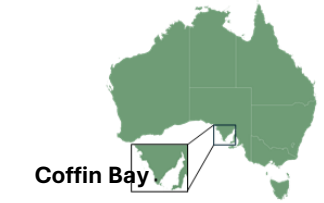


Q1 (D) Given the predicted climate changes, do you think the likelihood of a disease event in Pacific oysters caused by *Vibrio harveyi* would increase, decrease or stay about the same in 2040?

Likelihood	Descriptive definition	Probability ranges
High	The event would be very likely to occur	0.7 to 1
Moderate	The event would occur with an even probability	0.3 to 0.7
Low	The event would be unlikely to occur	0.05 to 0.3
Very low	The event would be very unlikely to occur	0.001 to 0.05
Extremely low	The event would be extremely unlikely to occur	0.000001 to 0.001
Negligible	The event would almost certainly not occur	0 to 0.000001

Confidence
High
Medium
Low

Coffin Bay, South Australia
2040 climate



Q1 (E) Given predicted climate changes, how do you expect the likelihood of a harmful algal bloom of *Prorocentrum minimum* causing significant impacts to Pacific oyster health or aquaculture production to change by 2040? Will it increase, decrease, or remain about the same?

Likelihood	Descriptive definition	Probability ranges
High	The event would be very likely to occur	0.7 to 1
Moderate	The event would occur with an even probability	0.3 to 0.7
Low	The event would be unlikely to occur	0.05 to 0.3
Very low	The event would be very unlikely to occur	0.001 to 0.05
Extremely low	The event would be extremely unlikely to occur	0.000001 to 0.001
Negligible	The event would almost certainly not occur	0 to 0.000001

Confidence
High
Medium
Low

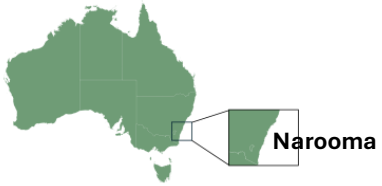
Coffin Bay, South Australia
2040 climate

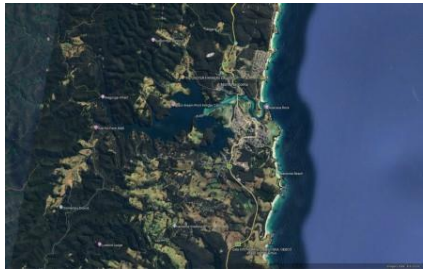
Q1 (F) Given predicted climate changes, how do you expect the likelihood of a harmful algal bloom of *Karenia spp.* causing significant impacts to Pacific oyster health or aquaculture production to change by2040? Will it increase, decrease, or remain about the same?

Likelihood	Descriptive definition	Probability ranges
High	The event would be very likely to occur	0.7 to 1
Moderate	The event would occur with an even probability	0.3 to 0.7
Low	The event would be unlikely to occur	0.05 to 0.3
Very low	The event would be very unlikely to occur	0.001 to 0.05
Extremely low	The event would be extremely unlikely to occur	0.000001 to 0.001
Negligible	The event would almost certainly not occur	0 to 0.000001

Confidence
High
Medium
Low

Narooma, NSW
CURRENT climate



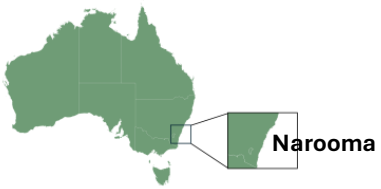


Q2 (A) Given the current climate scenario, what do you think is the likelihood of a significant *Vibrio harveyi* disease event affecting farmed oysters in the Narooma region will occur in the next 12 months?

Likelihood	Descriptive definition	Probability ranges
High	The event would be very likely to occur	0.7 to 1
Moderate	The event would occur with an even probability	0.3 to 0.7
Low	The event would be unlikely to occur	0.05 to 0.3
Very low	The event would be very unlikely to occur	0.001 to 0.05
Extremely low	The event would be extremely unlikely to occur	0.000001 to 0.001
Negligible	The event would almost certainly not occur	0 to 0.000001

Confidence
High
Medium
Low

Narooma, NSW
CURRENT climate

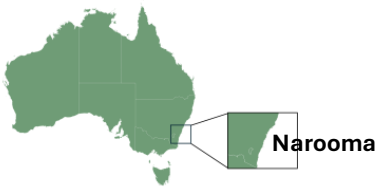


Q2 (B) Given the current climate scenario, what is the likelihood of a *Prorocentrum minimum* harmful algal bloom occurring within the next 12 months that would have a significant impact on oyster health or aquaculture production?

Likelihood	Descriptive definition	Probability ranges
High	The event would be very likely to occur	0.7 to 1
Moderate	The event would occur with an even probability	0.3 to 0.7
Low	The event would be unlikely to occur	0.05 to 0.3
Very low	The event would be very unlikely to occur	0.001 to 0.05
Extremely low	The event would be extremely unlikely to occur	0.000001 to 0.001
Negligible	The event would almost certainly not occur	0 to 0.000001

Confidence
High
Medium
Low

Narooma, NSW
CURRENT climate

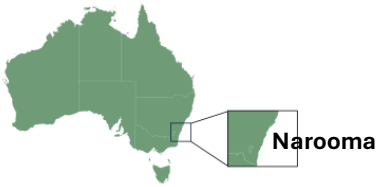


Q2 (C) Given the current climate scenario, what is the likelihood of a *Karenia spp.* harmful algal bloom occurring within the next 12 months that would have a significant impact on oyster health or aquaculture production?

Likelihood	Descriptive definition	Probability ranges
High	The event would be very likely to occur	0.7 to 1
Moderate	The event would occur with an even probability	0.3 to 0.7
Low	The event would be unlikely to occur	0.05 to 0.3
Very low	The event would be very unlikely to occur	0.001 to 0.05
Extremely low	The event would be extremely unlikely to occur	0.000001 to 0.001
Negligible	The event would almost certainly not occur	0 to 0.000001

Confidence
High
Medium
Low

Narooma, NSW
CURRENT climate

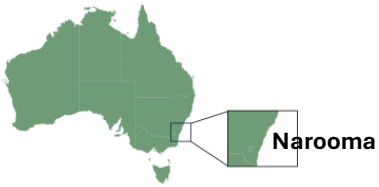


Q2 (D) Given the current climate scenario, what do you think is the likelihood of a significant QX disease event affecting farmed SROs in the Narooma region will occur in the next 12 months?

Likelihood	Descriptive definition	Probability ranges
High	The event would be very likely to occur	0.7 to 1
Moderate	The event would occur with an even probability	0.3 to 0.7
Low	The event would be unlikely to occur	0.05 to 0.3
Very low	The event would be very unlikely to occur	0.001 to 0.05
Extremely low	The event would be extremely unlikely to occur	0.000001 to 0.001
Negligible	The event would almost certainly not occur	0 to 0.000001

Confidence
High
Medium
Low

Narooma, NSW
2040 climate

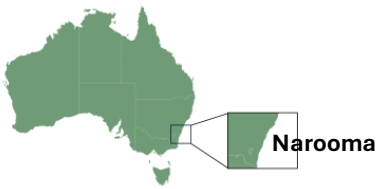


Q2 (E) Given the predicted climate changes, do you think the likelihood of a disease event in farmed oysters caused by *Vibrio harveyi* would increase, decrease or stay about the same in 2040?

Likelihood	Descriptive definition	Probability ranges
High	The event would be very likely to occur	0.7 to 1
Moderate	The event would occur with an even probability	0.3 to 0.7
Low	The event would be unlikely to occur	0.05 to 0.3
Very low	The event would be very unlikely to occur	0.001 to 0.05
Extremely low	The event would be extremely unlikely to occur	0.000001 to 0.001
Negligible	The event would almost certainly not occur	0 to 0.000001

Confidence
High
Medium
Low

Narooma, NSW
2040 climate

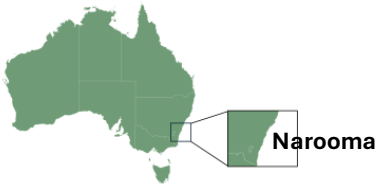


Q2 (F) Given predicted climate changes, how do you expect the likelihood of a harmful algal bloom of *Prorocentrum minimum* causing significant impacts to oyster health or aquaculture production to change by 2040? Will it increase, decrease, or remain about the same?

Likelihood	Descriptive definition	Probability ranges
High	The event would be very likely to occur	0.7 to 1
Moderate	The event would occur with an even probability	0.3 to 0.7
Low	The event would be unlikely to occur	0.05 to 0.3
Very low	The event would be very unlikely to occur	0.001 to 0.05
Extremely low	The event would be extremely unlikely to occur	0.000001 to 0.001
Negligible	The event would almost certainly not occur	0 to 0.000001

Confidence
High
Medium
Low

Narooma, NSW
2040 climate

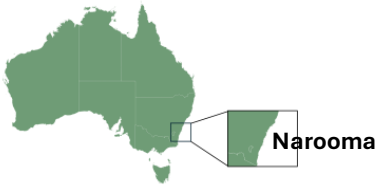


Q2 (G) Given predicted climate changes, how do you expect the likelihood of a harmful algal bloom of *Karenia spp.* causing significant impacts to oyster health or aquaculture production to change by 2040? Will it increase, decrease, or remain about the same?

Likelihood	Descriptive definition	Probability ranges
High	The event would be very likely to occur	0.7 to 1
Moderate	The event would occur with an even probability	0.3 to 0.7
Low	The event would be unlikely to occur	0.05 to 0.3
Very low	The event would be very unlikely to occur	0.001 to 0.05
Extremely low	The event would be extremely unlikely to occur	0.000001 to 0.001
Negligible	The event would almost certainly not occur	0 to 0.000001

Confidence
High
Medium
Low

Narooma, NSW
2040 climate

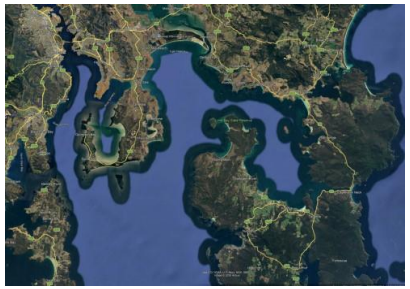


Q2 (H) Given the predicted climate changes, do you think the likelihood of a disease event in SROs caused by QX disease would increase, decrease or stay about the same in 2040?

Likelihood	Descriptive definition	Probability ranges
High	The event would be very likely to occur	0.7 to 1
Moderate	The event would occur with an even probability	0.3 to 0.7
Low	The event would be unlikely to occur	0.05 to 0.3
Very low	The event would be very unlikely to occur	0.001 to 0.05
Extremely low	The event would be extremely unlikely to occur	0.000001 to 0.001
Negligible	The event would almost certainly not occur	0 to 0.000001

Confidence
High
Medium
Low

Hobart/Norfolk Bay, Tasmania
CURRENT climate



Q3 (A) Given the current climate scenario, what do you think is the likelihood of a significant *Vibrio harveyi* disease event affecting farmed Pacific oysters in Norfolk Bay within the next 12 months?

Likelihood	Descriptive definition	Probability ranges
High	The event would be very likely to occur	0.7 to 1
Moderate	The event would occur with an even probability	0.3 to 0.7
Low	The event would be unlikely to occur	0.05 to 0.3
Very low	The event would be very unlikely to occur	0.001 to 0.05
Extremely low	The event would be extremely unlikely to occur	0.000001 to 0.001
Negligible	The event would almost certainly not occur	0 to 0.000001

Confidence
High
Medium
Low

Hobart/Norfolk Bay, Tasmania
CURRENT climate

Q3 (B) Given the current climate scenario, what is the likelihood of a *Prorocentrum minimum* harmful algal bloom occurring within the next 12 months that would have a significant impact on Pacific oyster health or aquaculture production?

Likelihood	Descriptive definition	Probability ranges
High	The event would be very likely to occur	0.7 to 1
Moderate	The event would occur with an even probability	0.3 to 0.7
Low	The event would be unlikely to occur	0.05 to 0.3
Very low	The event would be very unlikely to occur	0.001 to 0.05
Extremely low	The event would be extremely unlikely to occur	0.000001 to 0.001
Negligible	The event would almost certainly not occur	0 to 0.000001

Confidence
High
Medium
Low

Hobart/Norfolk Bay, Tasmania
CURRENT climate

Q3 (C) Given the current climate scenario, what is the likelihood of a *Karenia spp.* harmful algal bloom occurring within the next 12 months that would have a significant impact on Pacific oyster health or aquaculture production?

Likelihood	Descriptive definition	Probability ranges
High	The event would be very likely to occur	0.7 to 1
Moderate	The event would occur with an even probability	0.3 to 0.7
Low	The event would be unlikely to occur	0.05 to 0.3
Very low	The event would be very unlikely to occur	0.001 to 0.05
Extremely low	The event would be extremely unlikely to occur	0.000001 to 0.001
Negligible	The event would almost certainly not occur	0 to 0.000001

Confidence
High
Medium
Low

Hobart/Norfolk Bay, Tasmania
2040 climate

Q3 (D) Given the predicted climate changes, do you think the likelihood of a disease event in farmed oysters caused by *Vibrio harveyi* would increase, decrease or stay about the same in 2040?

Likelihood	Descriptive definition	Probability ranges
High	The event would be very likely to occur	0.7 to 1
Moderate	The event would occur with an even probability	0.3 to 0.7
Low	The event would be unlikely to occur	0.05 to 0.3
Very low	The event would be very unlikely to occur	0.001 to 0.05
Extremely low	The event would be extremely unlikely to occur	0.000001 to 0.001
Negligible	The event would almost certainly not occur	0 to 0.000001

Confidence
High
Medium
Low

Hobart/Norfolk Bay, Tasmania 2040 climate

Q3 (E) Given predicted climate changes, how do you expect the likelihood of a harmful algal bloom of *Prorocentrum minimum* causing significant impacts to Pacific oyster health or aquaculture production to change by 2040? Will it increase, decrease, or remain about the same?

Likelihood	Descriptive definition	Probability ranges
High	The event would be very likely to occur	0.7 to 1
Moderate	The event would occur with an even probability	0.3 to 0.7
Low	The event would be unlikely to occur	0.05 to 0.3
Very low	The event would be very unlikely to occur	0.001 to 0.05
Extremely low	The event would be extremely unlikely to occur	0.000001 to 0.001
Negligible	The event would almost certainly not occur	0 to 0.000001

Confidence
High
Medium
Low

Hobart/Norfolk Bay, Tasmania
2040 climate

Q3 (F) Given predicted climate changes, how do you expect the likelihood of a harmful algal bloom of *Karenia spp.* causing significant impacts to Pacific oyster health or aquaculture production to change by 2040? Will it increase, decrease, or remain about the same?

Likelihood	Descriptive definition	Probability ranges
High	The event would be very likely to occur	0.7 to 1
Moderate	The event would occur with an even probability	0.3 to 0.7
Low	The event would be unlikely to occur	0.05 to 0.3
Very low	The event would be very unlikely to occur	0.001 to 0.05
Extremely low	The event would be extremely unlikely to occur	0.000001 to 0.001
Negligible	The event would almost certainly not occur	0 to 0.000001

Confidence
High
Medium
Low

Final questions

- **After our discussion, what are some potential risk mitigation or adaptation strategies oyster farmers could use to reduce the impact of climate change on productivity?**
- **Are there any comments or questions you would like to add?**