



Climate Report Card

WESTERN AUSTRALIA

JUNE 2025



SEA CHANGE
AUSTRALIA

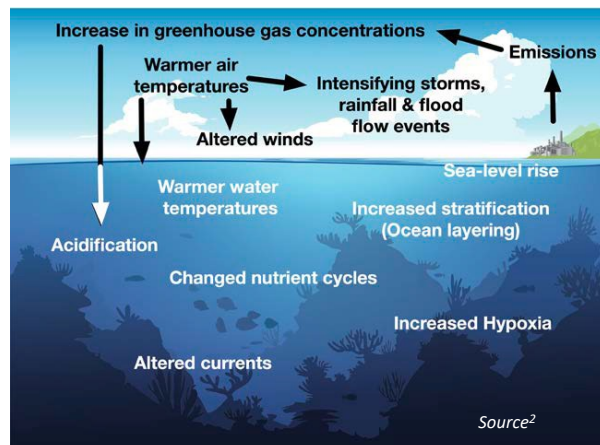
Australia's Changing Climate

What is climate change?

Increases in greenhouse gases lead to changes in the atmosphere and the physical and biogeochemical ocean environment.

Australia's sea surface temperature (SST) has warmed by over 1°C since 1900¹. Ongoing ocean warming contributes to longer and more frequent marine heatwaves. As waters warm, they also become more stratified – altering circulation and currents and reducing nutrient availability in surface waters.

Increased atmospheric CO₂ means more CO₂ is absorbed by the ocean, leading to shifts in ocean chemistry and ocean acidification.



What impacts are expected for the seafood sector?

The seafood we eat relies on healthy marine ecosystems. Ecosystem productivity can be impacted through changing nutrient cycles, increasing temperatures, and habitat loss. Shallow coastal and estuarine ecosystems are particularly vulnerable to climate change.

The impact of climate change to the seafood sector will vary by the degree of exposure to physical change and species vulnerability.

Image credit: Nicolas Job

How to use this report



Use **page 2** to find information on SST changes over the past year and forecasts for the next two months in your area.

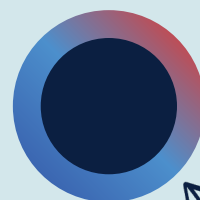


Use **pages 3-4** to learn about potential future ocean conditions due to climate change. These projections are based on a 'business as usual' scenario and show two global warming levels: 1.5°C (expected around 2015-2034) and 2°C (expected around 2030-2049). The Paris Agreement aims to limit global warming to well below 2°C above pre-industrial levels.



Report your climate observations and go 'Fishing for Climate Answers'!

Check out the [Sea Change Australia](https://www.seachangeaustralia.org.au) website to log potential climate related observations in your area and submit your climate questions. Our team connects your questions with climate and fisheries experts who provide clear, practical answers.



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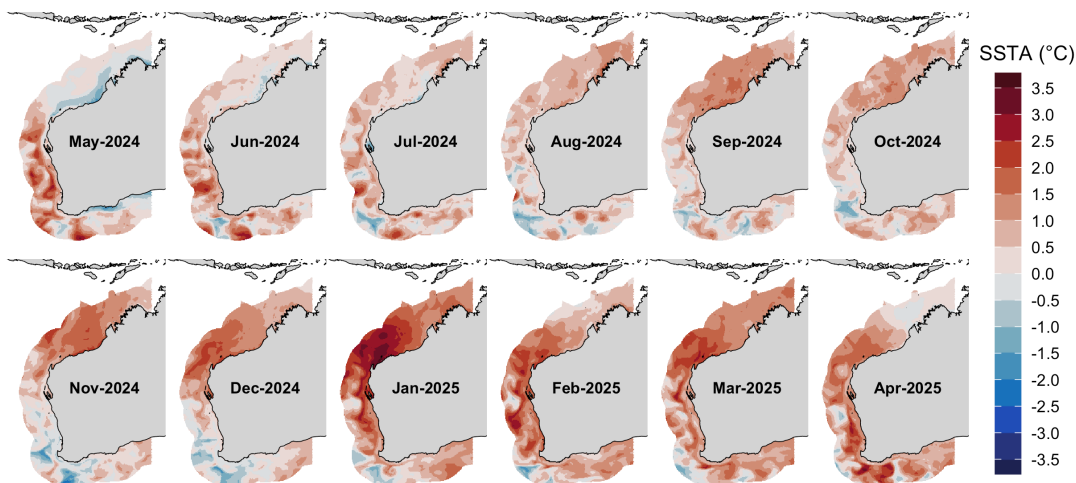
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Observed SST anomalies in 2024-25

Sea Surface Temperature Anomalies: May-2024 to Apr-2025



Monthly SST anomalies from May 2024 to April 2025 (base period 1993–2016)³. May 2024 showed cooler than average conditions in coastal waters and off the north-west shelf. Warming of most of the region began in June 2024, with a marine heatwave developing off the north-west shelf and shifting south throughout summer⁴.

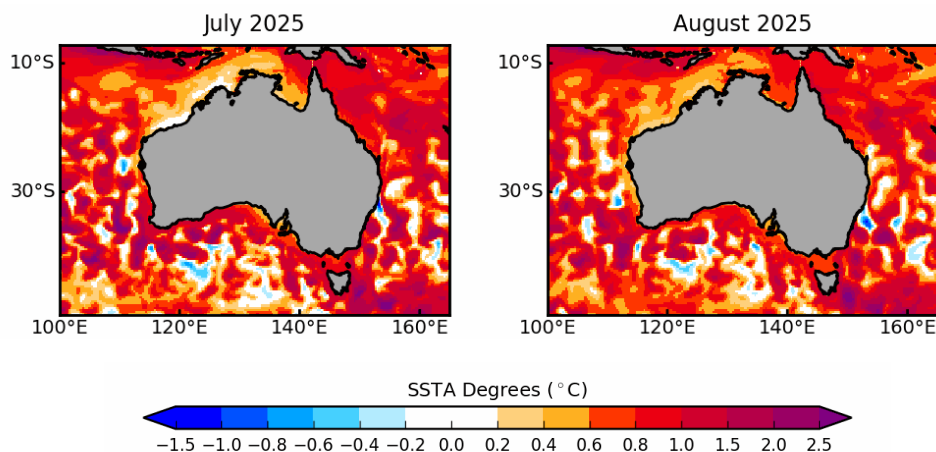
Similar SST anomaly maps from BOM can be accessed [here](#).



Waters have been anomalously warm in 2024–2025.

Forecast Conditions: Jul–Aug 2025

Australia Sea Surface Temperature Anomaly Outlook



© Bureau of Meteorology

Model Run: 09/06/2025

Model: ACCESS-S2

Issued: 11/06/25

Base Period: 1981–2018



See BOM for seasonal forecast outlooks for SST

Monthly SST anomalies are forecast to remain anomalously warm from July–August 2025⁵. Forecasts are updated regularly and can be accessed [here](#).



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Projected Change: Ocean Warming

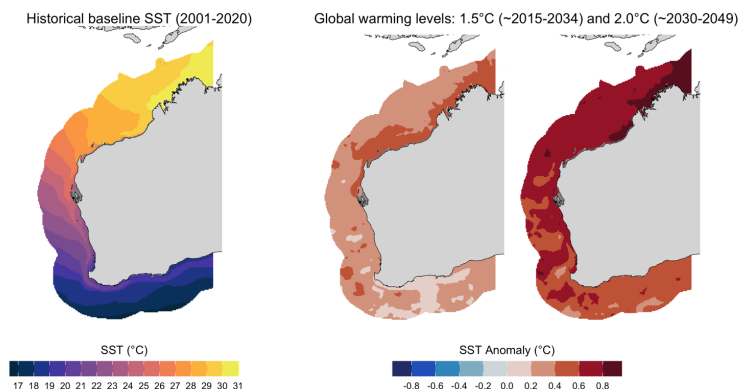
Baseline

Projected



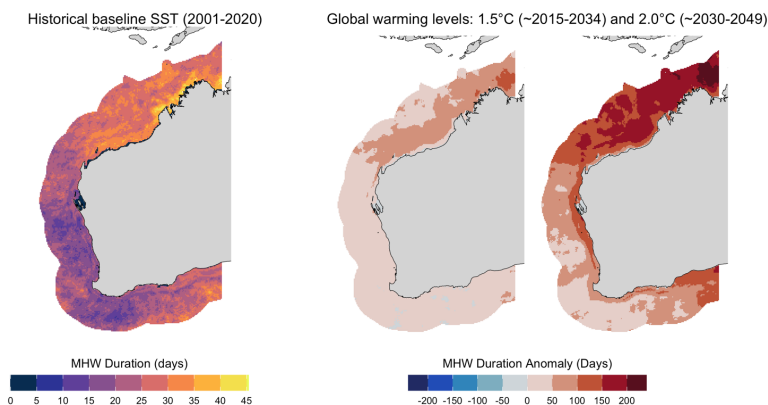
Waters are projected to warm, with longer-lasting marine heatwaves.

Sea Surface Temperature



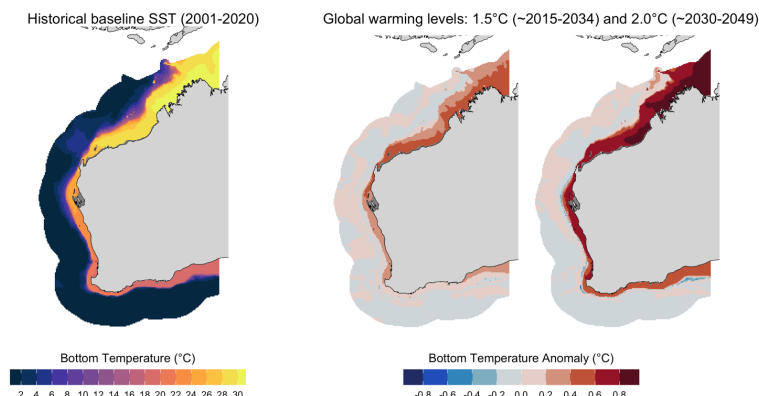
SSTs are projected to increase under climate change. The degree of warming is highest in the north.

Marine Heatwave Duration



Marine heatwaves are projected to increase in duration, and this pattern is highest in the north. Under a 2°C global warming level (~2030-2049), the north is projected to experience marine heatwave conditions for most of the year (relative to the baseline).

Bottom Temperature



Bottom temperatures are projected to increase under climate change. The degree of warming is highest in shallow waters on the continental shelf.

Climate projections are from the Ocean Forecasting Australian Model (OFAM), which is a spatially-downscaled ocean model⁶. Projections are based on a 'business as usual' scenario (CMIP5) and show two global warming levels: 1.5°C (expected around 2015-2034) and 2°C (expected around 2030-2049) relative to a historical baseline (2001-2020).



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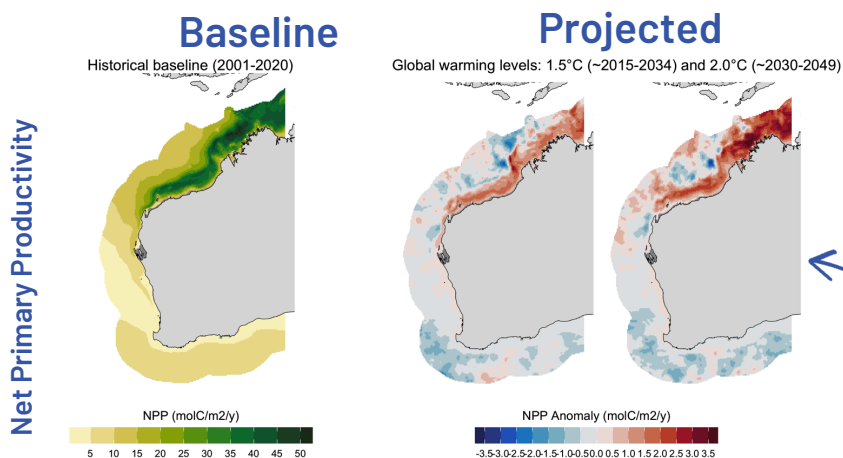
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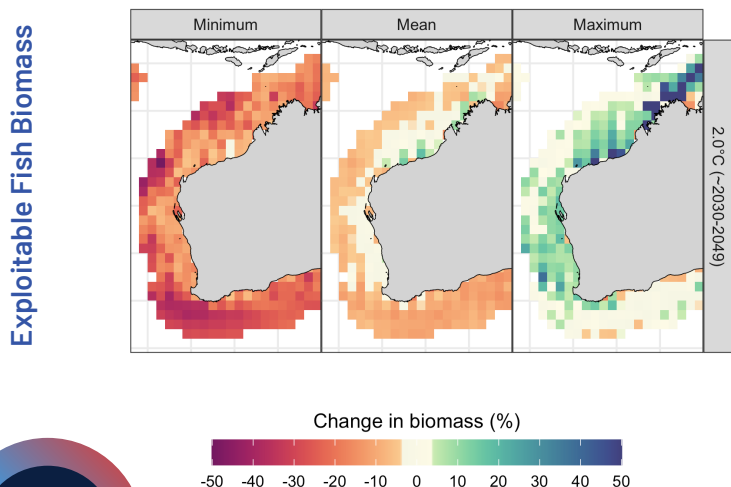
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Projected Change: Ecosystem Productivity



Productivity is projected to decline but is uncertain.

Projections of **net primary productivity**, the base of the marine food web, show an increase in the north and decrease in the south. Projections are highly uncertain, especially for the north-west⁶.



Ecosystem models project changes in the biomass available to fisheries (animals 10g - 100kg) under a 2.0°C global warming level.

On average, there is a decline or little-to-no change in biomass, but this is uncertain. Minimum and maximum biomass estimates show divergent patterns.

Biomass is estimated from 6 ecosystem models projected under CMIP6⁷. Ecosystem models integrate temperature, oxygen, salinity, acidity, nutrients, & primary productivity, among other variables.



Community Reflections and Feedback

We would love to hear from you! Contact.enquiries@seachangeaustralia.org



We recently surveyed the aquaculture industry to better understand their business concerns. Environmental changes were the most significant risk and a key determinant of success, especially for new entrants and those diversifying established businesses. ACWA is supporting the industry by providing tailored training and support to build in resilience to their operating systems. Initiatives like Sea Change Australia will help support this approach by providing real life examples of adaptation approaches by peers.

Justin Bellanger

CEO, The Aquaculture Council of WA



Produced by CSIRO in partnership with Sea Change Australia.

Sources: ¹BOM State of the Climate 2024, ²Fulton et al., 2021, ³CMEMS, ⁴MHW Tracker, ⁵BOM, ⁶CSIRO, ⁷Blanchard and Novaglio 2024

How to cite: <https://data.csiro.au/collection/csiro:65817>

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