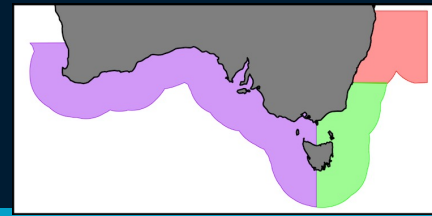




Climate & Ecosystem Status Report

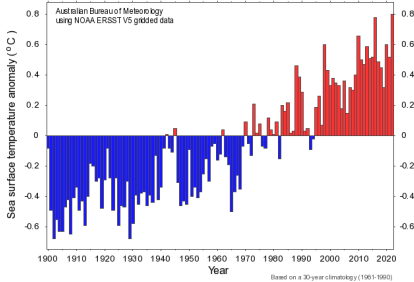
Small Pelagic Fishery

October 2023

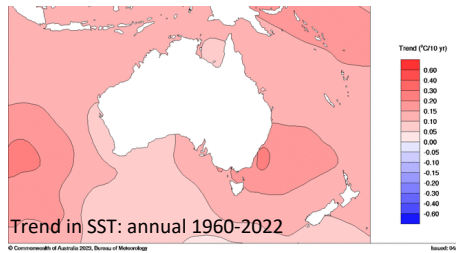


Historical Period

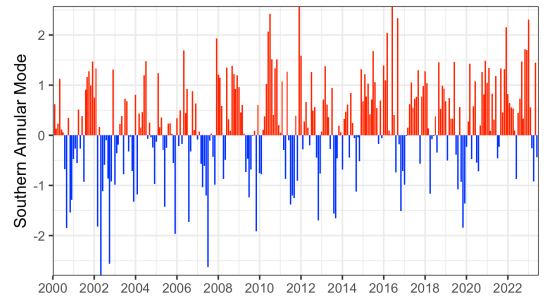
Climate Drivers



Australian waters have warmed significantly over time ([link](#))¹. The last decade has been ~0.5°C warmer than the 1960-1990 average.

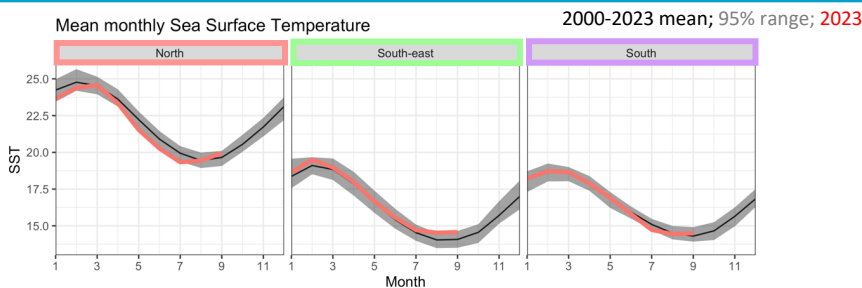


South-east Australia has warmed more rapidly than other regions ([link](#))¹.



Southern Annular Mode (SAM) indicates the north-south movement of westerly winds that bring storms to southern Australia. Positive phases have become more common over time, where westerlies move poleward. Rainfall over Australia varies regionally and seasonally within each SAM phase ^{1,2} ([link](#)).

Regional Dynamics: Sea Surface Temperature



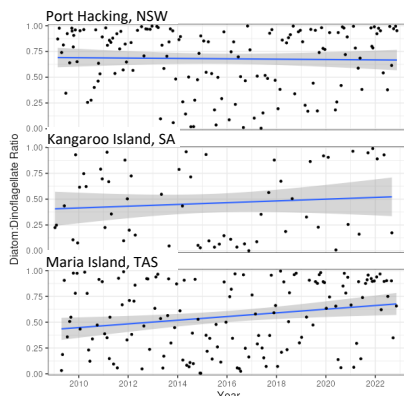
Sea surface temperature of regions (see map) from year 2000, with the red line showing 2023³. North region has been cooler than average, and south-east has been warmer than conditions since 2000.

Observations

- Jack mackerel in high abundance, with a potential distribution shift observed.
- Blue mackerel prefer warmer water, while jack mackerel prefer cooler water.
- No industry reports of concerning species distribution shifts.
- Increased redbait abundance is thought to be linked to upwelling.

Ecosystem: National Reference Stations

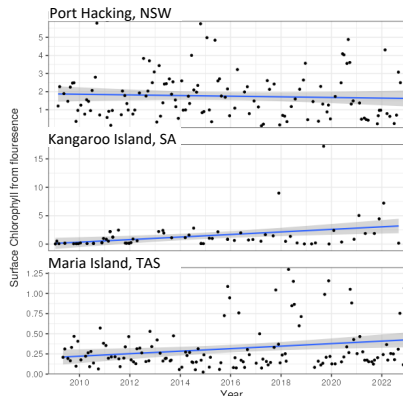
Diatom:Dinoflagellate ratio



Diatoms are part of the base of the food-web for many fished species.

The ratio of diatoms has increased off TAS, but has been relative stable in NSW and SA^{4,5} ([link](#)).

Chlorophyll Fluorescence



Surface chlorophyll has increased over time in SA and TAS, indicating changes to ecosystem productivity.

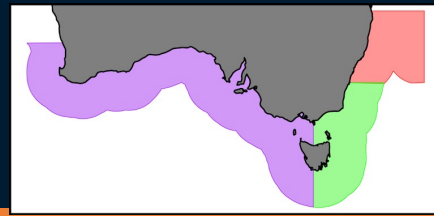
Seasonal blooms in TAS have become stronger in recent years^{4,5} ([link](#)).



Climate & Ecosystem Status Report

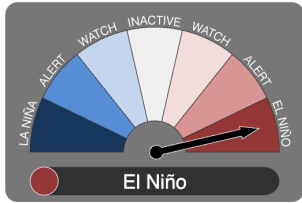
Small Pelagic Fishery

October 2023

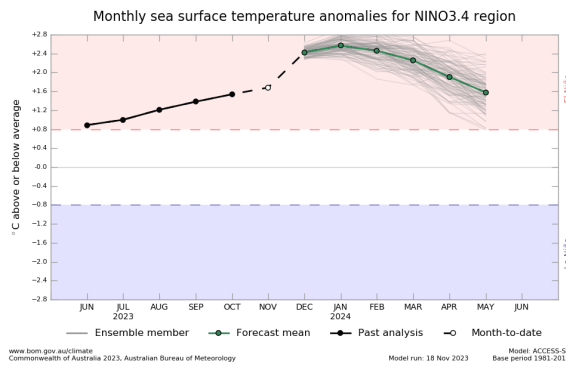


Future Outlook for 2023

Climate Drivers



El Niño has been declared¹ ([link](#))



El Niño forecast through May ([link](#))¹. These conditions:

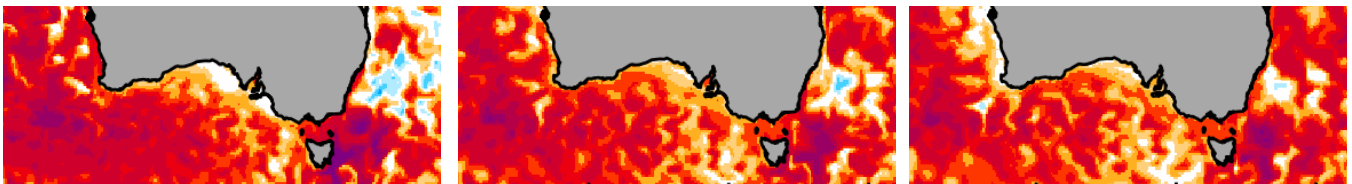
- Weaken the Leeuwin Current, which lead to a cooler GAB.
- Raise the thermocline along southern Australia.
- Strengthen Bonney upwelling intensity.
- Favour a negative Southern Annular Mode, where westerly winds shift north.
- Strengthen the EAC.

Regional Dynamics

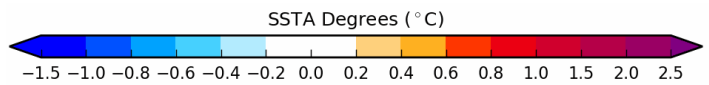
December 2023

January 2024

February 2024



Forecasts of SST anomalies for Dec, Jan, and Feb 2023 indicate warmer conditions across most of the SPF domain, especially for the south-east¹ ([link](#)).



© Bureau of Meteorology

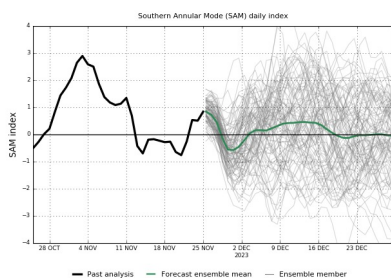
Model Run: 23/11/2023

Model: ACCESS-S2

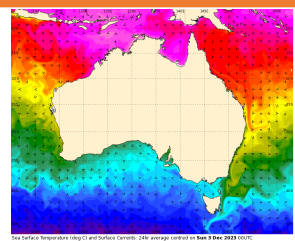
Issued: 25/11/23

Base Period: 1981-2018

Ecosystem and Fishery



Early Nov had a positive SAM, and is forecast to shift to neutral in Dec¹. SAM can change quickly and forecasts are updated regularly ([link](#)).



10-day forecasts of SST and currents around Australia ([link](#))¹ may be useful for fishing operations. E.g. identifying upwelled waters, eddies, and currents.

