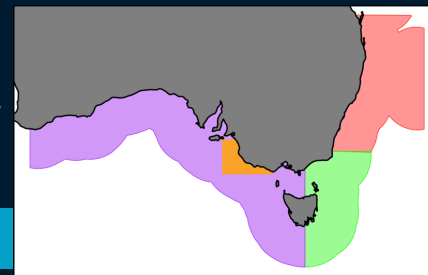




Climate & Ecosystem Status Report

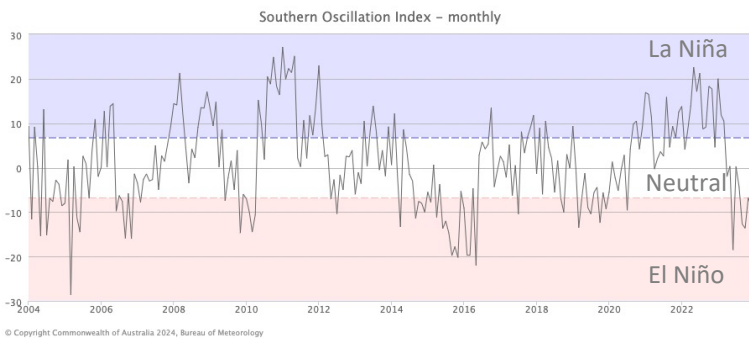
Southern & Eastern Scalefish & Shark Fishery

November 2023

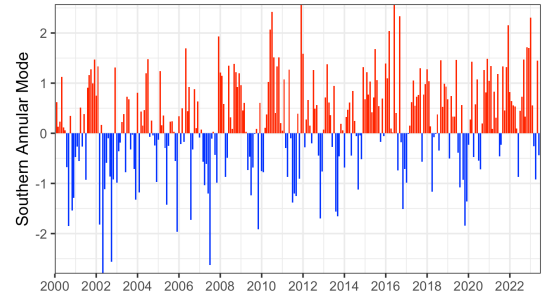


Historical Period

Climate Drivers

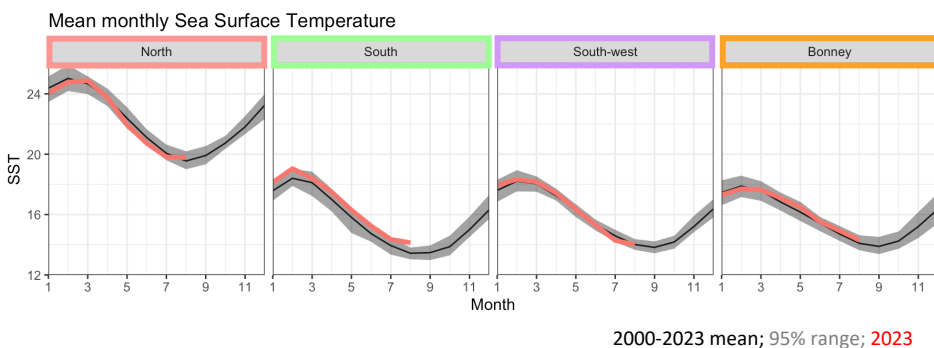


The Southern Oscillation Index gives an indication of the development and intensity of El Niño or La Niña events in the Pacific Ocean ([link](#))¹.



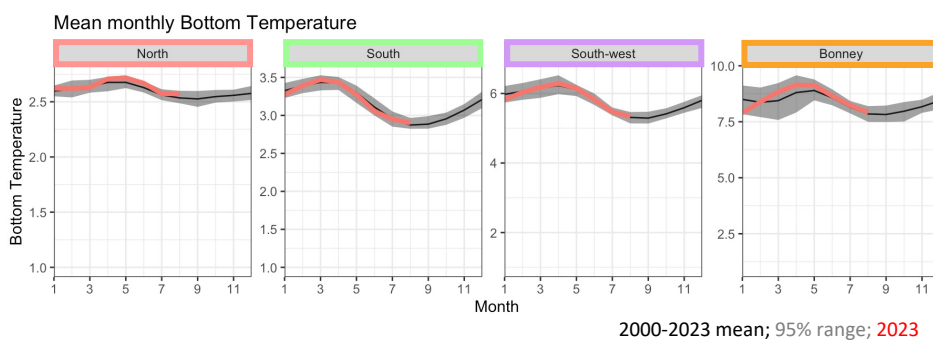
Southern Annular Mode (SAM) indicates the north-south movement of westerly winds that bring storms to southern Australia. Positive phases have become more common over time. Rainfall over Australia varies regionally and seasonally within each SAM phase^{1,2} ([link](#)).

Regional Dynamics: Sea Surface Temperature



Sea surface temperature of regions (see map) from year 2000, with the red line showing 2023³. South region has been warmer than average this year. In other regions, sea surface temperatures have been similar conditions since 2000.

Regional Dynamics: Bottom Temperature



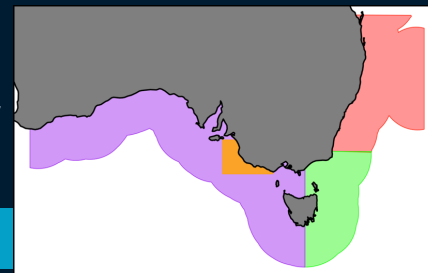
Bottom temperature of regions (see map)³ from year 2000, with the red line showing 2023. Note y-axis is different among regions. North and Bonney coast were warmer in autumn compared to average conditions since year 2000.



Climate & Ecosystem Status Report

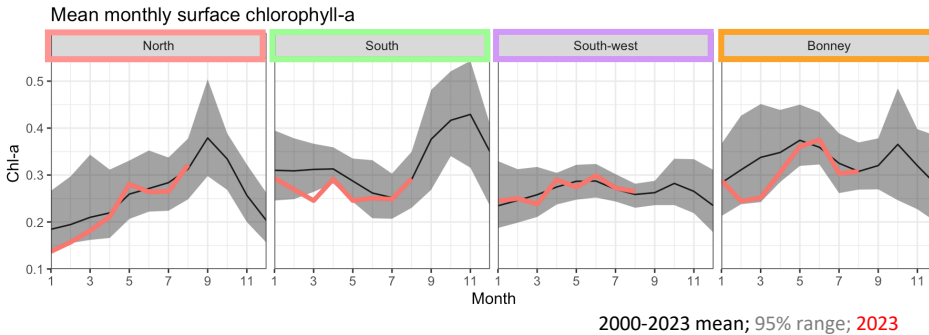
Southern & Eastern Scalefish & Shark Fishery

November 2023



Historical Period

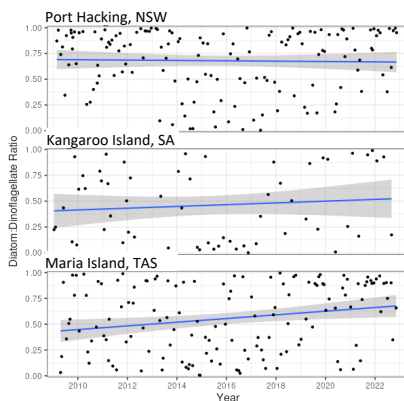
Regional Dynamics: Surface Chlorophyll-a



Surface chlorophyll-a of regions (see map) from year 2000, with the red line showing 2023². South region had lower than average chlorophyll-a all year. North and Bonney coast regions had lower than average chlorophyll-a during late-summer and early autumn before returning to normal.

Ecosystem: National Reference Stations

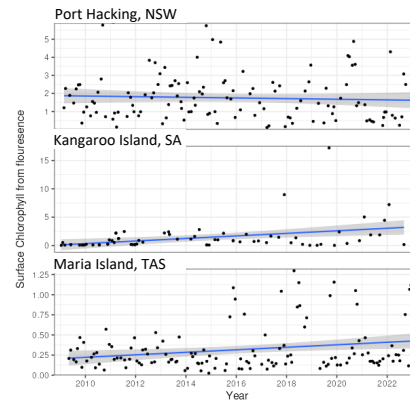
Diatom:Dinoflagellate ratio



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](#)).

Observations

SESSF-RAG

- Species have been moving deeper in the GAB (e.g. flathead) and caught later in the season (e.g. redfish).
- Some species in the GAB are more dispersed when upwelling events are weak and when temperatures are more uniform, which results in lower catchability.
- The fishery (location and catch) in the GAB varies from El Nino to La Nina.

SE-RAG

- Warmer waters in winter.
- Cooler water from cold upwelling events are being seen later each year.
- Strong currents have been observed throughout winter, but it hasn't come with the usual pockets of cold water.

GAB-RAG/MAC

- Deepwater flathead catches were higher in Sep-Oct in the central GAB, which is earlier than normal.
- 2023 has been cooler in the GAB
- Increase in redfish catch

Shark-RAG

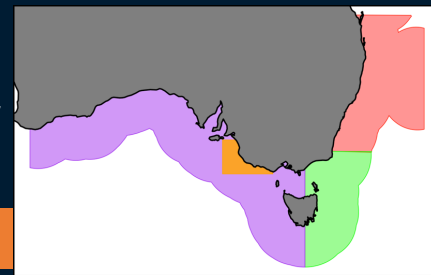
- Last 3 years have had strong tides and currents in Bass Strait but reduced current on TAS east coast shelf.
- Lots of draughtboard sharks of edge of TAS shelf, and larger school shark catch on TAS east coast.
- More bronze whalers in GAB.
- Tuna patterns have changed: seen in shallower waters & closer to shore in Bass Strait.
- Smaller school sharks seen earlier in the season in north Bass Strait.
- In Bass Strait: more draughtboard, bronze whalers, port Jackson sharks, and a change in fish composition.



Climate & Ecosystem Status Report

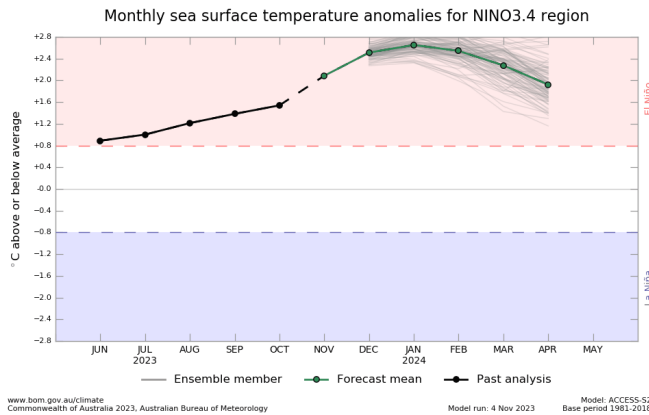
Southern & Eastern Scalefish & Shark Fishery

November 2023



Future Outlook for 2023-2024

Climate Drivers

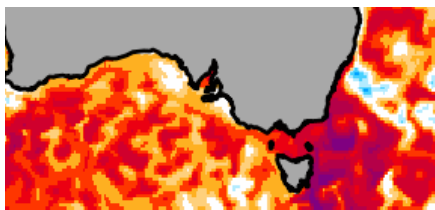


El Niño forecast through April [\(link\)](#)¹. These conditions:

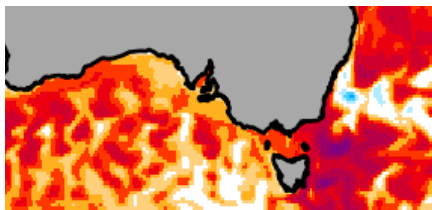
- Weaken the Leeuwin Current, which lead to a cooler GAB.
- Raise the thermocline along southern Australia.
- Strengthen Bonney upwelling intensity.
- Favour a negative Southern Annular Mode, where westerly winds shift north.
- Strengthen the EAC.

Regional Dynamics

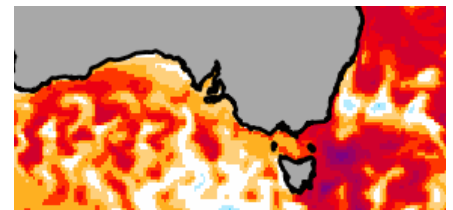
December 2023



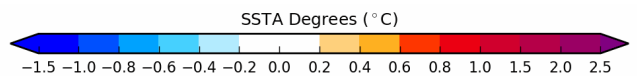
January 2023



February 2024



Forecasts of SST anomalies for Dec 2023, Jan, and Feb 2024 indicate warmer conditions across most of the SSSF domain, especially for the south-east [\(link\)](#).



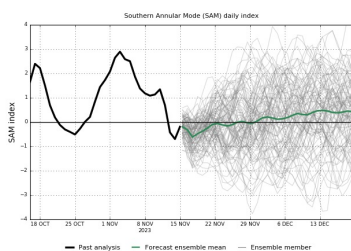
© Bureau of Meteorology

Model Run: 11/11/2023

Model: ACCESS-S2

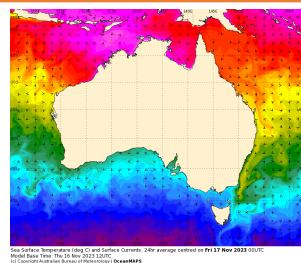
Issued: 13/11/23 Base Period: 1981-2018

Ecosystem and Fishery



www.bom.gov.au/climate Commonwealth of Australia 2023, Australian Bureau of Meteorology Model run: 13 Nov 2023 Model: ACCESS-S2 Base period: 1992-2022

Southern Annular Mode is forecast to be neutral until Dec 2023¹. 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.

