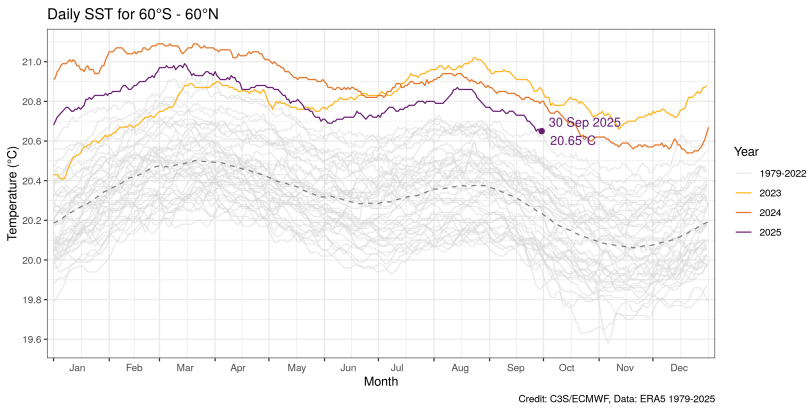
Southern Squid Jig Fishery

October 9, 2025

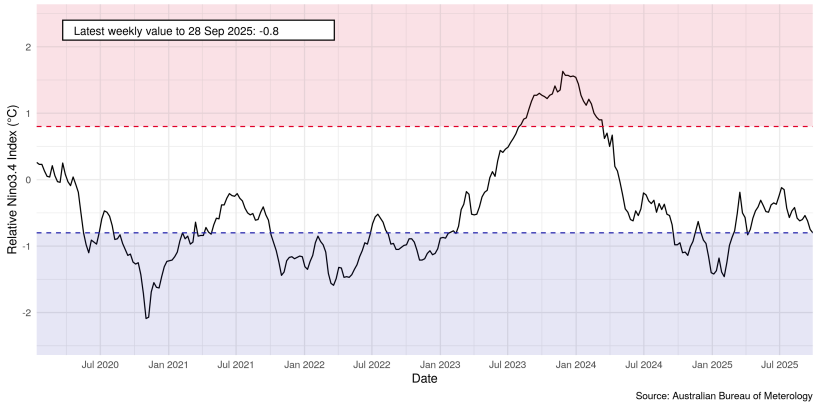
Historical Period

Climate Drivers: Sea Surface Temperature (SST)



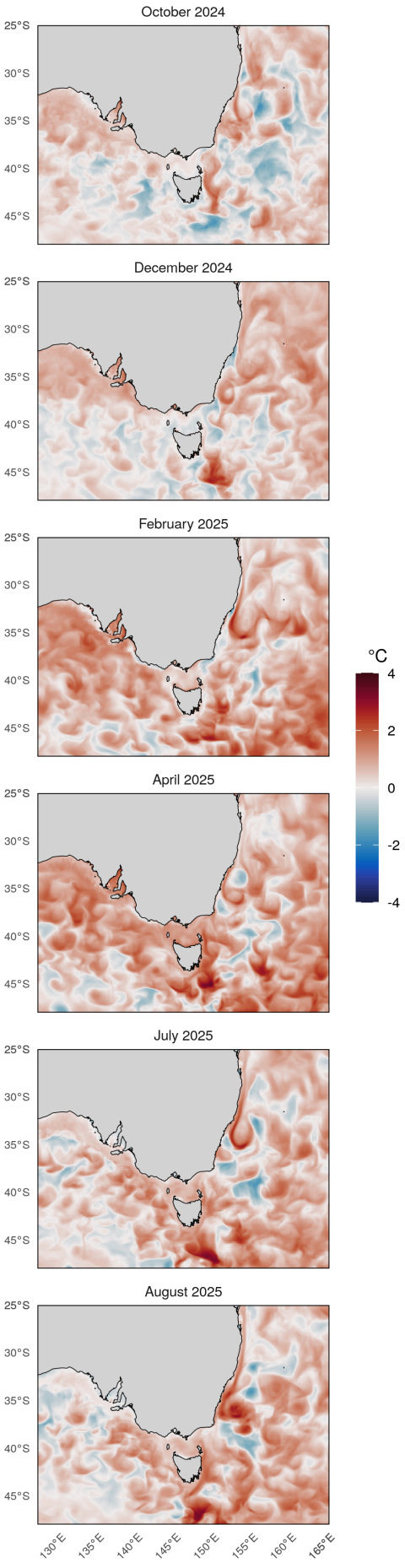
Global Sea Surface Temperatures (SST) from 2023-2025 have been at record highs (*Copernicus*)[2].

Climate Drivers: Nino3.4



ENSO is currently neutral. The relative Niño3.4 index (a revised index) measures the oceanic component of ENSO. Recently, BOM has revised Niño3.4 to account for changes in global SST from global warming. As such, conditions during the 2024/25 summer have been reclassified as La Niña (*BOM*)[1]. La Niña conditions can strengthen the Leeuwin current, leading to warmer waters in the GAB.

Regional Dynamics: SST Anomaly

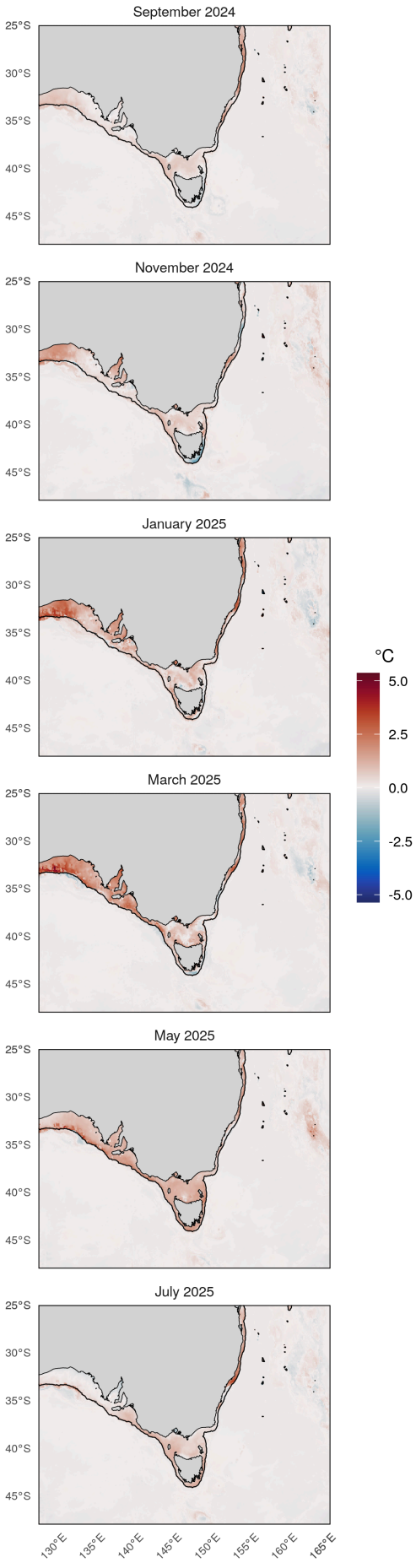


Source: CMEMS

Bi-monthly maps of SST anomalies show the south and east coasts of Australia have been anomalously warm for the last year, particularly across the southern coast and Bass Strait during summer and autumn[3]. Patches of anomalously cool water south of Sydney reflect the dynamic eddy field that is characteristic of this region. Anomalies are relative to 1993-2016.

Marine heatwaves (MHW), regions of sustained anomalously warm water, occurred across much of the region. Most notable were marine heatwaves off the mainland and TAS east coast in Dec 2024, and off South Australia in Jan 2025 (*MHWtracker*)[4]. The impacts to the SSJF are unknown.

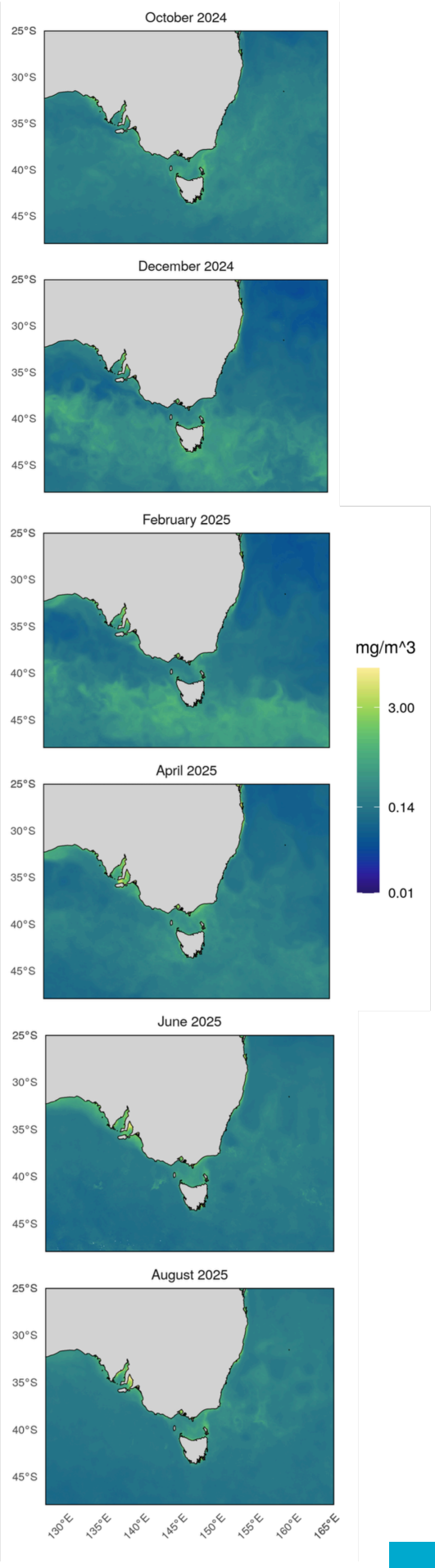
Regional Dynamics: Bottom Temperature Anomaly



Source: CMEMS, Climatology: 1993-2016

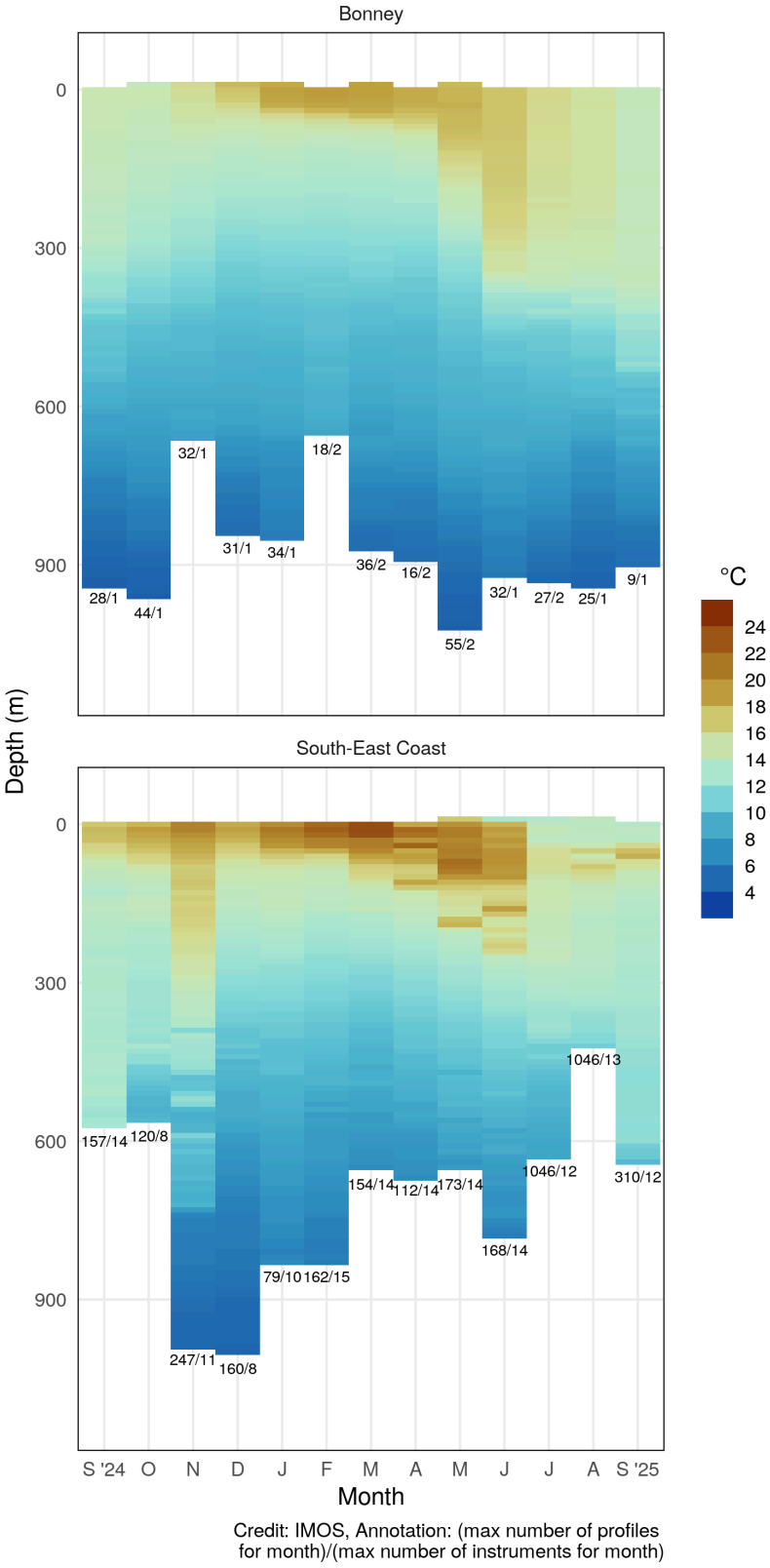
Bi-monthly maps of bottom temperature anomalies, with the 500 m contour shown in black. Most of the continental shelf region has seen average to anomalously warm waters across the domain over the past year[3]. Notable exceptions are anomalously cool temperatures off the east coast of TAS in Nov, off northern NSW in Nov, and south NSW in March. Anomalies are relative to 1993-2016, and are from an ocean model which is subject to error.

Regional Dynamics: Chlorophyll-a



Bi-monthly maps of surface chlorophyll-a (log scale; mg/m3)[3]. Surface chl-a is a proxy for ecosystem productivity. Elevated surface chl-a persists along the coastal margin, with spring and summer blooms notable off NSW in Oct and the southern ocean in Dec-feb. South Australian waters experienced a significant Harmful Alglal Bloom. This event is ongoing and a dedicated website exists: https://www.algalbloom.sa.gov.au/.

Regional Dynamics: FishSOOP Temperature-Depth Profiles

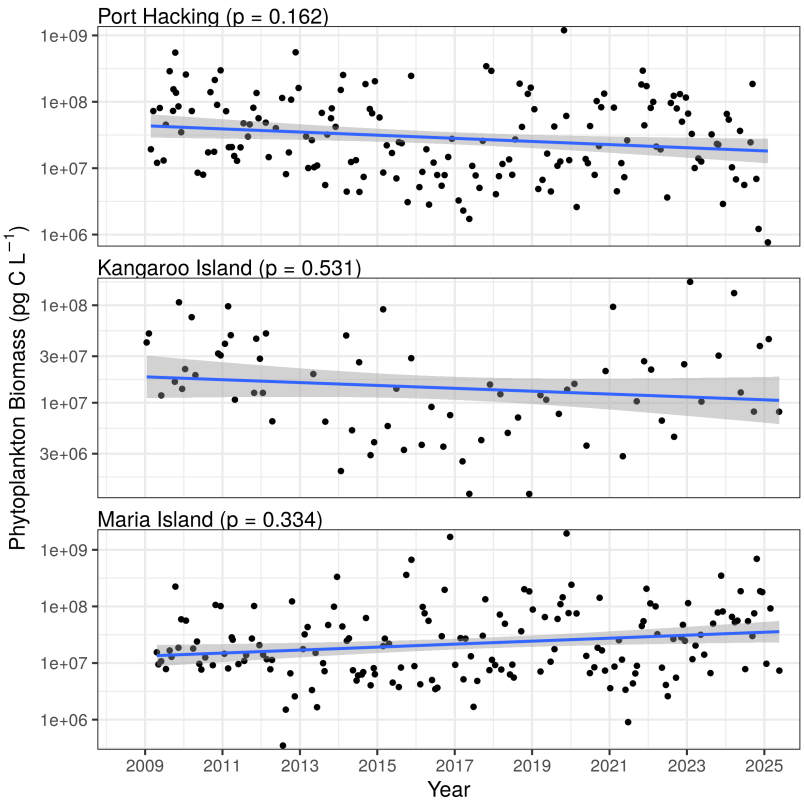


Credit: IMOS, Annotation: (max number of profiles for month)/(max number of instruments for month)

Average temperature at depth bins for each month over the past year, as sampled by instruments deployed on fishing vessels (*IMOS FishSOOP*)[5]. Bonney coast and South-east (Sydney to southern TAS) regions are shown.

Warmer water near the surface and cooler water at depth is most notable during summer, and breaks down over winter - a process known as seasonal stratification.

Ecosystem: Phytoplankton Biomass



Ecosystem productivity, as measured by phytoplankton biomass at IMOS National Reference Stations, show long-term increases off Maria Island and declines off Sydney (Port Hacking). Kangaroo Island is variable but showing a long-term decline [6] (*IMOS BOO*).

Observations

2025 observations

- Warm water has been noted to be deeper than usual, especially off Tasmania.
- Fishing effort continues in deeper waters, with tuna observed inshore.
- No catches off Portland despite expectations given strong upwelling in 2023/2024. No reported impacts from HAB, as catch occurred before bloom.
- Squid caught in trawlers and other fisheries are indicating potential for a good upcoming season. Tuna fleet have indicated tuna off Eden are full of squid.

2024 observations

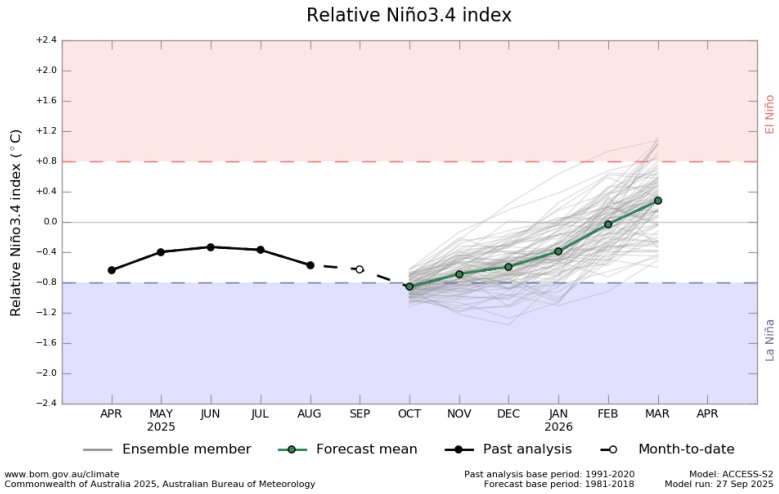
- Fishing effort continues in deeper waters (up to 160 m).
- Squid need to be aggregated to increase catchability. Squid were present in Bass Strait but not aggregated.
- Temperature loggers noted thermocline at ~40m off Maria Island.
- Hypothesized link between tuna inshore shifts, and squid offshore shifts.

2023 observations

- Across all regions, fisheries effort has shifted to deeper waters (~90m to ~130m) to follow squid.
- Catches higher during El Niño.
- Catch drops off very quickly after spawning occurs.
- Noted that tuna have moved inshore and hypothesized a potential link to offshore shifts in squid aggregations.

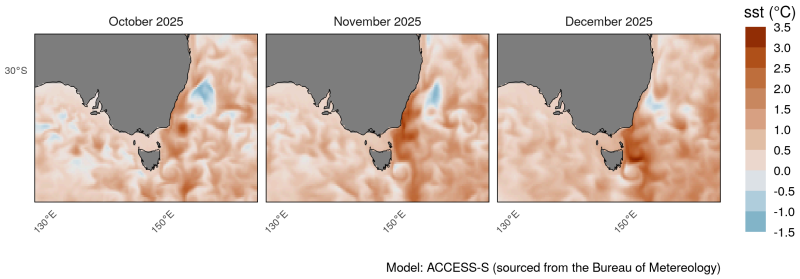
Future Outlook

Climate Drivers: Nino3.4



ENSO is currently neutral, with La Niña conditions forecast during Spring before returning to neutral conditions in summer (*BOM ENSO*)[7].

Regional Dynamics: SST Anomaly



Forecasts of SST anomalies for the next three months indicate anomalously warm conditions across the region, with elevated temperatures particularly notable for the east coast (*BOM OceanT*)[8,9]. Forecasts are updated regularly.

Sources:

(1) https://www.bom.gov.au/climate/enso/indices.shtml?bookmark=nino3.4

(2) https://pulse.climate.copernicus.eu/.

(3) Copernicus Marine Service.

(4) https://www.marineheatwaves.org/tracker.html.

(5) https://imos.org.au/facility/ships-of-opportunity.

(6) https://shiny.csiro.au/BioOceanObserver/.

(7) http://www.bom.gov.au/climate/ocean/outlooks/?index=nino34

(8) http://www.bom.gov.au/oceanography/oceantemp/sst-outlook-map.shtml.

(9) https://access-s.clide.cloud/