

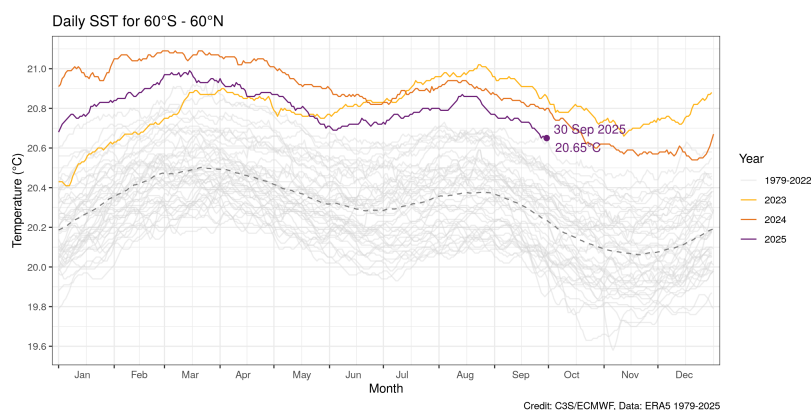
Torres Strait Beche-de-mer Fishery



September 23, 2025

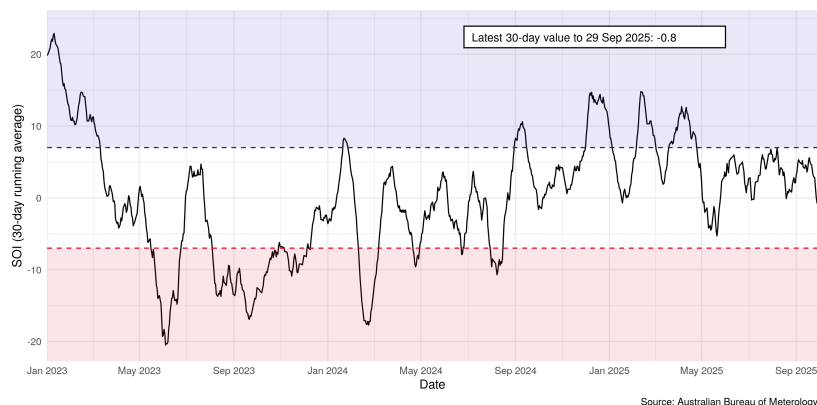
Historical Period

Climate Drivers: Sea Surface Temperature (SST)



Global Sea Surface Temperatures (SST) have remained at record highs in 2025 (*Copernicus*)¹.

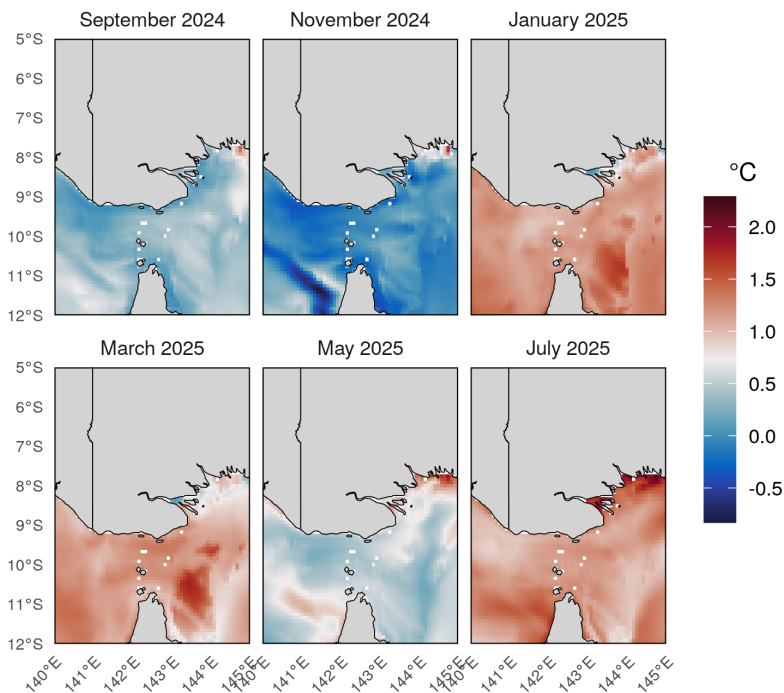
Climate Drivers: Southern Oscillation Index (SOI)



SOI reflects atmospheric conditions of ENSO; sustained values below -7 indicate El Niño, while values above $+7$ indicate La Niña. ENSO is currently neutral and has been neutral since Apr-24 (*BOM*)².

During El Niño, trade winds can weaken or reverse, causing warmer waters to shift eastward; this disrupts weather patterns and often leads to drier conditions in TS, with less cloud cover and more solar radiation. The opposite tends to occur under La Niña³. Increased water temperatures and solar radiation can increase risk of sea cucumber mortality due to thermal stress.

Regional Dynamics: SST Anomaly

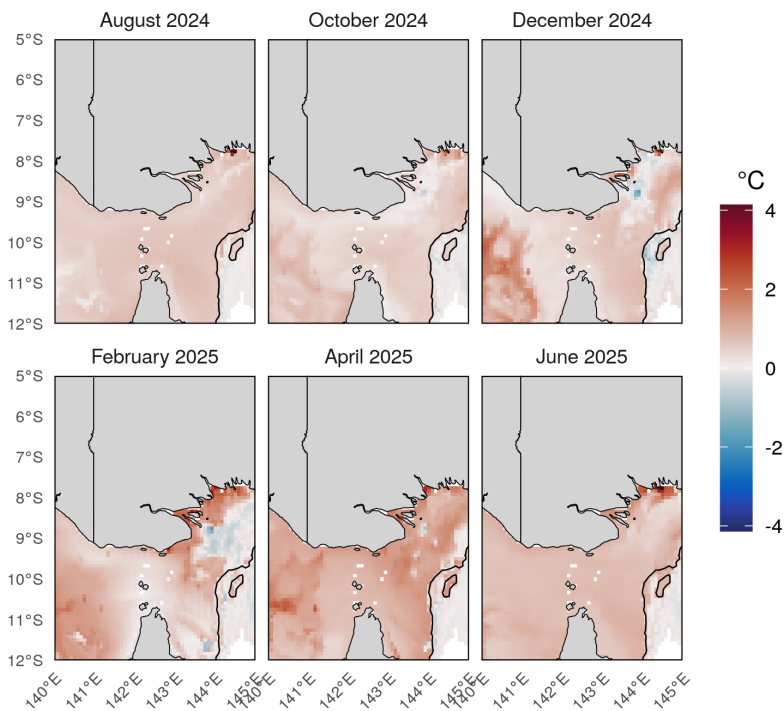


Source: CMEMS

Bi-monthly maps of SST anomalies show the TS was cooler than average in late-2024, before switching to being more than 1 degree warmer than average during Jan-March 2025. Anomalous cool waters returned in May, before switching again during July⁴. Anomalies are relative to 1993-2016.

Moderate-to-strong marine heatwaves (MHW), regions of sustained anomalously warm water, have intermittently occurred across the region from January to August (*MHWtracker*)⁵. The impacts to sea cucumbers are unknown.

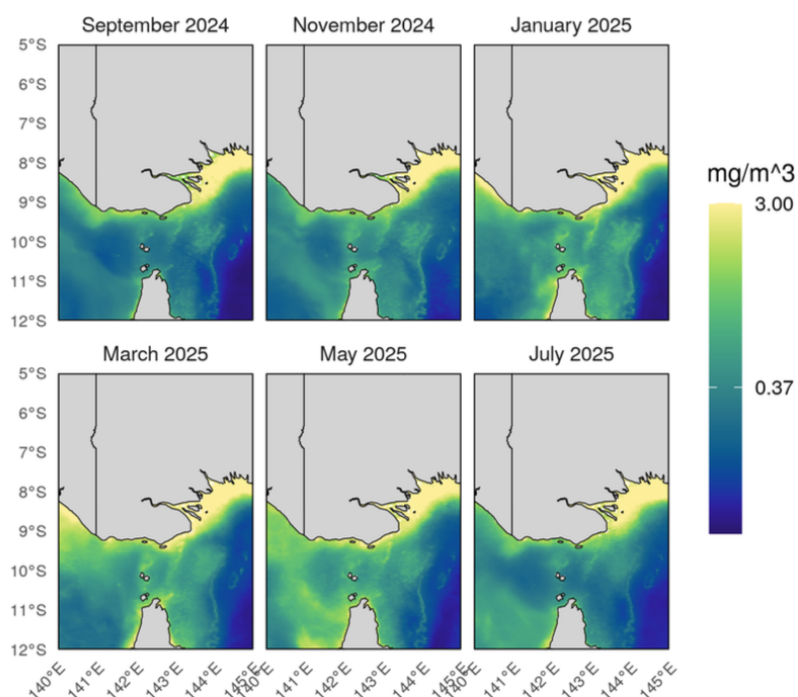
Regional Dynamics: Bottom Temperature Anomaly



Source: CMEMS, Climatology: 1993-2016

Bi-monthly maps of bottom temperature anomalies, with the 200 m contour shown in black. The TS region has seen average to anomalously warm waters across the domain from August 2024-June 2025⁴. Anomalies are relative to 1993-2016, and are from an ocean model which is subject to error. Patches of average and anomalously cool water can be seen in the Gulf of Papua and off the continental shelf.

Regional Dynamics: Chlorophyll-a



Source: CMEMS

Bi-monthly maps of surface chlorophyll-a (log scale; mg/m³)⁴. Surface chl-a is a proxy for ecosystem productivity, which can in turn influence sea cucumber growth and health. Elevated surface chl-a persists along the coastal margin, particularly in the Gulf of Papua which likely reflects the Fly river outflow. Fly river outflow typically only influences the northern regions of the TS. Peaks in surface chl-a are notable during summer months, and also notable during May 2025.

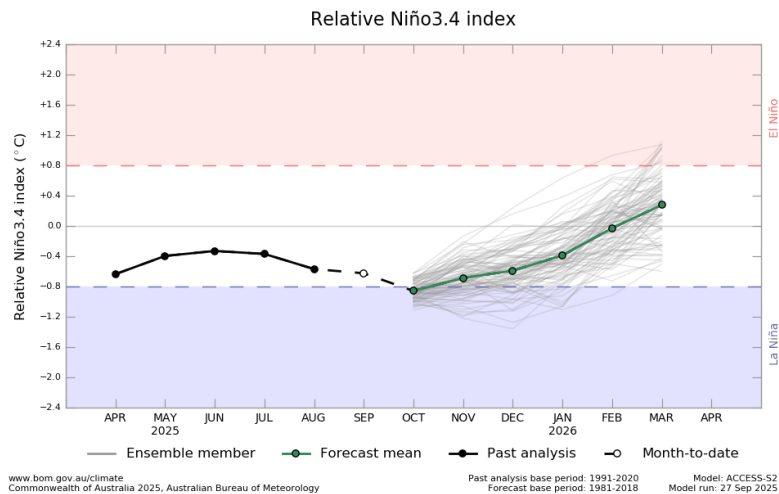
Observations

2025 observations

- Coral bleaching observed at Cumberland, Dungeness, and Warrior reefs.
- Crown-of-thorns outbreak in east TS.
- Oct-Dec was very hot. Lots of algae (brown, black, and green) seen growing over rocks and sand. Dead sardines observed around islands.
- Sep-Oct very hot at Warrior reef, with octopus and sandfish in low numbers.
- Seasonal change was very late, with south-easterly trade winds blowing until January which usually stop in ~Oct.
- Sardines taking longer to come back to islands.
- Tide levels are dynamic in the region, and very important for boating access and water temperatures.

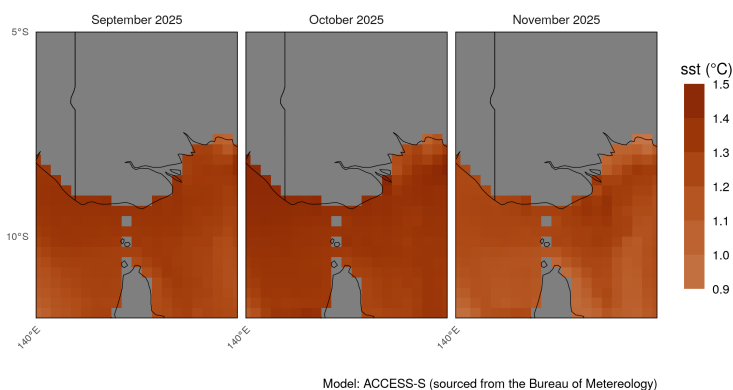
Future Outlook

Climate Drivers: Nino3.4



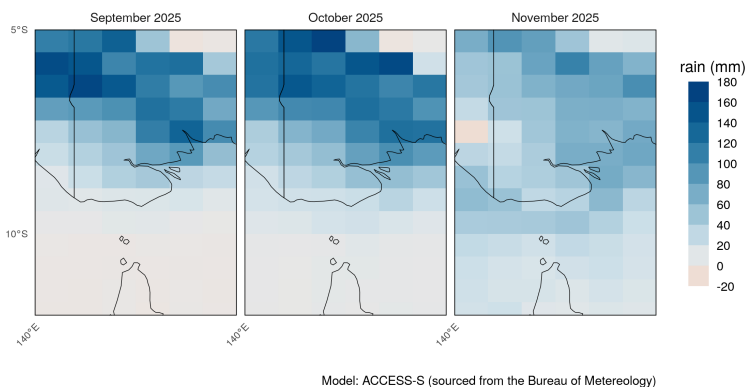
ENSO is currently neutral and forecast to remain neutral until February. Most models forecast neutral conditions, although some indicate potential La Niña levels (*BOM ENSO*)⁶.

Regional Dynamics: SST Anomaly



Forecasts of SST anomalies for the next three months indicate anomalously warm conditions across the TS region (*BOM OceanT*)^{7,8}. Forecasts are updated regularly.

Regional Dynamics: Rainfall Anomaly



Forecasts of rainfall anomalies for the next two months indicate more rainfall over PNG and the Fly River catchment, and less over the TS region (*BOM*)⁸. November is forecast to have higher than average rainfall over most of the domain. This aligns with the Northern Rainfall Onset likely to be earlier than normal in the TS (*BOM*)⁹. Forecasts are updated regularly.

Sources:

- (1) <https://pulse.climate.copernicus.eu/>.
- (2) <http://www.bom.gov.au/climate/enso/#tabs=Pacific-Ocean&pacific=SOI>.
- (3) <https://www.bom.gov.au/climate/about/australian-climate-influences.shtml?bookmark=enso>.
- (4) Copernicus Marine Service.
- (5) <https://www.marineheatwaves.org/tracker.html>.
- (6) <http://www.bom.gov.au/climate/ocean/outlooks/?index=nino34>
- (7) <http://www.bom.gov.au/oceanography/oceantemp/sst-outlook-map.shtml>.
- (8) <https://access-s.clide.cloud/>
- (9) <http://www.bom.gov.au/climate/rainfall-onset/>