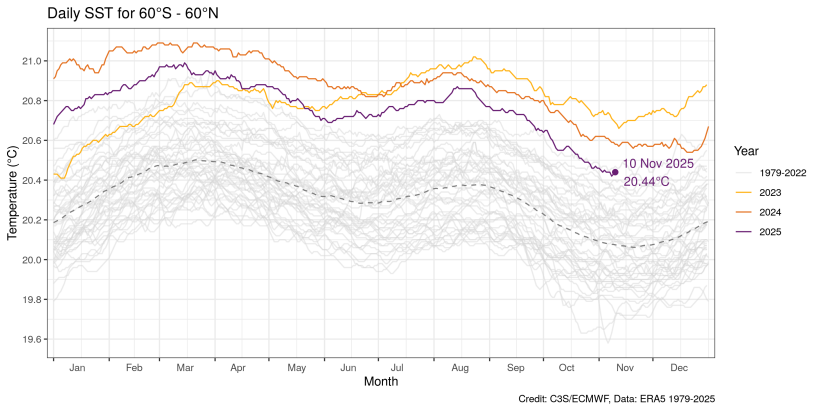
Tropical Rock Lobster Fishery

November 26, 2025

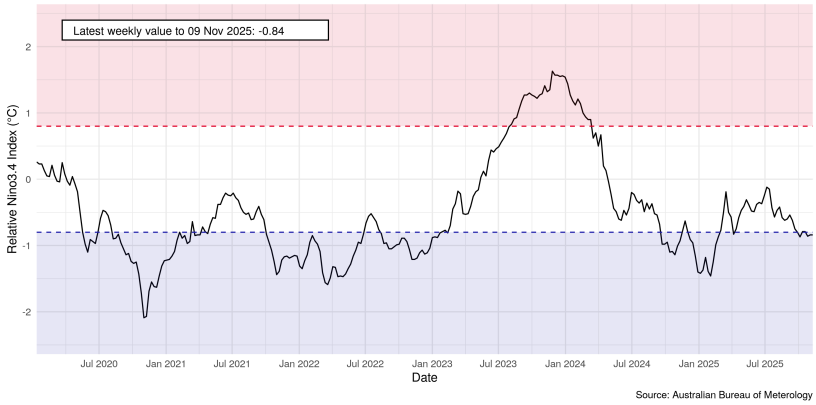
Historical Period

Climate Drivers: Sea Surface Temperature (SST)



Global Sea Surface Temperatures (SST) from 2023-2025 have been at record highs (*Copernicus*)[2]. Warmer waters can intensify extreme weather and disrupt marine ecosystems.

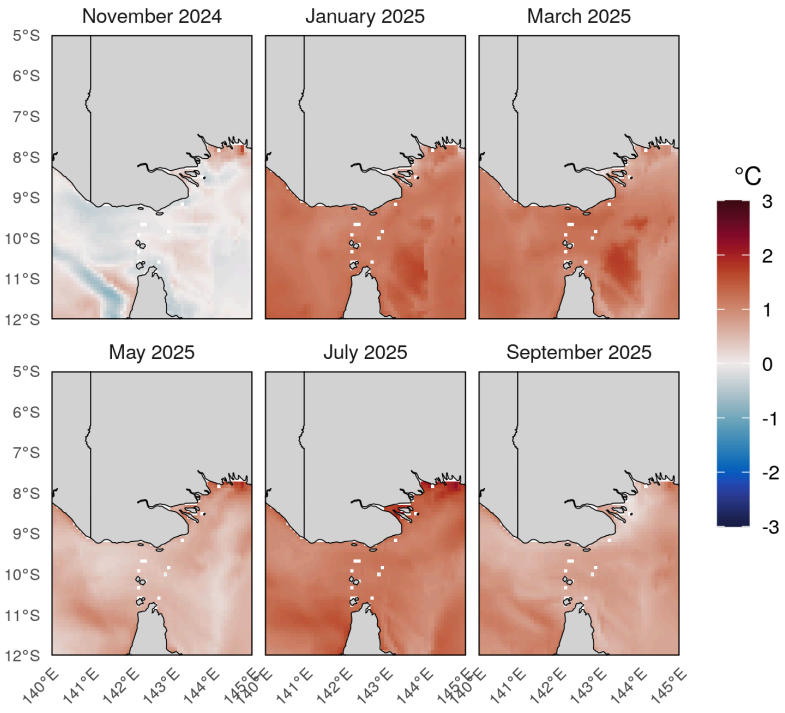
Climate Drivers: Nino3.4



ENSO is currently neutral. The relative Niño3.4 index (a new 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 2024/2025 summer have been reclassified as La Niña (*BOM*)[1].

In the TS during La Niña conditions, trade winds strengthen, sea levels rise, rainfall and cloudiness increases, and waters can be warmer. These changes can influence TRL recruitment, as well as TRL habitat condition (e.g. seagrass and coral).

Regional Dynamics: SST Anomaly

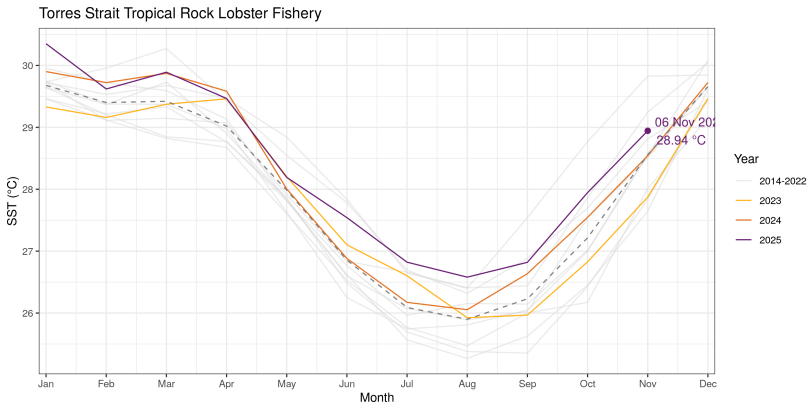


Source: CMEMS

Bi-monthly maps of SST anomalies, relative to 1993-2016[3]. SST has been above average for most of the year across the TS.

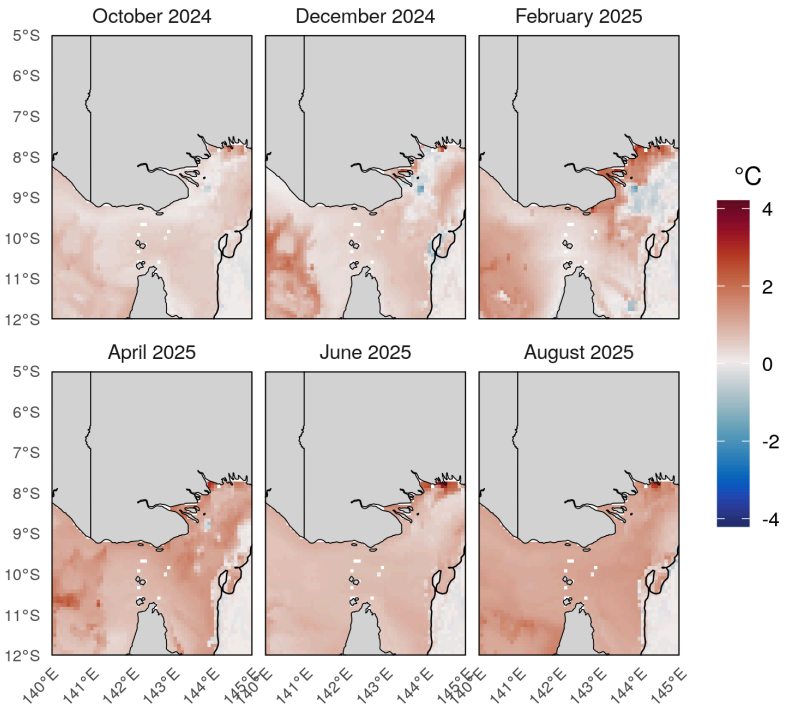
Marine heatwaves (sustained anomalously warm water) have also occurred over summer (*MHWtracker*)[4]. Coral bleaching occurred in 2024/2025, with 22% of the 23 TS reefs surveyed had medium bleaching or higher (*AIMS*)[5]. The impacts to TRL are not known.

Regional Dynamics: SST monthly timeseries



Timeseries of monthly averaged SST for example years 2014-2025[3]. Jan 2025 was the hottest SST in this time period, with temperatures across most months in 2025 higher than those seen in 2023 and 2024.

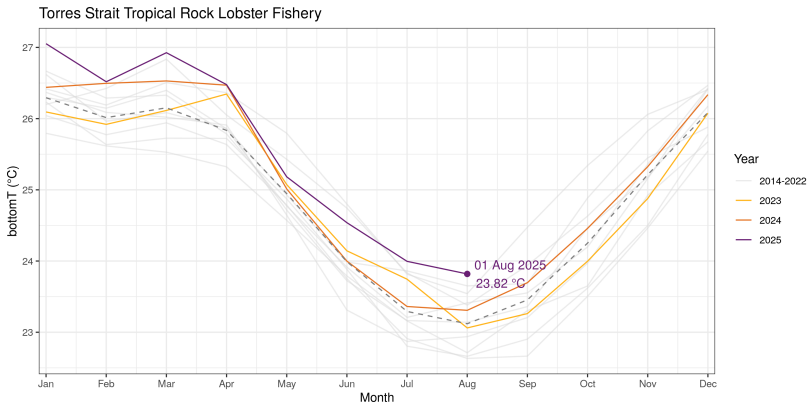
Regional Dynamics: Bottom Temperature Anomaly



Source: CMEMS, Climatology: 1993-2016

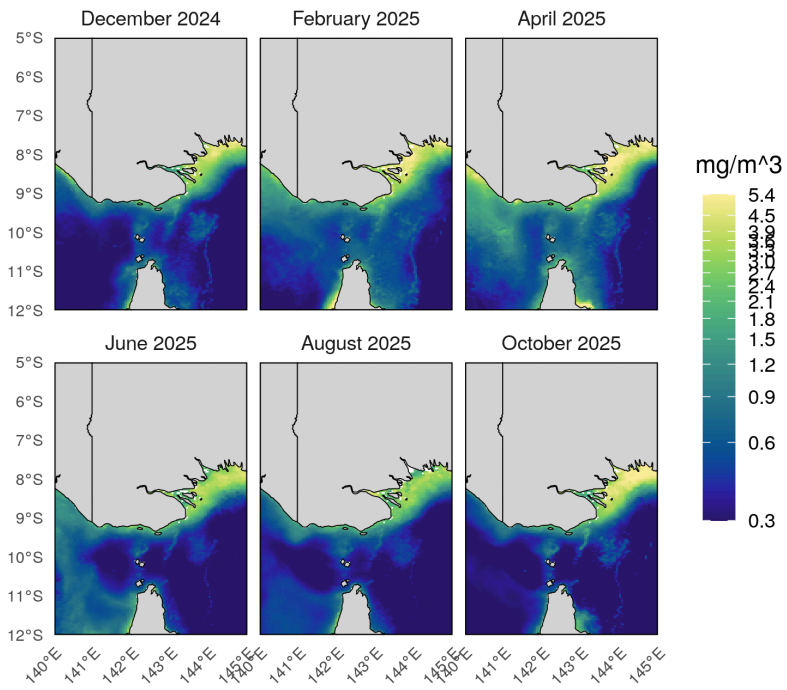
Bi-monthly maps of bottom temperature anomalies, with the 500 m contour shown in black[3]. The TS region has seen average to anomalously warm waters across the domain from Oct 2024-Aug 2025. Anomalies are relative to 1993-2016, and are from an ocean model which is subject to error. Patches of average and anomalously cool water can be seen in the Gulf of Papua and off the continental shelf. Bottom temperatures better reflect the temperatures that benthic habitats and species experience.

Regional Dynamics: Bottom temperature monthly timeseries



Timeseries of monthly averaged bottom temperature for example years 2014-2025[3]. Jan-Apr 2025 experienced the hottest temperatures seen in this time period.

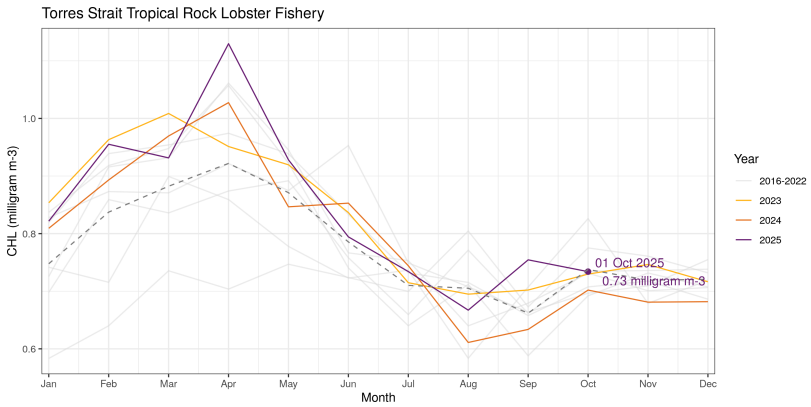
Regional Dynamics: Chlorophyll-a



Source: CMEMS

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, 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 April 2025.

Regional Dynamics: Chl-a monthly timeseries



Timeseries of monthly averaged chl-a for example years 2016-2025[3]. Chl-a has been above average for all months over the past year, with a notable peak in April 2025. Chl-a can indicate ecosystem productivity, such as food sources for TRL.

Observations

Observations are drawn from fishery stakeholder discussions at meetings of AFMA's resource assessment groups (RAGs) and working groups. Further details are provided in meeting minutes accessible on the AFMA website.

2025 observations

- Higher temperatures during winter months was noted by industry, which led to increased growth rates and shedding rates. Quality of live lobsters decreased, resulting in increased rejection for the live market.
- Migration occurred at the usual time and appeared unaffected by warm winter temperatures.
- Large sand incursions in eastern areas.
- More blue-green algae seen in recent years. This is seen growing on top of seagrass and is thought to be bad for lobsters.

2024 observations

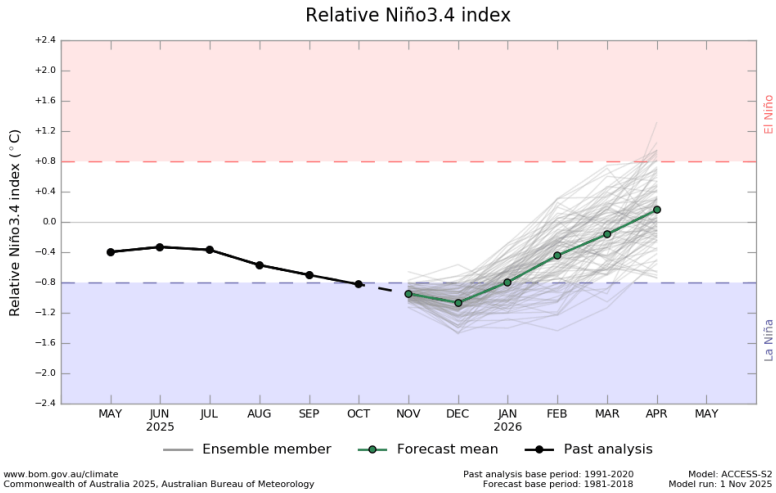
- Lobster are mobile and seen to readily move between different areas and depths.
- Lots of undersize lobsters seen in deeper waters in early December.
- Prolonged westerly flow of tidal currents have been seen. Typically, an easterly flow begins in ~October but westerly flows have been maintained until early December.
- Water temperatures are cooler than expected, and thought to coincide with low bait and finfish catch off Bramble Cay.

2023 observations

- Reports of sand incursion covering up seagrass.
- Reports of winds being different to normal.
- Recreational fishing observed to be higher in Oct-Nov.
- Fishing effort was low but reports of abundance being good in some areas. More smaller and medium sized lobsters observed.
- Lots of sponge grass around that prohibits lobster movement. Typically, early onset of westerlies helps clear habitat for lobsters.
- Shell habitat (Pinctada spp.) is considered good foraging grounds for lobsters.

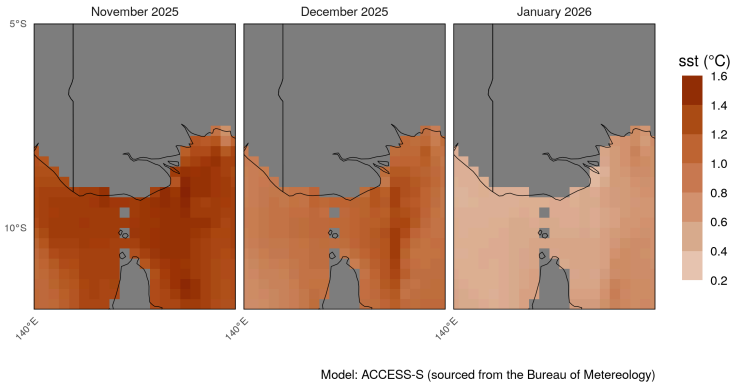
Future Outlook

Climate Drivers: Nino3.4



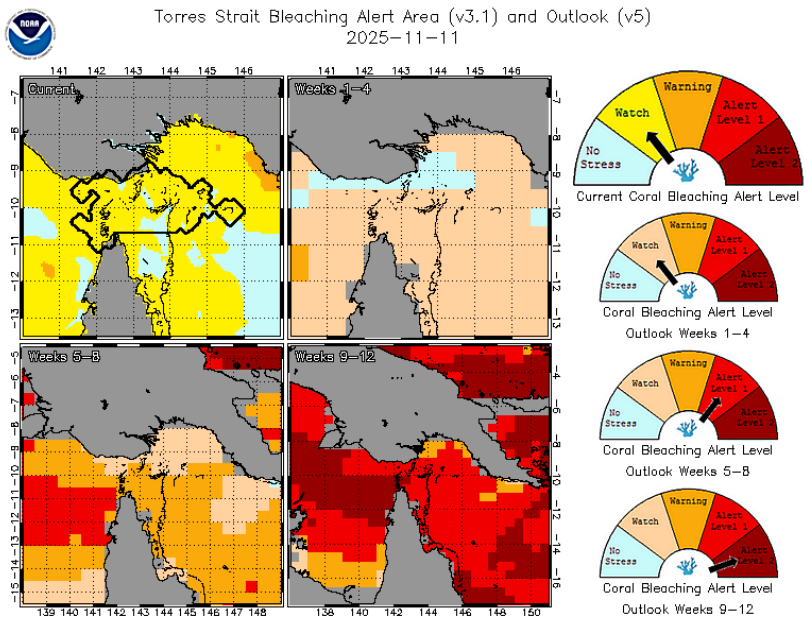
ENSO is currently neutral, with La Niña levels forecast to be met before returning to neutral levels in summer (*BOM ENSO*)[6].

Regional Dynamics: SST Anomaly



Forecasts of SST anomalies for the next three months indicate anomalously warm conditions across the region, with elevated temperatures decreasing from Nov-Jan (*BOM OceanT*)[7]. Forecasts are updated regularly.

Ecosystem: Coral bleaching alert



Coral Reef Watch has forecast a Bleaching Alert Level 2 by Feb 2026, but this is restricted to the western domain while alert level 1 is forecast for the east TS. Alert level 2 indicates a risk of reef-wide bleaching with mortality of heat-sensitive corals (*NOAA*)[8].

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://www.aims.gov.au/research-topics/environmental-issues/coral-bleaching/coral-bleaching-events

(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://coralreefwatch.noaa.gov/product/vs/gauges/torres_strait.php