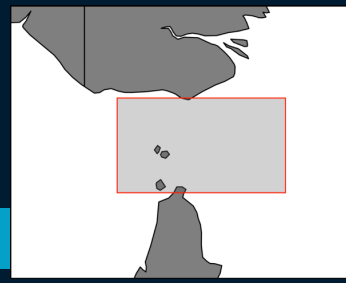




Climate & Ecosystem Status Report

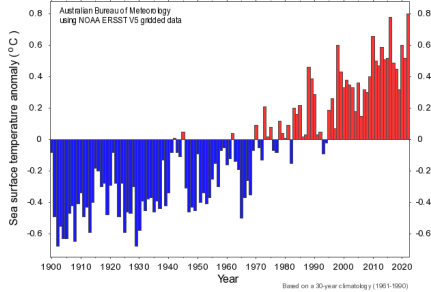
Torres Strait Kaiar - Tropical Rock Lobster Fishery

November 2023

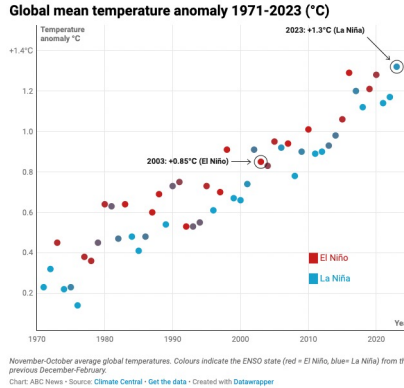


Historical Period

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.

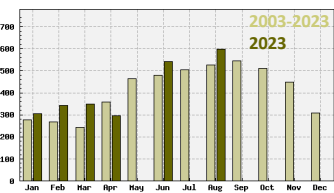


ENSO dynamics interact with long-term warming.

E.g. Hot, dry conditions during El Niño are exacerbated. La Niña events bring cooler conditions to Australia, but recent La Niña's have been warmer than historical El Niño's.

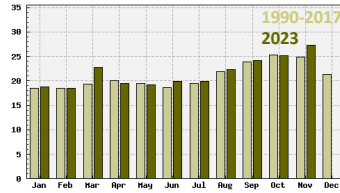
Regional Dynamics¹: Horn Island ([link](#))

Mean daily wind run (km)



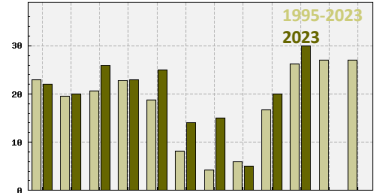
Wind run (mean speed over 24hrs) in 2023 has been higher than average.

Mean daily solar exposure (MJ/m²)



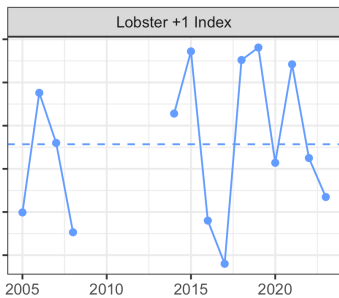
Solar exposure (low cloud cover) was above average in Mar & Nov '23. El Niño brings low cloud cover & warms surface waters.

Number of days air temp. >30°C

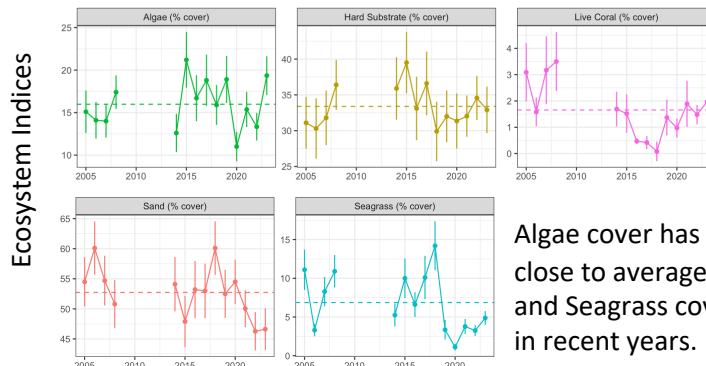


2023 has been hotter than average, especially during June and July.

Ecosystem Trends



Lobster+1 index in 2022 & 2023 was below the long-term average.



Live coral and hard substrate cover has been increasing since 2018.

Algae cover has been below or close to average since 2020. Sand and Seagrass cover has been low in recent years.

Observations

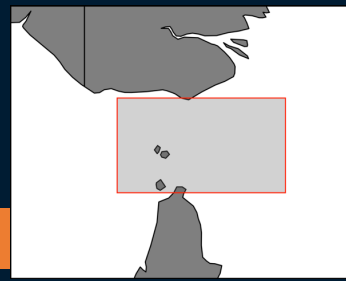
- Reports of sand incursion covering up seagrass.
- Reports of winds being different to normal.
- Recreational fishing observed to be higher in Oct-Nov.
- Fishing effort was low but reports of abundance being good in some areas. More smaller and medium sized lobsters observed.
- Lots of sponge grass 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.



Climate & Ecosystem Status Report

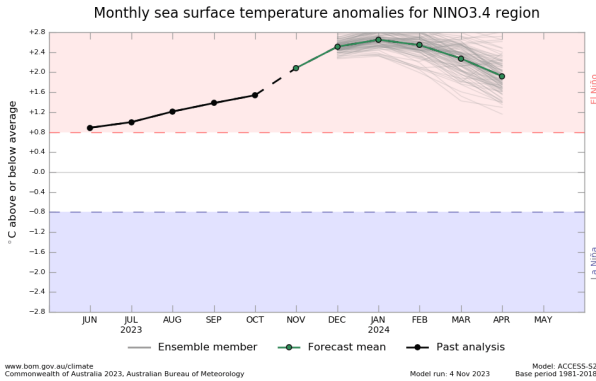
Torres Strait Kaiar - Tropical Rock Lobster Fishery

November 2023



Future Outlook for 2023-2024

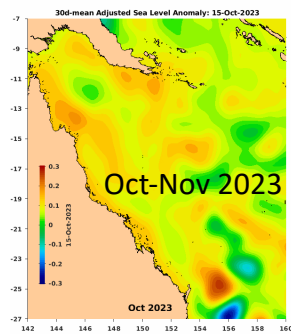
Climate Drivers



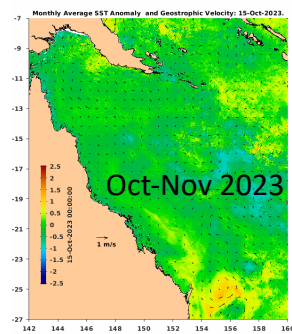
El Niño is forecast through April ([link](#))¹. These conditions:

- Weaken/reverse easterly trade winds.
- Decreases gradient of sea surface height between TS and GoC, which can reduce water movement/flushing.
- Delay monsoon season 2-6 weeks.
- Delay the onset of cyclone season & reduces the number of cyclones & lows.
- Result in low cloud cover and increased solar radiation, which can warm surface waters.
- Can have higher sand incursion in Torres Strait.

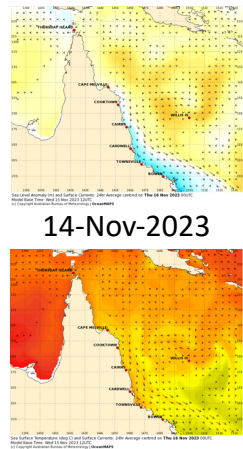
Regional Dynamics



Sea Level Anomaly for the past 30 days ([link](#))³.

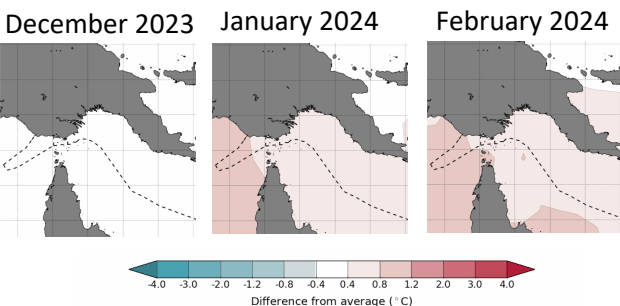


Sea Surface Temperature anomalies show normal conditions for the past 30 days ([link](#))³.

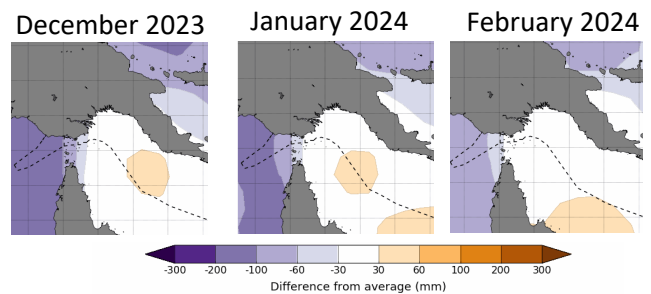


10-day forecasts of sea surface temperature, sea level anomaly, and currents around Australia ([link](#))¹ may be useful for fishing operations.

Ocean Forecasts



Forecasts of SST anomalies¹. SST is forecast to be typical for 2023, but warming by up to 0.8°C is forecast for summer 2024 ([link](#))¹.



Sea Surface Height anomaly forecasts¹. The Coral Sea Gyre and SSH gradient at Torres Strait weakens throughout summer, driven by monsoonal westerlies. Eastward flowing water from GoC can warm the TS⁴ ([link](#)).