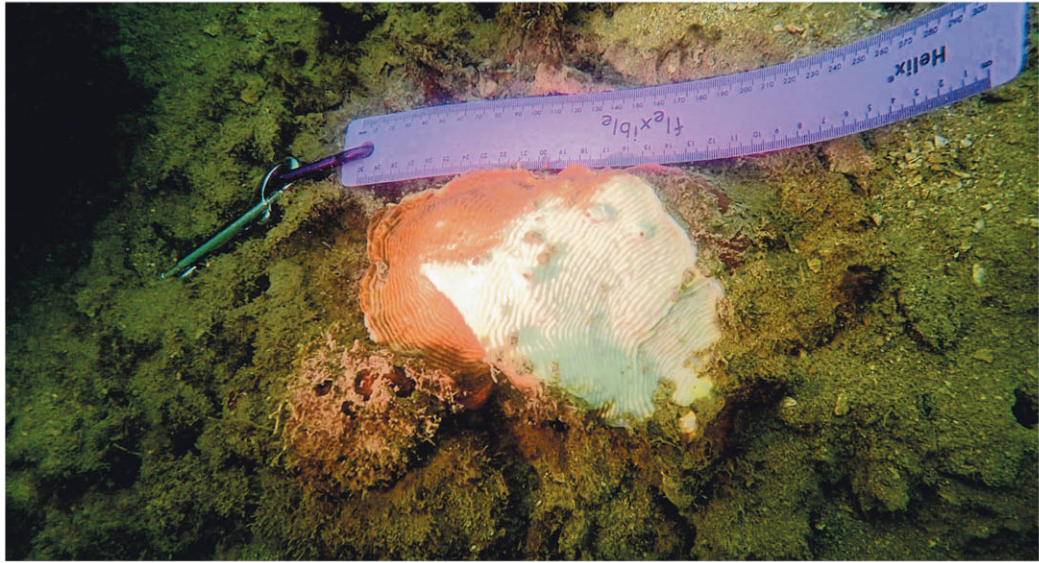




Above: A hard coral at Pulau Hantu showing signs of bleaching on May 4.
PHOTO: JASON TAY/MARINE STEWARDS



Left: Some corals on April 29 at Pulau Satumu, where Raffles Lighthouse is located, were beginning to turn white, in a sign of stress and partial bleaching.
PHOTO: VINCENT CHOO/FACEBOOK

S'pore waters see slight coral bleaching amid global event

Shabana Begum

Amid the fourth global coral bleaching event, some corals in the shallow waters and intertidal zones of Singapore are turning pale and white.

About 20 per cent of corals off Kusu Island were showing signs of stress or partial bleaching as at May 17, said Dr Jani Tanzil, facility director of the St John's Island National Marine Laboratory (SJINML).

This slight bleaching is also seen at the Sisters' Islands, which are part of Singapore's only marine park.

The majority of Singapore's corals are found no deeper than 6m underwater, and this covers the intertidal zones and shallow waters.

The corals in deeper waters – where reef cover and diversity are lower – are faring okay for now, said Dr Karenne Tun, director of the National Parks Board's (NParks) National Biodiversity Centre.

The agency, alongside marine enthusiasts and divers, has been keeping a closer watch on the health of the reefs amid higher sea-surface temperatures. Efforts include taking note of the level of bleaching while diving.

In recent weeks, sea-surface temperatures here have surpassed 31 deg C, with a peak of 31.7 deg C on May 18, according to SJINML's Marine Environment Sensing Network. The highest average monthly temperature is 30.5 deg C.

Global coral bleaching also took place in 1998, 2010 and 2016, and Singapore experienced mass coral bleaching in those years.

In 2010 and 2016, the El Nino climate phenomenon – which causes sea-surface temperatures in the eastern Pacific to heat up and elevate global temperatures – was reaching its tail end.

The current El Nino cycle is expected to taper off in the middle of 2024.

But El Nino is likely to still make its presence felt here in the form of higher-than-usual temperatures in the months ahead, as heat takes time to transfer from the sea sur-

face to the atmosphere, weather experts had told The Straits Times previously.

Dr Tanzil said: "We are now entering our seventh week of higher-than-usual temperatures. The next one to two weeks are crucial. If sea-surface temperatures don't go up further, or, better yet, cool, then we have some hope our corals will be out of danger."

Corals get their vibrant colours from microscopic algae that live in their tissues. When they get stressed from rising sea temperatures, the corals will expel the algae and turn ashen white.

Most of Singapore's intact coral reefs are found in the Southern Islands. Reefs act as the underwater rainforest, sustaining life. They serve as habitat for more than 100 species of reef fish, about 200 species of sea sponges, and rare and endangered seahorses and clams, among other creatures.

In mid-April, the United States National Oceanic and Atmospheric Administration (NOAA) confirmed that the world's fourth global bleaching event was under way.

On May 16, the NOAA warned that the massive coral-bleaching episode is expanding and deepening in reefs around the globe. Amid record ocean temperatures, coral bleaching has been recorded in 62 countries and territories since February 2023.

NParks' Dr Tun added that from May onwards, bleached – or stressed and diseased – corals are expected to be seen in many areas within the Indo West Pacific and Indian Ocean.

NParks and the National University of Singapore (NUS) started monitoring various reef sites in early May, and will continue to do so until the NOAA declares that the mass bleaching event is over.

NParks has also been monitoring the NOAA's Coral Reef Watch page, as well as data from the US body's virtual station for the Singapore Strait.

The statutory board has also reached out to marine enthusiasts who survey intertidal reefs and dive operators to submit reports on the Bleaching Watch Singapore Facebook page to consolidate local

observations.

Said Dr Tun: "Such data will help to provide a comprehensive understanding of the situation in Singapore and guide our response plans accordingly."

Despite the slight decline in reef health, the marine community was relieved to see that the corals did not miss their annual spawning event – the mass release of eggs and sperm into the waters – in end-April.

The synchronous reproduction is influenced by environmental cues such as the lunar cycle and full moon.

One mass spawning event happened on the night of April 29 at Pulau Satumu, where Raffles Lighthouse is located. Once released, the eggs and sperm join in the water, and can grow into new coral once they settle on a hard surface, such as a rock.

In 2017, a year after mass bleaching hit Singapore, the intensity of coral spawning was drastically reduced. Back then, up to 66 per cent of corals in intertidal areas and nearly 60 per cent of corals in subtidal areas and shallow waters had bleached, noted a 2020 paper published in scientific journal Marine Pollution Bulletin.

Since then, much of the reefs have bounced back – only 10 per cent died. But it can take up to 15 years for full recovery. And being exposed to more marine heatwaves fuelled by climate change would strain the reefs further.

Research to address the impact of climate change on local marine ecosystems is crucial for mitigation, said NParks.

Under its Marine Climate Change Science research programme, an NUS study is looking to develop climate-resilient corals with the help of microbes that naturally live on the reef builders.

The research findings of such projects could guide measures such as future coral reef restoration, to ensure their success.

Over the next 10 years, starting in 2024, 100,000 corals will be progressively planted and grown in Singapore's waters to beef up its reef cover.

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Coral bleaching

Coral reefs globally are experiencing mass bleaching amid record ocean temperatures and the El Nino phenomenon

1 Healthy coral

- Zooxanthellae are microscopic algae that live in the tissue of coral.
- They give the host its colour and help convert sunlight into food for it.

2 Stressed coral

- Under exposure to heat, the algae are expelled by the coral.
- The coral's white skeleton is seen through its tissue.

3 Bleached coral

- It becomes more vulnerable to diseases.
- It can recover if the waters cool off soon after. Full recovery can take up to 15 years.

4 Coral death

- Under extended thermal stress, the coral starves or becomes diseased as reduced plant cells fail to supply sufficient food to it.
- Death ensues and the exposed skeleton gets covered in fibrous algae.

Source: NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION PHOTOS: ADOBE STOCK STRAITS TIMES GRAPHICS