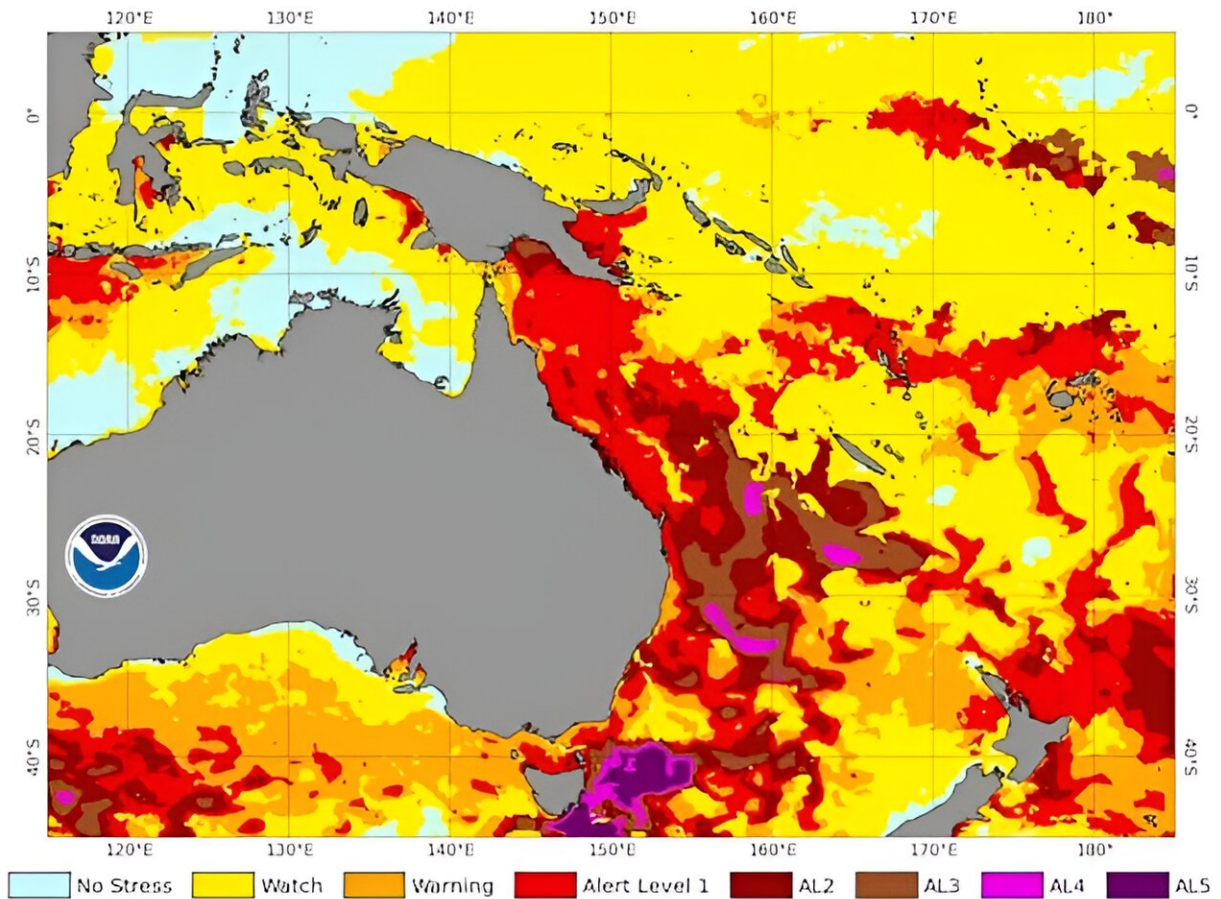


# Sentinels of the sea: Ancient boulder corals are key to reef survival in a warmer world

February 22 2024, by Kate Marie Quigley



An image showing various levels of bleaching alert around Australia as of February 19, 2024. Credit: NOAA Coral Reef Watch

Seas surrounding Australia this month hit an [alarming level](#) of warming.

It comes on the back of serious [marine heat waves](#) in the Northern Hemisphere summer.

Such warming is [highly dangerous](#) for corals. Every [half a degree](#) of ocean warming increases their risk of bleaching and potential death.

The best long-term strategy to protecting Earth's coral reefs is to dramatically cut greenhouse gas emissions and so limit global warming. But in the meantime, we must urgently make corals more resilient and protect those that are vulnerable.

That is particularly true for the huge, ancient features of reefs known as boulder corals. Research suggests they will be a vital part of reef survival in a warmer world.

## **The old-growth trees of the sea**

Boulder corals (Porites) can grow to more than [10m high](#) and live for [more than 600 years](#). In Australia they are often referred to as "bommies". Each bommie can comprise multiple species, but they're often a single massive individual.

The corals [play a crucial role](#) in reefs, including providing habitat for marine life. Importantly, they can [maintain these functions](#) even when other coral species are absent.

[Some species](#) are thought to be [resistant to stress](#). Old corals have [likely experienced](#)—and survived—past warming episodes, proving [their resilience](#).

For example, a paper in 2021 described a giant boulder coral discovered on the Great Barrier Reef which [was thought to be](#) more than 400 years old. It has survived 80 major cyclones, numerous coral bleaching events

and centuries of exposure to other threats.

This resilience can benefit the whole reef ecosystem. We can think of boulder corals as akin to old-growth trees in a forest. Just like forests containing big, old trees are more resistant [to fire](#), studies show a mix of different growth forms, including old and large boulder corals, [fare better](#) in the long-term under marine warming.

Older and bigger corals may also produce [more offspring](#), so can more rapidly replenish the reef after disturbances.

Clearly, as our oceans face unprecedented pressures under [climate change](#), we must protect—and learn from—these sentinels of the sea.

## **Preparing for the challenges ahead**

Understanding boulder corals is crucial to predicting how they might cope under climate change, and planning for their protection.

But scientists still have much to learn about boulder corals. In particular, we [don't know](#) exactly how many species exist, their life histories and how they evolved.

My colleagues and I are aiming to overcome this knowledge gap. We are studying reefs across Australia, with a particular focus on boulder corals at Ningaloo Reef off Western Australia.

We are creating maps of what species of boulder corals exist and where they are located. And using cutting-edge [genomics technology](#), such as DNA sequencing, we are measuring the tolerance of each species to warming and trying to predict when they will reproduce.

Importantly, we are also examining the mutually beneficial relationship

between the corals and algae. This relationship provides algae with shelter, gives corals their color and provides nutrients to both partners. It may also be a [main factor](#) in coral resistance to warmer temperatures.

So far, we have found more diversity than initially expected. This is exciting because it may signal an increased capacity to resist different types of stress. But the work to fully map Ningaloo's coral diversity has only just begun.

We hope our findings, once finalized, can inform local community management actions such as:

- public education campaigns and signs
- managing visitor numbers to reefs
- installing public moorings to reduce harm from boat anchoring, especially during coral spawning.

The information can also be used in broader management actions such as:

- establishing "baseline" conditions from which to measure change
- zoning decisions, including the establishment or ramping up of of marine park protections, especially for resilient [coral species](#) and individuals
- impact assessments following events such as heat waves
- direct conservation actions for iconic, at-risk bommies, such as providing shade to diminish stress from heat
- the development of national reef management plans.

## **Something worth fighting for**

The stress to coral wrought by recent marine heat waves compounds damage incurred over decades. The Great Barrier Reef, for example, has

experienced five major heat waves in 30 years.

Broadly, making reefs more resilient to these pressures involves:

- resisting, recovering, managing and adapting to shocks across ecosystems
- improving governance structures
- preparing human communities for change.

Awareness of the need to increase reef resilience is growing. For example, it formed the basis of a 2017 [blueprint](#) for the Great Barrier Reef and a [strategy](#) for the Ningaloo Coast released last year. But more work is required.

There's also a need for coordination across Australia's reef areas. This might include the exchange of knowledge and data between researchers and combined lobbying efforts to better protect reef ecosystems.

What's more, Traditional Owners must be offered the opportunity to be consulted about, and meaningfully engaged in, protection of reef areas, including co-management of Sea Country.

The [Australian Coral Reef Society](#), of which I am a councilor, last week released [an open letter](#) to the federal government, calling for action on climate change to protect reefs. The task has never been more urgent.

There is still a lot of reef worth fighting for—but only if we act now.

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