Tonga - Niuatoputapu

Regional summary of 6 dive sites (5 with their own page). Figures are averages across the sites that report them (n = sites with a value); each site's own page has its individual values. Part of the Tonga overview.

0 — 5

Coral Health Index: TBD

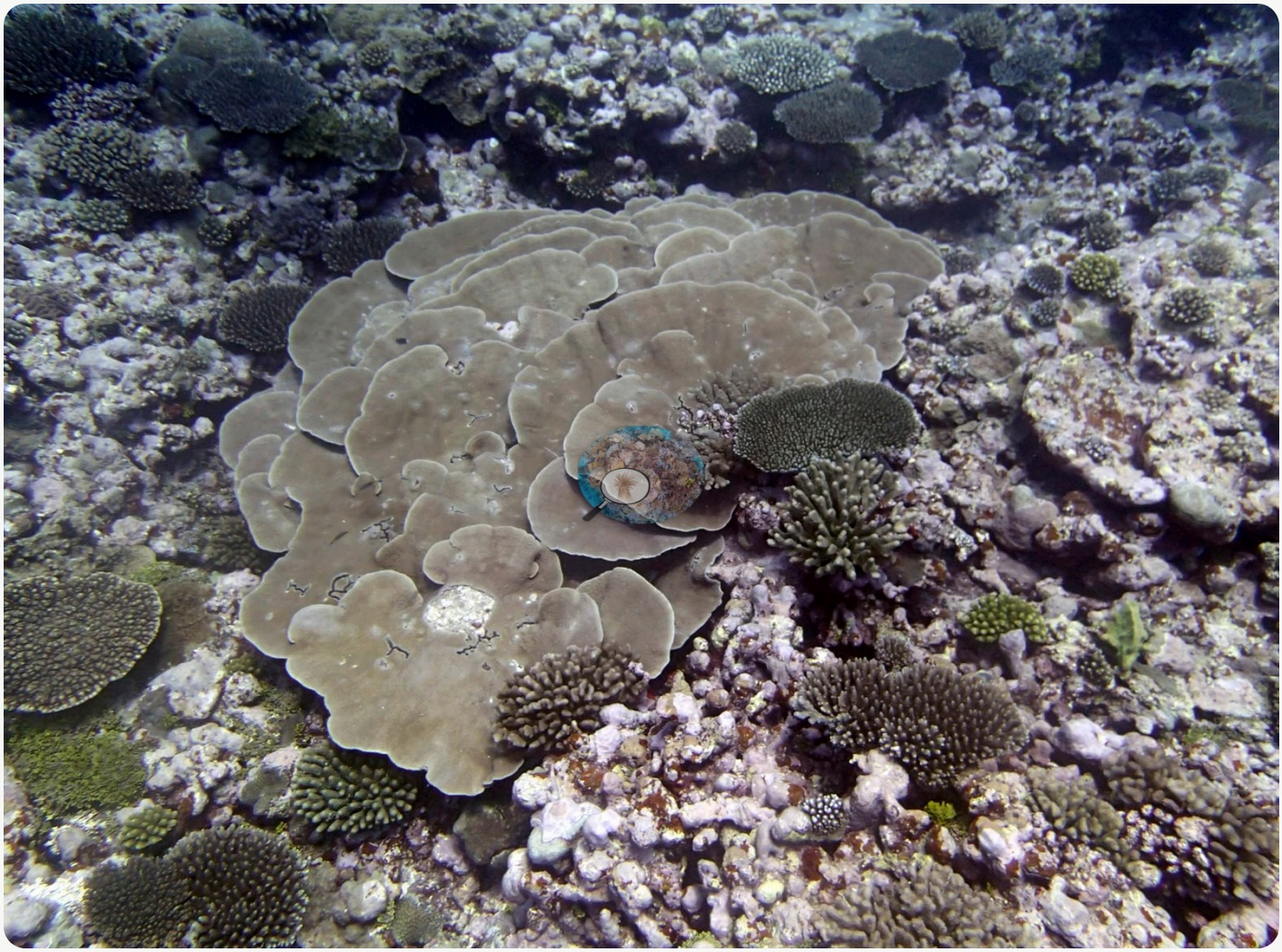


Photo: Anderson Mayfield/Coral Reef Diagnostics — Tonga - Niua (TONI55)

COUNTRY

Tonga

SITES

6

each linked below

HARD CORAL COVER (REGIONAL MEAN)

30% ± 11% (std. dev.)

n=6. range 15–44%

WATER TEMP. DURING SURVEYS (REGIONAL MEAN)

27.7°C

n = 6 of 6 sites; surveyed Sep 2013; all are station CTD-cast midpoints, not dive readings

CORAL HEALTH INDEX (REGIONAL MEAN)

not yet scored

n = 0 of 6 sites

MOST RECENT WATER TEMPERATURE RECORD

26.2°C

26 Oct 2026 · Northern Tonga

MOST RECENT HEAT STRESS RECORD

0.0°C-weeks

26 Oct 2026 · No heat stress

MEAN ANNUAL MAX DEGREE HEATING WEEKS (DHW), LAST 5 YEARS

5.2°C-weeks

2021–2025 · Northern Tonga

HIGHEST ANNUAL HEAT STRESS

15.2°C-weeks 🔥

in 2024 · Northern Tonga

SEVERE HEAT-STRESS YEARS

3

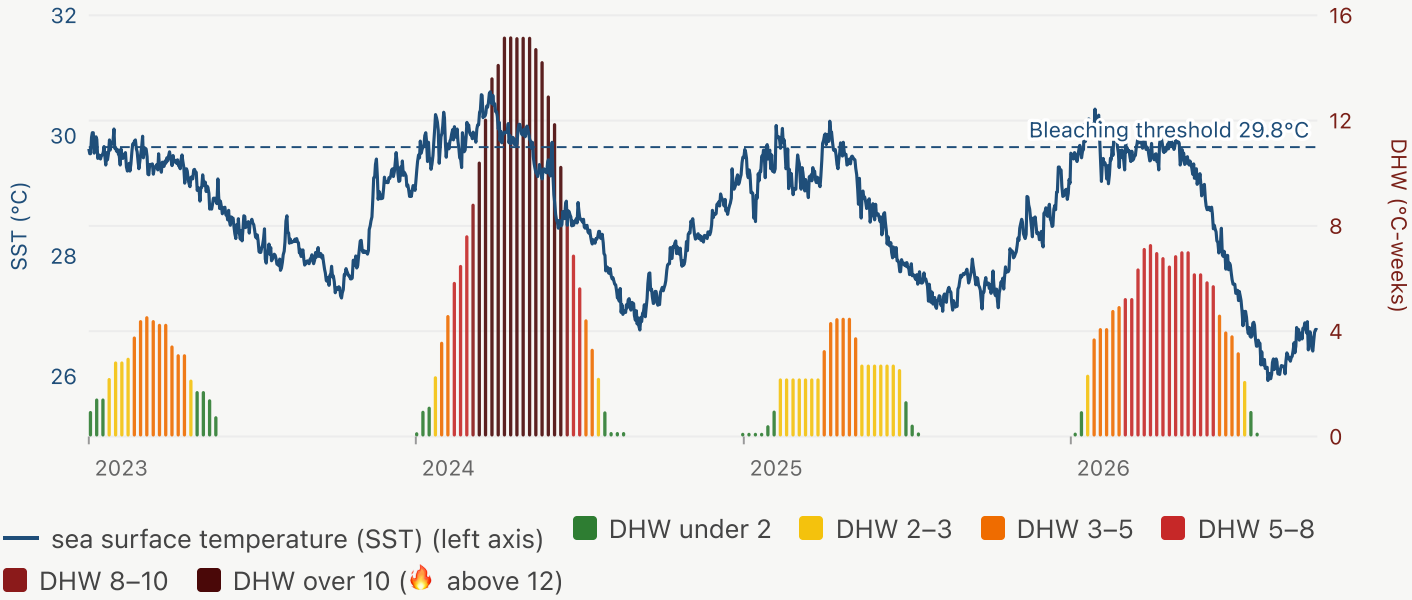
1985–2025 · 1 in the last 10 years

Heat-stress figures: NOAA Coral Reef Watch — Northern Tonga 5-km virtual station. Each pill links its source record and carries the values behind it.

REGIONAL SUMMARY

Niuatoputapu's six modest-relief fringing, platform, and barrier reefs, surveyed in September 2013, stand apart from the rest of Tonga because Acropora does not dominate them. Disease in Pocillopora was recorded at five of the six stations, while tsunami rubble on the barrier reef is being recolonized.

Heat stress



Daily SST (line) and weekly maximum Degree Heating Weeks (bars), Jan 2023–Oct 2026, NOAA Coral Reef Watch 5-km Northern Tonga virtual station. Dashed line: bleaching threshold (maximum monthly mean 28.8°C + 1°C). DHW ≥ 4: bleaching likely; ≥ 8: severe bleaching and mortality likely. A bar is drawn only where DHW exceeds zero, so a stretch with no bar is accumulated heat stress of zero, not missing data — the SST line runs the full period.

Long-term record: 3 years from 1985 through 2025 reached 8 or more °C-weeks at NOAA's Northern Tonga station. Download the annual DHW data (CSV).



6 sites in this region — click a marker to open that site.

Read this summary in: English | lea faka-Tonga

Regional setting

Spalding et al. (2001) treat Tonga's reefs mainly at the national scale and do not describe Niuatoputapu itself; on their map it appears as a separate group in the far north, near Tafahi and

the volcanic island of Niuafo'ou. Nationally, they describe two parallel arcs along the convergent margin of the Indo-Australian and Pacific plates. The western Tofua Arc is a chain of high volcanic islands running north to Niuafo'ou, which last erupted in 1942 with further activity in 1985, and tectonic activity there leaves many islands and shoals too unstable for significant reef growth. The eastern arc, made up of the Tongatapu, Ha'apai, and Vava'u groups, consists largely of islands of reef origin, and there reefs are widespread, with fringing reefs around most coasts and platform and barrier-type structures in most groups. The atlas estimates about 1,500 km² of coral reef across Tonga and notes some 192 scleractinian coral species recorded at 11 reefs around Tongatapu, a count the authors regard as an underestimate. As of 2001, it reports periodic cyclone damage, most recently in 1995, 1997, 1999, and 2000, and a major bleaching event in 2000.

The sources say nothing about Niuatoputapu's recent state, and only regional summaries are available. Reviewing the 2004 report on the Polynesia Mana network, which includes Tonga, Wilkinson (2006) considered its reefs mainly healthy and at low immediate risk, since they lie far from large landmasses, but singled out climate change, cyclones, and bleaching as the main threats, with sedimentation, overfishing, dredging, and nutrient pollution of concern around densely settled islands. Souter et al. (2021) show average live hard coral cover across the Pacific declining from about 37% before 1998 to 31% in 2019, largely through bleaching, with El Niño conditions in 2015 and 2016 causing substantial coral mortality.

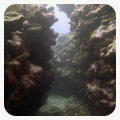
Overview

The six Niuatoputapu stations, surveyed on 29 and 30 September 2013 at maximum depths dived from 16.2 m (TONI56) to 32.9 m (TONI54), cover a south-facing fore reef off the southern tip, side-on to the trades (TONI54), a broad gently sloping platform (TONI55), a west-coast fringing ridge (TONI56), the north-coast barrier reef (TONI57 and TONI59), and a sandy submerged fore reef (TONI58). Relief is generally modest: small discontinuous spurs rising from flat rubble plains at TONI54, spurs running hundreds of meters across TONI55, a long ridge 2-3 m wide standing 2 m above sand at TONI56, and narrow channels barely wider than a diver cut through the barrier at TONI57.

These reefs were not *Acropora*-dominated. Mounding *Astreopora*, plating *Montipora*, large *Turbinaria*, and *Porites* carried much of the cover at TONI55 and TONI56, and TONI55 held extensive stands of blade-like fire coral. TONI59 had numerous meter-plus *Turbinaria* plates at 8-15 m, and TONI58 was defined by mushroom-shaped *Porites lobata* bommies up to 3 m tall standing over an extensive field of long-dead pillars at 15-18 m. Table acroporids and massive corals together reached 30-50% cover on the larger spurs of TONI54.

Transect cover ranged from 15% at TONI57, where algae covered 81% of the benthos, to 44% at TONI56, where algae covered 47%. The barrier reef at TONI57 appeared to have suffered extensive tsunami damage, but most of its rubble was cemented by thick crustose coralline algae and being recolonized by thin plating *Montipora*. Disease in *Pocillopora* was the recurring condition signal across the group, recorded at five of the six stations, alongside about 30% dead coral at TONI54 and a 10 m *Porites* at TONI59 that had lost roughly 80% of its tissue. Crown-of-thorns starfish and *Culcita* were scarce, and giant clams, blue-white sea stars, and dozens of spider conch were abundant at TONI56.

Highlights

- An *Acropora*-poor platform of mounding *Astreopora*, plating *Montipora*, and big *Turbinaria*, with extensive stands of blade-like fire coral (TONI55). 
- Table *Acropora* and massive corals at 30-50% cover on the larger spurs of a south-facing fore reef, side-on to the trades, where about 30% of the corals were dead (TONI54). 
- *Porites lobata* bommies up to 3 m tall over a field of old dead pillars (TONI58). 
- 15% cover, on a barrier reef whose tsunami rubble is cemented by coralline algae and being recolonized by thin plating *Montipora* (TONI57). 
- 44% cover, on a long west-coast ridge with numerous giant clams, blue-white sea stars, and dozens of spider conch (TONI56).

Notable observations

- Tonga - Niua (TONI54): High numbers of diseased Pocillopora; about 30% dead corals, including a large dead stand of thick-branched staghorn at 15 m; one massive/encrusting colony with several rounded lesions 
- Tonga - Niua (TONI55): About 20-30% of the Pocillopora had recent mortality and old dead patches caused by disease; a few Culcita and recently dead corals 
- Tonga - Niua (TONI56): 10-20% of the Pocillopora were sick; many Astreopora with small dead areas forming chimneys with tufts of red algae

- Tonga - Niua (TONI57): Many of the Pocillopora colonies have disease; large patches of cyanobacteria; extensive apparent tsunami damage; an old rope across the reef, colonized by a branching coral



- Tonga - Niua (TONI58): Extensive field of dead, easily broken pillars at 15-18 m (old mortality)



- Tonga - Niua (TONI59): No snails, crown-of-thorns starfish (COTS), or Culcita seen but high numbers of diseased Pocillopora; a ~10 m Porites had lost roughly 80% of its tissue

Sites in this region

- Tonga - Niua (TONI54) — 34% coral cover
- Tonga - Niua (TONI55) — 33% coral cover
- Tonga - Niua (TONI56) — 44% coral cover
- Tonga - Niua (TONI57) — 15% coral cover
- Tonga - Niua (TONI58) — 18% coral cover
- Tonga - Niua (TONI59) — 34% coral cover

% coral cover by method

Pooled across 2 dive sites

Method	Mean % coral cover	Std. dev. between dive sites	n dive sites	Note
CoralSCOP (SAM-based mask-sum), unedited photos	34%	±0.5	2	—
Claude (Anthropic), blind point count	27%	±10	2	—
In-water diver transect (line/point intercept)	34%	±1.1	2	—

The mean is an UNWEIGHTED mean of the dive site values — each dive site counts once, whatever its photo count — which is the convention of the published tables and of every other figure on this page. Each value is the one printed on that dive site's own page; a page that prints no value for a method (fewer than 10 photographs) is left out of that method's mean.

This table pools only the 2 dive sites in this unit that have a method comparison; the table for all 22 dive sites is on the Tonga page.

Deviation from the reference

Over the dive sites where an independent reference exists, Claude (Anthropic), blind point count has a mean absolute deviation of 8.0 pp from it across 2 dive sites. Not in this ranking: CoralSCOP (unedited), which is not comparable with this reference. A mean absolute deviation is not an accuracy score: a model with a consistent offset is correctable, while one with the same deviation scattered in both directions is not.

By dive site

Dive site	CoralSCOP (unedited)	Claude	Diver transect
TONI54	34% n=13	20% n=13	34%
TONI55	34% n=15	35% n=15	33%

n under each value is the number of photographs that method scored at that dive site. ⚠ marks a cell that is not an independent check.

Reference: Living Oceans Foundation (LOF) Global Reef Expedition in-water transects (mean of all the station's transects, Living Oceans Foundation per-transect benthic data). Denominator: line/point intercept along the transect; not a photo-point denominator. Source: LOF Global Reef Expedition 2013, per-transect benthic data ('GRE data-full benthic'): the mean of all of each station's transects For all 22 dive sites in the comparison: The transect is THE coral-cover value at every site; the Claude photo estimate is a methods comparison only, never averaged with the transect and never a headline. Site-level only: the photos come from the survey dives, not from the transect points. Accuracy, Claude vs transect, the 22 sites with 10 or more reef-habitat photos (sampled-colony close-ups left out; sites with fewer than 10 have no Claude row): mean difference -4.2 pp (95% CI -8.8 to +0.5), mean absolute difference 8.4 pp, r 0.43. Claude tracks the transect only weakly from site to site in Tonga. This is a methods comparison, not a ranking.

All images from Coral Reef Diagnostics. Data are from the Khaled bin Sultan Living Oceans Foundation Global Reef Expedition and Coral Reef Diagnostics.

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References

- Souter D, et al. (eds) (2021) *Status of Coral Reefs of the World: 2020*. International Coral Reef Initiative / Global Coral Reef Monitoring Network. [PDF]
- Spalding MD, et al. (2001) *World Atlas of Coral Reefs*. University of California Press, Berkeley. [PDF]
- Wilkinson C (2006) Status of coral reefs of the world: summary of threats and remedial action. In: Côté IM, Reynolds JD (eds) *Coral Reef Conservation*. Cambridge University Press, Cambridge. [PDF]