Fiji - Northern Lau (Vanua Balavu / Cicia / Nayau)

Regional summary of 38 dive sites. 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 Fiji - Lau overview. Island summaries: Vanua Balavu, Cicia, Nayau.

0 — 5

Coral Health Index: 3.50/5

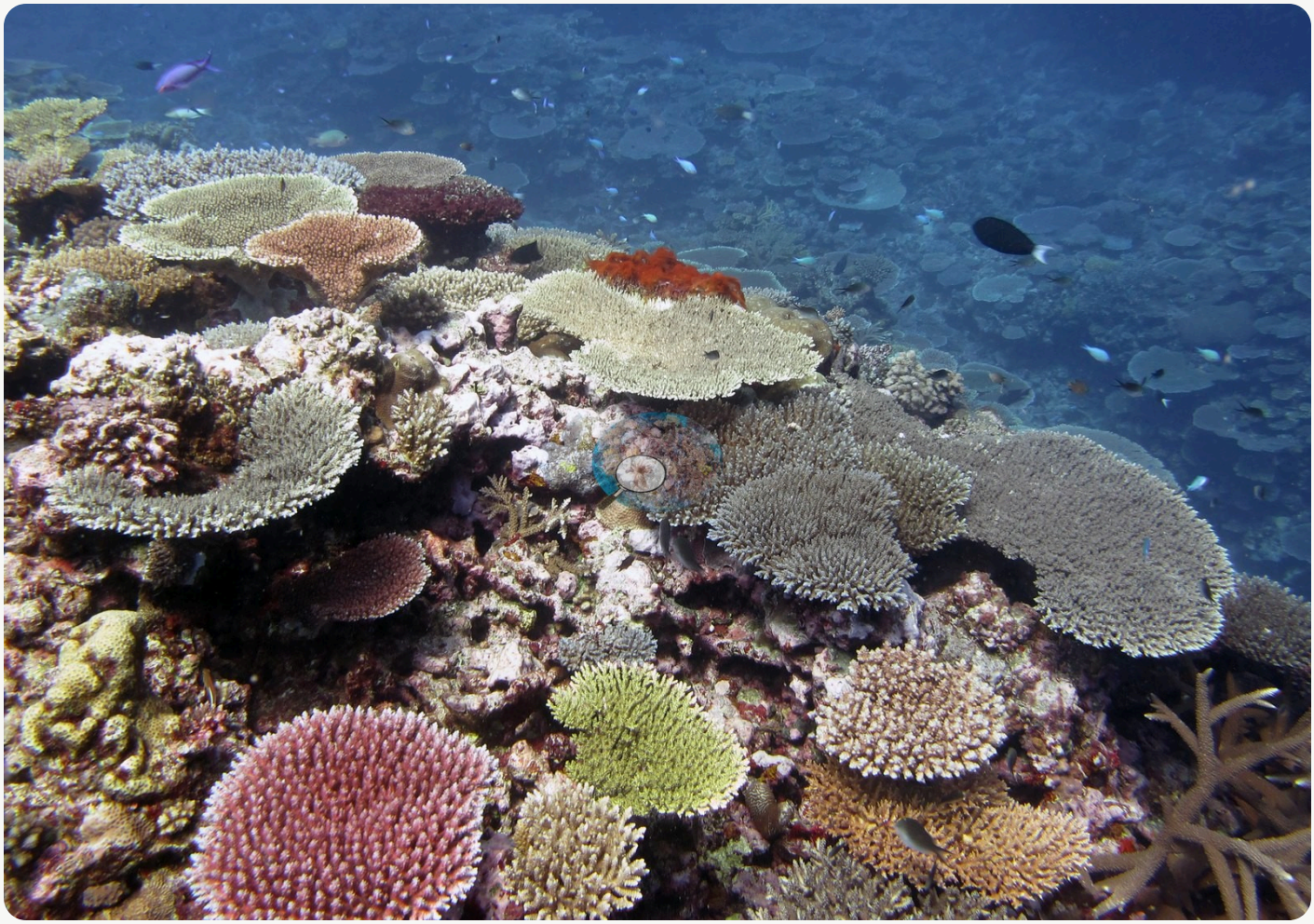


Photo: Anderson Mayfield/Coral Reef Diagnostics — Fiji - Cicia (FJCC45)

COUNTRY	SITES	HARD CORAL COVER (REGIONAL MEAN)
Fiji	38	31% ± 16% (std. dev.)
	each linked below	n = 36 of 38 sites. range 2.5–67%

WATER TEMP. DURING SURVEYS (REGIONAL MEAN)

27.0°C

n = 36 of 38 sites; surveyed Jun 2013; 34 of these are station CTD-cast midpoints, not dive readings

CORAL HEALTH INDEX (REGIONAL MEAN)

3.50 / 5

n = 3 of 38 sites; scale of zero to five, higher is healthier

MOST RECENT WATER TEMPERATURE RECORD

25.8°C

26 Oct 2026 · Fiji

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

8.9°C-weeks

2021–2025 · Fiji

HIGHEST ANNUAL HEAT STRESS

16.7°C-weeks 🔥

in 2026 (to date, 26 Oct) · Fiji

SEVERE HEAT-STRESS YEARS

11

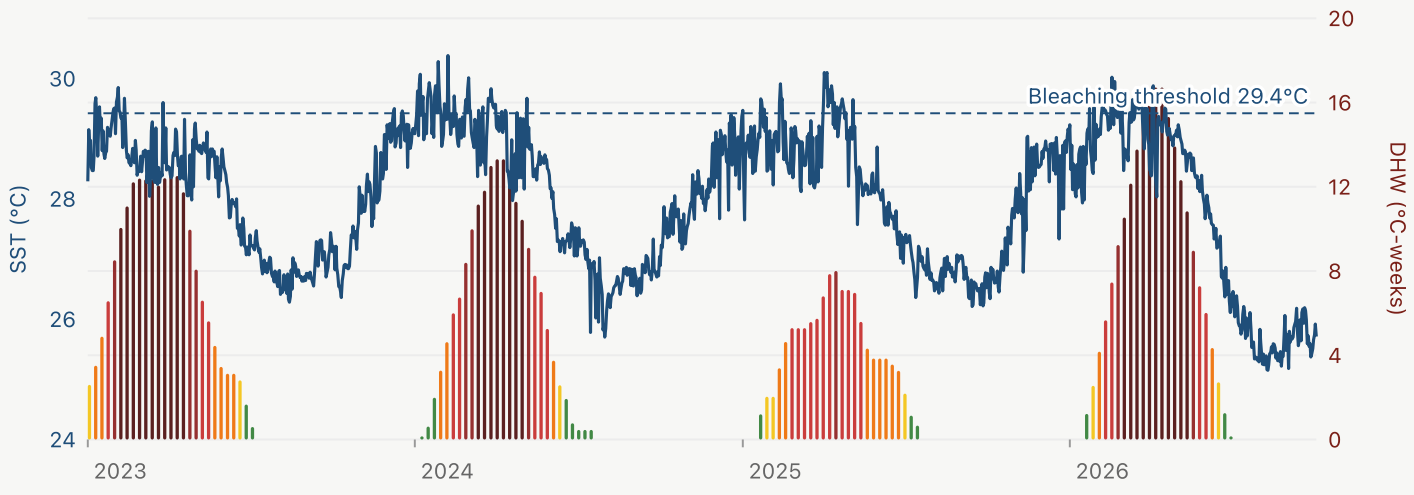
1985–2025 · 6 in the last 10 years

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

REGIONAL SUMMARY

Northern Lau's fore-reef terraces, spur-and-groove slopes, and walls, surveyed in June 2013, include high-cover, Acropora-dominated reefs on Cicia, Nayau, and Tuvuca, the island Anderson's photo labels single out as a highlight of the trip. Vanua Balavu was the weak island, algae-dominated with most stations below 30% coral.

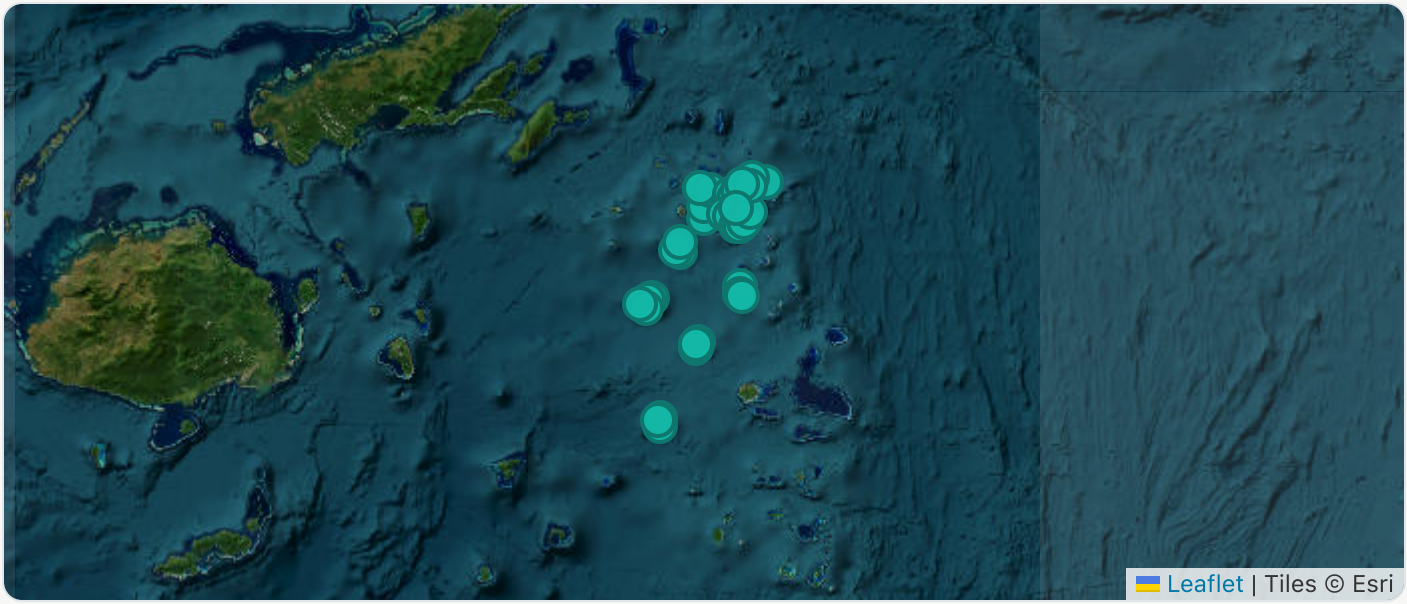
Heat stress



— sea surface temperature (SST) (left axis) DHW under 2 DHW 2–3 DHW 3–5 DHW 5–8
DHW 8–10 DHW over 10 (🔥 above 12)

Daily SST (line) and weekly maximum Degree Heating Weeks (bars), Jan 2023–Oct 2026, NOAA Coral Reef Watch 5-km Fiji virtual station. Dashed line: bleaching threshold (maximum monthly mean 28.4°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: 11 years from 1985 through 2025 reached 8 or more °C-weeks at NOAA's Fiji station. Download the annual DHW data (CSV).



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

Read this summary in: English Vosa Vakaviti

Regional setting

Spalding et al. (2001) describe Fiji as an archipelago resting on two fairly shallow geological structures: the Fiji Platform, which carries Viti Levu and Vanua Levu, and the Lau Ridge. The Lau Islands crown the ridge along Fiji's eastern edge, and the Nanuku Channel separates them from the platform. In the northern part of the chain the islands are mostly high and volcanic, carbonate islands take over farther south, and atolls and near-atolls are scattered along its whole length. Among the biggest Lau structures are the Exploring Isles, where Vanua Balavu, a high island, is joined by an extensive eastward barrier reef that encloses several smaller islands; nearer the middle of the chain, the Bukatatanoa Reefs make up a second large barrier-reef complex. Spalding et al. (2001) estimate about 10,020 km² of coral reef for Fiji as a whole, with some 298 scleractinian coral species recorded, and note that research had concentrated around Suva and the Great Astrolabe Reef, leaving much of the country's reef area poorly known. They also report that the bump-headed parrotfish (*Bolbometopon*) had not been caught in Lau for at

least ten years, and that a warming event early in 2000 bleached 50–100% of corals over wide areas of Fiji, down to 30 m, with heavy subsequent mortality.

For the years after 2000, the sources treat Fiji only within regional summaries. Drawing on the 2004 Southwest Pacific assessment, which covered Fiji, Wilkinson (2006) described the region's reefs as generally in good condition despite extensive bleaching in 2000–2002, with some reefs fully recovered and others not. Anderson ranked human activities and cyclones as the greatest threats, followed by crown-of-thorns starfish and disease, and noted that overexploitation and pollution were concentrated near towns and in lagoons. Souter et al. (2021) report that live hard coral cover in the Fiji Islands subregion rose between 2002 and 2008, but that across the Pacific average cover fell from about 37% before 1998 to 31% in 2019, mainly through bleaching, with the sharpest losses between 2015 and 2017.

Overview

This region comprises 36 Global Reef Expedition benthic stations around Vanua Balavu, Cicia, Mago, Nayau, Tuvuca, and Vanua Vatu in the northern Lau group of eastern Fiji, plus an island-level marker for Vanua Balavu and a 2 m snorkel site at Nayau, 38 sites in all. They were surveyed between 15 and 26 June 2013, from Vanua Vatu (15 June), Nayau (16), Tuvuca (17), Cicia (18-19), and Mago (20) to Vanua Balavu (21-26 June), the last stops of the Fiji mission. The majority of stations sit on fore-reef terraces, spur-and-groove slopes, and walls, with maximum dive depths up to 32.3 m at FJCC47 (the Nayau snorkel station, with no logged dive, is 2 m deep); among the scuba stations the shallowest dive was 12.2 m at FJCC46. The survey team's notes describe Nayau's stations as shallow fore-reef slopes built up by acroporids with rubble piled at their bases, and FJNA39 as a classic spur-and-groove reef with well-developed coral on the spur tops.

Coral cover ranged from 2.5% at FJVB64 to 67% on the Cicia barrier reef at FJCC46. Cicia, Mago, Nayau, and Vanua Vatu all held 33% to 67% coral, and their reefs are *Acropora*-led: FJCC45 is a flat-topped coral mountain paved with table *Acropora*, FJCC48 has an overhanging buttress of plating corals, FJVV37 has tables cantilevered over a spur-and-groove edge, FJMG49 (53%) is an acroporid-dominated Mago slope, and at Tuvuca FJTV42 carries near-continuous staghorn meadows. The Tuvuca wall at FJTV41 is a gorgonian forest rather than a stony-coral reef, and FJCC47 is a low, dense mosaic of small colonies rather than tables.

On Vanua Balavu, 17 of the island's 19 survey stations were below 30% coral, and algae held most of the benthos (83% at FJVB58, 90% at FJVB69). Survey notes there describe cyanobacteria mats, old dead coral, leather corals, and *Millepora*, plus a *Pavona clavus* colony at least 10 m across. The steep slope edge at FJVB52 (47%) and the coral-covered rise at FJVB54 (37%) are the exceptions. Only the three Vanua Vatu stations carry a Coral Health Index, 3.50

out of 5. Island-pooled physiological outlier scores ran from 5.00 (no outliers) at Cicia and Tuvuca to 3.89 at Vanua Balavu on a 0-5 scale, and the one colony sampled at FJVB67 was flagged.

The surveys recorded an active crown-of-thorns outbreak on one Cicia reef, with 212 starfish removed (expedition field report), crown-of-thorns predation with large areas of white coral at Mago, *Drupella* on Nayau *Acropora*, a bleached *Pocillopora damicornis* at FJMG51, two bleached colonies at FJTV41, a bleached and a partly bleached pocilloporid at FJNA40, and a partly bleached tagged colony at FJNA38; Anderson's sampling sheet also records sampled colonies 80% or more bleached at FJCC44, FJMG51, FJVB60, FJVB63, and FJVV36 (95% and 90%), and one at 70% at FJVV35. Sightings include a manta ray at FJVB65, spotted eagle rays at FJTV42, a dogtooth tuna at FJVB54, a green turtle at FJVB69, a day octopus at FJMG49, a triton's trumpet at FJVB67, whitetip reef sharks at FJMG51, FJVB52, FJVB55, FJVB61, and FJVV37, a reef shark at FJTV41, and giant clams at FJCC44, FJMG51, FJNA40, FJVV37, and FJVB68.

Highlights

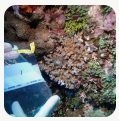
- Cicia's reefs ran 38% to 67%, with a flat-topped coral mountain of table *Acropora* (FJCC45). 
- Near-continuous staghorn *Acropora* meadows, with spotted eagle rays (FJTV42). 
- A deep, current-swept wall that is a gorgonian forest rather than a stony-coral reef (FJTV41). 
- Vanua Balavu is algae-dominated: 17 of its 19 survey stations under 30% coral, with algae up to 90% (FJVB69, FJVB64). 
- Gray-green *Acropora* tables cantilevered over a spur-and-groove edge, with a giant clam and a whitetip reef shark (FJVV37). 
- A manta ray, spotted eagle rays, and a dogtooth tuna (FJVB65, FJTV42, FJVB54). 

▼ Notable observations (13)

- Fiji - Cicia (FJCC46): Crown-of-thorns outbreak (field report): 212 crown-of-thorns starfish (COTS) were removed from one outbreak reef on Cicia, where hundreds were found in very shallow water down to about 15 m; the report does not tie that reef to a surveyed station. The FJCC46 transects logged

7.3% dead coral. No starfish or feeding scars appear in the photographs of the other Cicia stations.

 photo: Fiji - Cicia (FJCC44)

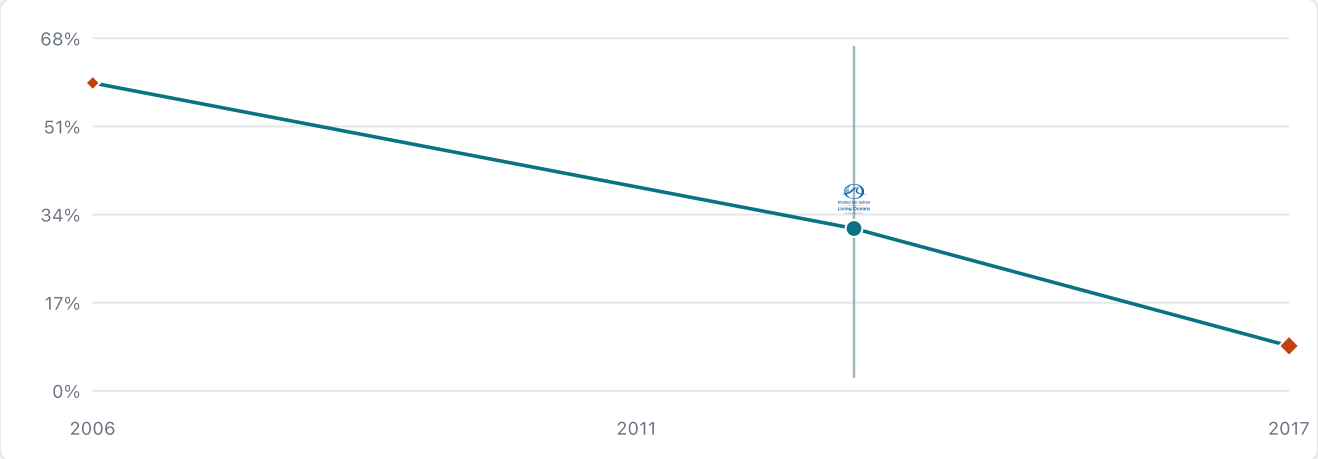
- Fiji - Cicia (FJCC44): No bleaching, disease lesion, or crown-of-thorns starfish in the habitat frames, but Anderson's sampling sheet records two of the colonies sampled here as 80% and 50% bleached and several others as 5–15% pale. 
- Fiji - Nayau (FJNA40): Bleaching: a bushy pocilloporid Anderson recorded as bleached, uniformly cream-white, and a second pocilloporid with pale, partly bleached tissue between still-brown polyps (single colonies, no extent inferred). The survey team's notes for Nayau's northwest side record Drupella snails on several Acropora colonies (station not stated). No crown-of-thorns starfish recorded. 
- Fiji - Nayau (FJNA38): Debris: an old anchor chain lying across the pavement has been colonized by small Pocillopora. 
- Fiji - Vanua Balavu (FJVB55): "Some COTS predation found at FJVB55" (stated in the survey notes) 
- Fiji - Vanua Balavu (FJVB61): Diploastrea at 20 m had a mortality gradient with what appears to be a high trematode abundance; diseased Porites were also common (survey notes) 
- Fiji - Vanua Balavu (FJVB60): Transects logged 13% dead coral 
- Fiji - Vanua Balavu (FJVB67): Physiological stress outliers: the one coral colony Anderson sampled here (F153, recorded on the sheet as 10% bleached) was flagged as a physiological stress outlier (Mayfield et al. 2017, PLoS ONE); island-level screening flagged 4 of the 18 corals with an outlier score. 
- Fiji - Mago (FJMG50): Survey notes record COTS predation with large areas of white corals; two large tables look pale under a strong blue cast (paling cannot be separated from natural pale color in these frames), and Anderson's sampling sheet records two of the five colonies sampled here as partly bleached (50% and 20%); several large tables turned over from possible storm damage. 
- Fiji - Mago (FJMG51): One Pocillopora damicornis colony that Anderson noted at the time as bleached, stark white beside pigmented neighbors; the sampling sheet records two of the three colonies sampled

here as 80–95% bleached (no reef-wide extent inferred). 

- Fiji - Tuvuca (FJTV43): Survey team's notes: mortality on tabular acroporids, with older dead skeleton on smaller colonies colonized by algae (the notes compare it with neighboring Tuvuca stations).
  
  photo: Fiji - Tuvuca (FJTV41)
- Fiji - Tuvuca (FJTV41): Bleaching: two colonies photographed bleached, a badly bleached fine-branching colony being overgrown by algae and a partially bleached pocilloporid; Anderson's sampling sheet records the six colonies sampled here as healthy, three of them pale or partly pale (up to 20%).
  
- Fiji - Vanua Vatu (FJVV36): Bleaching: Anderson's sampling sheet records two of the four colonies sampled here as 95% and 90% bleached and 'likely unhealthy' (F72, F73), and the frames of them show cream-white over nearly the whole colony (see the FJVV36 thumbnail); apart from the sampled colonies, no bleaching is visible in the reef frames. 

Coral cover over time (pooled)

One point per year: the mean of every hard coral cover value available for this region that year — Anderson's own dives and every independent survey station within 5 km of them. The vertical bar is the full range behind that mean. Different programs use different methods at different stations, so this is a regional summary, not a single comparable series. Years resting on fewer than three values are drawn as smaller points (2006). Non-CRD/LOF points are from Reef Check Foundation, WCS Fiji, and Vatuvara Foundation Fiji. Marker shape: ● Anderson's own dives, ◆ other organizations' surveys, the year includes Global Reef Expedition dives made with the Khaled bin Sultan Living Oceans Foundation (CRD+LOF data).



▼ Sites in this region (38)

- Fiji - Cicia (FJCC44) — 42% coral cover
- Fiji - Cicia (FJCC45) — 50% coral cover

- Fiji - Cicia (FJCC46) — 67% coral cover
- Fiji - Cicia (FJCC47) — 38% coral cover
- Fiji - Cicia (FJCC48) — 47% coral cover
- Fiji - Lau Islands: Vanua Balavu
- Fiji - Mago (FJMG49) — 53% coral cover
- Fiji - Mago (FJMG50) — 42% coral cover
- Fiji - Mago (FJMG51) — 47% coral cover
- Fiji - Nayau (FJNA38) — 48% coral cover
- Fiji - Nayau (FJNA39) — 52% coral cover
- Fiji - Nayau (FJNA40) — 44% coral cover
- Fiji - Nayau snorkel (FJNA38SN)
- Fiji - Tuvuca (FJTV41) — 28% coral cover
- Fiji - Tuvuca (FJTV42) — 37% coral cover
- Fiji - Tuvuca (FJTV43) — 41% coral cover
- Fiji - Vanua Balavu (FJVB52) — 47% coral cover
- Fiji - Vanua Balavu (FJVB53) — 25% coral cover
- Fiji - Vanua Balavu (FJVB54) — 37% coral cover
- Fiji - Vanua Balavu (FJVB55) — 29% coral cover
- Fiji - Vanua Balavu (FJVB56) — 16% coral cover
- Fiji - Vanua Balavu (FJVB57) — 13% coral cover
- Fiji - Vanua Balavu (FJVB58) — 13% coral cover
- Fiji - Vanua Balavu (FJVB59) — 10% coral cover
- Fiji - Vanua Balavu (FJVB60) — 15% coral cover
- Fiji - Vanua Balavu (FJVB61) — 15% coral cover
- Fiji - Vanua Balavu (FJVB62) — 30% coral cover
- Fiji - Vanua Balavu (FJVB63) — 28% coral cover
- Fiji - Vanua Balavu (FJVB64) — 2.5% coral cover
- Fiji - Vanua Balavu (FJVB65) — 3.3% coral cover
- Fiji - Vanua Balavu (FJVB66) — 12% coral cover
- Fiji - Vanua Balavu (FJVB67) — 22% coral cover
- Fiji - Vanua Balavu (FJVB68) — 30% coral cover
- Fiji - Vanua Balavu (FJVB69) — 9.0% coral cover
- Fiji - Vanua Balavu (FJVB70) — 17% coral cover
- Fiji - Vanua Vatu (FJVV35) — 49% coral cover
- Fiji - Vanua Vatu (FJVV36) — 33% coral cover
- Fiji - Vanua Vatu (FJVV37) — 42% coral cover

% coral cover by method

Pooled across 5 dive sites

Method	Mean % coral cover	Std. dev. between dive sites	n dive sites	Note
CoralSCOP (SAM-based mask-sum), edited photos	37%	±4.0	5	4 of these 5 values rest on 10–19 photographs (*)
Claude (Anthropic), blind point count	38%	±6.5	5	4 of these 5 values rest on 10–19 photographs (*)
In-water diver transect (line/point intercept)	45%	±5.0	5	—

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 5 dive sites in this unit that have a method comparison; the table for all 10 dive sites is on the Fiji - Lau 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 9.8 pp from it across 5 dive sites. Not in this ranking: CoralSCOP (edited), which measures coral area rather than points. 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 (edited)	Claude	Diver transect
FJCC45	41%* n=18	41%* n=18	50%
FJCC48	38%* n=14	39%* n=14	47%
FJNA40	31%* n=15	28%* n=15	44%
FJVB52	34%* n=11	39%* n=11	47%
FJTV42	38% n=23	45% n=23	37%

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. * marks a value resting on only 10–19 photographs, which is less certain.

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 10 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. Few usable habitat photos exist for Fiji: only 10 sites have 10 or more, and 9 of them have fewer than 20 (low-n), so these are not confident site estimates. Accuracy, Claude vs transect, 10 sites: mean difference -5.4 pp (95% CI -12.7 to +1.9), mean absolute difference 10.3 pp, r 0.35. Claude reads lower than the transect at most sites and does not track it from site to site. This is a methods comparison, not a ranking.

Nearby external survey stations

4 independent survey records within 5 km of a site in this region (each record counted once).

- Reef Check — Barracuda Point (2006): 59% hard coral cover, 4.99 km from Fiji - Cicia (FJCC44)
- Vatuvara Foundation Fiji / WCS Fiji via MERMAID — Ada01 (2017): 7.0% hard coral cover, 4.68 km from Fiji - Lau Islands: Vanua Balavu
- Vatuvara Foundation Fiji / WCS Fiji via MERMAID — Ada04 (2017): 9.3% hard coral cover, 4.50 km from Fiji - Vanua Balavu (FJVB54)
- Vatuvara Foundation Fiji / WCS Fiji via MERMAID — Kan04 (2017): 9.7% hard coral cover, 4.86 km from Fiji - Vanua Balavu (FJVB54)

All images from Coral Reef Diagnostics. Data are from the Khaled bin Sultan Living Oceans Foundation Global Reef Expedition, Coral Reef Diagnostics, Reef Check Foundation, WCS Fiji, and Vatuvara Foundation Fiji.


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