



## EXECUTIVE SUMMARY

### KEY FINDINGS

- **25.8%** global average hard coral cover in 2024.
- Overall, a **9.5% relative decline** in hard coral cover has been observed when comparing modern averages (2020–2024) with the reference period (1980–2009).
- **Four global coral bleaching events** recorded since 1998, each associated with a **6.5–9.9% relative loss** of global hard coral cover.
- **8.9% decline between 2023 and 2024** – the largest single-year loss on record, with the fourth global bleaching event not yet fully captured.
- **Recovery intervals are shrinking** from approximately 10 years to 5–6 years in many regions, with **no return to reference-period cover at any point since 2010**.
- **6% relative recovery** in global hard coral cover following the third global bleaching event, demonstrating coral reefs can recover when disturbance frequency eases.
- Projected frequency of global bleaching events suggests global hard coral cover will continue to decline.
- While the fourth global bleaching event was the largest and most intense event on record, the full ecological impacts of this event are not yet reflected in this assessment.
- **44.1% relative increase** in average global macroalgal cover relative to the 1980–2009 reference period, which nonetheless remains low at 6.8% globally.
- **21.1 million observations** analysed from **87,299 surveys**, across **36,886 reef sites**, representing the largest coral reef assessment to date.

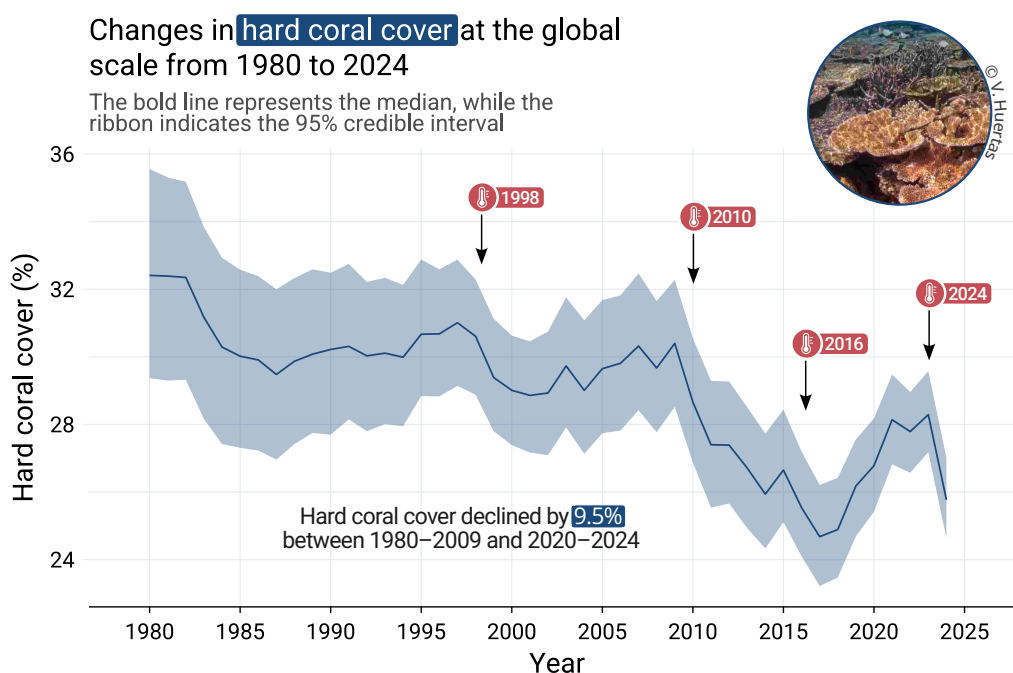
## OVERVIEW

Coral reefs worldwide are in decline, and the interval in which they recover between disturbances is shortening. Based on 21.1 million observations collected through 87,299 surveys across 36,886 reef sites between 1980 and 2024, the *Status of Coral Reefs of the World: 2025* describes multi-decadal trends in hard coral and macroalgal cover across the world's shallow-water, warm-water coral reefs, with detailed analyses for each of the ten regions of the Global Coral Reef Monitoring Network (GCRMN). The *Status of Coral Reefs of the World: 2025* – the seventh edition of the GCRMN's flagship assessment – is the most comprehensive assessment of coral reef condition and trends ever produced by the Network. Synthesising global and regional monitoring data, the report provides an unparalleled evidence base to inform coral reef conservation and policy worldwide.

The report draws on data from 600 contributing partners across more than 120 countries, territories, and economies; roughly three times the data available in 2020. Regional chapters were written by data contributors and regional experts, and the global report was externally peer-reviewed by the International Coral Reef Society.

Trends in hard coral and macroalgal cover were estimated using Bayesian hierarchical models, with regional estimates weighted by coral reef area to derive global averages. Change is expressed by comparing 2020–2024 with the reference period of relative stability (1980–2009). Estimates are medians with 95% credible intervals (CrI<sub>95%</sub>), and confidence that change occurred is expressed as evidence strength derived from Bayesian exceedance probabilities.

[Part 1](#) presents the global synthesis. [Part 2](#) assesses each of the 10 GCRMN regions. The [Conclusion](#) considers future trajectories and implications, including an invited section on the fourth global bleaching event.

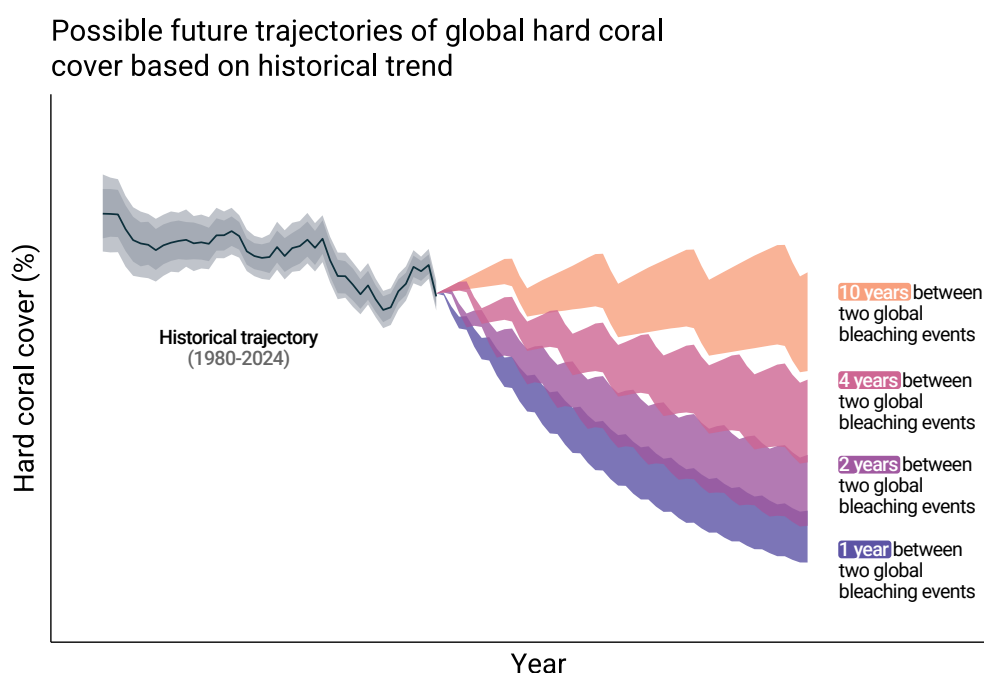


## GLOBAL HARD CORAL COVER HAS DECLINED BY APPROXIMATELY 9.5%

Hard coral cover averaged 30.2% across the 1980–2009 reference period and 27.3% across 2020–2024, a relative decline of 9.5% (CrI<sub>95%</sub>: 4.0–14.5%). Between 2023 and 2024 alone, cover fell by a relative 8.9% (CrI<sub>95%</sub>: 6.4–11.3%), the largest single-year decline on record, resulting in a single-year estimate for coral cover of 25.8% (CrI<sub>95%</sub>: 24.6–27.0%) for 2024. At this level of coral cover, many reef systems would still be expected to deliver key ecological services, including carbonate production, biodiversity, fisheries, coastal protection, and cultural value, though this is not the case across all regions. At local scales, a loss of this size is often recoverable; detected globally, it indicates a systemic shift across large spatial extents that is far harder to reverse.

## CORAL DECLINE IS STEPWISE, ACCELERATING AFTER 2010 AND DRIVEN BY INTENSIFYING MARINE HEATWAVES

Four periods of steep decline coincide with the four global bleaching events between 1998 and 2024, each associated with a relative loss of 6.5–9.9%. Since 2010, these events have recurred every four to six years. Satellite records show sea surface temperatures over coral reefs rose 0.81 °C between 1985 and 2025, amplified periodically by the El Niño Southern Oscillation (ENSO). Coupling this temperature data with the coral reef data in this report, declines in hard coral cover clearly coincide with peaks in the proportion of reefs exposed to heat stress during each bleaching event, indicating that the primary driver of coral decline is marine heatwaves, the frequency and intensity of which are increasing under climate change.



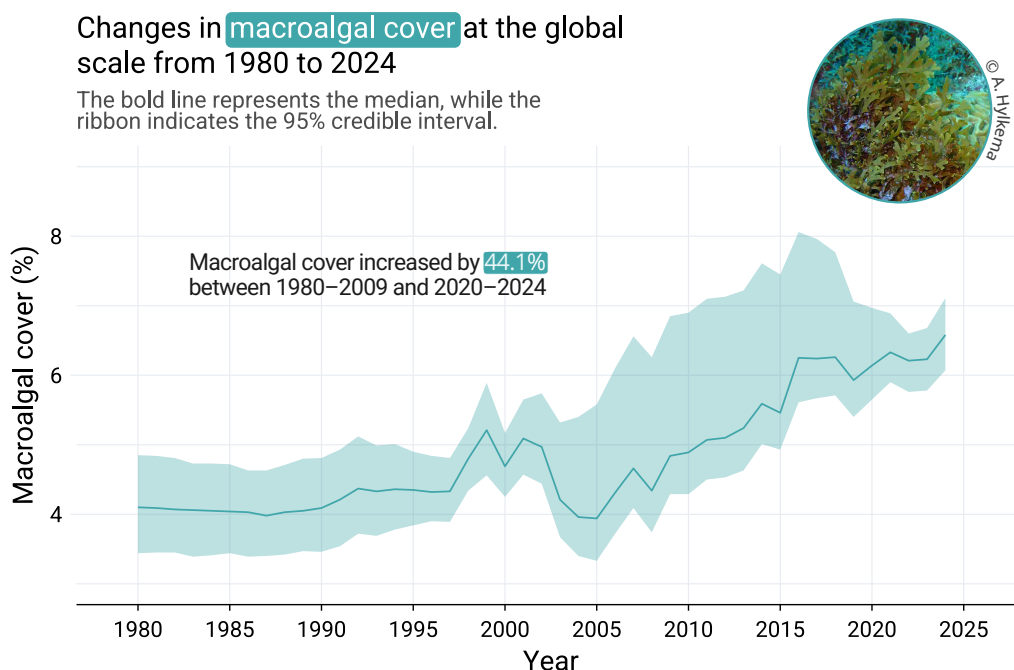
## RECOVERY IS POSSIBLE BUT CURTAILED BY INCREASING FREQUENCY OF LARGE-SCALE DISTURBANCES

Coral reefs continue to demonstrate the capacity to recover following major disturbances. This pattern is particularly evident after the third global bleaching event, when global average hard coral cover increased by 6% between 2017 and 2019 (CrI<sub>95%</sub>: 2.1–10.0%), relative to post-disturbance levels. While this pattern of increase did not fully restore hard coral cover to historical reference levels, it demonstrates that coral reefs can regain hard coral cover following disturbances given sufficient time. However, recovery intervals have shortened dramatically, from approximately one major disturbance per decade to major disturbances every four to six years in many regions after 2010. Marine heatwaves, compounded by local human and environmental pressures, are pushing coral reefs towards a sustained global decline. As recovery windows shrink, continued reef degradation is likely unless urgent climate mitigation and local management action occur.

Simulations projecting future trends with varying recovery times suggest an increase in the frequency of major disturbances – exceeding decadal events (*i.e.* more than one event every 10 years) – will lead to a continual decline in global coral cover. When the frequency of major disturbances exceeds historical patterns, the decline in coral cover is expected to be more severe than currently documented in this report.

## MACROALGAL COVER HAS RISEN STEADILY BUT REMAINS LOW GLOBALLY

Globally, average macroalgal cover on coral reefs has increased steadily by 44.1% since 1980 (CrI<sub>95%</sub>: 28.0–59.0%), with much of that increase occurring after 2010. At 6.8% (CrI<sub>95%</sub>: 6.1–7.1%) in 2024, this trend does not indicate a global shift toward algal dominance.

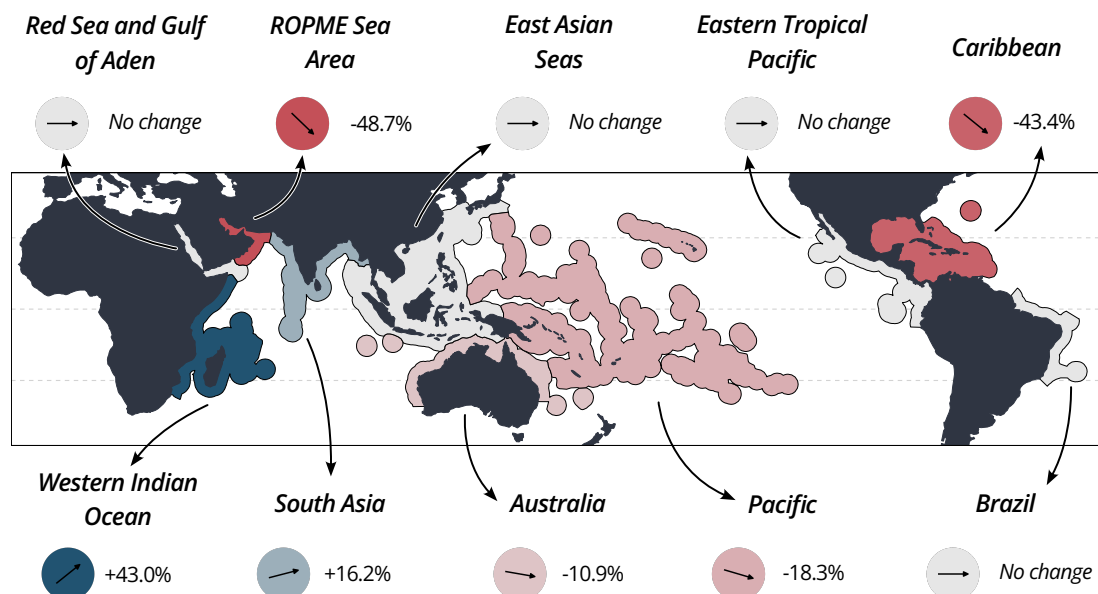


However, it remains concerning as increases in macroalgal cover at regional and local scales can hinder reef recovery. Macroalgal dominance is well documented in the Caribbean, and nearshore reefs that are subject to nutrient enrichment and herbivore loss remain at risk.

## CORAL REEFS ARE NOT CHANGING UNIFORMLY

Global hard coral cover trends mask regional differences. Regional trajectories demonstrate that coral reef decline is not uniform and that recovery remains possible under favourable conditions. Four regions have shown strong evidence of decline (Caribbean, ROPME Sea Area, Australia, and the Pacific). Four regions demonstrated fluctuations in hard coral cover over time and have not shown strong evidence of long-term changes relative to the reference period (Brazil, East Asian Seas, Eastern Tropical Pacific, and Red Sea and Gulf of Aden). In contrast, two regions demonstrated a strong recovery from already-degraded reference states (South Asia and the Western Indian Ocean). This divergence of regional trajectories is related to the compounding effects of local and regional-scale environmental and anthropogenic stressors – including acute events such as increased levels of coral predation (e.g. by crown-of-thorns starfish), tropical cyclones, and the often-chronic pressures from pollution, coastal development, and unsustainable marine resource use – particularly outside of global bleaching years. These diverging trajectories demonstrate that while multi-decadal decline is observed at global scales, coral reef trajectories are highly region-specific, and highlight the need to prioritise threat reduction at every scale.

Comparison of relative changes in hard coral cover between 1980-2009 to 2020-2024 across the ten GCRMN regions



## CONFIDENCE AND DATA LIMITATIONS

The decline in hard coral cover reported here is statistically robust but conservative. Data are scarce in the early years, limiting reference-period accuracy, and the reference period almost certainly already includes degraded reefs. The true long-term loss for regions with limited data available during the reference period is likely steeper than the data suggest. Throughout the report, the confidence in the changes is presented by assessing the strength of the evidence within a Bayesian inference framework.

The fourth and most intense global bleaching event concluded in 2025. This bleaching event began in 2023 and reached unprecedented levels of heat stress in 2024 (see [Box 2](#) for details). However, the full impact of this event has not been captured here as data in this report only extend to 2024.

## IMPLICATIONS

Coral reefs have not crossed a point of no return. They retain the potential to recover where disturbance intervals allow, and whether that potential is realised depends principally on climate change trajectories and their impact on ocean warming trends. Reducing local pressures cannot substitute for climate mitigation, but reefs under lower local pressure resist and recover from heat stress more effectively.

Standardised coral reef monitoring and reporting efforts have significantly improved the collective understanding of coral reef trends, but further expansion — especially in high-priority, vulnerable regions and using a broader set of indicators — is essential to guide more effective conservation. Six priorities emerge for strengthening coral reef monitoring on which all of this depends:

1. **Resourcing.** Increase funding for monitoring, particularly for developing nations;
2. **Coverage.** Extend monitoring in time and space, prioritising regions that hold a large share of the world's reefs but remain understudied;
3. **Standardisation.** Converge on common methods so data are comparable across programmes;
4. **Data access.** Improve data discoverability and interoperability while recognising data ownership under FAIR principles;
5. **Indicators.** Raise taxonomic resolution and broaden indicators beyond hard coral cover;
6. **Integration.** Combine ecological with socio-economic indicators to support whole-system interpretation.

The evidence presented in this report shows that coral reefs remain under unprecedented pressure, but also that recovery is still possible. The future condition of the world's coral reefs will depend on the actions taken during the coming decade to limit climate change, reduce local pressures, and sustain long-term monitoring and management.