



Coral Reefs of the Caribbean

Regional summary

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SUMMARY

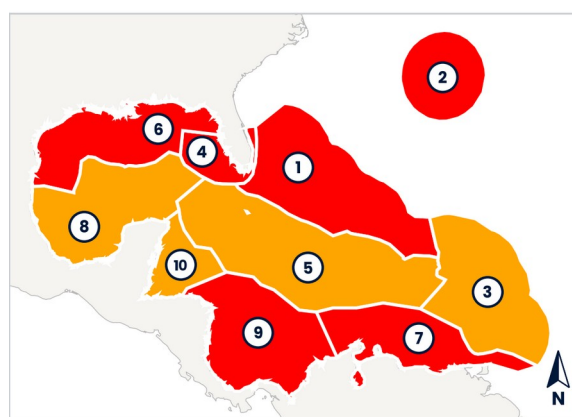
Caribbean coral reef ecosystems host evolutionarily distinct corals, invertebrates, and reef fish communities across the tropical Western Atlantic. These ecosystems face severe pressure from climate change-induced marine heatwaves, destructive coral disease, overharvesting of functional species, and intense land-based pollution. The IUCN Red List of Ecosystems assessment evaluated all 10 Caribbean coral reef ecoregions as Critically Endangered (CR). Based on the past 50 years of observed change, risk is driven by severe reductions in hard coral cover (Criterion A), restricted geographic distributions combined with ongoing threats (Criterion B), heat stress (Criterion C1), and disruption of the balance between corals, algae and fish (Criterion D). Under future climate scenarios, all ecoregions are Critically Endangered (CR), driven by projected annual marine heatwaves and mass bleaching events (Criterion C2).

REGIONAL DESCRIPTION

Coral reefs of the Caribbean extend across the tropical Western Atlantic, bounded by the Gulf of Mexico to the west, Bermuda to the north, Barbados to the east, and the continental coasts of Panama and Colombia to the south. Spanning both continental coastlines and scattered island systems, the region contains an estimated 13,554 km² of coral reefs. Reefs are grouped into 10 marine ecoregions defined by the Marine Ecoregions of the World, corresponding to Level 4 of the IUCN Global Ecosystem Typology.

Observed change

Based on the past 50 years of observed change
Criteria A1, B, C1 and D1



CO Collapsed
NT Near Threatened

CR Critically Endangered
LC Least Concern

EN Endangered
DD Data Deficient

VU Vulnerable
NE Not Evaluated

- ① Bahamian
- ② Bermuda
- ③ Eastern Caribbean
- ④ Floridian

- ⑤ Greater Antilles
- ⑥ Northern Gulf of Mexico
- ⑦ Southern Caribbean
- ⑧ Southern Gulf of Mexico

- ⑨ Southwestern Caribbean
- ⑩ Western Caribbean

Overall risk

Observed change plus future climate projections
Adds projected heat stress (C2, IPCC SSP2-4.5)

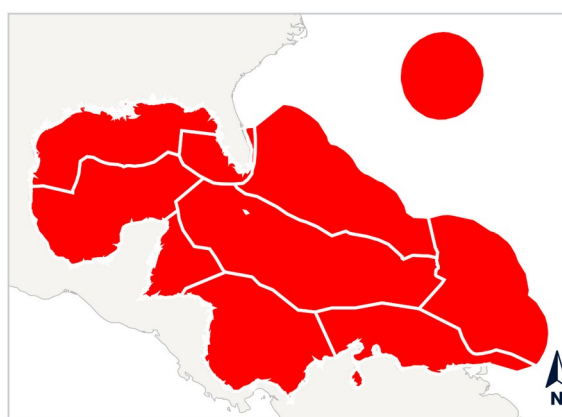


Figure 1. Risk categories of the 10 coral reef ecoregions of the Caribbean. Left: observed change, based on the past 50 years of observed change (criteria A1, B, C1 and D). Right: overall risk (official RLE category), based on observed change plus projected heat stress from ocean warming over the next 50 years (IPCC SSP2-4.5; criterion C2). Numbers identify the ecoregions listed below the maps and in Table 1.

BIOTIC COMPONENTS

Caribbean coral reefs are evolutionarily distinct from Indo-Pacific reefs following the closure of the Isthmus of Panama around 2.8 million years ago. The region contains 65 species of hard coral, all endemic to the Atlantic Ocean. Shallow reef crests were historically built by branching corals (*Acropora* spp.), while fore-reef environments are dominated by large bouldering corals (*Orbicella* spp.). Half of native hard coral species are threatened with extinction, with *Acropora* spp. considered functionally extinct in many areas. Associated biota include around 600 reef fish species, featuring herbivorous parrotfishes and surgeonfishes, and carnivorous groupers and snappers, alongside key grazing invertebrates like the urchin *Diadema antillarum*.

ABIOTIC ENVIRONMENT

Caribbean reefs occur in warm, nutrient-poor waters between 0–30 m depth. Most tropical reefs experience temperatures between 25°C and 30°C, though high-latitude subtropical reefs in Bermuda experience winter drops down to 17°C. Salinity ranges from 32–37 ppt and pH ranges from 7.8–8.6. The substrate typically features spur-and-groove formations interspersed with sand channels. Oceanic banks in the Gulf of Mexico, Greater Antilles and Western Caribbean feature exceptional water clarity extending to low-light depths. Tropical storms and hurricanes periodically shape reef architecture by breaking branching corals but can also provide relief by lowering water temperatures during times of bleaching.

MAIN THREATS

Marine heatwaves linked to climate change represent the greatest threat to Caribbean coral reefs. Thermal stress is causing severe mass coral bleaching and mortality (>50% mortality in recent events). Between 2018 and 2025, 99.9% of Caribbean reef sites experienced heat stress indicative of bleaching. Chronic ocean warming (+1.07°C since 1985) and ocean acidification (pH drop of ~0.1) impair calcification, reduce crustose coralline algae growth by as much as 40%, and impede coral recruitment. Local anthropogenic threats include coastal development and runoff of agricultural sediment and nutrients. Overharvesting and invasive species (*Pterois volitans*, *Unomia stolonifera*) are further reducing ecosystem resilience. Catastrophic disease outbreaks, such as White Band Disease, Stony Coral Tissue Loss Disease, and *Diadema* mortality events, add further pressure.

ASSESSMENT RESULTS

The IUCN Red List of Ecosystems assessment evaluated all 10 Caribbean coral reef ecoregions as Critically Endangered (CR). Based on the past 50 years of observed change, risk is driven by severe reductions in hard coral cover (Criterion A), restricted geographic distributions combined with ongoing threats (Criterion B), heat stress (Criterion C1), and disruption of the balance between corals, algae and fish (Criterion D). Under future climate scenarios, all ecoregions are Critically Endangered (CR), driven by projected annual marine heatwaves and mass bleaching events (Criterion C2).

Reduction in distribution (Criterion A): Four ecoregions are threatened, Bahamian (CR), Floridian (EN), Eastern Caribbean (EN) and Greater Antilles (VU), based on the proportion of monitoring sites where hard coral cover has fallen below the 5% net-accretion collapse threshold over the past 50 years.

Restricted distribution (Criterion B): Bermuda and Northern Gulf of Mexico qualify as Critically Endangered (CR), and Floridian is Vulnerable (VU), due to highly restricted geographic distributions (extent of occurrence) combined with ongoing threats such as coral bleaching.

Abiotic degradation (Criterion C): Based on historical heat stress (C1), 9 of 10 ecoregions are threatened, with Bermuda and Southern Caribbean being Critically Endangered (CR). Based on future climate projections (C2, IPCC SSP2-4.5), all 10 ecoregions are Critically Endangered (CR) due to projected annual severe heat stress exceeding collapse thresholds.

Biotic disruption (Criterion D): Eight of the 10 ecoregions are threatened, with four rated Critically Endangered (Bahamian, Floridian, Southern Caribbean, Southwestern Caribbean), driven by loss of hard coral cover, macroalgal phase shifts, and severe depletion of herbivorous and piscivorous fish biomass.

Table 1. Risk category of each coral reef ecoregion of the Caribbean under each criterion, observed change and overall risk. Numbers match Figure 1.

Ecoregion	A1	B1	B2	C1	C2	D1	Observed change	Overall risk
1 Bahamian	CR	LC	LC	VU	CR	CR	CR	CR
2 Bermuda	LC	CR	EN	CR	CR	LC	CR	CR
3 Eastern Caribbean	EN	LC	LC	EN	CR	EN	EN	CR
4 Floridian	EN	VU	LC	VU	CR	CR	CR	CR
5 Greater Antilles	VU	LC	LC	VU	CR	EN	EN	CR
6 Northern Gulf of Mexico	LC	CR	CR	LC	CR	VU	CR	CR
7 Southern Caribbean	LC	LC	LC	CR	CR	CR	CR	CR
8 Southern Gulf of Mexico	LC	LC	NT	EN	CR	NT	EN	CR
9 Southwestern Caribbean	LC	LC	LC	EN	CR	CR	CR	CR
10 Western Caribbean	LC	LC	LC	EN	CR	VU	EN	CR

Overall risk: the official RLE category; risk of collapse based on observed change plus projected heat stress from ocean warming over the next 50 years (IPCC SSP2-4.5; criterion C2). Observed change: risk of collapse based on the past 50 years of observed change (criteria A1, B, C1 and D). Categories: CO: Collapsed; CR: Critically Endangered; EN: Endangered; VU: Vulnerable; NT: Near Threatened; LC: Least Concern; DD: Data Deficient; NE: Not Evaluated.