



Coral Reefs of Brazil

Regional summary

Authors: Beatrice Padovani Ferreira; Camila Brasil L. da Silveira; Jéssica Borba Q. dos Santos; Thales Jean Vidal; Ana Lídia Bertoldi Gaspar; Luísa V. M. de Vasconcelos Queiroz-Véras; Ágatha Naiara Ninow; Fernando Castro Cardoso; Guilherme O. Longo, Kelly Yumi Inagaki; Giovanna Destri; Tito Lotufo; César A. M. M. Cordeiro; Rodrigo Leão de Moura; Carlos Hackrad; Fabiana Hackrad; Carlos Eduardo L. Ferreira; Miguel Mies; Mariana Coxey; Thiago B. N. de Oliveira; Mauro Maida; Zelinda Leão; Ruy K. P. Kikuchi; João Lucas Leão Feitosa; Jorge Luiz Silva Nunes; Cláudio Sampaio; Bráulio Almeida Santos; Leonardo T. Messias; Ana Paula Leite Prates; Franz Smith and Mishal Gudka.

SUMMARY

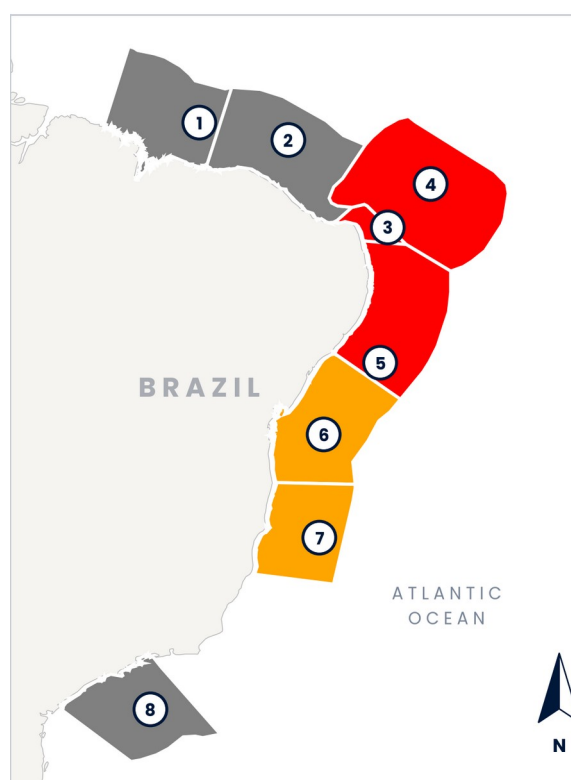
Brazilian shallow water coral reefs extend along nearly 3,000 km of the South Atlantic coast, including the Northeast Coral Coast formations, Abrolhos Bank and the oceanic reefs of Atol das Rocas and Fernando de Noronha. They are characterized by relatively low coral species richness but high endemism, unique characteristics, including their distinct growth form, and endemic species of coral, fish and invertebrates, supporting high levels of marine biodiversity. Primary threats include escalating marine heatwaves (notably in 2019–2020 and 2024), as well as overfishing, coastal development, land-based runoff, oil and gas activities, and invasive species. The IUCN Red List of Ecosystems assessment evaluated five of the eight ecoregions as Critically Endangered (CR), driven mainly by projected thermal stress (Criterion C2, IPCC SSP2-4.5), together with restricted geographic distributions (Criterion B), coral cover loss (Criterion A), heat stress (Criterion C1) and biotic disruption (Criterion D1). The remaining three ecoregions are Data Deficient (DD) overall. Parcel de Manuel Luís and Semiarid are Endangered (EN) based on reduced or restricted distribution (A1, B), but lack heat-stress and biotic data (C, D). As these could indicate a higher risk, they are Data Deficient (DD) overall. Queimada Grande lacks data for all criteria.

REGIONAL DESCRIPTION

Brazilian coral reefs cover approximately 1,100 km² along nearly 3,000 km of the South Atlantic coast, from the northern coast of Brazil to the marginal reefs of Queimada Grande in the south. They represent approximately 0.6% of global coral reef extent, yet include the Abrolhos Bank, the largest and richest reef complex in the South Atlantic, as well as the oceanic reefs of Atol das Rocas and Fernando de Noronha. Brazilian coral reefs span five Marine Ecoregions of the World. For this assessment, their boundaries were refined based on ecological evidence and expert knowledge, resulting in a total of eight ecoregions, 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

① Parcel de Manuel Luís

② Semiarid

③ Parrachos

⑧ Rocas Atoll and Noronha

CR Critically Endangered

LC Least Concern

EN Endangered

DD Data Deficient

⑤ Costa dos Corais

⑥ BTS and Baixo Sul

⑦ Abrolhos

⑧ Queimada Grande

VU Vulnerable

NE Not Evaluated

Overall risk

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

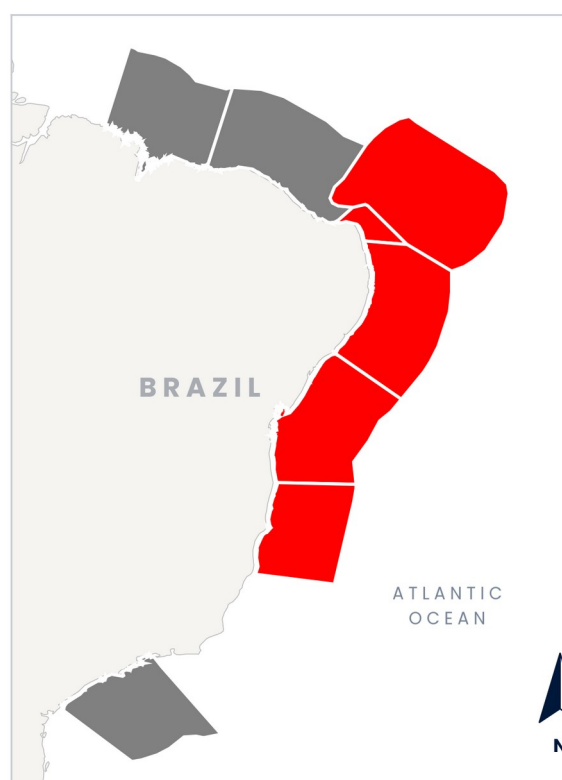


Figure 1. Risk categories of the eight coral reef ecoregions of Brazil. Left: observed change, based on the past 50 years of observed change (criteria A1, B, C1 and D). Right: overall risk (official RLE category), based on observed change plus projected heat stress from ocean warming over the next 50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

BIOTIC COMPONENTS

Brazilian coral reefs have relatively low coral species richness but high endemism, supporting 21 hard coral and five hydrocoral species. Reef frameworks are built by hard corals together with crustose coralline algae and bryozoans, forming distinctive structures such as the mushroom-shaped chapeirões of Abrolhos. Massive corals include the endemic genus *Mussismilia*, while branching *Millepora* hydrocorals contribute substantially to reef structural complexity. Benthic communities vary across the region and include macroalgae, turf algae, crustose coralline algae, sponges and soft corals, with high algal cover characteristic of several nearshore reefs. Brazilian reefs also support a distinctive reef-fish fauna, where approximately 24% of Southwestern Atlantic reef fishes are endemic. Functionally important groups include herbivorous parrotfishes and surgeonfishes, as well as predatory groupers and snappers.

ABIOTIC ENVIRONMENT

Brazilian coral reefs occur across a broad continental shelf with strong gradients in depth, sedimentation and terrestrial influence. Coastal reefs develop on mixed substrates, where seasonal rainfall and river discharge influence turbidity, nutrients, temperature and salinity. High sediment discharge near the Amazon River limits the development of shallow coral reefs. In contrast, offshore and oceanic reefs experience lower inputs from the land and generally have clearer, nutrient-poor waters. Ocean circulation, particularly the Brazil and South Equatorial Currents, influences

temperature and reef conditions, while waves and sediment resuspension further shape coral distribution and development.

MAIN THREATS

Marine heatwaves have emerged as the main threat to Brazilian coral reefs, with major thermal stress events recorded across the region. Severe bleaching and mortality of key coral species were experienced during recent events, particularly in 2019–2020 and 2024. Local human pressures include overfishing, coastal development, tourism, and land-based sediment and nutrient runoff, which contribute to declining water quality and reduce reef resilience and recovery. Coastal reefs are generally exposed to greater cumulative pressures than offshore reefs. Oil and gas activities, mining and shipping pose additional risks from contamination and disturbance, while invasive species such as sun corals (*Tubastraea* spp.) and lionfish (*Pterois* spp.) are emerging pressures on reef biodiversity. Together, increasing heat stress and persistent local pressures compromise coral recovery and ecosystem resilience.

ASSESSMENT RESULTS

The IUCN Red List of Ecosystems assessment found five of the eight Brazilian coral reef ecoregions to be Critically Endangered (CR), while three are Data Deficient (DD). Risk reflects reductions in hard coral cover (Criterion A), restricted geographic distributions combined with ongoing threats (Criterion B), historical and projected heat stress (Criteria C1 and C2), and disruption of key biotic processes (Criterion D). Under future climate scenarios (Criterion C2), all five ecoregions with sufficient data are Critically Endangered (CR). Parcel de Manuel Luís and Semiarid are Endangered (EN) based on reduced or restricted distribution (A1, B) but lack heat-stress and biotic data (C, D). As these could indicate a higher risk, they are Data Deficient (DD) overall. Queimada Grande lacks data for all criteria.

Reduction in distribution (Criterion A): Four ecoregions are threatened due to declines in hard coral cover over the past 50 years. Semiarid and Costa dos Corais are Endangered (EN), while Parcel de Manuel Luís and Baía de Todos os Santos and Baixo Sul are Vulnerable (VU). Abrolhos, Parrachos, and Rocas Atoll and Noronha are Least Concern (LC). Queimada Grande is Data Deficient (DD).

Restricted distribution (Criterion B): Seven ecoregions are threatened due to restricted geographic distributions combined with continuing threats. Parrachos and Rocas Atoll and Noronha are Critically Endangered (CR). Abrolhos, Baía de Todos os Santos and Baixo Sul, Parcel de Manuel Luís and Semiarid are Endangered (EN), and Costa dos Corais is Vulnerable (VU). Queimada Grande is Data Deficient (DD).

Abiotic degradation (Criterion C): Based on historical heat stress (C1), all five ecoregions with sufficient data are threatened. Baía de Todos os Santos and Baixo Sul, Costa dos Corais, and Parrachos are Endangered (EN), while Abrolhos and Rocas Atoll and Noronha are Vulnerable (VU). Based on future climate projections (C2, IPCC SSP2-4.5), all five are Critically Endangered (CR) due to projected increases in thermal stress. The remaining three ecoregions (Parcel de Manuel Luís, Queimada Grande and Semiarid) are Data Deficient (DD) for this criterion.

Biotic disruption (Criterion D): All five ecoregions with sufficient data are threatened due to disruption across key biotic components, including hard coral cover, the algae-to-coral ratio, and biomass of herbivorous and piscivorous fishes. Costa dos Corais is Critically Endangered (CR). Baía de Todos os Santos and Baixo Sul and Parrachos are Endangered (EN), and Abrolhos and Rocas Atoll and Noronha are Vulnerable (VU). The remaining three ecoregions are Data Deficient (DD).

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

Ecoregion	A1	B1	B2	C1	C2	D1	Observed change	Overall risk
1 Parcel de Manuel Luís	VU	EN	EN	DD	DD	DD	DD	DD
2 Semiarid	EN	EN	EN	DD	DD	DD	DD	DD
3 Parrachos	LC	CR	EN	EN	CR	EN	CR	CR
4 Rocas Atoll and Noronha	LC	CR	CR	VU	CR	VU	CR	CR
5 Costa dos Corais	EN	VU	VU	EN	CR	CR	CR	CR
6 BTS and Baixo Sul	VU	EN	VU	EN	CR	EN	EN	CR
7 Abrolhos	LC	EN	VU	VU	CR	VU	EN	CR
8 Queimada Grande	DD	DD	DD	DD	DD	DD	DD	DD

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), shown as DD where the overall risk is DD. Categories: CO: Collapsed; CR: Critically Endangered; EN: Endangered; VU: Vulnerable; NT: Near Threatened; LC: Least Concern; DD: Data Deficient; NE: Not Evaluated.