

# TECHNICAL REPORT

## PART 6: Offshore Marine

Reporting on data collected 2022 - 2023



## 13 Offshore Marine Environment

The Offshore Marine Environment in the Townsville Dry Tropics region consists of only one zone (the Offshore Marine Zone). The water quality and habit indices are measured in this zone, however currently only the habitat index is reported (see section 13.1.1 Data source). The extent of the zone is shown in Figure 25, and results are presented below.

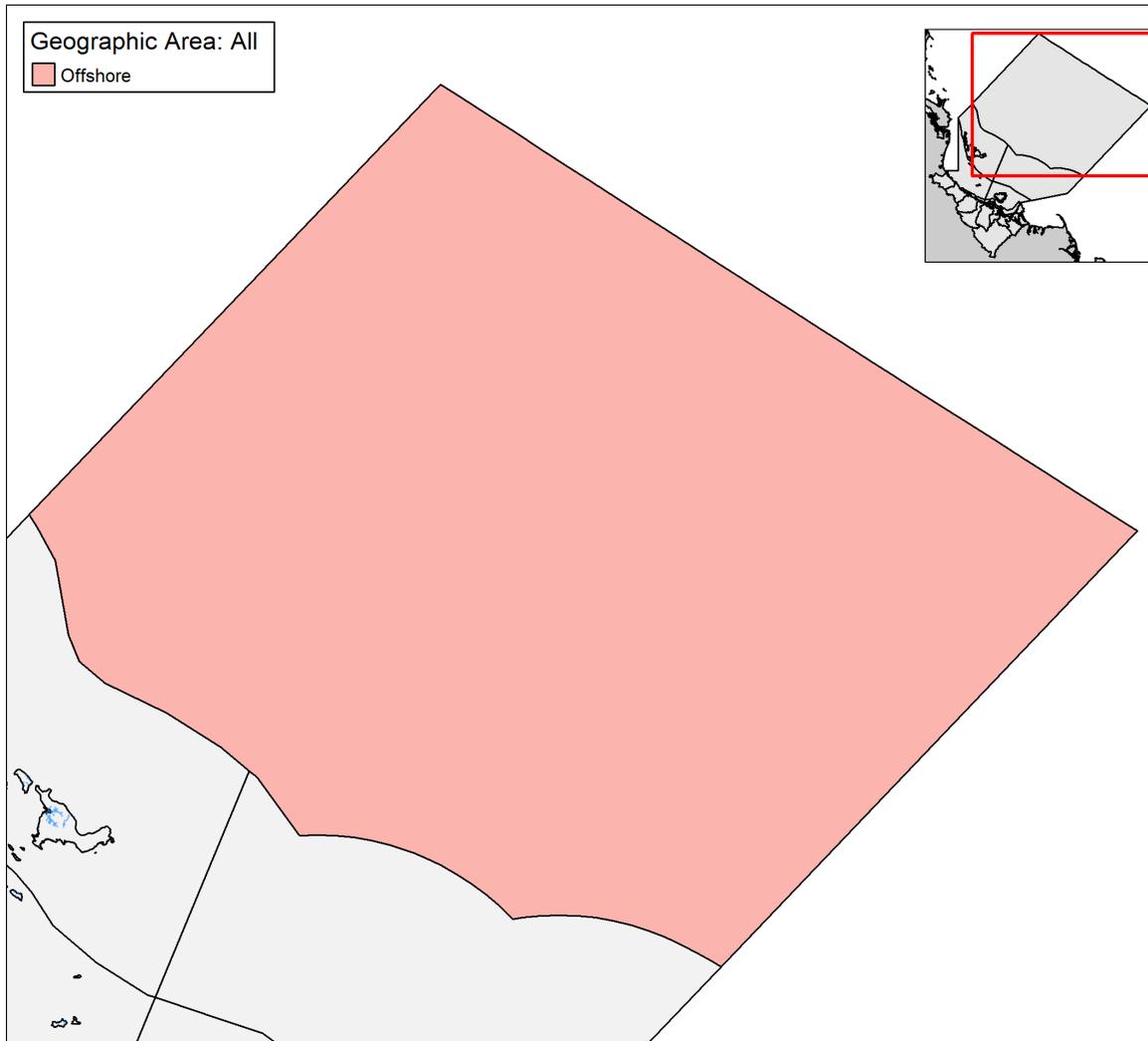


Figure 23. Dry Tropics offshore marine zone.

### 13.1 Water Quality

The 2022–2023 reporting period was the third year in which the water quality index has not been reported (see section 13.1.1 Data source). For years previous to 2020–2021 offshore water quality results were obtained from the BoM Marine Water Quality (MWQ) dashboard and were based upon relative area (%) of the water body where the annual mean value met the water quality guideline value (Table 71). The scores were similar for all reporting years.

Table 71. Current and previous water quality scores and grades for the Townsville Dry Tropics Offshore Marine Zone.

Zone	Water Quality				
	2022-2023	2021-2022	2020-2021	2019-2020	2018-2019
Offshore Marine	ND	ND	ND	100	97

**Standardised scoring range:** ■ Very Poor (E) = 0 to <21 | ■ Poor (D) = 21 to <41 | ■ Moderate (C) = 41 to <61 | ■ Good (B) = 61 to <81 | ■ Very Good (A) = 81 – 100 | ND = No Data | NA = Not Applicable (data available but not usable) | X = Data was not updated this year.

### 13.1.1 Data source

During 2019–2020 there were limitations in the technical support for maintaining the BoM Marine Water Quality (MWQ) dashboard processing scripts and satellite data streams. Consequently, the more recent data for the 2019–2020 time series may be of lower quality than earlier time series data and the confidence criteria for validation was lowered from 2 to 1. In early 2021 the Bureau of Meteorology advised that the MWQ dashboard had been decommissioned and that the underlying data preparation workflow was being discontinued. Alternative data sources are to be identified for the 2023–2024 reporting year.

## 13.2 Habitat

The habitat index for the Offshore Marine Zone consists only of the coral indicator category. The coral indicator category sources its results from AIMS’ Long-Term Monitoring Program (LTMP) (AIMS 2023). In the Townsville Dry Tropics region this data is updated every year with the most recent update occurring in 2023.

### 13.2.1 Overall Summary: Offshore Habitat

The score for the habitat index in the Offshore Marine Zone was similar to the previous reporting period, receiving a score of 63 within the same grade (good). These results show the continued stability of coral health in the Offshore Marine Zone after several years of disturbances (Table 72).

Table 72. Standardised score for the Offshore Marine Zone habitat index.

Zone	Coral	Habitat Index				
		2022-2023	2021-2022	2020-2021	2019-2020	2018-2019
Offshore Marine Zone	63	63	64	62	54	59

**Standardised scoring range:** ■ Very Poor (E) = 0 to <21 | ■ Poor (D) = 21 to <41 | ■ Moderate (C) = 41 to <61 | ■ Good (B) = 61 to <81 | ■ Very Good (A) = 81 – 100 | ND = No Data | NA = Not Applicable (data available but not usable) | X = Data was not updated this year.

#### 13.2.1.1 Key Messages

- The Offshore Marine Zone coral grade remained.
  - Juvenile density was graded as “very good” at 7 of 9 reefs surveyed.
  - All coral reefs had an overall grade of “moderate” or “good”.

### 13.2.2 Coral

Coral data was collected by the Australian Institute of Marine Science’s LTMP (AIMS 2023). In previous reporting years additional coral monitoring has been conducted by Reef Check Australia

(RCA), however no additional sampling occurred during 2022–2023 due to a limited budget. Coral was monitored between Mar 2023 and May 2023.

### 13.2.2.1 Monitoring Sites

The coral indicator category was monitored at nine locations in the Offshore Marine Zone. All sites were monitored as part of the LTMP and have been sampled in previous years (Figure 26).

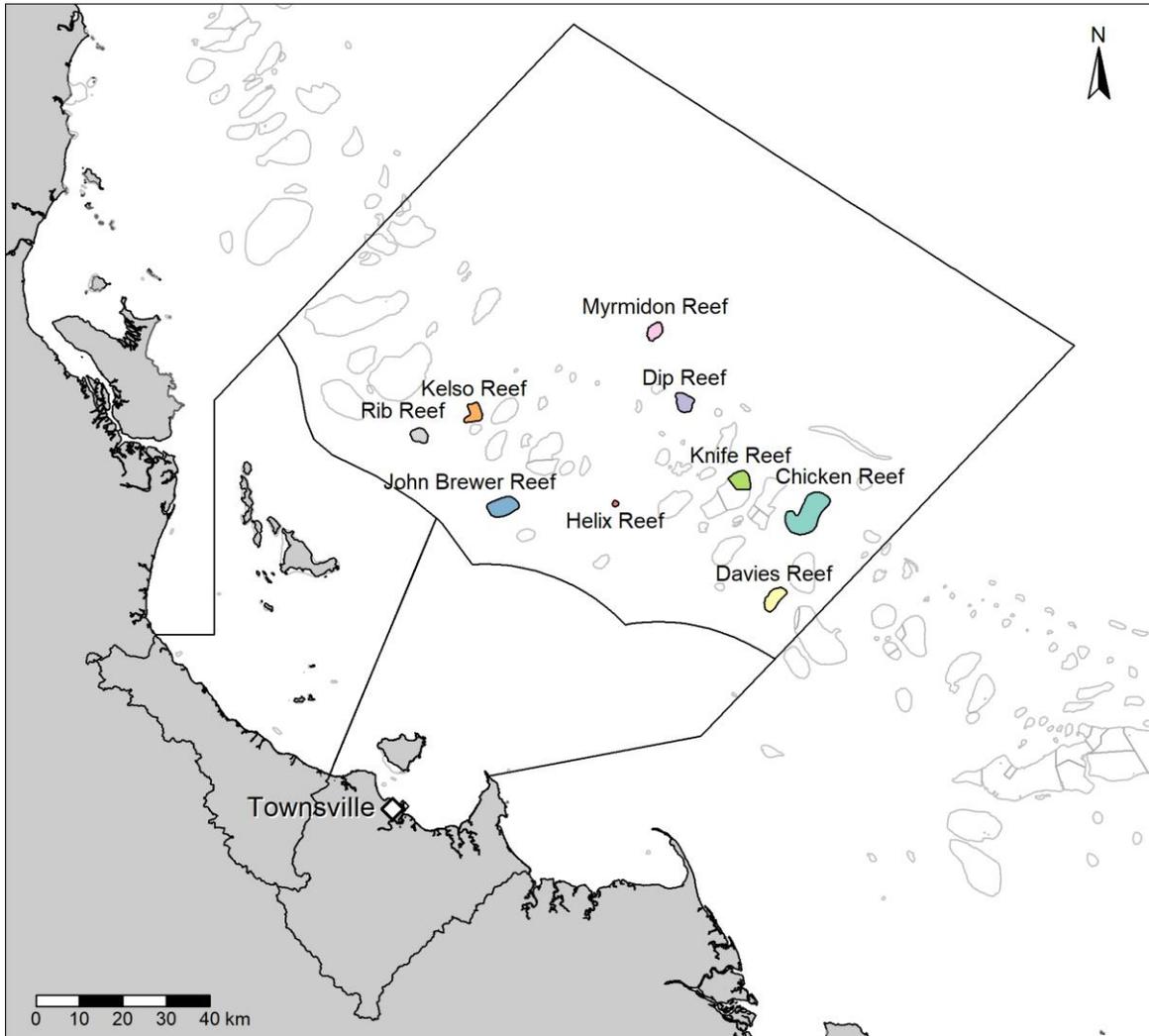


Figure 24. Offshore marine coral sampling locations in the Dry Tropics region.

### 13.2.2.2 Result: Offshore Coral

In the Offshore Marine Zone, the coral indicator category is comprised of three indicators: change in coral cover, percentage of coral cover, and juvenile density. Base on the combined scores of these indicators overall offshore coral index score remained good with individual reefs all grades as being in either moderate or good condition (Table 73). Contributing strongly to the good coral index score were high numbers of juvenile corals with scores for the Juvenile density indicator remaining good or very good at all reefs. In contrast, scores for the Coral cover indicator were variable ranging from very poor at John Brewer Reef, where corals are yet to recover from a recent crown-of-thorns starfish

outbreak<sup>9</sup>, through to good at the more offshore reefs of Chicken, Knife, and Myrmidon. Fluctuation in coral cover is expected as reefs are exposed to severe disturbances, of concern is the slower recovery suggested by poor scores from the Cover change indicator at Davies and Helix. However, the moderate to good cover change scores at other reefs demonstrate ongoing recovery potential (Table 73).

Table 73. Coral indicator and indicator category scores for the Offshore Marine Zone.

Reef	Change in Coral Cover	% Coral Cover	Juvenile Density	Standardised Score (Grade)
Chicken Reef	53	73	100	75
Davies Reef	25	50	100	58
Dip Reef	60	42	76	60
Helix Reef	26	44	100	57
John Brewer Reef	45	18	63	42
Kelso Reef	47	38	100	62
Knife Reef	48	70	100	73
Myrmidon Reef	51	63	100	71
Rib Reef	74	31	100	68
Offshore Marine Zone	48	48	93	63

**Standardised scoring range:** ■ Very Poor (E) = 0 to <21 | ■ Poor (D) = 21 to <41 | ■ Moderate (C) = 41 to <61 | ■ Good (B) = 61 to <81 | ■ Very Good (A) = 81 – 100 | ND = No Data | NA = Not Applicable (data available but not usable) | X = Data was not updated this year.

### 13.2.3 Confidence Scores

The overall confidence of the coral indicator category was high with a rank of 4 out of 5. Only Representativeness and Measured Error were not given 3/3 as some components of the indicator do not have their error quantified, and there are several reefs that are not part of the LTMP surveys.

Table 74. Confidence scores for the coral and seagrass indicator categories.

Indicator Category	Maturity (x0.36)	Validation (x0.71)	Representativeness (x2)	Directness (x0.71)	Measured error (x0.71)	Score (Rank)
Coral	3	3	2	3	2	10.8 (4)

Rank based on score: 1 (very low) = 4.5 to 6.3; | 2 (low) = >6.3 to 8.1; | 3 (moderate) = >8.1 to 9.9; | 4 (high) = >9.9 to 11.7; | 5 (very high) = >11.7 to 13.5.

<sup>9</sup> Reef Monitoring | John Brewer Reef | Benthic community cover (aims.gov.au)