

GRIERSON REEF (UNION REEFS)

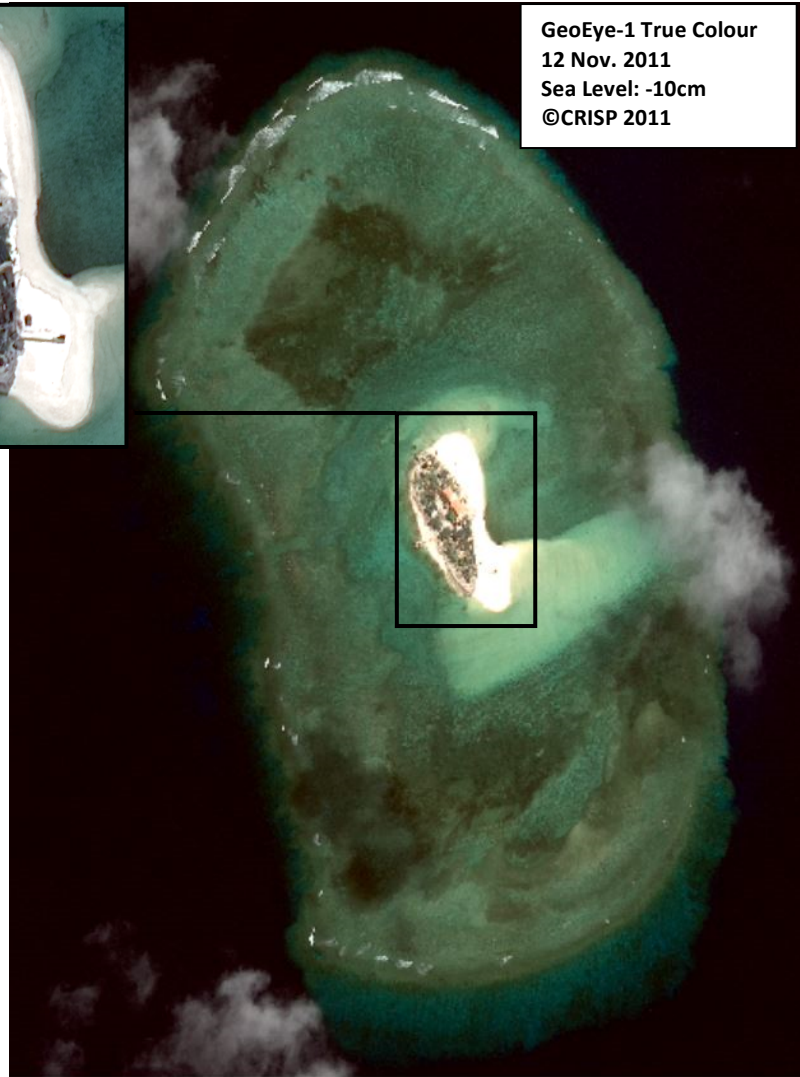
9°54'08.97"N, 114°33'50.89"E

Geographic area

Grierson Reef is a shallow reef platform located in the southeastern part of Union Reefs between Bamford Reef 1 (around 1.66NM southwest) and Ross Reef (around 1.5NM east). The reef platform extends 1.1km along its north-south axis and 550m along its west-east axis.

Land area above water

An above-water land area is located in the centre of the reef flat. It is composed of an elongated built-up area (around 175m long by 50m wide and an area of 6,700m²) enclosed within a wide seawall. Some terrestrial vegetation (trees mostly) can be seen within the seawall. East of the seawall, there is an above-water area of sand (unbuilt) (8200m²). These sandy areas extend seaward up to 40m and appear to connect to northeastward sand plumes, suggesting that the sandy areas are dynamic and therefore temporary. This is confirmed by other satellite images where the eastern sandy areas have different shapes, sizes and locations (see images from 15 January 2012, 26 February 2014 and 4 October 2014 viewable on Google Earth). Satellite images from 26 February 2014 and 4 October 2014 also show that a new above-water area that extends 40-45m has been added west of the seawall and enclosed in a new seawall. This newly built area occupies a slightly larger area than what was already enclosed within the first seawall. A few buildings, some vegetation, drainage systems and other construction works are visible within this new area.



GeoEye-1 True Colour
12 Nov. 2011
Sea Level: -10cm
©CRISP 2011

0 0.1 0.2 0.4 Km

Human infrastructure

Within the seawall, 10 man-made structures can be counted, one of which is larger than the others (35m by 12m). Most of the roofs have solar panels and some wind turbines appear located along the seawall. Two 20-25m long jetties built of concrete can be seen on the southeastern tip and west side of the above-water land area. However, the latter, which must have been the old pier built prior to recent constructions activities, provided access to an above-water sandy area and has since been removed (this is apparent on the 26 February 2014 satellite image available on Google Earth). Two sets of non-accessibility devices are placed along the outer part of the reef flat: 150m long in the west and 300m long in the south.

Intertidal and submerged area

The aerial coverage of the coral reef platform is 0.61km². The reef flat is 0.5m² and the reef slope 9100m². Overall, the reef flat is around 1m deep throughout. It is shallow and flat and is therefore likely to be at least partly exposed at Lowest Astronomical Tide. The longest reef slope is located south of the reef platform and extends 80m at 3-4m depth. Dredging marks are visible in the 12 November 2011 satellite image. Four dredgers can be seen in the north and south tip of the island, likely contributing to the northeastward sand plume. Pronounced dredging marks are visible in satellite images captured in 2014, extending from Grierson Island to the reef slope. Shipping activities (including fishing and dredging) are visible in all the images.

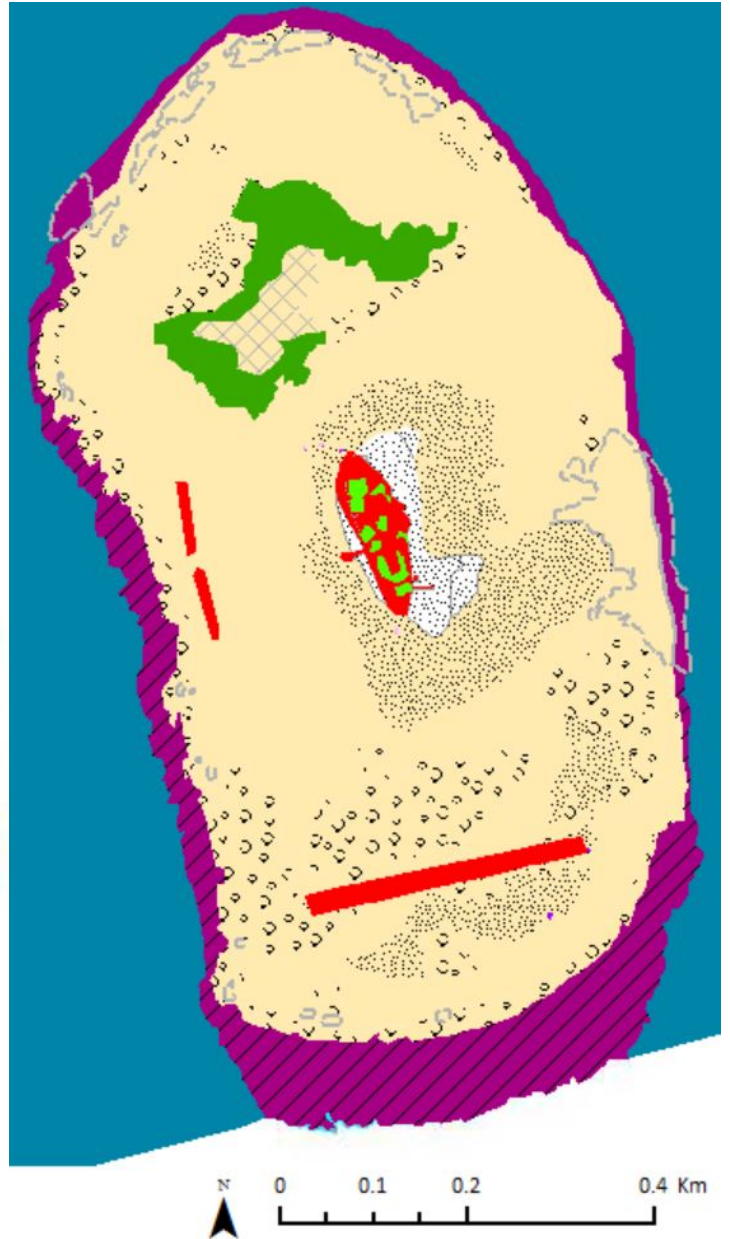
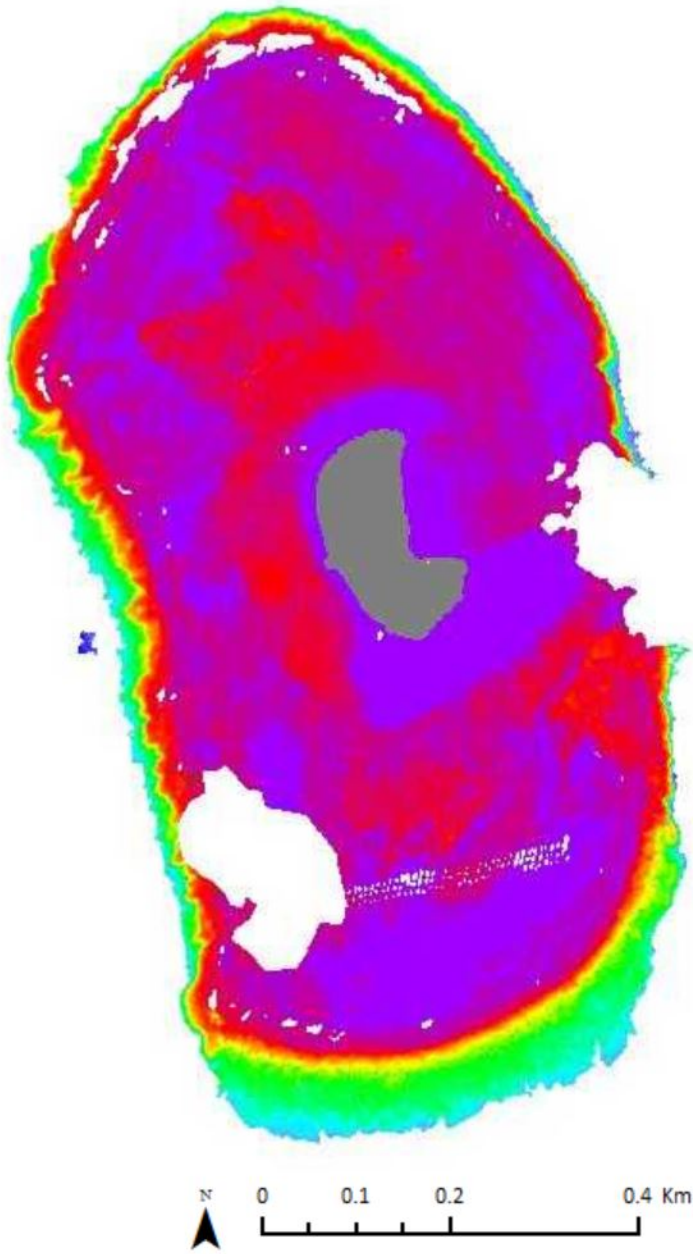
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Derived primarily from GeoEye-1 satellite data captured on 12 November 2011 [Sea Level: -10cm]

Bathymetry Map

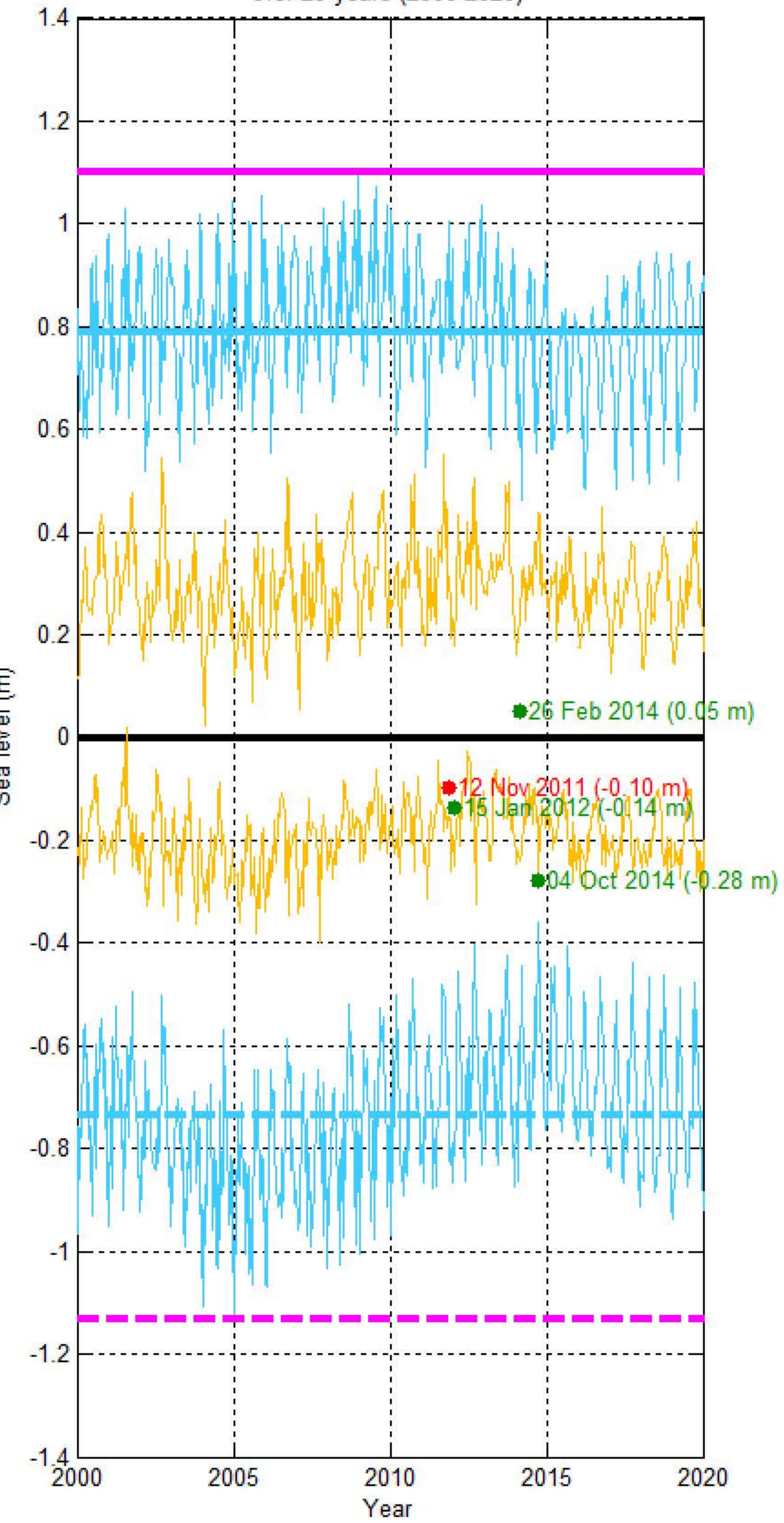
Habitat Classification and Land Cover Map



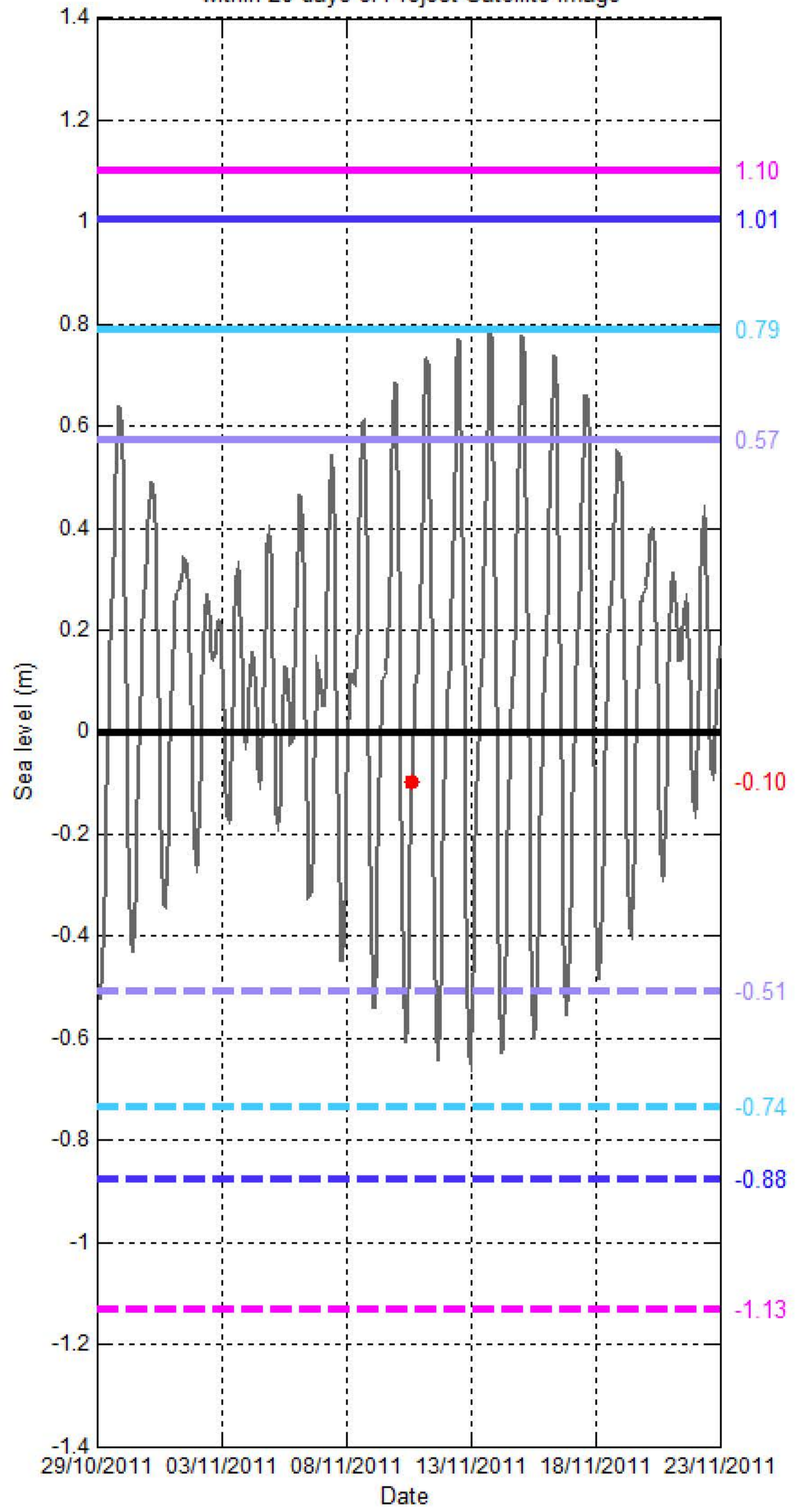
Sea level (SL) at GRIERSON REEF (UNION REEFS)

[9°54'08.97"N, 114°33'50.89"E]

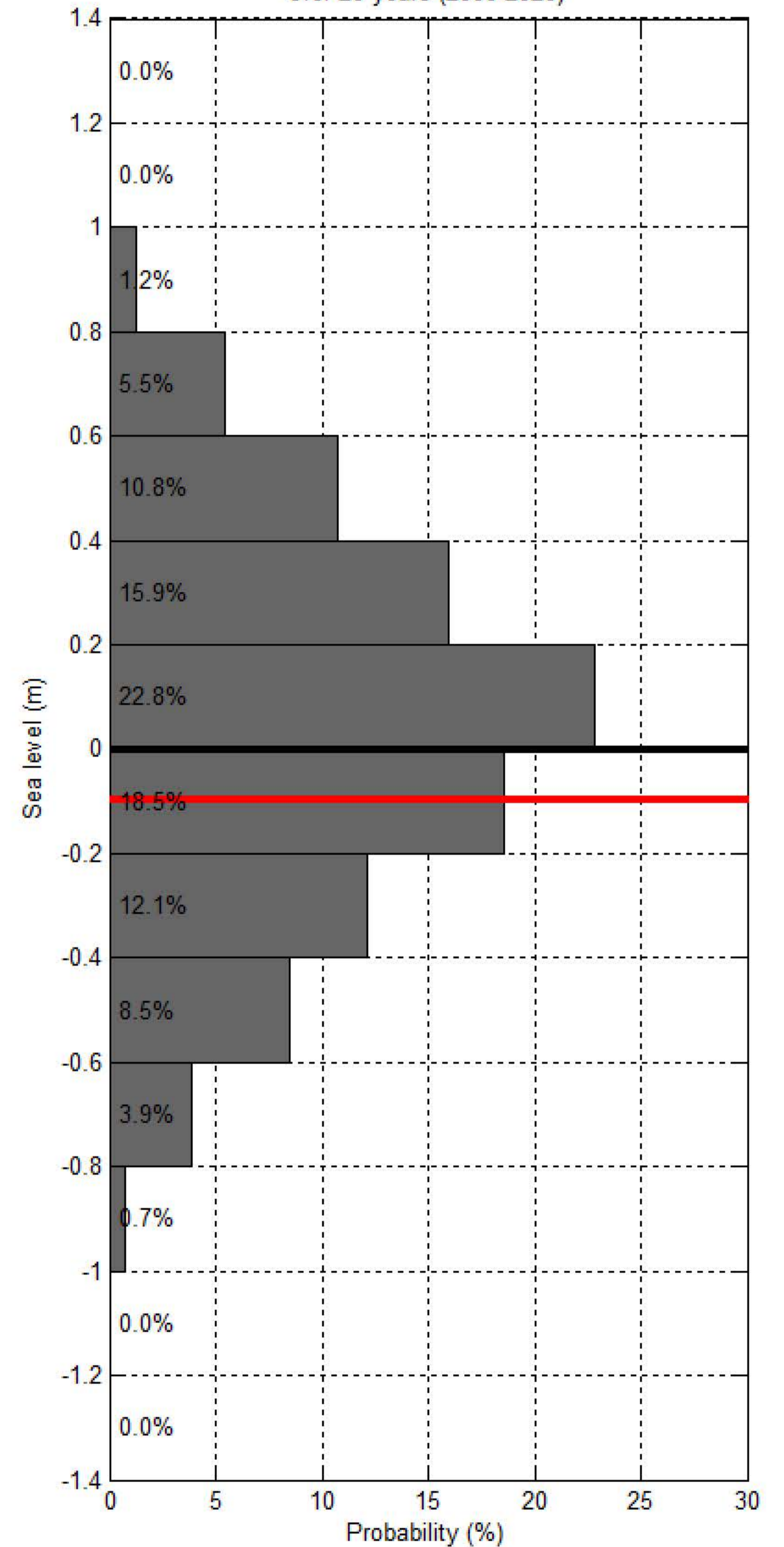
Sea level at spring/neap tide at UNION REEFS - GRIERSON REEF over 20 years (2000-2020)



Sea level at UNION REEFS - GRIERSON REEF within 20 days of Project Satellite Image



Probability of sea level at UNION REEFS - GRIERSON REEF over 20 years (2000-2020)



— Hourly sea level
 — SL at spring tide
 — SL at Mean High Water Spring
 — SL at highest tide of the year
 — SL at Mean Higher High Water
 — SL at Highest Astronomical Tide
 ● Project Satellite Image
— Mean Sea Level
 — SL at neap tide
 — SL at Mean Low Water Spring
 — SL at lowest tide of the year
 — SL at Mean Lower Low Water
 — SL at Lowest Astronomical Tide
 ● Google Earth and Landsat satellite images