

LOVELESS REEF

9°51'11.71"N, 114°16'42.10"E

Geographic area

Loveless Reef is a shallow coral reef platform located in the northwest of Union Reefs between Gent Reef (around 1.8NM northeast) and Collins Reef (around 4.2NM south). It seems to be connected to both reefs by deeper coral stretches of mostly less than 10m depth. Loveless Reef overall (including the deeper coral reef sections that are visible on satellite imagery) stretches 3km along its northeast-southwest axis by 2km along its northwest-southeast axis.

Land area above water

One small above-water sand bank of 70m by 20m is visible in the southeastern part of the 18 January 2012 satellite image.

However, it is not visible on the 17 February 2006 satellite image viewable on Google Earth.

Furthermore, it is visible but in a different location in the 17 December 2012 and 22 February 2015 satellite images also viewable on Google Earth. Therefore, this sand bank appears to be dynamic under the combined effect of astronomic tides, storm surges and wind-waves. Furthermore, on the basis that the 18 January 2012 satellite data was captured when the sea level was 4cm below Mean Sea Level, the sea level is expected to increase by over 80cm at Mean High Water Spring, which may be sufficient to submerge this sand bank.

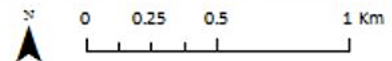
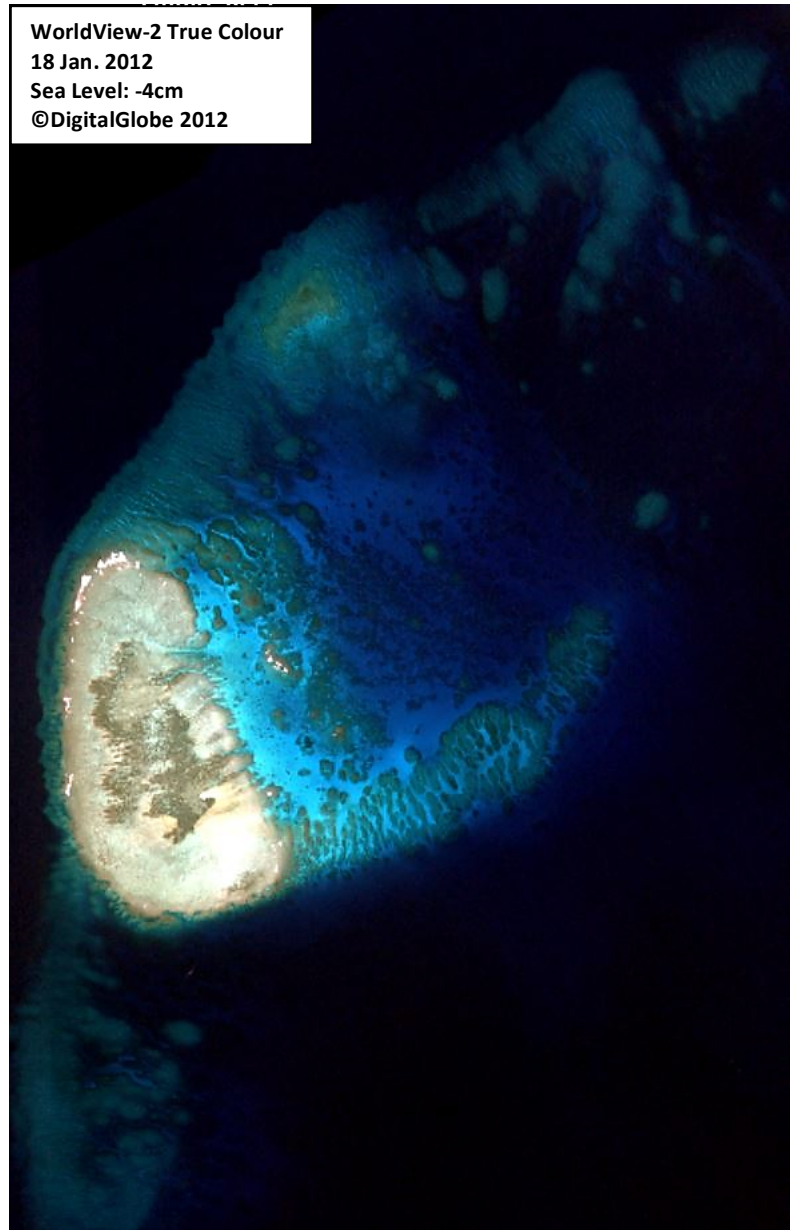
Human infrastructure

There are no man-made structures on this reef as at 22 February 2015.

Intertidal and submerged area

The aerial coverage of the coral reef area is 3.82km², of which 0.86km² is reef flat and 2.96km² is reef slope or deeper reef formation. In addition to the emerged sand bank at Mean Sea Level in the 18 January 2012 satellite image, the other shallowest part of the reef flat is another sand bank located 130m southwest and is 0.7-1m deep on a small area of 50m by 50m. The rest of the reef flat is 1-2m deep. Most of the reef flat is expected to remain submerged at Lowest Astronomical Tide, except the two sand banks mentioned. An area of 0.22km² of the reef flat is covered by coral/seagrass/algae. The reef slope extends over 1.5km northeastwards where pronounced spurs and grooves are visible at a depth of 5-10m.

As at 18 January 2012, whilst there was no evidence of any human infrastructure, there were dredging marks in the central part of the reef flat (54,000m²). It is unclear whether additional dredging activities have taken place since as the clarity of recent satellite image viewable on Google Earth has been affected by water ripples which negatively impact interpretation.

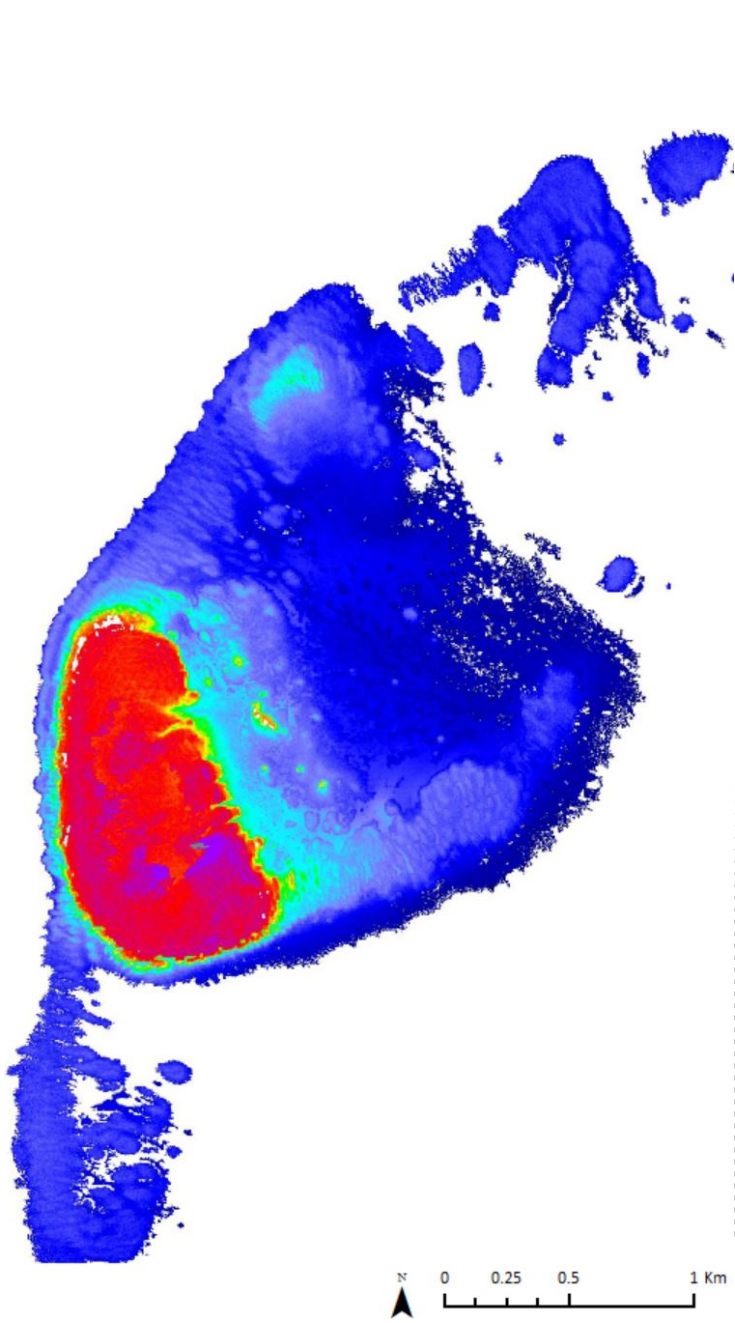


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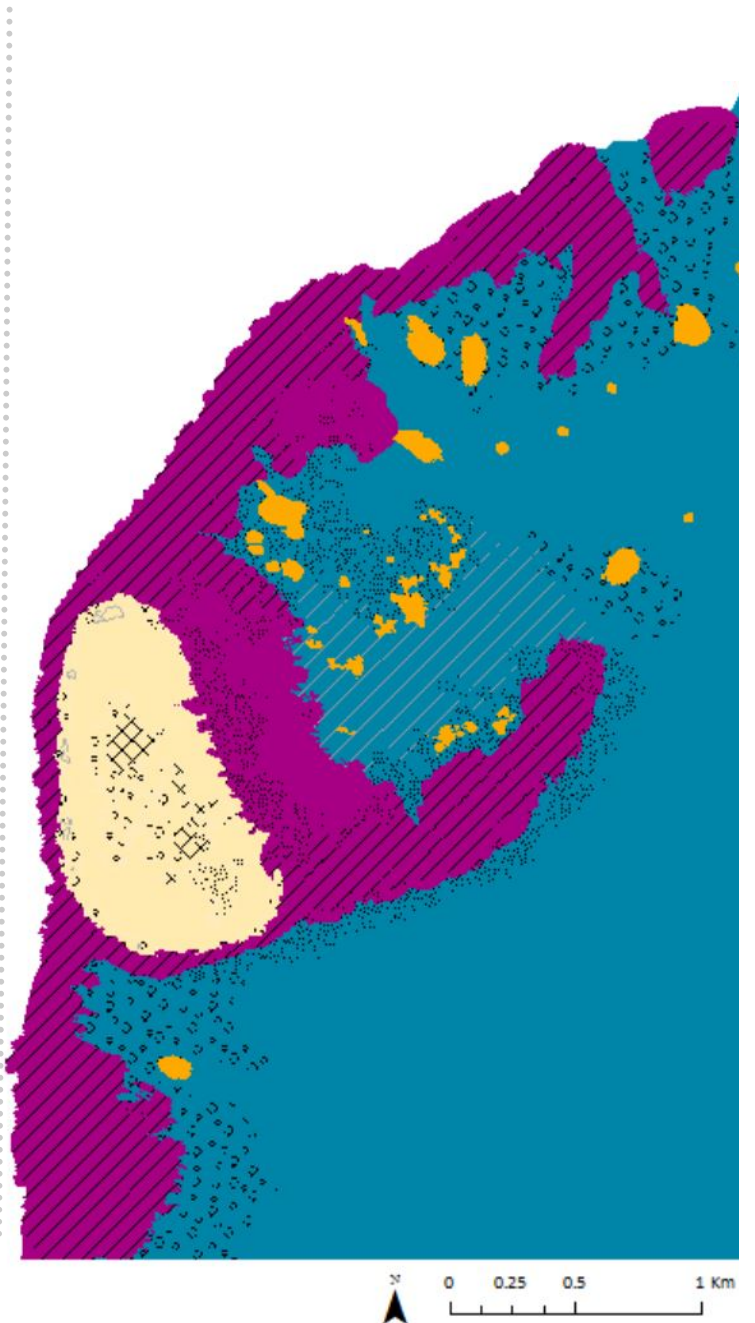
9°51'11.71"N, 114°16'42.10"E

Derived from WorldView-2 satellite data captured on 18 January 2012 [Sea Level: -4cm]

Bathymetry Map



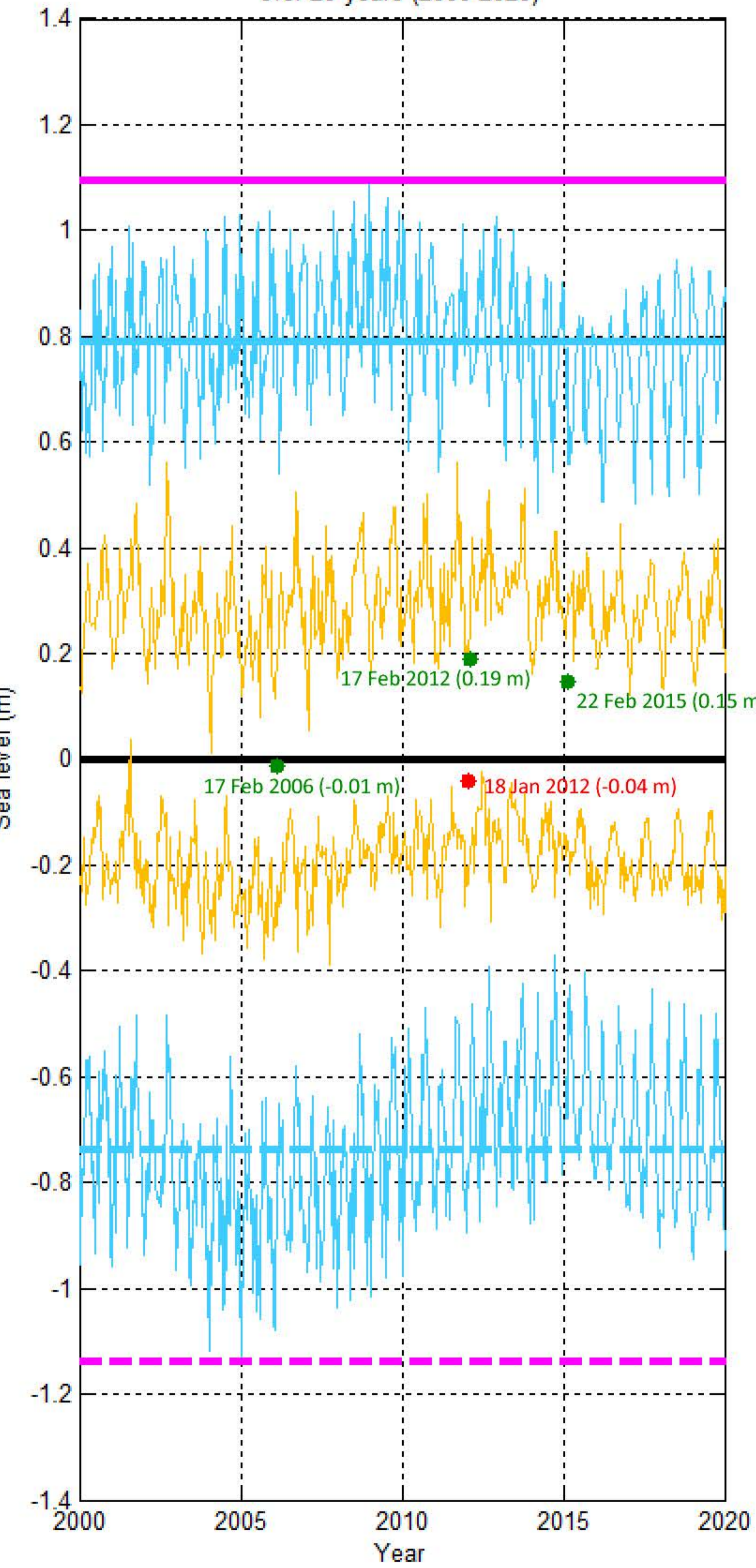
Habitat Classification and Land Cover Map



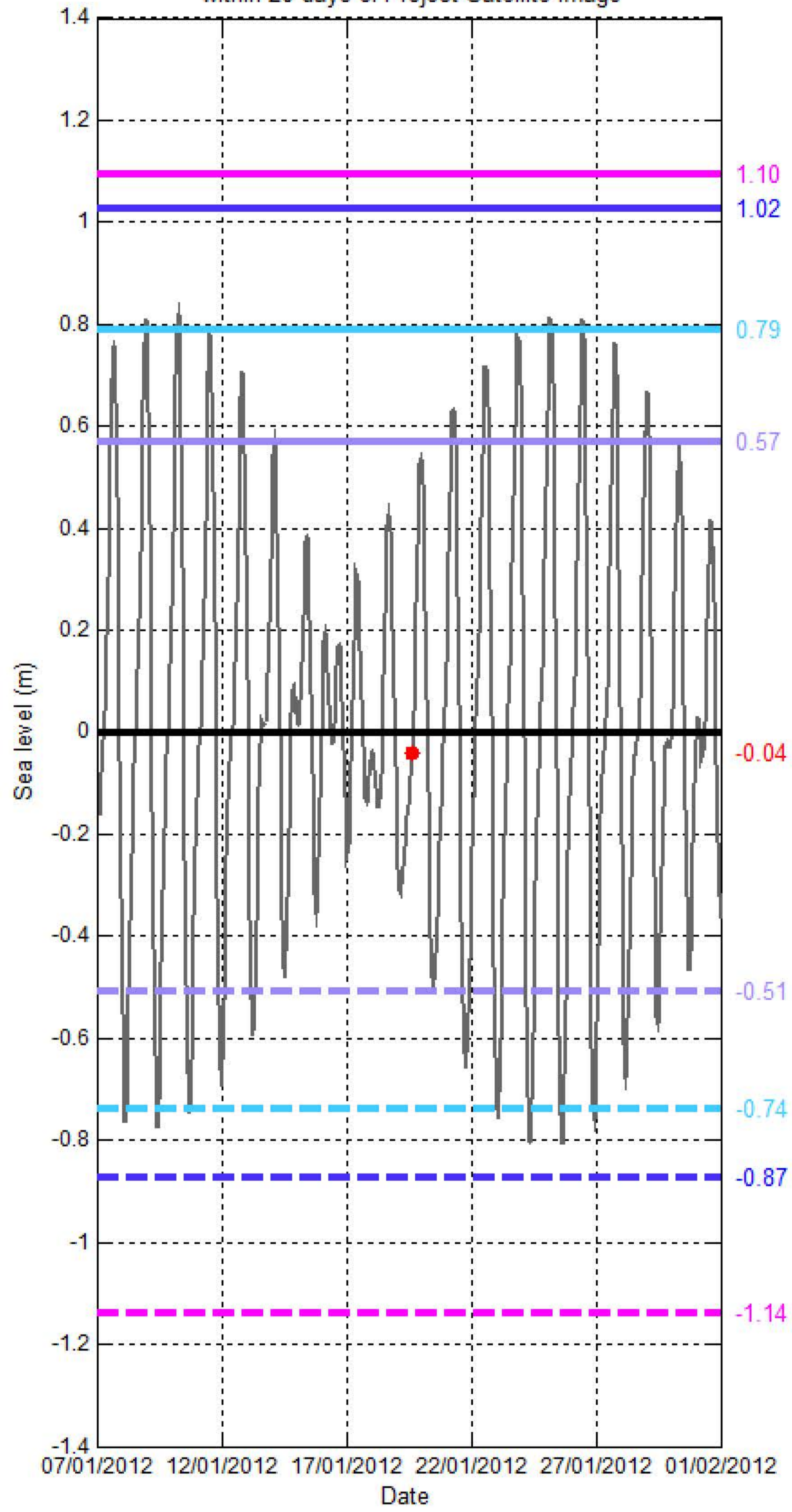
Sea level (SL) at LOVELESS REEF (UNION REEFS)

[9°51'11.71"N, 114°16'42.10"E]

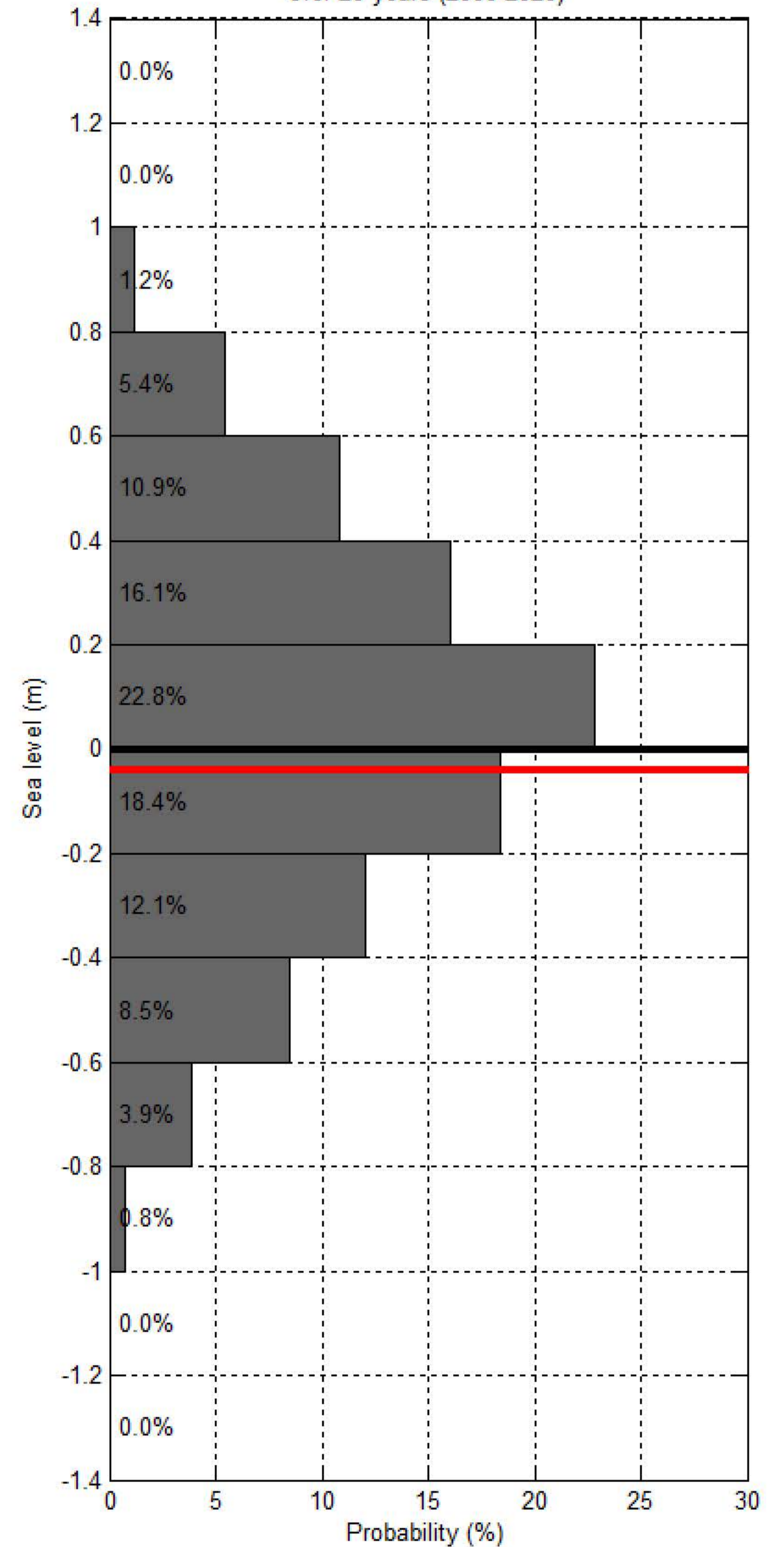
Sea level at spring/neap tide at UNION REEFS - LOVELESS REEF over 20 years (2000-2020)



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



Probability of sea level at UNION REEFS - LOVELESS 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