

DISCOVERY GREAT REEF

10°03'28.5"N, 113°51'15.63"E

Geographic area

Discovery Great Reef is an isolated, long (close to 15km) and narrow (1.8km in the widest point) coral atoll in the northwestern part of the Spratlys, located southwest of Tizard Bank and over 200NM northwest of the islands of Palawan and Borneo. The closest shallow geographic features are Discovery Small Reef, less than 9NM southeast and Western Reef, over 13NM northwest.

Land area above water

There is one small barren sand bank of 15m by 30m on the southwestern side of the reef flat in the 28 April 2013 satellite image, which is also visible on 9 April 2005. On the basis that the 2013 satellite image was captured when the sea level was 83cm above Mean Sea Level, being a few centimetres over Mean High Water Spring, this bank could be considered above water at high tide (being MHWS). However, it may be of a dynamic nature, changing size, shape and location under the combined effect of astronomic tides, storm surges and wind-waves. Furthermore, it is possible that this sand bank has been covered during the highest tide of 2013 (increase of sea level of 20cm) and most likely at Highest Astronomical Tide.

Human infrastructure

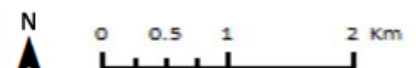
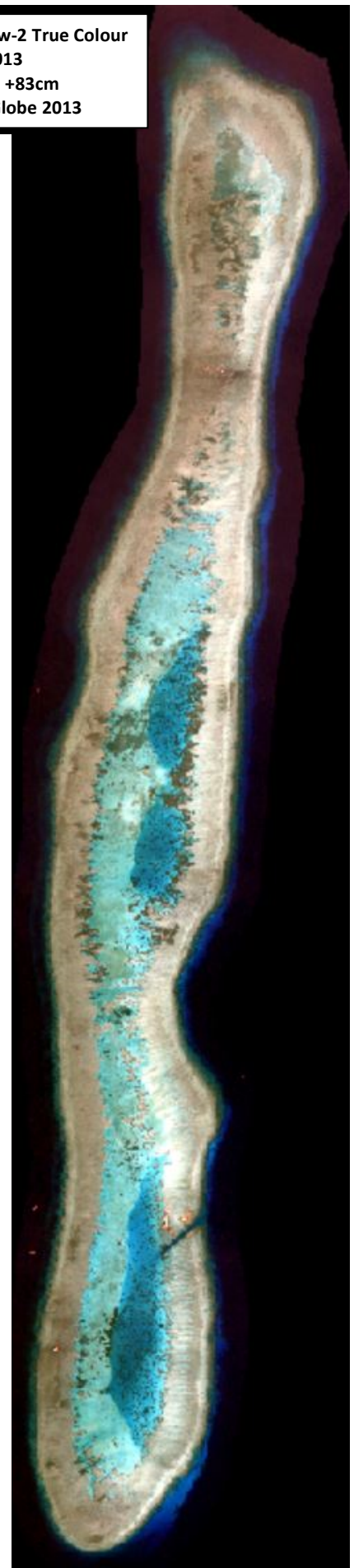
Six man-made structures are located in three different parts of the reef flat: one tower in the narrowest section of the northern part of the reef flat, two towers and two buildings in the southeastern side of the reef flat and another tower on the southwestern side. The towers are similar, each of 15m diameter constructed on a wider base of 30m diameter and surrounded by water that is at least 1m deep. Two jetties that are 10-20m long are generally built on opposite sides of each tower. Two of such towers are built on the southeastern side of the reef flat. They are connected together by an above-water pathway, as well as two additional buildings to form an elongated structure. They can be accessed through a 700m-long and 50m-wide man-made channel that extends from the reef slope to the lagoon. Two (220m and 130m-long) non-accessibility devices have been constructed on the reef flat seaward of these four man-made structures. On the northern part of the reef flat, a second tower is visible on 7 August 2014, east of the original one and connected by a 90m-long above-water pathway. A 240m-long man-made channel connects the towers to the western reef slope.

Intertidal and submerged area

The aerial coverage of this atoll is 25.07km² comprising a reef flat of 17.87km², two lagoons totalling 2km², and a reef slope that surrounds the reef flat of 5.20km². The shallowest part of the reef flat is a 300-500m wide band that follows the reef slope and is 1.5-2.2m deep in the 28 April 2013 satellite image taken at high tide. Areas that are under 2m deep are expected to uncover at Lowest Astronomical Tide. The part of the reef flat that borders the lagoon is sandy with areas of coral/seagrass/algae. It is also deeper (2-3m) and typical of a back reef. The two lagoons are of irregular size but comparable depth of 4-7m and characterised by a reticulate reef system. The longest reef slope is on the northwestern side of the atoll where it extends 620m seaward. However, the reef slope is generally closer to 120-200m long. Pronounced spurs and grooves are visible throughout.

Several areas of the reef flat appear degraded (0.12km² overall). They may have been the subject of past dredging or other destructive activities. Distinctive areas of seagrass/algae/cyanobacteria (0.56km²) can also be observed.

WorldView-2 True Colour
28 Apr. 2013
Sea Level: +83cm
©DigitalGlobe 2013

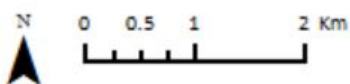
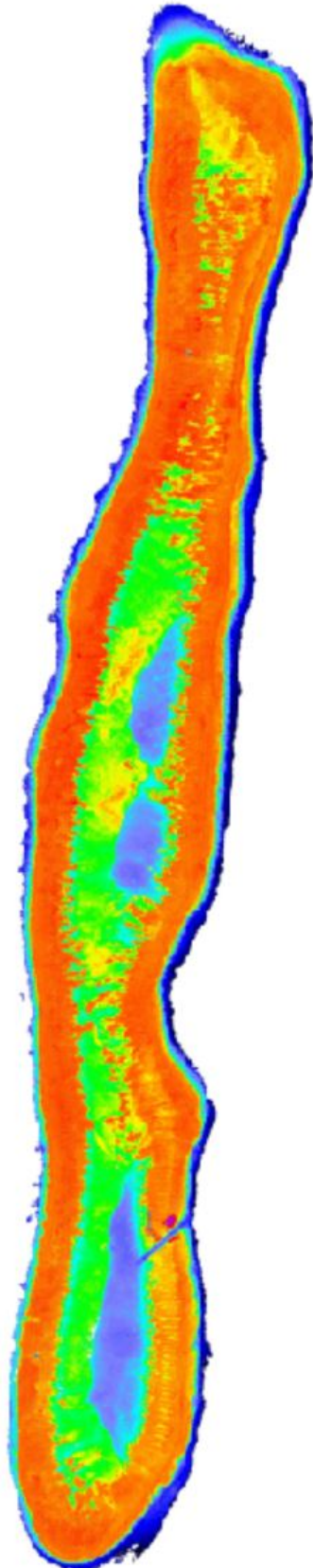


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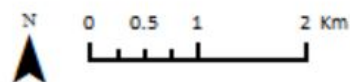
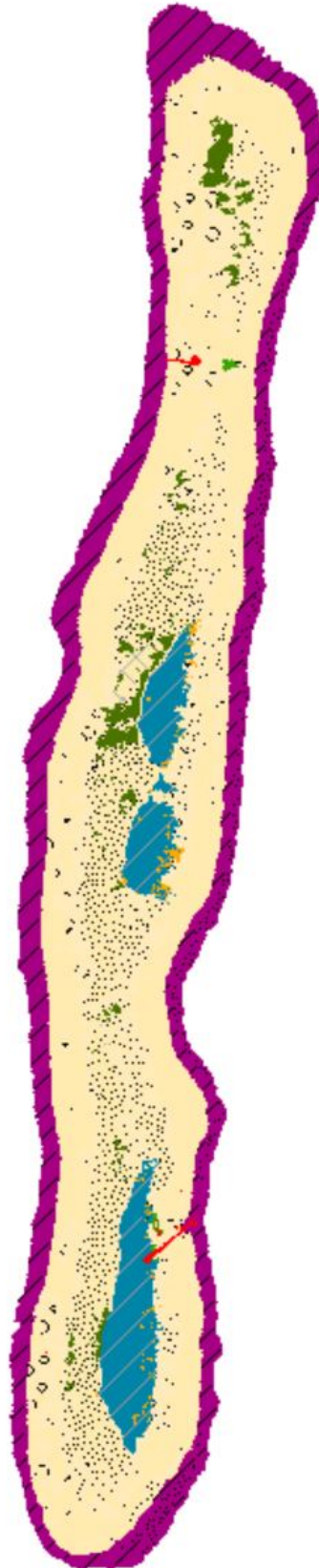
10°03'28.5"N, 113°51'15.63"E

Derived from WorldView-2 satellite data captured on 28 April 2013 [Sea Level: +83cm]

Bathymetry Map



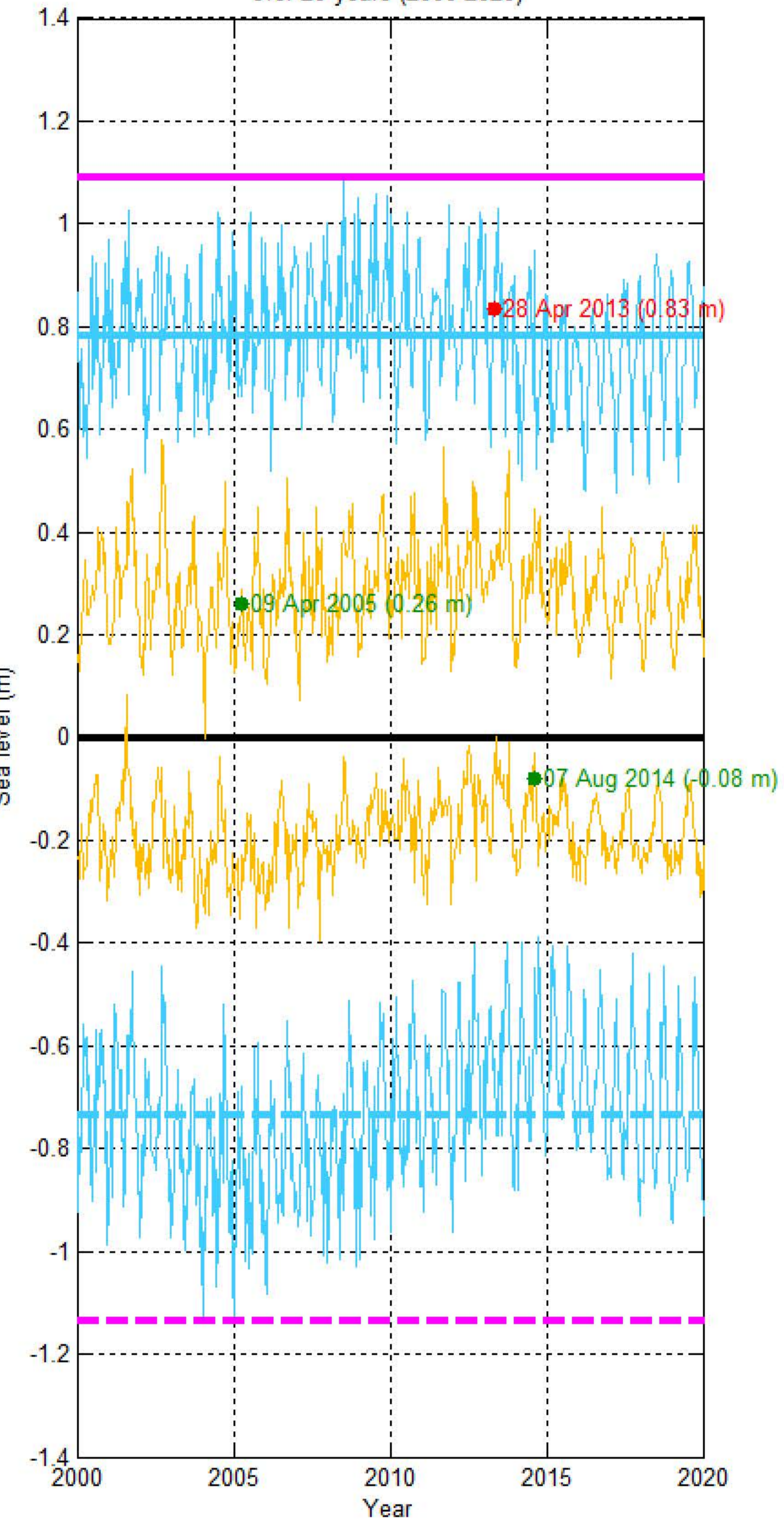
Habitat Classification and Land Cover Map



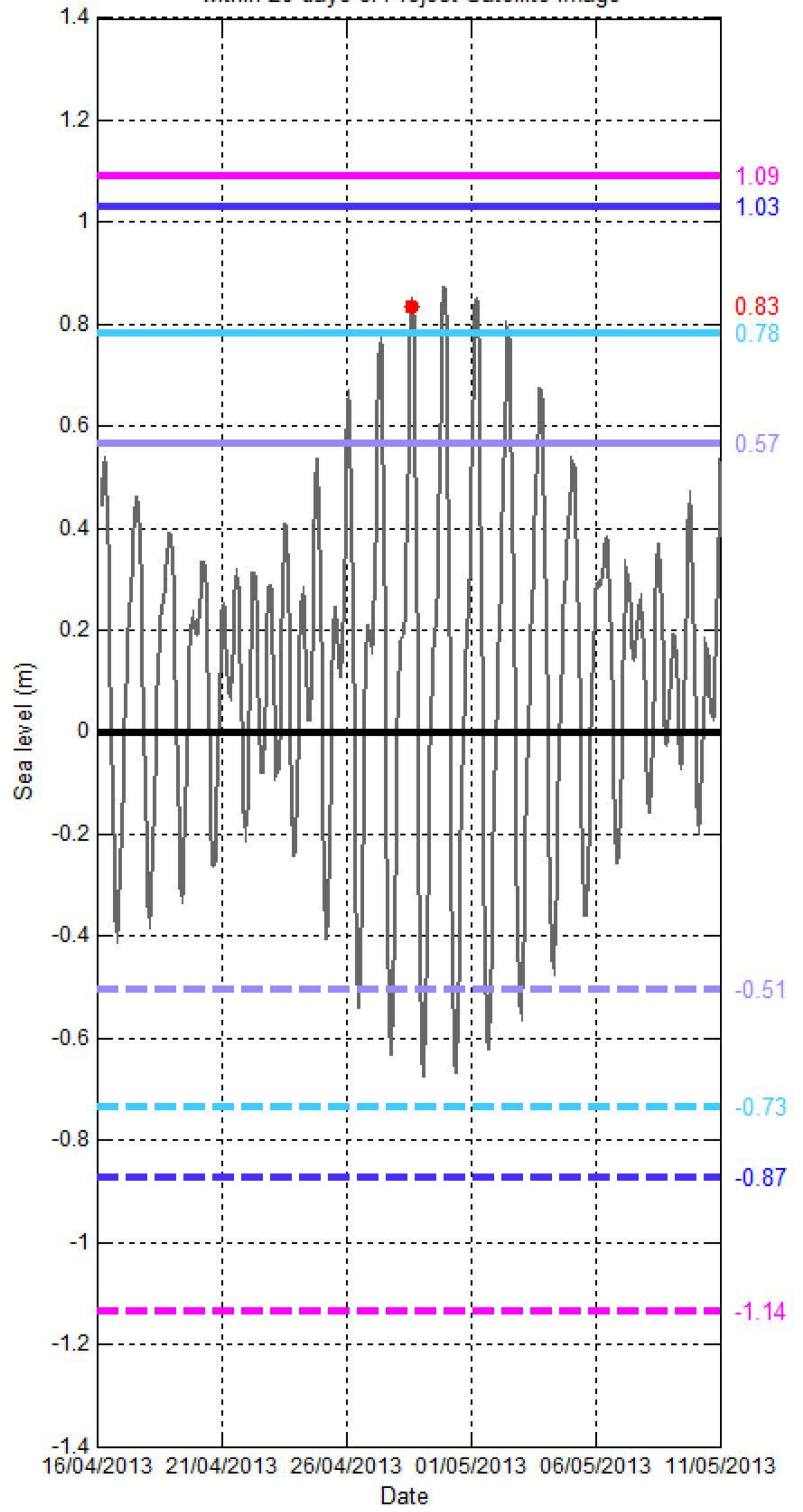
Sea level (SL) at DISCOVERY GREAT REEF

[10°03'28.50"N, 113°51'15.63"E]

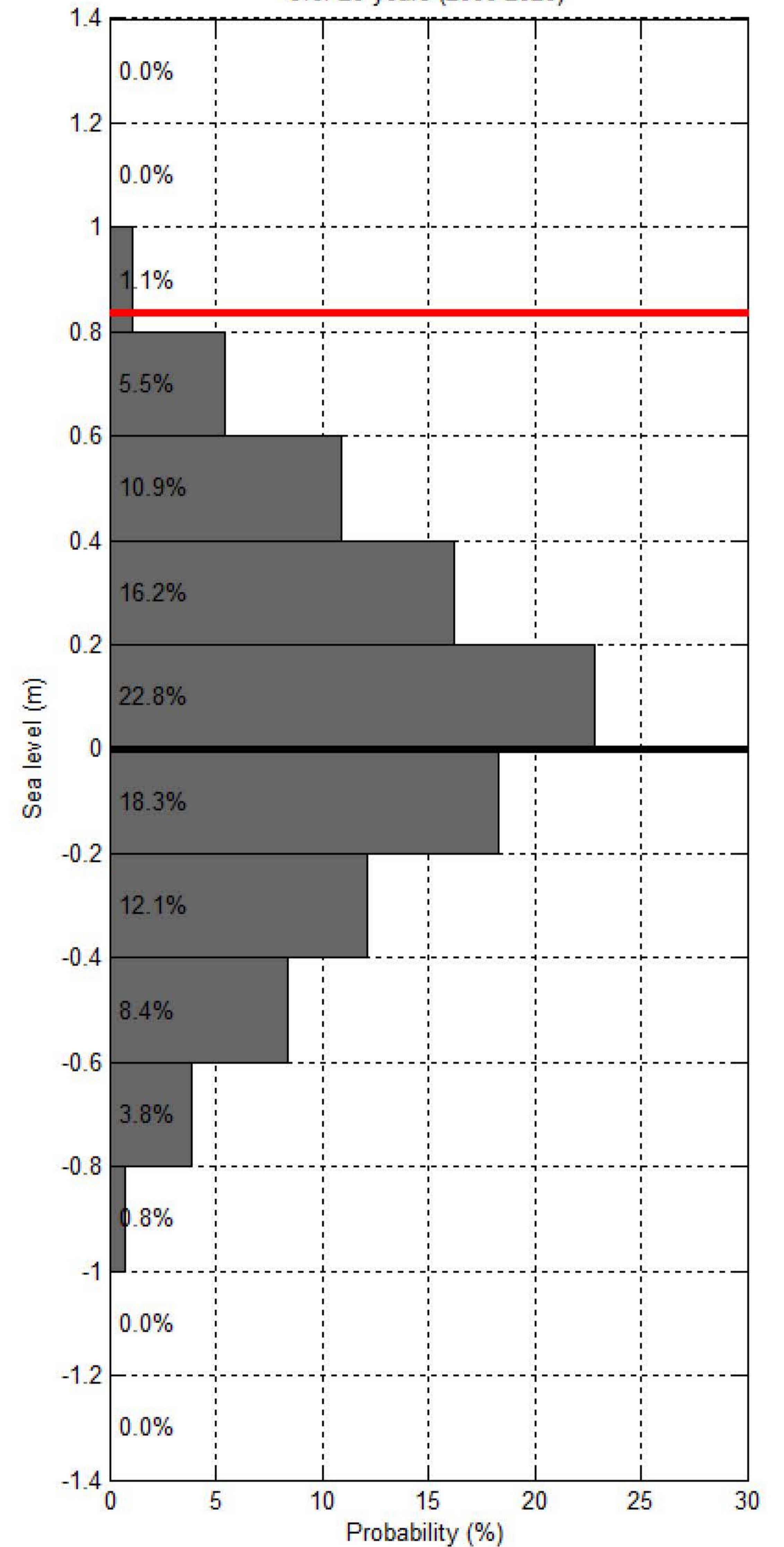
Sea level at spring/neap tide at DISCOVERY GREAT REEF over 20 years (2000-2020)



Sea level at DISCOVERY GREAT REEF within 20 days of Project Satellite Image



Probability of sea level at DISCOVERY GREAT 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