

COMMODORE REEF

8°21'58.03"N, 115°13'05.923"E

Geographic area

Commodore Reef is an oceanic coral atoll that developed on top of a seamount in the southeastern part of the Spratlys and is shaped like an hour glass placed horizontally; the western part and its lagoon are larger than the eastern part and its lagoon. It is located around 113NM west of the island of Palawan and over 115NM northwest of the tip of the island of Borneo. The closest shallow geographic feature is Investigator Shoal, over 26NM southwest. The atoll extends over 12.6km along its west-east axis and reaches 4km along its north-south axis in the western part and 2.5km in the eastern part.



Land area above water

There is one above-water land area in the 17 October 2011 satellite image on a large sand bank located on the central reef flat of the atoll. However, the exact size and contour of the above-water area could only be traced manually and tentatively given the cloud cover which interferes with the near-infrared reflectance generally needed to distinguish areas that are above-water from those that are submerged. The 1 February 2015 satellite image available on Google Earth confirms the presence of a sand bank in this area. The extent to which this above-water area remains above water at Mean High Water Spring (MHWS) is unclear as the sand bank elevation is unknown. As the 2011 satellite data were captured when the sea level was 37cm below Mean Sea Level, it is expected that a substantial part of the sand bank would be submerged when the sea level increases by over 1.2m to reach MHWS. The presence of buildings on this area in 2011 and 2015 suggests that the area where they are located would generally remain above water. Other narrow and irregularly-shaped stretches of above-water coral rubble are visible in the 2011 image. However, based on their shape and the sea level at the time of capture, it is expected that they would be submerged at MHWS and possibly even at Mean Sea Level.

Human infrastructure

Several man-made structures can be observed on a 25m by 25m area located in the central reef flat, between the two lagoons. Two hexagonal roofs are visible that might be roofs covering makeshift buildings constructed on stilts.

Intertidal and submerged area

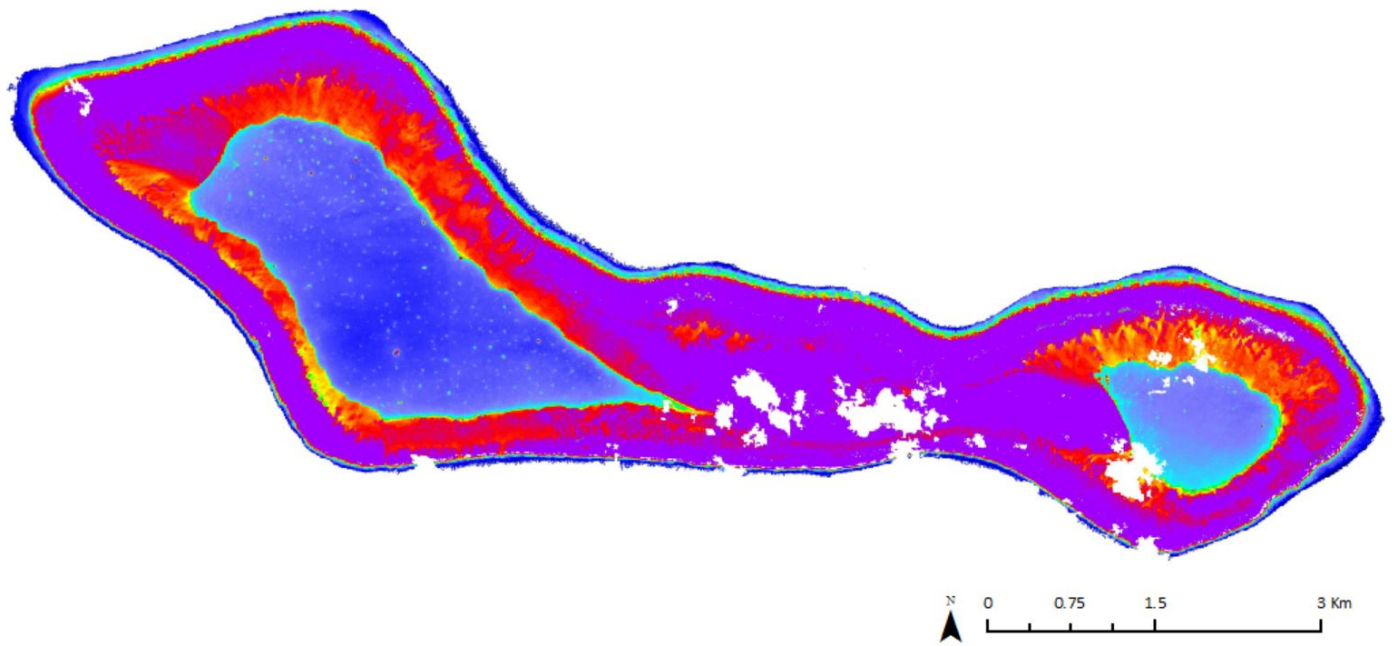
The atoll is composed of a reef flat of 16.86km², two lagoons (5.26km² and 1.34km² for western and eastern lagoon, respectively) and a reef slope of 2.25km². The reef flat is composed of a shallow band (mostly less than 80cm deep) along the reef slope that stretches around the atoll and is dominated by hard coral rubble and algae. The width varies from 150-400m and overall, it is around 27km long. The inner part of the reef flat is the sand-dominated back reef that connects the reef flat with the lagoon as well as the two lagoons to each other. The above-water sand bank is located on this central sand-dominated area, which is particularly shallow. Most of the reef flat is expected to uncover at Lowest Astronomical Tide when the sea level is expected to decrease by 80cm compared to the sea level at the time of the 17 October 2011 satellite image. Only isolated deeper areas would remain submerged as well as large parts of the back reef that surround the lagoon where the water is 2m deep. Both lagoons are characterised by dense reticulate reef systems that include narrow coral reef ridges that connect knolls and coral heads of varying sizes, some of which are expected to uncover or become awash at Lowest Astronomical Tide. The western lagoon is 6-8m deep, whereas the eastern lagoon is 5-6m deep. The reef slope is narrow: mostly around 100m in the north and less than 50m in the south. Dredging marks and areas of degraded reef flat are already visible in the 2011 satellite image, but extensive additional circular dredging marks can be observed in the 2015 satellite image that cover most of the back reef. Several areas of distinctive seagrass/algae/cyanobacteria cover can also be observed (1.26km²).

COMMODORE REEF

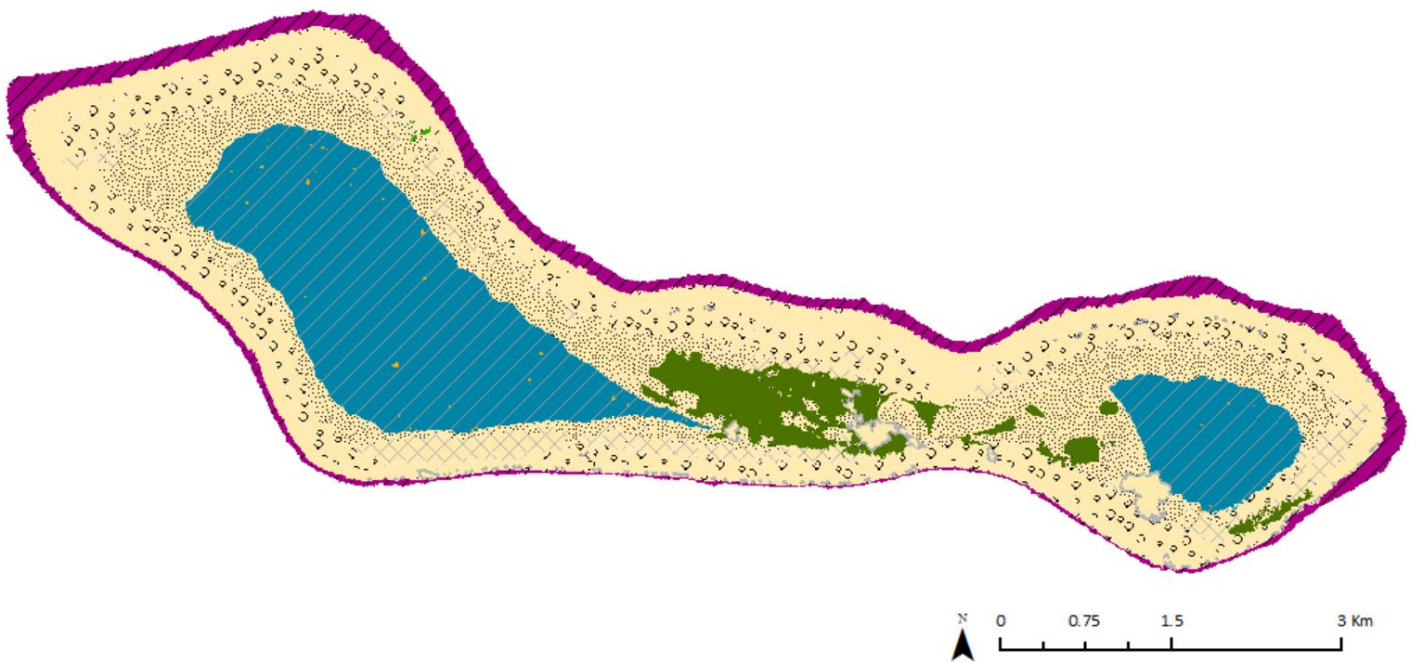
8°21'58.03"N, 115°13'05.923"E

Derived from WorldView-2 satellite data captured on 17 October 2011 [Sea Level: -34cm]

Bathymetry Map

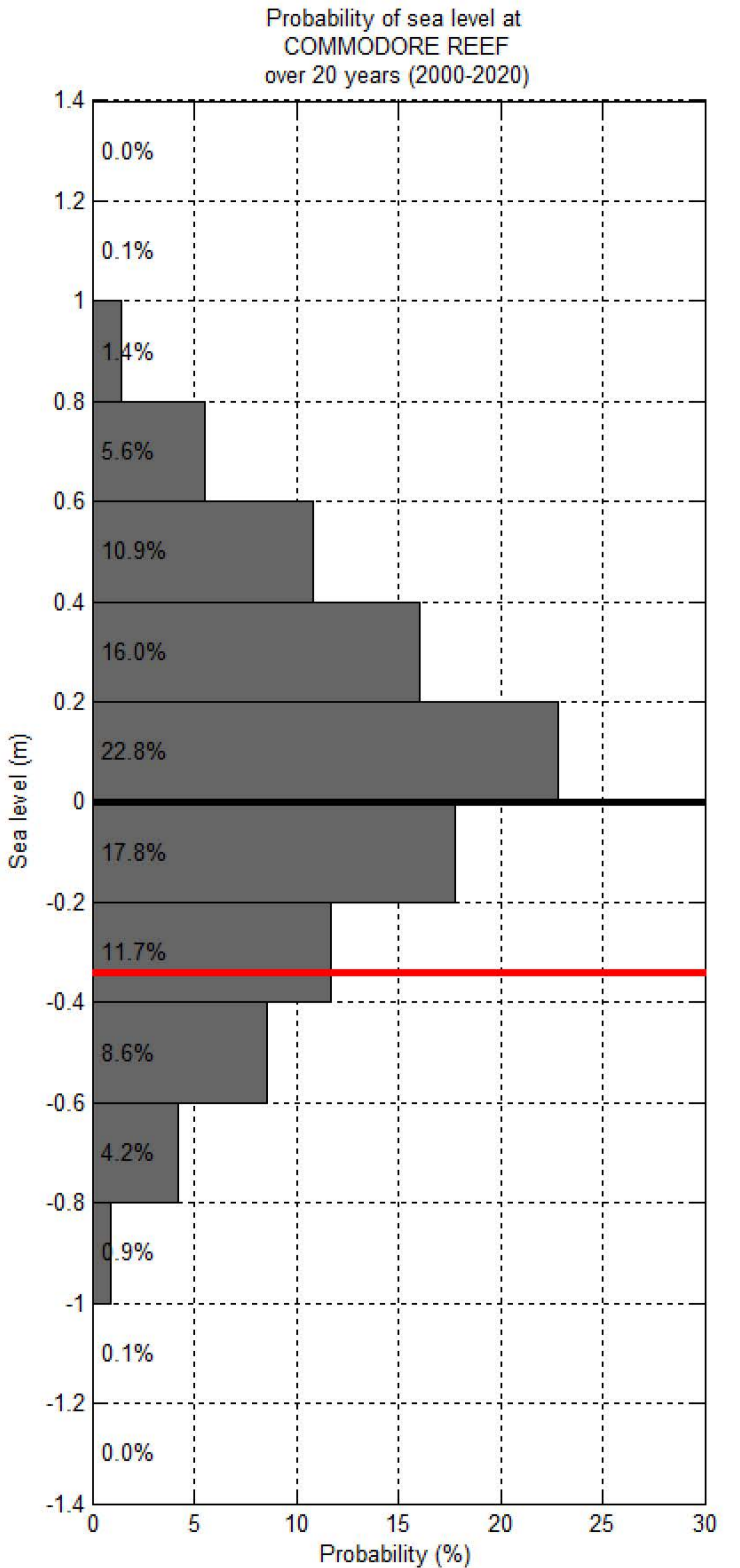
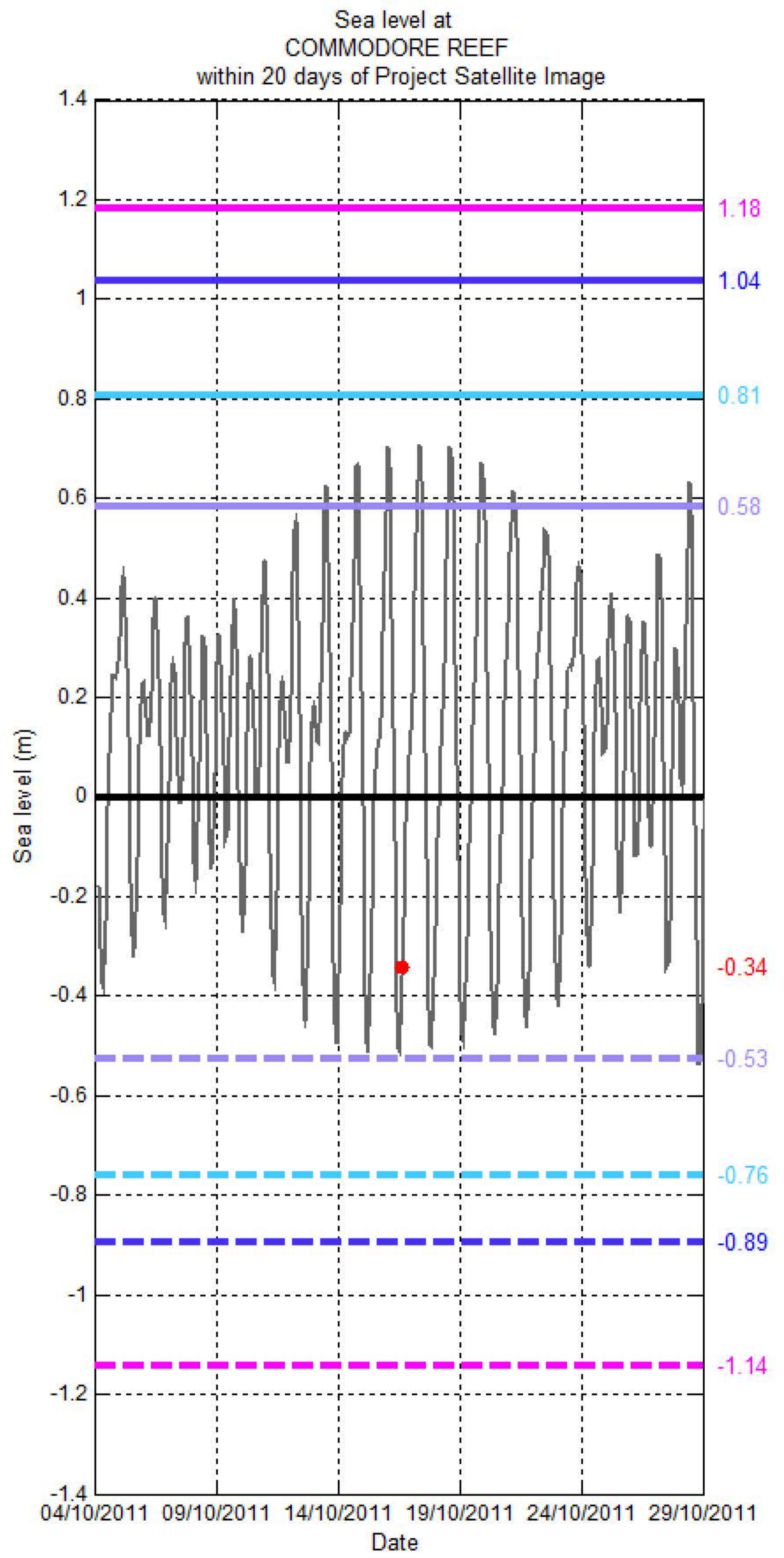
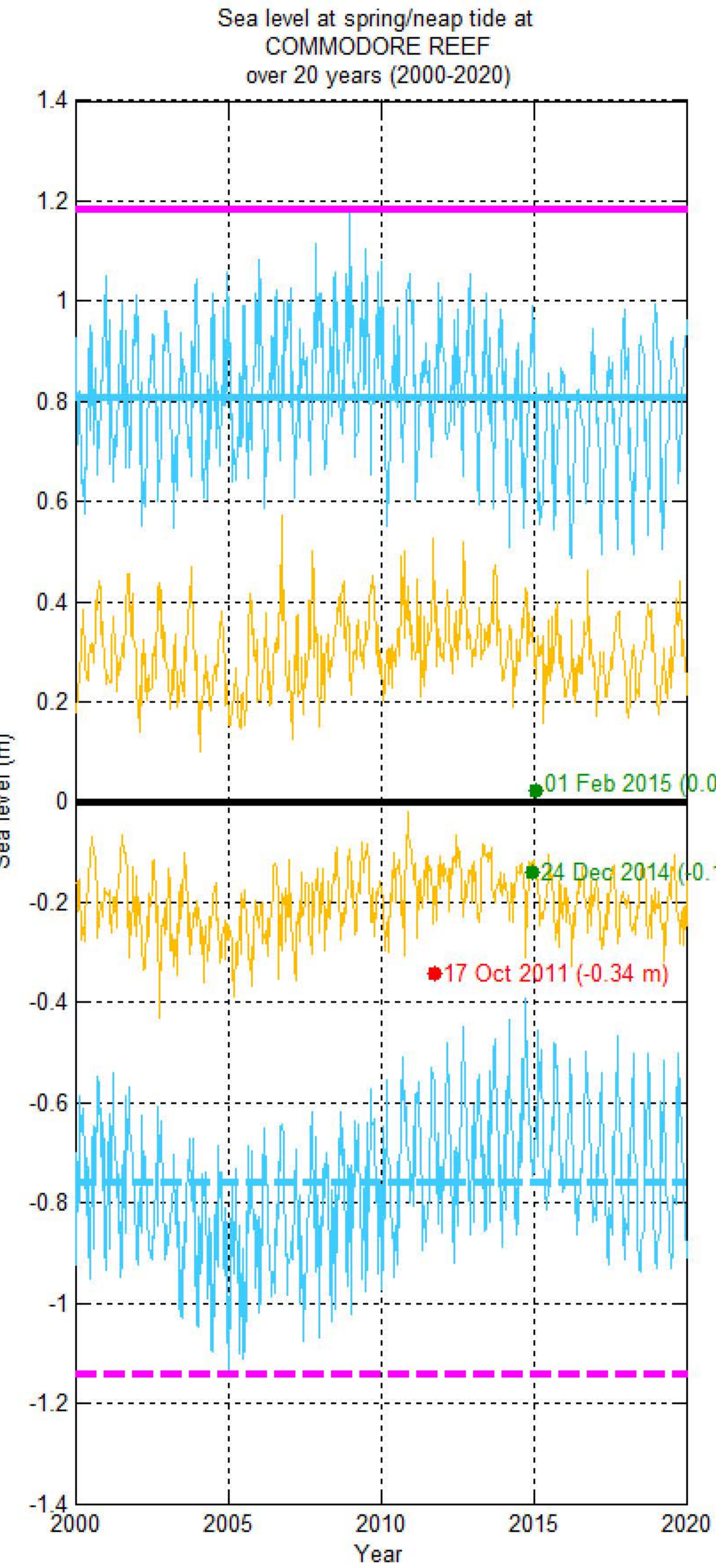


Habitat Classification and Land Cover Map



Sea level (SL) at COMMODORE REEF

[8°21'58.03"N, 115°13'05.92"E]



— 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