Allen Coral Atlas
User Guide

Guide for how to use the ACA global geomorphic and benthic habitat maps

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Allen Coral Atlas: interpreting the global map

The Allen Coral Atlas has two mapped levels – one that displays **global geomorphic zones** and another for **global benthic zones** commonly associated with shallow water tropical coral reefs.

The following guide outlines some of caveats in interpreting these maps, for map users to bear in mind.

Interpreting the coral habitat maps – *guide to understanding map limitations*

Corals are animals that deposit limestone skeletons that contribute – along with other abiotic factors - to the incremental development of complex three-dimensional limestone structures: reefs! To characterise a continuously growing, three dimensional structure in two-dimensional space (as a map), we are forced to apply some constraints.

Understanding the five main limitations of the map can help you understand and interpret these data better.

- *Bathymetric constraint*. **The Allen Coral Atlas is a shallow reef atlas: displaying reef features 10 meters deep (for benthic) and 20 m (for geomorphic) or shallower**. Planet Dove satellites cannot reliably collect information from deeper water. This means features beyond 20 m - for example deepwater (mesophotic) reefs found from 30 – 150 m depth, drowned reefs and submerged reef platforms - will not be visible on the map. Depth on the map is relative – i.e. not linked to a datum, which is why class definitions provide approximate depths.

  By limiting the third dimension (depth), very steep reef features – like reef walls – may not appear on the map, or their true extent (width) will be under-represented in two-dimensional space.

- *Latitudinal constraint*. **The Allen Coral Atlas is a tropical reef atlas: only shallow water tropical reefs occurring 30° either side of the equator are displayed.** Limestone reefs tend not to develop at higher latitudes, due to cooler sea temperatures. Other biogenic reef types – e.g. serpulid reefs, *Halimeda* reefs – are also not captured.

- *Biological constraint*. **The Allen Coral Atlas is a coral reef atlas, not a coral atlas.** Coral reefs (with a few rare exceptions) are built by corals, but not all corals build reefs: in fact at least half of the planet's corals are either not able to (e.g., soft corals or non-reef building corals), or not living in the right location to (e.g. living on rocky reefs) support complex reef development. Despite its name, the Allen Coral Atlas is actually a Coral Reef (and not a Coral) Atlas: remote sensing can detect reefs well but is less good at detecting individual corals. Therefore, corals growing in or on non-reef habitats are not represented here. For an interactive map of coral species distribution, visit Coral Geographic.

- *Temporal constraint*. **The Allen Coral Atlas represents the current distribution of coral reefs, as seen from space.** Large (kilometre) scale coral reef limestone structures (displayed in the global geomorphic map) develop over millennia, but across the surface of these structures benthic features – such as the distributions of corals and algae – will fluctuate on seasonal to decadal timeframes. While both maps represent a single point in time, geomorphic maps will reflect reality beyond the life of the project, while benthic map classes are more likely to shift.

- *Spatial constraint*. **The Allen Coral Atlas is designed as a large extent mapping product: hence local applications could potentially be limited.** The Atlas has been designed to capture coral reef distributions and features at the regional (e.g. 100 km) to ocean-basin scale (e.g. 1000 km). It is less appropriate for local exploration, e.g. below the "at the reef" (0.1 km) level. Coral reefs are difficult to map both globally and in high detail, as they are a relatively sparsely distributed and scarce (covering 280,000 sq km compared to e.g., tropical forests, which cover 39 million sq km) ecosystem.

  While the Atlas takes global level mapping to the next level in terms of detail, when exploring the map, keep in mind that the main value in a global map is being able to compare reef features across scales of kilometres to ocean basins. For a more detailed, meter-scale understanding of an individual reef it will always be better to source a local map (e.g. Level 5 local maps).