GEOMORPHIC MAP CLASSES

ALLEN CORAL ATLAS

Short description of twelve shallow coral reef internal structure geomorphic mapping categories for *Allen Coral Atlas* global geomorphic maps

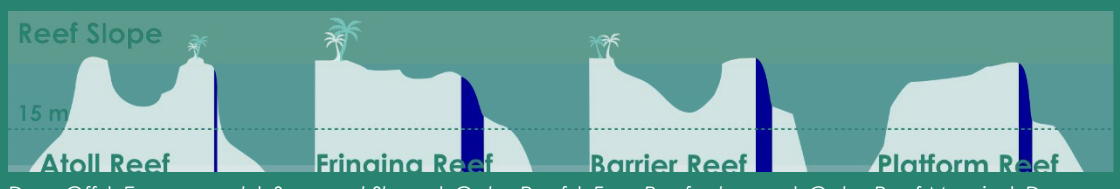
The *Allen Coral Atlas* is a global-scale coral reef habitat mapping project that is using Planet Dove 3.7m resolution daily satellite imagery (in combination with wave models and ecological data) to create consistent global coral reef habitat maps with the purpose of supporting science and conservation.

The twelve Global Geomorphic Zones mapped by the *Allen Coral Atlas* are listed below, in logical order from external seaward-facing through to internal coral reef structural features. These zones are known to be fairly consistent across different biogeographic regions, and often associated with regionally distinct ecological assemblages of benthic animals and plants. Moreover, geomorphic classes like these have been shown to be reliable predictors of biological habitat richness and diversity.

Reef Slope

Definition and examples

Reef Slope is a submerged, sloping area extending seaward from the Reef Crest (or Flat) towards the shelf break. Windward facing, or any direction if no dominant prevailing wind or current exists.



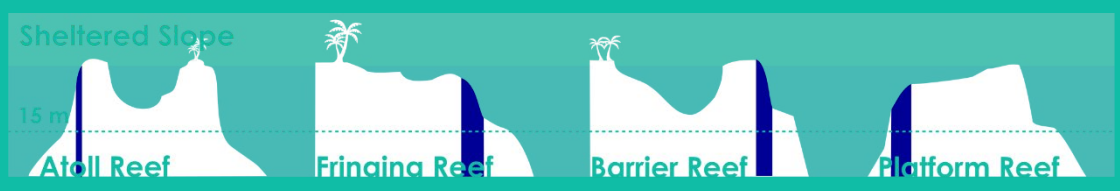
Other terms: *Drop Off* | *Escarpment* | *Seaward Slope* | *Outer Reef* | *Fore Reef subzone* | *Outer Reef Margin* | *Deep Reef Slope* | *Outer Fore Reef* | *Windward Slope* | *Exposed Slope*

Also known as: Terumbu depan | Pendiente arrecifal frontal | Pente externe | المرجاني الشعب منحدر

Sheltered Slope

Definition and examples

Sheltered Reef Slope is any submerged, sloping area extending into Deep Water but protected from strong directional prevailing wind or current, either by land or by opposing reef structures.



Other terms: *Leeward Slope* | *Protected Slope* | *Sheltered Slope*

Also known as: Terumbu depan terlindung | Pendiente arrecifal frontal protegidos | Pente externe abrité | منحدر المحميه المرجاني الشعب

Reef Crest

Definition and examples

Reef Crest is a zone marking the boundary between the Reef Flat and the Reef Slope, generally shallow and characterised by highest wave energy absorbance.

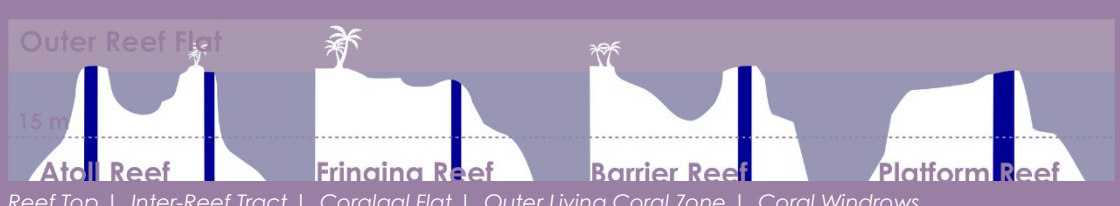
Other terms: *Surf Zone* | *Breaker Zone* | *Reef Edge* | *Reef Rim* | *Reef Margin* | *Rim Margin* | *Hardline Perimeter*

Also known as: Igir terumbu | Cresta arrecifal | Crête récifale | المرجاني الشعب قمة

Outer Reef Flat

Definition and examples

Adjacent to the seaward edge of the reef, Outer Reef Flat is a levelled (near horizontal) broad and shallow carbonate platform, displaying distinct wave-driven zonation.



Other terms: *Reef Top* | *Inter-Reef Tract* | *Coralgal Flat* | *Outer Living Coral Zone* | *Coral Windrows*

Also known as: Rataan terumbu luar | Arrecife plano exterior | Exterieure du platier récifal | خارجي مرجاني مسطح

Inner Reef Flat

Definition and examples

Inner Reef Flat is a low energy, sediment-dominated, horizontal to gently sloping platform behind the Outer Reef Flat.

Other terms: *Sand Flat* | *Sand Zone* | *Leeward Reef Flat* | *Coral Patches* | *Unfused Coral Windrows*

Also known as: Rataan terumbu dalam | Arrecife plano interior | Extérieure du platier récifal | داخلي مرجاني مسطح

Terrestrial Reef Flat

Definition and examples

Terrestrial Reef Flat is a broad, flat, shallow to semi-exposed area fringing reef flat found directly attached to land at one side. It is subject to freshwater run-off, nutrients and sedimentation.

Back Reef Slope

Definition and examples

Back Reef Slope is a complex, interior - often gently sloping - reef zone occurring behind the Reef Flat. Of variable depth (but deeper than Reef Flat and more sloped), it is sheltered, sediment-dominated and often punctuated by coral outcrops.

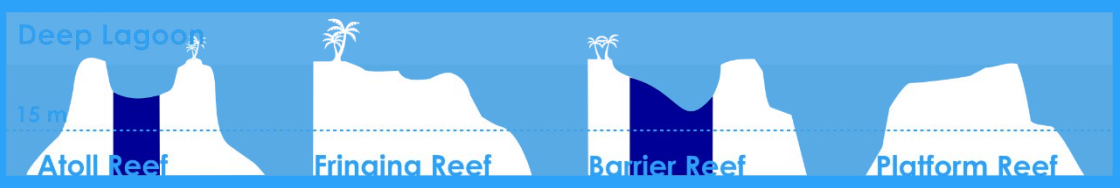
Other terms | *Open Complex Lagoon* | *Subtidal Reef Flat* | *Lagoon Reef Slope* | *Back Reef* | *Escarpment* | *Back Barrier* | *Sediment Apron*

Also known as | Lereng terumbu belakang | Pendiente de arrecife posterior | Pente récifale interne | الخلفي الشعب منحدر

Deep Lagoon

Deep Lagoon is any sheltered broad body of water, fully to semi-enclosed by reef, with a variable depth (but deeper than 5 m approx. and shallower than surrounding ocean) and a soft bottom dominated by reef-derived sediment.

Definition and examples



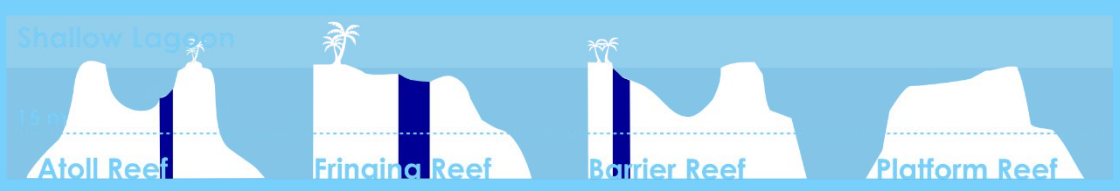
Other terms | *Blue Lagoon* | *Lagoon*

Also known as | Laguna (dalam) | Laguna (profunda) | Lagon (profound) | بحيرة

Shallow Lagoon

Shallow Lagoon is any fully to semi-enclosed, sheltered, flat-bottomed sediment-dominated lagoon area, shallower than 5 m approx.

Definition and examples



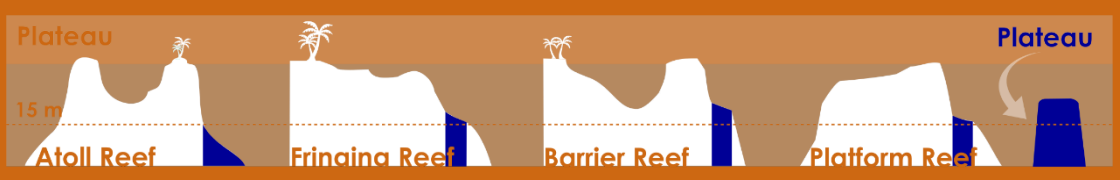
Other terms | *Boat Channel* | *Pseudo-Lagoon* | *Lagoonlet* | *Miniature Lagoon* | *Back Reef Channel* | *Tidal Flat* | *Moat* | *Sand channel* | *Shallow Water Body*

Also known as | Laguna dangkal | Laguna somera / Laguna Pre-Arrecifal | Lagon peu profound | ضحلة بحيرة

Plateau

Plateau is any deeper submerged (> 5 m approx), hard-bottomed, horizontal to gently sloping (angle shallower than 10 ° approx), seaward facing reef platform.

Definition and examples



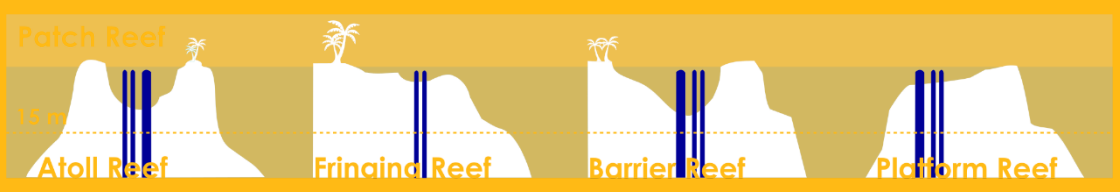
Other terms | *Platform* | *Bank* | *Shelf* | *Shoal* | *Bank Shelf* | *Offshore Platform*

Also known as | Laguna dangkal | Laguna somera / Laguna Pre-Arrecifal | Lagon peu profound | ضحلة بحيرة

Patch Reef

Patch Reef is any small, detached to semi-detached lagoonal coral outcrop arising from a sheltered, sandy-bottomed area.

Definition and examples



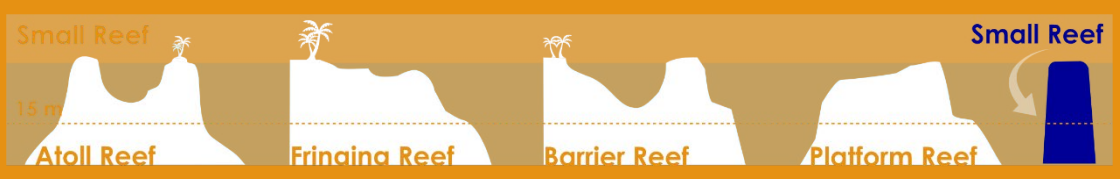
Other terms | *Lagoonal Reef* | *Mesh* | *Bommies* | *Coral Patches* | *Pinnacles* | *Knolls* | *Reticulate Reef* | *Coral Outcrops* | *Lagoon Reef*

Also known as | Terumbu serpihan | Parche arrecifal | Massif corallien | رقعي شعب

Small Reef

Small Reef refers to any detached (stand-alone) reef, surrounded by Deep Water and too small (generally less than approx. 1 sq km) to show a central depression and/or other clear geomorphic zonation (e.g. crest, flat, backreef) besides a Reef Slope.

Definition and examples

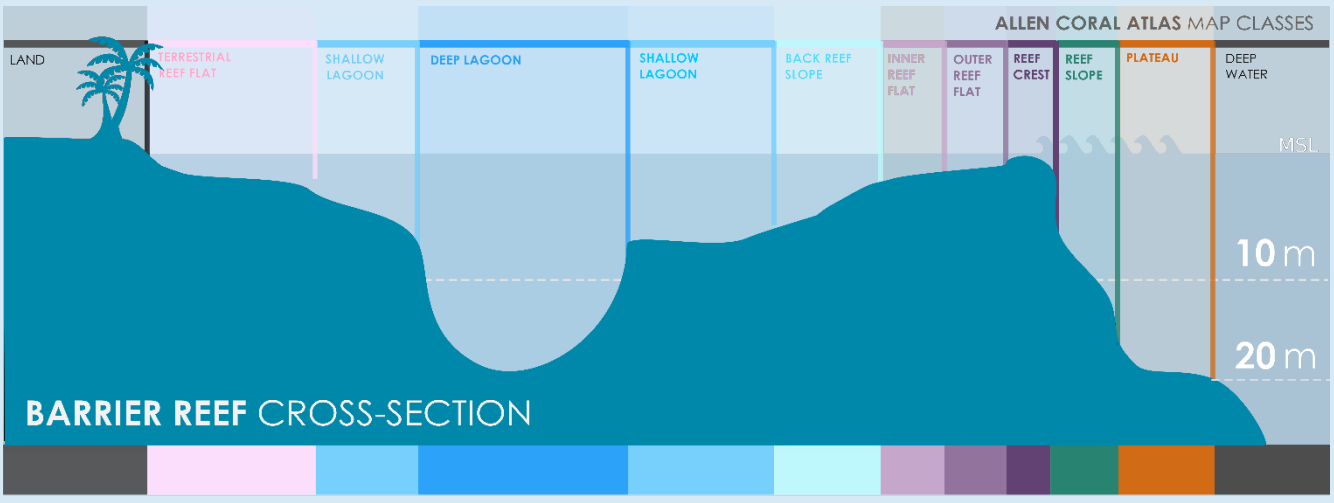


Other terms | *Coral Knoll* | *Pinnacle Reef* | *Patch Reef* | *Marginal Structure*

Also known as | *Terumbu karang kecil* | *Arrecifes pequeños* | *Petit récif corallien* | صغير شعب

Unknown

The 'Unknown' class is assigned to any location where a Global Geomorphic Class cannot be defined due to some factor that made classification difficult or impossible (e.g., depth too shallow, depth too deep, cloud interference, turbid water).



As with any classification, the classes mapped are an approximation of reality and can never fully represent the full diversity of natural features presented by coral reefs. This twelve-zone classification represents a first step in supporting development and use of a new breed of dynamic habitat map, and will hopefully be further refined with input from the community and as technological advances allow for expansion of finer-scale mapping methodologies.

For more detailed information on creation of classes
and guidance on how to interpret **Allen Coral Atlas** Global Geomorphic Map classes, please see:

Kennedy, E.; Roelfsema, C.; Lyons, M.; Kovacs, E.; Borrego-Acevedo, R.; Roe, M.; Phinn, S.; Larsen, K.; Murray, N.; Yuwono, D., et al. (2020) **Reef Cover: a coral reef classification to guide global habitat mapping from remote sensing**. bioRxiv 2020, doi:10.1101/2020.09.10.292243

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