

# VIRTUAL REEF DIVER- Help guide

## Contents

PART 1: Description of the interface and how it works .....	1
PART 2: Classifying coral reef images.....	1
PART 3: Common misclassifications .....	1
PART 4: Example images (full classification) .....	3
PART 5: Further description .....	6

## PART 1: Description of the interface and how it works

When classifying an image, first select the Classification Type from the right hand side of the interface, and then click on the circles within the image which match this classification type. You can change the classification of an already classified point by reselecting it with a different option chosen. The colours display on the image correspond to the classification type.

This process is repeated until you have completed all 15 points on the image, and the form will allow you to submit and complete the Amazon Turk task.

## PART 2: Classifying coral reef images

Below you can find examples of images that have been classified using the same interface you will see when completing your Amazon Turk task.

Carefully examine the images to note which areas have been classified with different coral types (hard coral and soft coral), algae, sand, unsure and other.

Each example image, and the images you will complete for the Amazon Turk tasks, will contain 15 classification points. There are 6 options to choose from when identifying an area within the image: *Hard Coral, Soft Coral, Algae, Sand, Water, Other* and *Unsure*.

As a general rule of thumb, if the classification point is:

- clear enough to see well but does not match any of the categories, choose:  OTHER (Other)
- not clear to identify, choose:  UNSURE (Unsure)

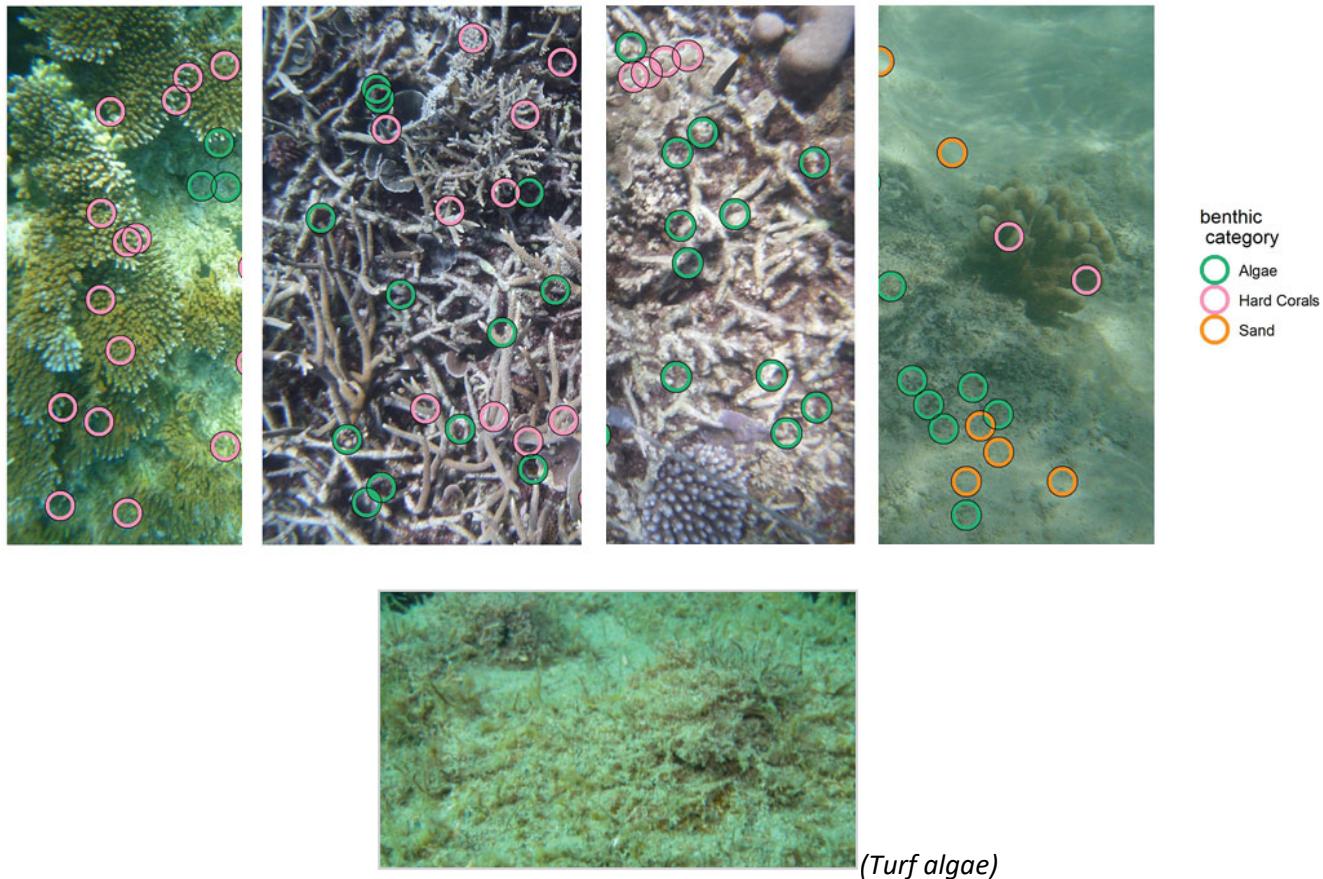
## PART 3: Common misclassifications

Two common mistakes are:



### 3.1 Algae confused with Hard Coral

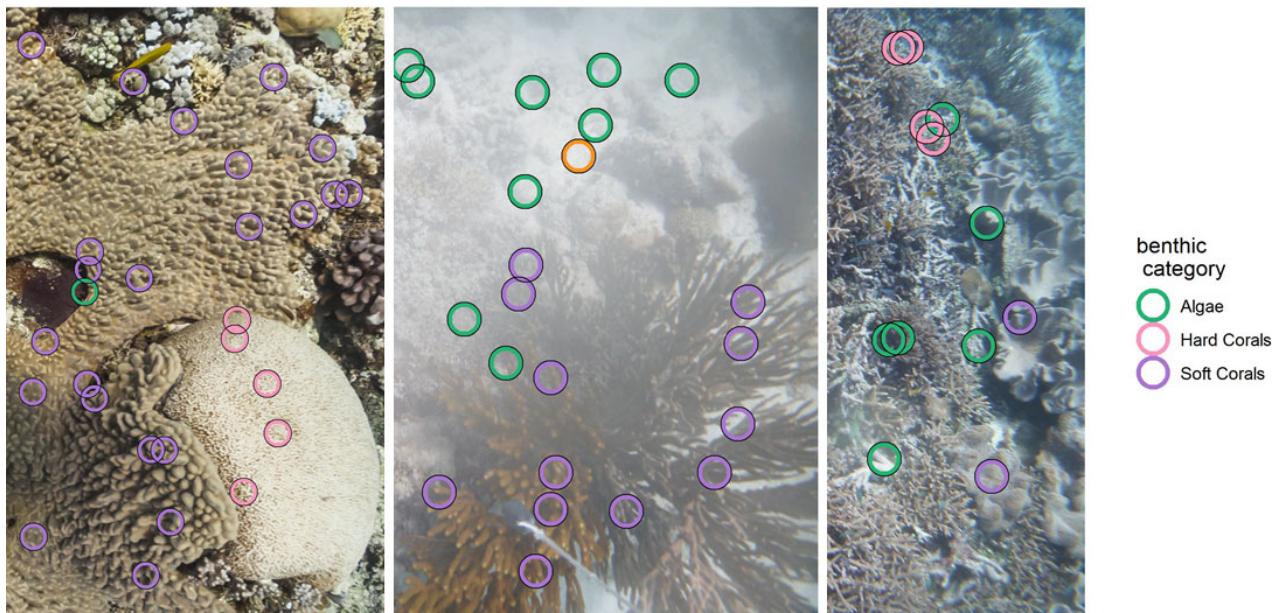
The following examples are cropped from classification images. Here, the (green) points are classified as "Algae" because the hard coral is dead and it is colonized with turf algae.



Turf Algae is not the only Algae that you will encounter. Part 5 describes in details the most common types of algae.

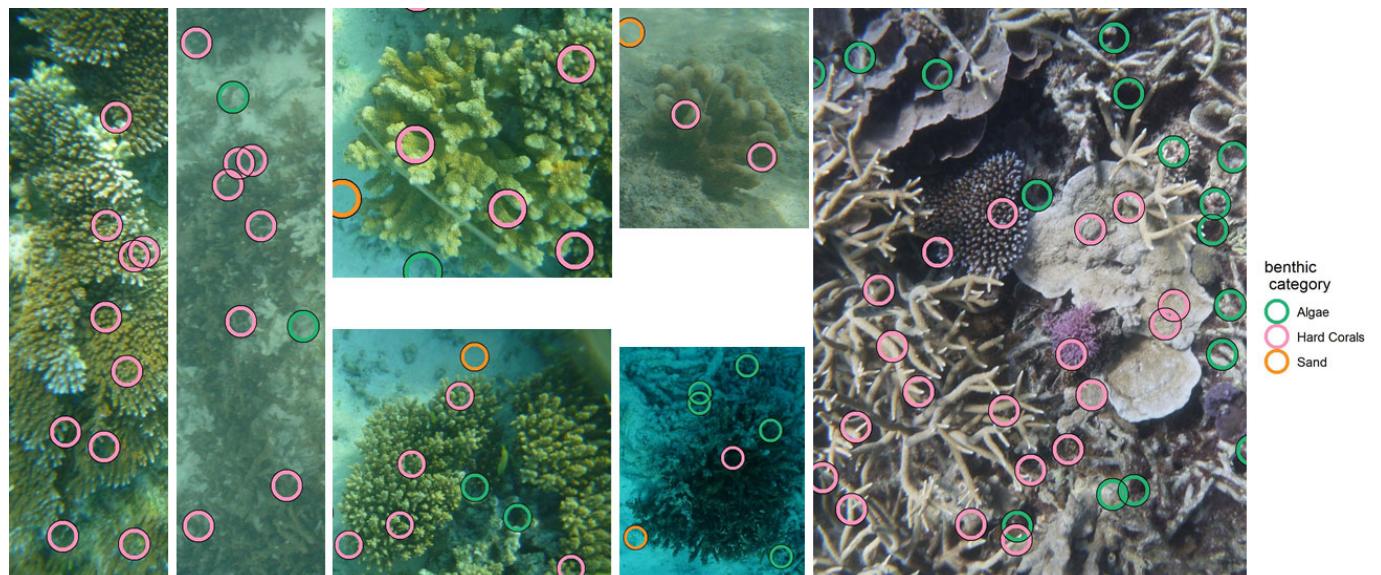
### 3.2 Soft coral confused with Hard coral

The following examples are cropped from classification images. Here, the focus is on the points that are classified as "Soft Corals" (purple). These three different forms of soft corals are the most common in the classification images. See Part 5 for more information on soft corals.



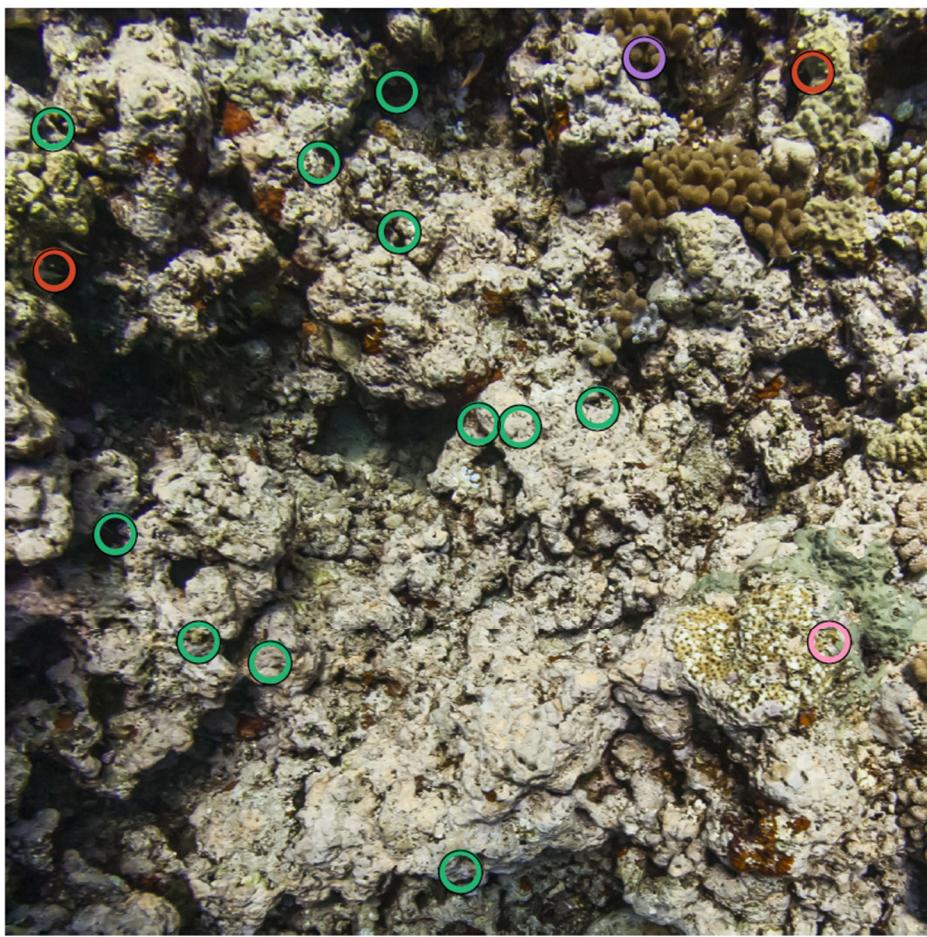
### 3.3 Hard coral diversity in shapes

Hard corals can take different shapes and colours depending on their types. The pink classification points show the most common types of hard corals – different types of hard corals can be found within a same classification image. Part 5 has a full section about the different shapes of hard corals but they look may slightly change depending of the light and quality of images.



## PART 4: Example images (full classification)

Find below examples of 5 classified images:



HELP

PLAY HELP FAQ

0%

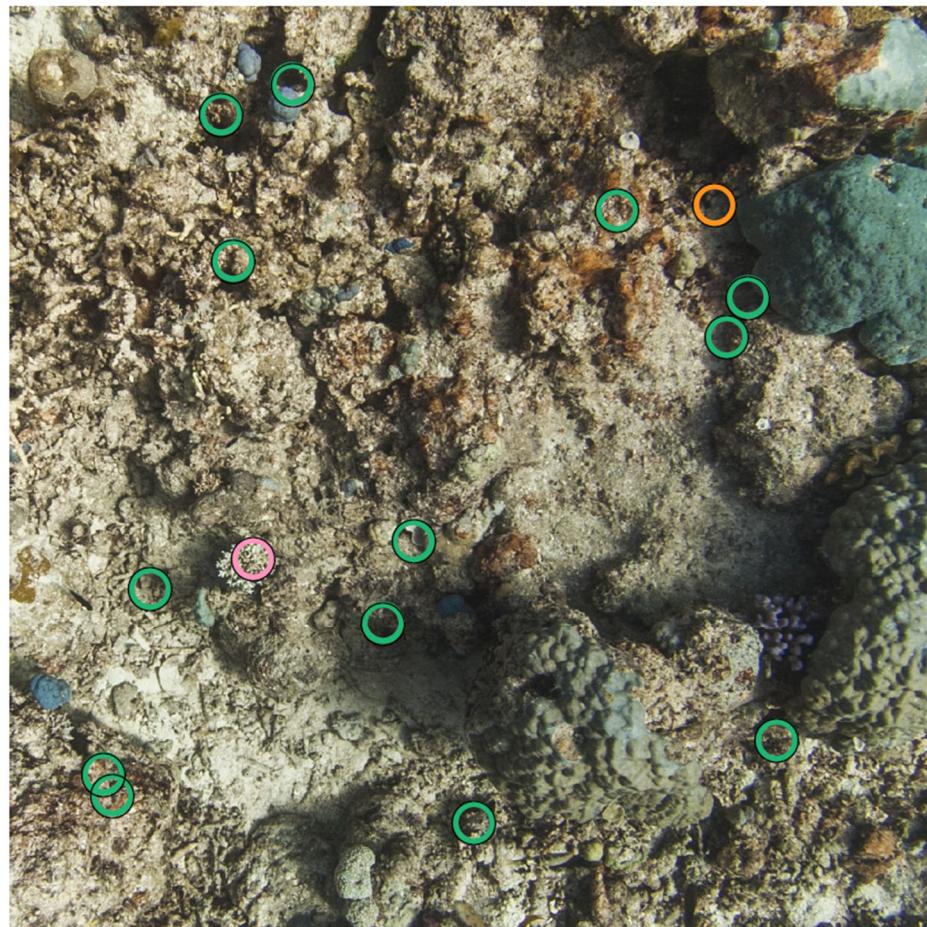
YOU'VE FINISHED  
0/15 POINTS!

SUBMIT

SELECT TYPE (HELP)

?	UNSURE
coral icon	HARD CORAL
coral icon	SOFT CORAL
algae icon	ALGAE
sand icon	SAND
water icon	WATER
fish icon	OTHER

RESET ALL



HELP

PLAY HELP FAQ

0%

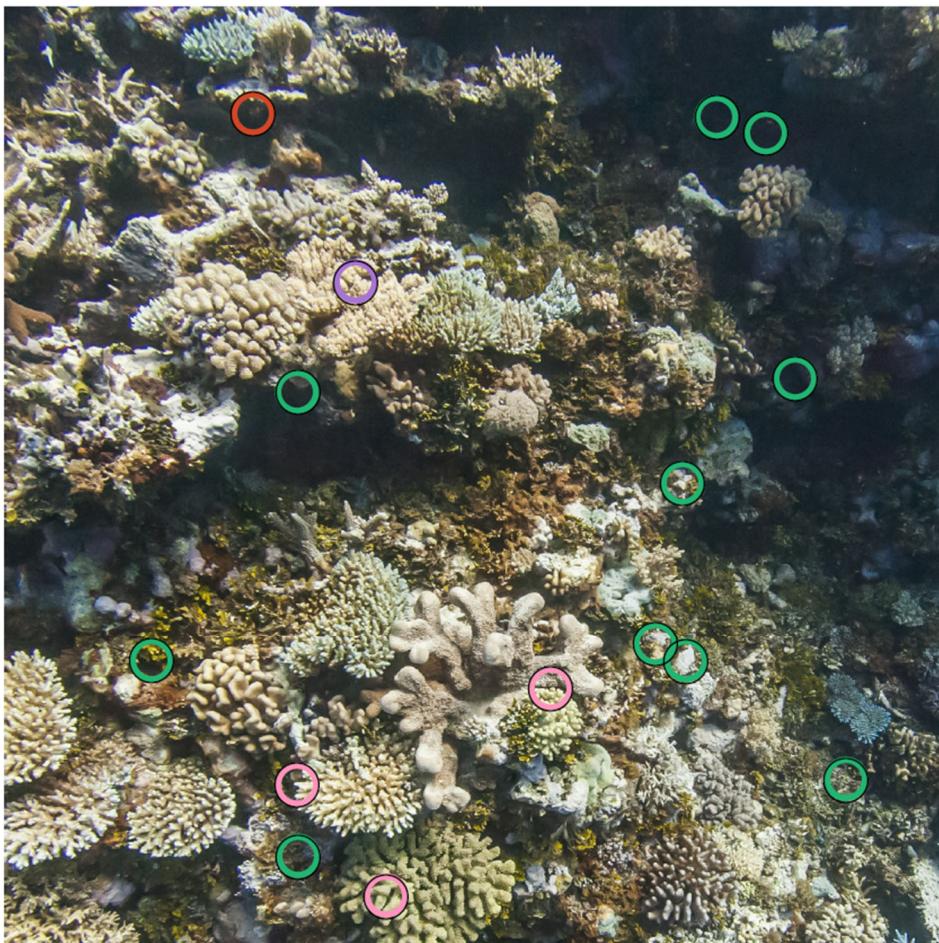
YOU'VE FINISHED  
0/15 POINTS!

SUBMIT

SELECT TYPE (HELP)

?	UNSURE
coral icon	HARD CORAL
coral icon	SOFT CORAL
algae icon	ALGAE
sand icon	SAND
water icon	WATER
fish icon	OTHER

RESET ALL



HELP

PLAY HELP FAQ

0%

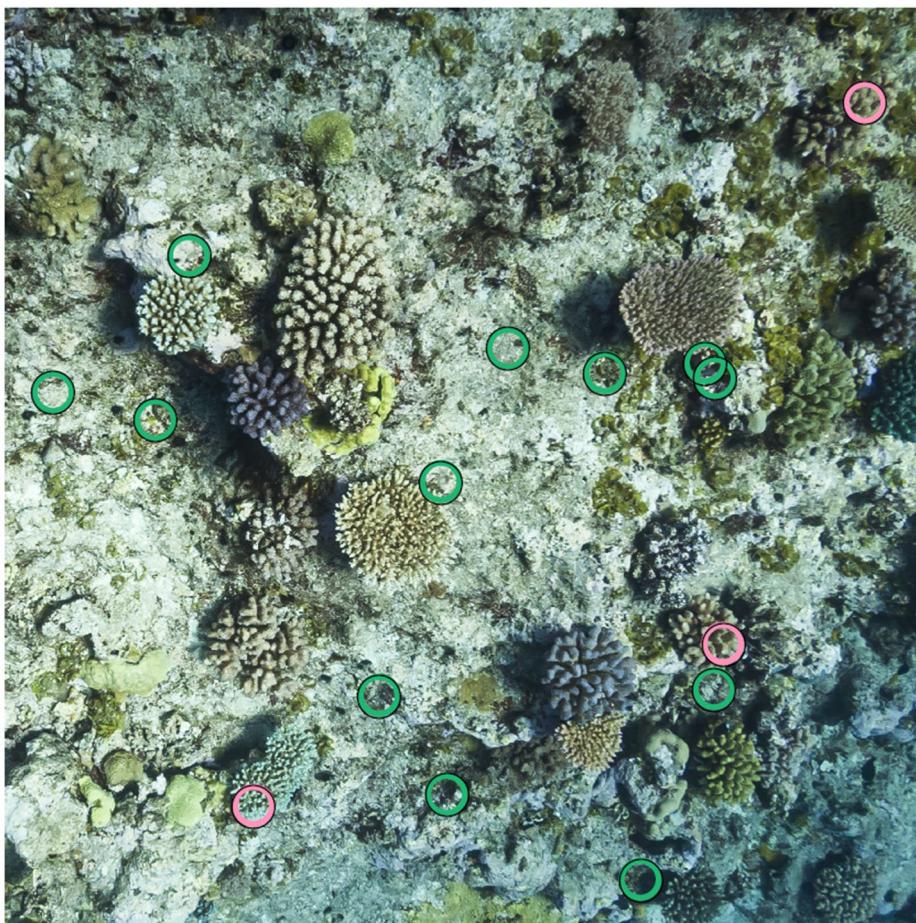
YOU'VE FINISHED  
0/15 POINTS!

SUBMIT

SELECT TYPE (HELP)

?	UNSURE
珊瑚	HARD CORAL
海葵	SOFT CORAL
海藻	ALGAE
沙子	SAND
水	WATER
其他	OTHER

RESET ALL



HELP

PLAY HELP FAQ

0%

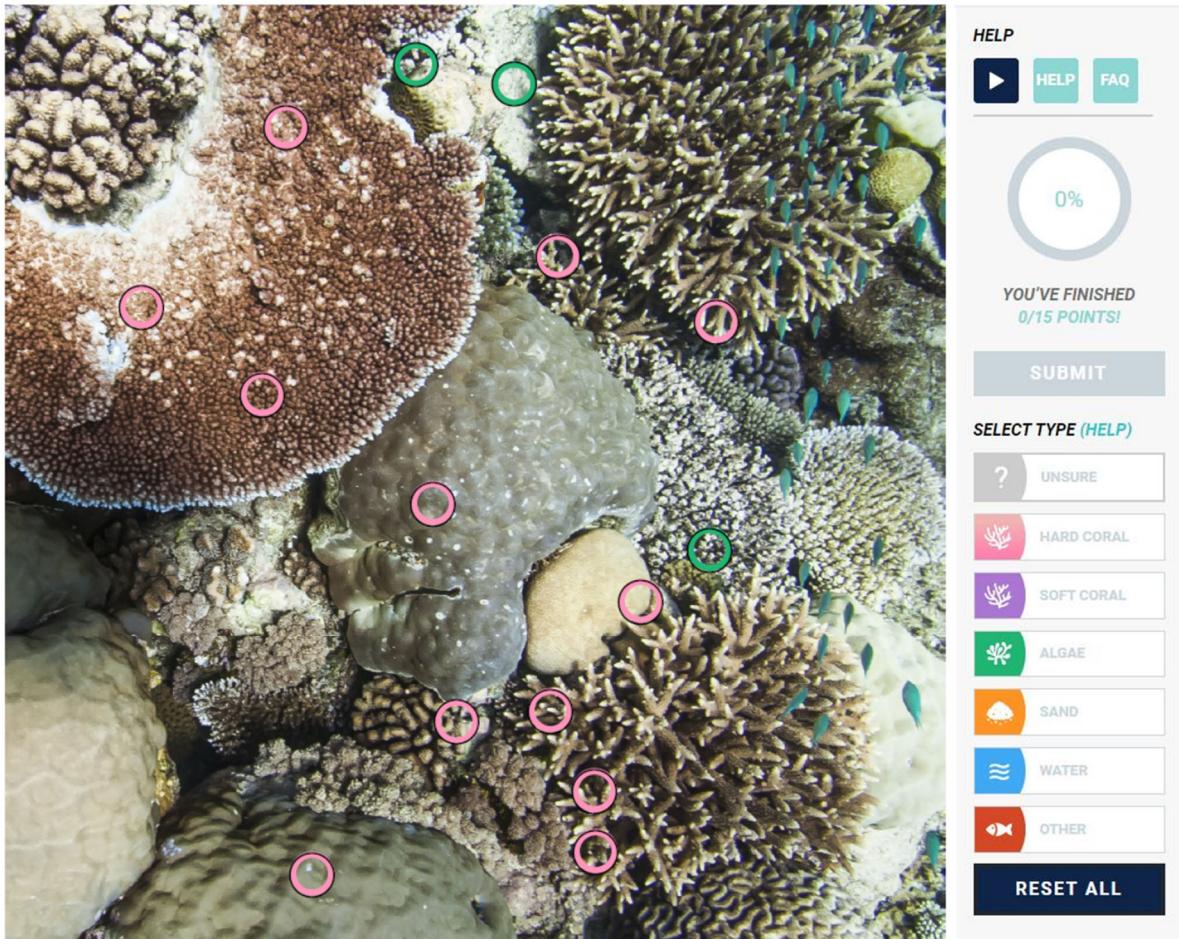
YOU'VE FINISHED  
0/15 POINTS!

SUBMIT

SELECT TYPE (HELP)

?	UNSURE
珊瑚	HARD CORAL
海葵	SOFT CORAL
海藻	ALGAE
沙子	SAND
水	WATER
其他	OTHER

RESET ALL



## PART 5: Further description



**THE FOLLOWING INFORMATION AND EXAMPLES ARE SUPPLIED TO ASSIST THE VIRTUAL REEF DIVER IN THE CLASSIFICATION OF THE REEF IMAGES.**

We've put together this guide to help citizen scientists distinguish between categories such as hard and soft coral, algae, sand, and other. Simply assign the category found within each of the 15 classification circles and hit Submit. This is easiest when only one category is found within a circle, but in many cases, it will contain more than one category (e.g. sand and hard coral). In this situation, just select the category that covers the largest part of the circle.

Sometimes it will be unclear what is shown within the circle. The image may be blurry or you may not recognise what it is. In this case, simply select Unsure.

### I. HARD CORALS

The Great Barrier Reef has approximately 450 different types of hard corals, also known as “reef-builders”. Hard corals grow best in relatively shallow, clear, warm waters (20°C – 26°C) where they receive plenty of sunlight. The polyps (i.e., the animal) of hard corals draw calcium from their surroundings and deposit it as limestone (also known as calcium carbonate), forming a skeletal structure. These coral skeletons often appear abrasive or have sharp edges.

The shape of hard corals varies widely between colonies. Some resemble plates, others look like shrubs, and they may also be brain, tongue, or vase-shaped. To help make sense of this variety of shapes, marine biologists have recognised the following formations:

### MASSIVE

*Rounded, domed or bulky masses of coral*



### COLUMNAR

*Cylindrical, column or trunk-like*



### BRANCHING

*Cylindrical, column or trunk-like*



### FOLIACEOUS

*Leaf-like or lettuce-like*



### LAMINAR / PLATE

*Plates or tables arranged in a tier*

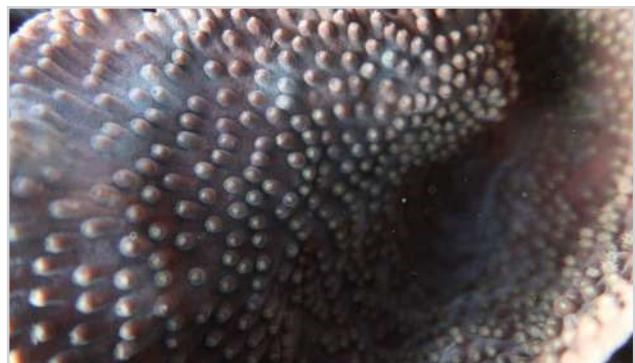


### ENCRUSTING

*Surface layer growths*

### VASE-SHAPED

*Vase-like*



### FREE-LIVING / MUSHROOM

*Unattached to reefs*



## II. SOFT CORALS

Soft Corals are described as ‘undersea wildflowers’ because of their bright colours (usually pink, red, purple, orange and yellow) and their resemblance to plants, often forming ‘fields’ on the sea bed and outer reef slopes.

While more diverse and widespread than hard corals, not as much research has been done on soft corals, so their contribution to reef biodiversity is poorly understood. Like their name suggests, they have soft, tissue-like bodies which are flexible – either soft and squishy or firm and leathery. Contrary to the hard corals, soft corals are non-reef builders.

Approximately one-third of the earth’s soft coral species are located on the Great Barrier Reef. There are two distinct groups of soft corals that favour inshore or offshore reefs, but both groups may also form impressive growths under overhangs, in caves, or on the sides of coral or rock walls.

LEATHERY



ORNATE



SEA WHIP



SEA FAN



## III. ALGAE

Algae are a large and assorted group of organisms that play a key role in the health of coral reefs, as they form the base of the marine food chain. In other words, a lot of organisms eat

algae, but algae don't eat anything. Instead, they are photosynthetic primary producers, meaning they convert energy from the sun to food and oxygen. There are three major types of algae: macroalgae, turf and crustose coralline algae. They can be many colours, but are usually red, green and brown.

Red algae can look leafy or bushy. The most common red algae on the Great Barrier Reef are the crustose coralline algae, which most often resemble pink bubble gum. Green algae comes in the most diverse range of shapes and sizes. Brown algae forms small crusts or pads growing on rock and dead corals, while the largest are bushy and tree-like in form with stems and leaves.

The types of algae present on a reef depends on environmental conditions, natural disturbances and the presence of herbivorous fish, while human activities also affect the distribution and abundance of algae. Poor water quality caused by increased sediment and nutrient levels can encourage harmful algal blooms. However, some types of algae enhance the recovery of corals.

### ASPARAGOPSIS

*Red algae*



### CRUSTOSE CORALLINE ALGAE

*Red algae*



### CAULERPA

*Green algae*



### DICTYOTA

*Brown algae*



### CHLORODESMIS

*Green algae*



### TURF

*Brown algae*



## IV. SAND

Coral Reefs are often flanked by large deposits of desert-like, featureless coralline sand. Although these sandy habitats may appear barren, an extraordinary variety of plants and animals call these plains home.

The sand-dwellers that occupy this type of environment are a major food source for a variety of fish that inhabit other reef zones.

SAND



SAND



## V. OTHER

As a general rule of thumb, if the classification point is:

(1) clear enough to see well, (2) not a hard or soft corals, (3) not algae, (4) not sand or water its belongs to the Other Category.

### SPONGES

Among them, sponges, also referred to as “underwater vacuum cleaners”, they pump water through their bodies, filtering and using any organic particles as nutrients for themselves.

Sponges play a vital role in the health of coral and other reef creatures. Some sponges are able to break down dead coral, eroding the limestone and also making it available for new coral reef growth. Sponges located on the Great Barrier Reef are often vibrant in colour, ranging from reds to yellows and blues to browns. It is currently estimated there are 450 species of sponges that have been described from the Great Barrier Reef, with the Queensland Museum having already collected over 2,500 species from the reef, most of which are new to science. The distribution of sponges is influenced by environmental factors including water quality, which varies depending on depth, the amount of sediment in the water, current stress and nutrient levels.

### TUBE SPONGE



### ENCRUSTING SPONGE



## SPONGE



## SPONGE



## CORAL DEBRIS

Widespread areas of coral debris called coral rubble are usually found along the outskirts of fringing reefs and outer reef slopes. This debris is formed from parts of stony coral broken off by waves, swells, storms and destructive feeding fish, sea urchins and coral-eroding organisms. This rubble provides shelter for numerous plants and animals.

The surface of the rubble offers an ideal growing surface for anemones, soft corals and some hard corals.

## CORAL RUBBLE



## CORAL RUBBLE



## EVERYTHING ELSE

Any type of fish, molluscs, anemones, ascidians, hydroids, gorgonians, corallimorphs and rock are classified in the Other Category.

## REFERENCES

- Czechura, G. (2013). *The Great Barrier Reef: A Queensland Museum Discovery Guide*. Brisbane, Qld: Queensland Museum.
- Veron, J.E.N., & Stafford-Smith, M. (2000). *Corals of the world*. Townsville MC, Qld, Australia: Australian Institute of Marine Science.

## IMAGE CREDITS

Trevor Smith – Dive2go; Sota Yamaguchi - Sota Photography; Reef Check Australia.  
[www.reefcheckaustralia.org](http://www.reefcheckaustralia.org); Dr. Kristen Brown – School of Biological Sciences, the University of Queensland, Brisbane, Australia.

## ACKNOWLEDGEMENTS

We thank Trevor Smith, Amy Rawson, and Dr. Kristen Brown for their contributions to the help guide.