

# Learning Coral Surveying Method Through CRIOBE's Polynesia Mana Project



Keanu Rochette-Yu Tsuen<sup>1</sup>  
Yannick Chancerelle, M.Sc.<sup>2,3</sup> ; Serge Planes, Ph.D.<sup>2,3</sup>

<sup>1</sup> Kapi'olani Community College, HI, USA

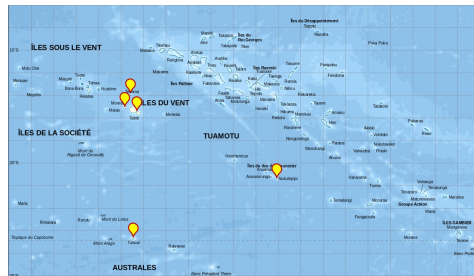
<sup>2</sup> Centre de Recherche Insulaire et Observatoire de l'Environnement, Moorea, PF

<sup>3</sup> École Pratique de Hautes Études, Paris, FR



## Introduction

Due to global climate change and additional local anthropogenic pressures, coral reefs around the world are subject to bleaching events making them more susceptible to collapse. They must be monitored to better understand the consequences of higher oceanic temperature and local environmental pressures on their health over time. The project Polynesia Mana encompasses a set of islands in French Polynesia and its surroundings where corals are surveyed every two years to enable a close monitoring of those ecosystems throughout the years.

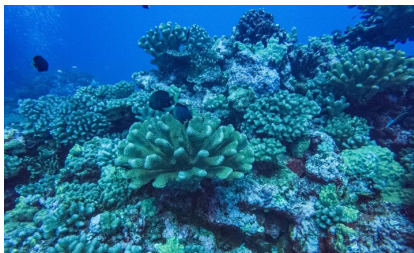


**Figure 1:** The project Polynesia Mana covers 3 archipelagos of French Polynesia. During this internship, 5 islands were surveyed: Tahiti, Moorea and Tetiaroa (Society Islands), Nukutepepi (Tuamotu Islands) and Tubuai (Austral Islands).

## Objectives

In order to conduct similar research and surveys while in college, the objectives were the following:

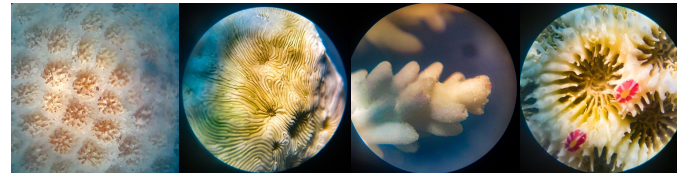
- Learn coral taxonomy of coral spp. occurring in French Polynesia
- Recognize coral genera on-site and on photographic media
- Process data from quadrat photo
- Acquire additional skills by helping fellow researchers on the research center



**Figure 2:** Example of *Pocillopora* spp. Picture taken on the outer reef of Arue, Tahiti. (Credits: Keilan Rochette)

## Learning Coral Taxonomy

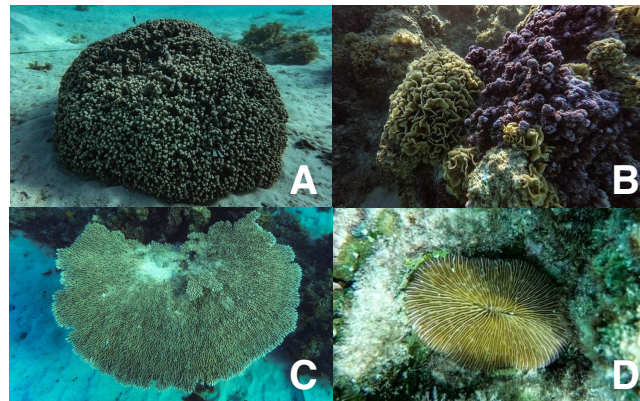
25 of the most common species of scleratinian corals occurring in Moorea were studied this summer 2021. The learning experience started with a Coral Identification book written by Bosserelle et al. (2014). Close observation on coral skeletons (naked eye and binocular microscope) allows for a better understanding on the defining features of each coral genus. Specific traits to observe are : shape and size of corallites, separated, shared or no walls, shape of the colonies (branching, encrusting, massive...) etc.



**Figure 3:** Sample of corallites observed with binocular microscope (unspecified magnification). Left to Right : *Porites* spp., *Leptoseris* spp., *Acropora* spp., *Acanthastera* spp.

## On-Site Studies

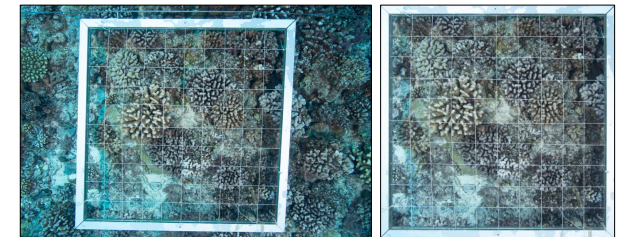
On-site studies allowed for a closer observation on coral species and genera in the wild. Indeed, certain coral species can present ambiguities when observed on digital media. Corals also have plastic capabilities allowing them to alter their shapes to adapt to the environmental conditions they are exposed to. For a more comprehensive learning of coral taxonomy, researchers must be able to identify corals regardless of the form they take.



**Figure 4:** Coral species observed in Moorea and studied for the internship. (A) *Porites* spp., (B) *Pavona* spp. (left) & *Montipora* spp. (right), (C) *Acropora hyacinthus*, (D) *Fungia* spp.

## Photo Processing and Image Analysis

Raw photos of quadrats were taken on 5 different islands and were processed using Adobe Photoshop. Colors were adjusted to enhance their quality and make the photos more legible for further analysis. Pictures were cropped, resized and squared. Each quadrat is numbered and represents a particular area on a transect. That way, it is possible to compare the changes at a site over time with as much accuracy as possible. Coral cover is evaluated using the point intercept method. Coral cover is expressed as a percentage and can be broken down per genus.



**Figure 5:** Side by side comparison of a "raw" quadrat photo (unedited) and a squared quadrat photo, standardized to fit within the guidelines of the project.

## Conclusion and Acknowledgements

The objectives of the internship were successfully completed. I have gained a comprehensive knowledge regarding coral genera occurring in Moorea and French Polynesia and have more confidence in my coral identification skills. Through the help of fellow students and researchers, I have learned more about the current state of coral reefs in French Polynesia and the complex interspecies interactions occurring in our lagoons. I would like to thank specifically Yannick Chancerelle for mentoring me throughout this internship experience and help me grow as a student and future researcher. Thank you to Dr. Serge Planes for accepting my internship request, allowing me to work at the CRIOBE of Moorea.



**Figure 6:** CRIOBE Staff, Researchers and Students surrounding President Emmanuel Macron during his visit to Moorea for the inauguration of Te Fare Natura (museum).