# CAP TERNAY Newsletter

## One world one mission

by Andy Ezeta

Hello and welcome to the second edition of the Cap Ternay Newsletter!

The main objective of this newsletter is to inform our volunteers, recent and past, what were the final results of the monitoring and the other projects that we carried out in 2018.

Last year was a very fruitful year for us as we managed to complete mostly all of the study sites for corals, fish and invertebrates. For fish we completed 492 sites (Belt and SPC), for corals, 130 LITS and 108 Quads and for invertebrates we managed to finish 150 LITS and 82 Belts. Thanks to this, our final analyzes were more complete and gave us a better understanding of the conditions of our reef.

In the case of our additional projects, the results were also very positive. We managed to do 80 Coral Watches, checking 1589 corals from the different dive sites. We collected a total of 62.8 kg of garbage from our two adopted sites, Corsaire (20.3kg) and Site X (42.5kg). We identified 2372 different individuals of mega fauna, 245 turtles, 280 sharks and 408 rays, mentioning a few and, thanks to the support of our interns, we successfully transplanted 29 corals for the first time to the reef.

We want to give a massive thanks to everyone that made this possible! We could not do without the help of all our volunteers and staff.

Enjoy!


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## Our story

Global Vision International (GVI) is a multi-award winning social enterprise that runs high impact volunteer and international education programs.

For more than 20 years GVI has helped thousands of people make a real difference to the world they live in while also gaining the knowledge and skills necessary to live and work in a globally interdependent and culturally diverse world.

We began more than 15 years ago with a simple mission: To work hand in hand with local communities, NGO's and government organisations to facilitate real change on the ground while also giving our participants the opportunity to grow personally and professionally.

It's an undertaking we've been proud to pursue in over 25 countries, through 450 programs and by the support of over 25,000 participants.

# Behind the Science, Coral edition

by Andy Ezeta

2018 was an eventful year for us here in Cap Ternay. Thanks to the help of many volunteers and staff we are currently analyzing 14 years of data that we managed to collect after conducting a large number of stationary point counts, diversity belts, line intercept transects and quadrats along the coast of northwest coast Mahé.

This year, as we have done in the past, we focused on the study of the benthic composition and the abundance and diversity of fish, corals and other inverts that can be found in our ecosystem. A thorough database of this size gives us a better understanding on the dynamics of our reef and with this we can get a clearer idea on how reef systems recover after a bleaching event.

As we all know, during 2016 we suffered a massive bleaching event that hit not only our reef but almost all reefs worldwide. For two years this event reduced our coral cover to almost nothing; leaving us with only 15% of live corals. Fortunately, this year we can appreciate a small increase up to 17% in the overall cover showing a small recovery in our reef.

Here in Cap Terney we study different types of reef. We have our granitic areas and carbonate areas. these are divided depending on the type of rock compositions. Normally we always find more abundance of corals in the granitic reefs, this is because this type of reef offers better stability for the corals to attach. This year the dive site with the largest amount of corals was in our bay: Cap Ternay North East.

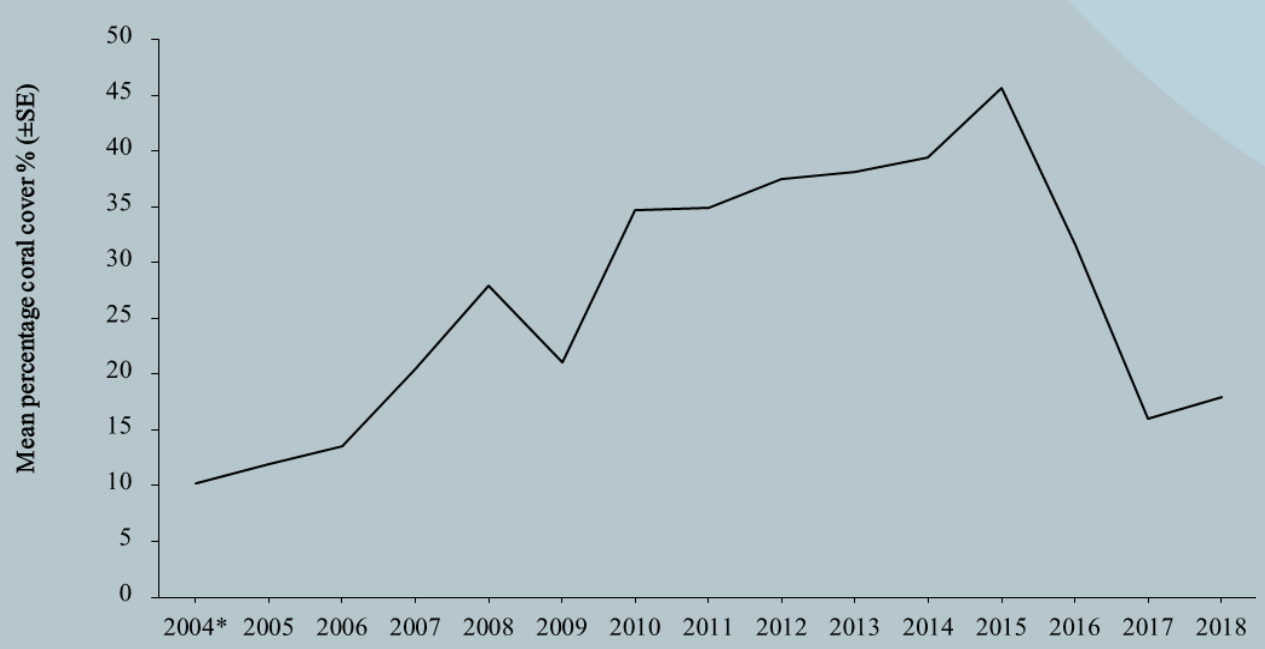
Following the same trend as previous years *Porites* was the most abundant coral of them all. *Porites* is one of the few genuses of corals that are more resistant to disturbance events such as bleaching. On the other hand, the once very common *Acropora* dropped even more. Before the bleaching event, *Acropora* was the most dominant coral with a variety species scattered all across the reef. We hopefully expect to see an increase next year on its numbers but it will all depend if the reef doesn't suffer another stressful event.

Besides studying the abundance and diversity of corals we also focus on the study of the other components of the reef such as coralimorphs, zooanthids and sponges. All together they play an important part to maintain a balance in the ecosystem, either filtering the organic matter in the water, being homes for other inverts or a food source for fish and turtles. This year the numbers of these inverts was very low. These organisms have a competitive advantage over corals so that's why it's good to have them in small numbers.

In the case of the algae cover, turf algae, as usual, was the most abundant type of algae of them all, even though this year it had a big decrease in numbers. This is good news for our corals since they are always competing against it for a space on the reef.

And last but not least our corals recruits, unfortunately, had a decrease in abundance of 22 %, a negative impact on the recovery of the reef. The cause of this is not known since we cannot see a clear pattern after the bleaching event. Hopefully in time and with more analysis of the reef we can be start to explain why the coral recruits specifically decrease.

Overall we can say that our 2018 results were optimistic. Our coral cover is getting better over time. We are starting this new year training new volunteers so we can continue our studies. With these assessments, we can begin to understand how our corals behave after stressful events and maybe in the future we will have the appropriate tools to help them.




Mean percentage live hard coral cover for each survey period from 2005 – 2018.

# Fishy facts from Cap Ternay

by Nico Fassbender

Almost everyone has seen the film Finding Nemo and with it heard the phrase "Fish are friends – not food". However, reality often looks a far bit different. Fish is one of the most crucial food sources in most tropical countries and here in the Seychelles, you can find dozens of different fish species in the fish markets, restaurant, little food stands and takeaways around the islands. With that being said, it is important to monitor these fish species and learn a little bit more about them and how they are affected by fishing.

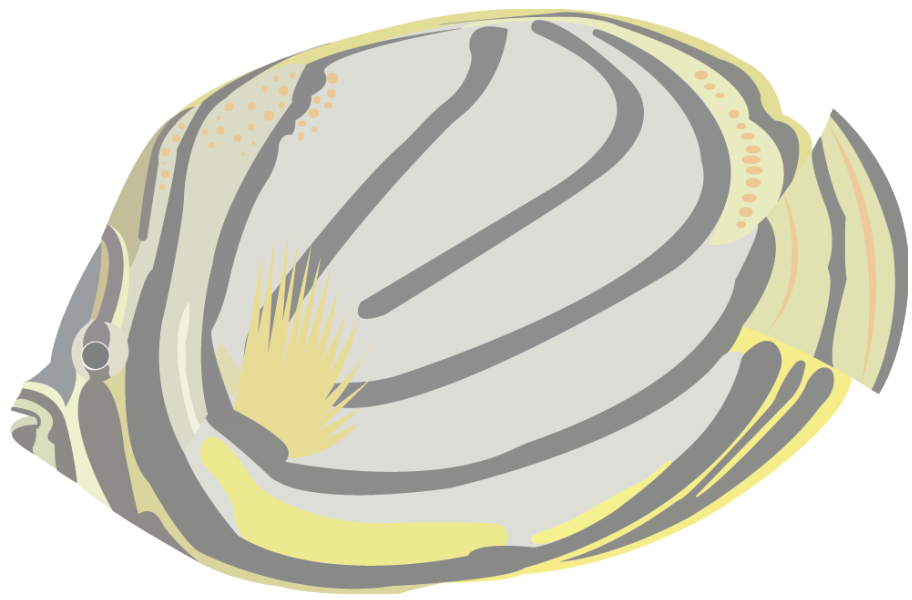
GVI has monitored the reefs around the North-western coast of Mahé for the last 14 years, compiling amazing long-term data that enables marine biologists and conservationists alike to create effective management strategies and closely monitor changes to the Seychelles fish populations. With large scale disturbance events, such as the 2016 coral bleaching event, threatening our coral reefs and associated species, we focussed our research on the changes in fish density and abundance and compared marine protected areas to unprotected ones this last year.

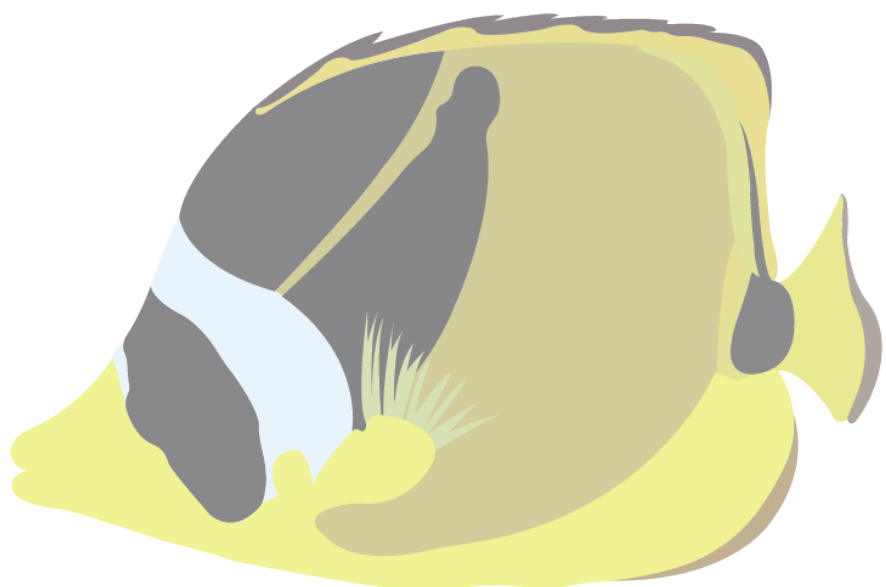
After the bleaching event the fish stocks initially showed an incline in fish density per m2. Whilst this may seem odd as the habitat and food source for most reef fishes was reduced to almost nothing, science found a way of explaining what had happened as this has previously been observed in other areas around the world.

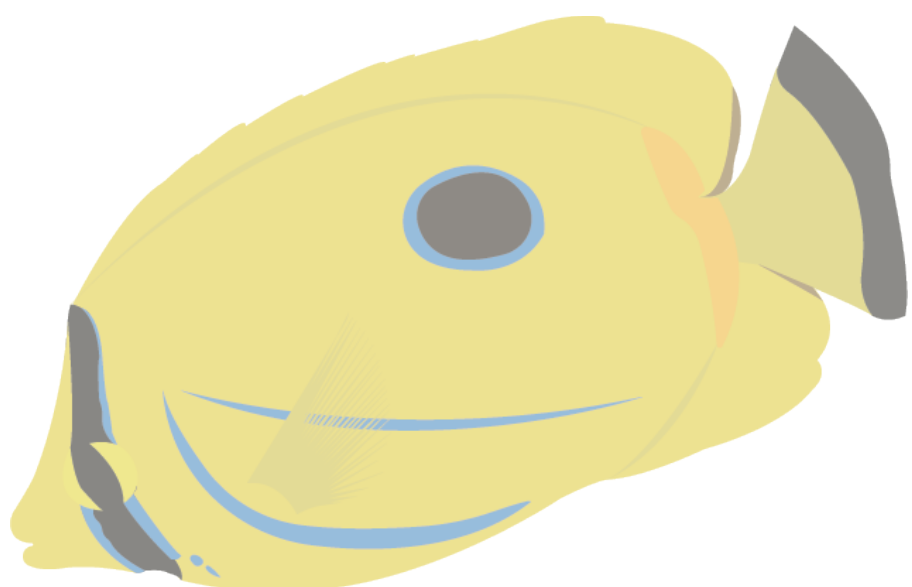
After a coral bleaching event the corals itself will show changes almost immediately and will die quickly. Fish however will need some time to adjust to their new habitat and with a lot of algae available, the numbers of grazing fish species can increase massively, hence the initial incline throughout 2016. Afterwards, fish stocks were found to display what scientists call a "lag-effect": Fish abundance and density will slowly decline as the next generations are adjusting to the little habitat and food available. This decline can continue whilst the actual coral is growing back as fish will take time to adjust to their new habitat.

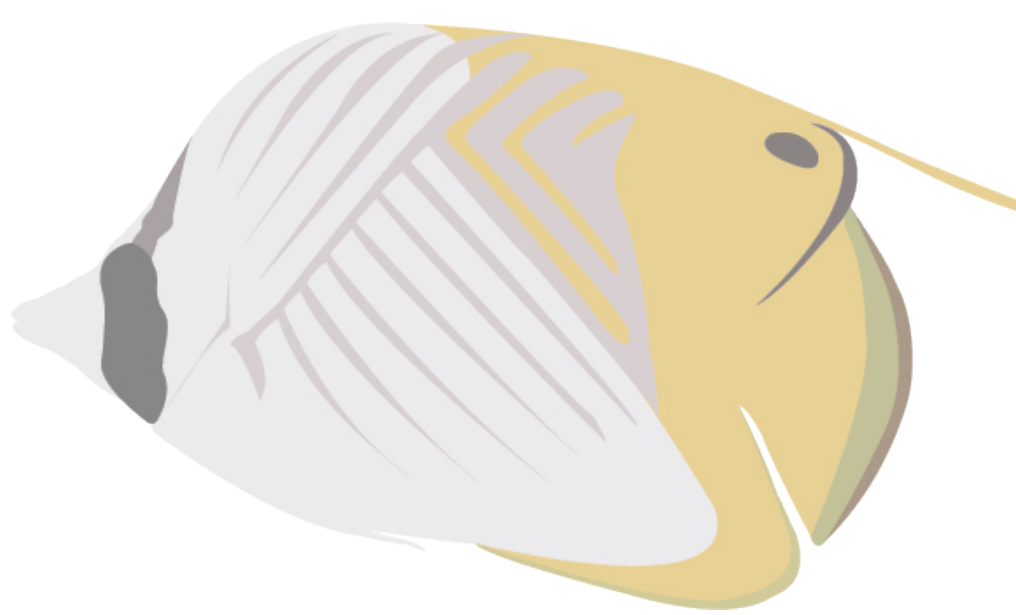
This year, like previous survey years, we found the highest fish density in our bay, in the centre of Baie Ternay. Overall Baie Ternay and Port Launay marine park kept representing higher fish densities than unprotected survey sites, displaying how well the management strategies work and how much this can improve diversity and density in certain areas. Most importantly it shows that the fish densities for the protected areas are actually increasing for the first time since 2016, which displays the potential for the reefs inside the protected areas recover more quickly. With no fishing pressure inside the MPA's, the fish stocks can recover more swiftly from a heavy disturbance.

With the help of our team of volunteers and our experienced staff members we managed to survey 23 different sites stretching from Therese Island all the way to L'Ilot island in the north. We will continue to build our long-term data set and will keep tracking and analysing the changes to the coral reefs and fish communities to keep supplying the SNPA with valid data.









# It's inverts time

by Katie Searle-Evans

Here at Cap Ternay we train volunteers to identify and survey the invertebrates found on our reefs. Some of the species include a variety of sea urchins, sea stars, sea cucumbers, crustaceans (lobsters and crabs) and mollusks (oysters, snails etc.). We monitor the invertebrates using a belt method, which consists of laying out a 50m tape underwater and having someone either-side of the tape recording everything they see within 2.5m from the tape, covering 250 sqm in total per survey. We do two of these belts per dive site, making sure we cover shallow and deep reef so we can get a more complete image of what is happening with the invertebrate abundance and diversity in the area.

There are several reasons why we choose the species we survey, for example Sea urchins are important to maintain a healthy coral reef and become most valuable when the reef is vulnerable after a bleaching event or natural disaster. This is because Urchins eat the main competitors of hard coral, such as algae and sponges that outcompete them for space if the urchins did not keep their populations under control. Long-spined and short-spined urchins were the most abundant invertebrates recorded on the 50 m belt surveys in 2018 which is consistent with most years. Long-spined urchins showed a large increase in numbers and short-spined urchins densities seem stable from 2017.

Sea cucumbers are monitored for a couple of reasons, one is because of the fishing trade. Certain species are highly valuable for sea cucumber fisherman as there is a large demand and in turn a large export trade to Asia. These certain cucumbers are monitored to assess whether their numbers are going down due to over fishing, potentially using data we collect to help put in more protection for specific cucumbers. The other reason we monitor cucumbers is that sea cucumbers, like urchins, are very good for a healthy reef. As they are natures recyclers turning rubble and sediment back into sand they are very important for creating clean areas for new coral growth. Another very important job that sea cucumbers do for the reef is produce Calcium Carbonate as a bi-product of digestion. Calcium carbonate is a vital component for hard coral strength and growth as coral will use it to create their hard protective structure that they need to survive, which is currently getting more difficult for them due to ocean acidification. Luckily sea cucumbers are stable and numbers are even on the rise in certain species.

We monitor a couple of species because they are coral predators, and we want to make sure that their numbers are not getting too high. This includes the Crown on Thorn (COT) Star Fish which numbers have been known to get into tens of thousands when there is an outbreak and can decimate a large number of coral in a short period of time. As well as surveying them we also document incidental sightings and eradications of any COT encounters and share this information to try and keep ahead of any outbreaks in the area. Drupella snails are the other main coral predator that we monitor. They can be found in their thousands if an outbreak occurs, and are attracted to stressed reefs. Outbreaks are thought to be due to the over fishing of Drupella predators such as triggerfish, snappers, wrasse etc. which is another reason for us to monitor fish species, looking at the ecosystem as a whole. Here at Cap Ternay our levels are very low so we have no control methods in place, however we are monitoring them like the COT to try and keep ahead of any outbreaks. The overall density of COT and Drupella spp. is continuing along a decreasing trend since 2015.

All this information gives us a good image of our reef health, and give us hope that the reefs we monitor have a good chance of recovering well from previous bleaching events due to healthy population and positive trends of beneficial species to the reef.

# Cap Ternay's first coral transplantation

by Andy Ezeta

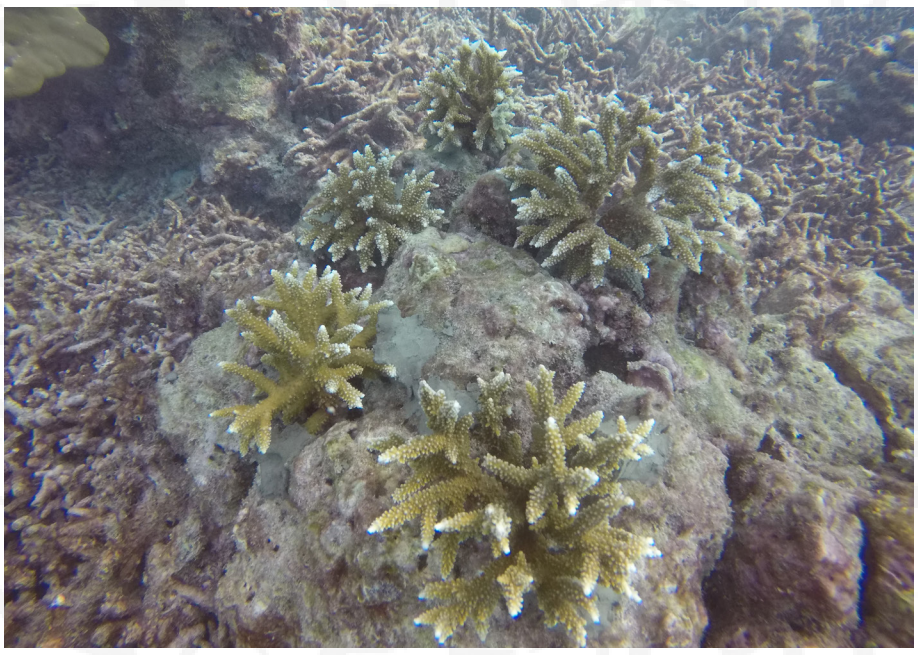
In 2018 the Cap Ternay team successfully transplanted 29 *Acropora* fragments to the reef. This was thanks to a year of hard work in which our volunteers and staff collected and took care of the tiny, fragile corals.

The project started in May when the science officers collected 30 *Acropora* fragments from the Cap Ternay Bay and attached them to our rope nursery. This nursery was created in 2017 by the efforts of our interns, who helped start our coral restoration project.

Throughout the year several volunteers and interns helped with the maintenance of the nursery. They measured and cleaned the corals and made sure that the ropes were in good condition to maintain a stable support for the coral.

We organized the transplantation of our corals from the nursery on December 6th. The dive site we selected was Secret Beach since it is located in an area where the fragments could be protected from storms and currents, and with the help of a large group of volunteers we transplanted our 29 *Acropora* corals on the reef. It took 45 minutes of diving for the volunteers to attach all the fragments using coral friendly cement. The next day a team returned to the site to observe the condition of the corals, what they discovered was that only 3 corals were lost and the others were successfully transplanted.

We want to thank all the people who made this possible, the Marine Conservation Society Seychelles (MCSS) who donated us the necessary material to be able to achieve the relocation, the staff and volunteers who collected and cared for the corals. This year we will do the project again and hopefully we will have more corals to transplant into our reef.



# The Holy Trinity Rap

Each quarter our volunteers participate in the Biological Survey Technics (BIOST) course where they have the opportunity to learn different topics related to marine conservation. These themes, which include Target species and Monitor methodologies explain in more detail how and why conservation biologists use the techniques they use and how they choose the species they study. Depending on each module our interns have an assigned task. For the first module called The Holy Trinity, where they study the relationship between coral reefs, mangroves and seagrass, they have to present what they learned to the group in form of a presentation. Each group can be as creative as they want and in this quarter one of the groups wrote a rap that explained the important relationship between these ecosystems. We liked it so much that we want to share it with you. Hopefully you enjoy it.

## Coral:

Yeah imam reef a building cnidarian
Provide support and protection around the area
I'm a hermatypic coral, hard skeleton
Not a flimsy fan, we ahead of this peloton

32 to 42 ppm salinity
Don't give me less that's my affinity
I dig 23 to 29 degrees' best
But gimme 18 to 30 and ill survive the test

They call me the rainforest of the ocean
3000 species in a reef, stop the commotion
With coralline algae, I lay calcium carbonate
I know it's hard but try not to salivate

Zooxanthellae and I, we have symbiosis
She's a colour algae, and that's no prognosis
High Diversity, higher productivity
Don't forget Mother Effin' Holy Trinity

## Seagrass:

Gimme the sediments in water I'm filtering for coral reefs, I'm contributing my part helping the power of three,

I'm just a flowering plant submerged in shallow waters, I'm here providing homes and food for fish among us,

I stabilize the sand protecting the land you know, I do this job right now enabling mangroves to grow,

Another mangrove got smoked and it's no surprise, Humans killing all my brothers right in front of my very eyes,

It seems that everyone is questioning our personal worth, Do they not understand our importance on planet earth?

But they all suckas, infatuated by their own agenda, All the benefits and pros that seagrass has to lend ya,

My sensitivity to changes in water is really obvious,  And if you don't see me, that shit is poisonous,

I'm able to determine the health of ecosystems, Seeing me in abundance will give you a stigmatism.

## Mangroves:

Here's the end of the wholly trinity, first coral, seagrass and now me.
I'm the tree that grows from this sea.
But you may as well call me nanny P cause' I make the best damn nursery.

I'm a safe space for the slow paced
Early beginners in this harsh race
But be prepared to be outpaced by the greatness of my real case

My main mission is distillation
Sedimentary filtration of this here ecosystem
My disruption of the water's gushin'
provides the cushion for the new generation of the coral nation

Sorry to give you all dendrophylia
But without me symphilia and lobophylia would all be missing ya

Surely

But why should you listen to me
I'm just a tree that grows in the sea
How important could I really be?
Inter-relationship:

I am the ocean, and this is my neighborhood
I get annoyed when I get misunderstood
I'll send out some ripples, with intent to cripple
Which coral dissipates in less than a triple

Seagrass is next and takes the shock
It does a great job even though it's not a rock
Seagrass will speak and the wave wont sneak
Y'all thinking grass is weak, man that's just peak

Then we got the mangroves absorbing the last
Now the first wave is chilling in the past
What started as a wave is now just a wavelet
Erosion would be bad if the wave woulda made it

When you see it in reverse the mangrove takes the brunt
Stopping all the rivers and all the sediment
Seagrass with its roots will stop, lock and hold
Keeping all the sand locked in a little chokehold

Doing all this they keep each other safe
The power of three will decide the earths fate

## Conclusion:

Having Mangroves and Seagrass as areas for juveniles to grow means a higher diversity in the coral reef and a higher diversity means the ecosystem will respond quicker to disturbances and changes.

Coral maintains the first barrier so that the energy dissipates the remaining energy will move to the seagrass which further dissipates the energy, the residual energy will then go to the mangroves which can reduce wave action by up to 80%. This helps to prevent costal erosion.

Seagrass meadows account for more than 10% of the worlds carbon stores, per hectare they hold twice as much $CO_2$ as the rainforest. They also assist in oxygenating the sediment which makes the area more hospitable to other organisms.

All three units play unique and important roles.
One cannot survive without the other.
Together they make up the holy trinity.

## Authors:

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# We want you to be our next Scholar!

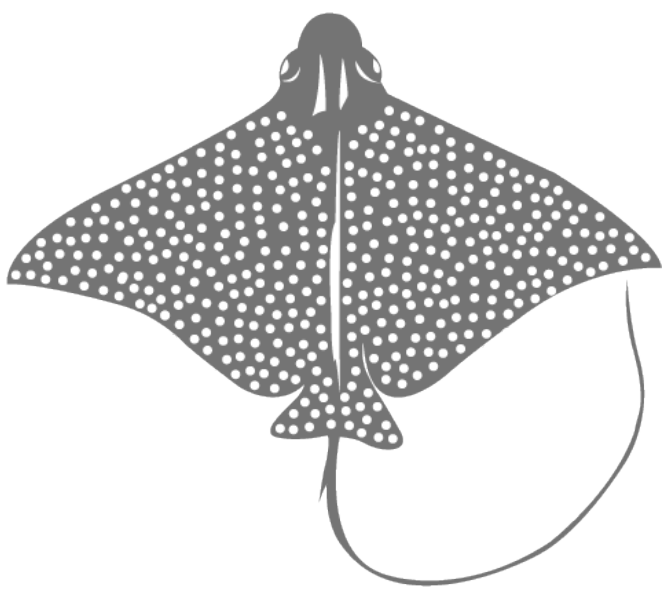
Cap Ternay has an amazing opportunity for those people who are looking for their first or next step into the world of marine conservation and diving:

## The Scholarship Position.

This position runs for a three-month term in which whoever is selected will help the field staff in diversity of tasks, including assisting and/or teaching PADI diving courses; training volunteers on coral, fish and/or inverts identification and underwater monitoring techniques; conducting science dives and supporting the Program Manager in the day-to-day logistics and smooth running of base through daily duties.

This is an incredible job in which you will get a lot of experience, good memories and it will help you improve your CV. It is challenging and a lot of hard work, that's why we need someone who is passionate about marine conservation, enthusiastic, very proactive and a team player.

If you think you have what it takes to be a Cap Ternay Scholar or you know someone who does send us an email to capternay@gviworld.com
We look forward to hearing from you!



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