

CORAL REEF 2015

September - October 2015

This year saw more great adventures, learning, challenges and experiences: Pictured right; two students undertaking coral health surveys Lissenung Island: Papua New Guinea

"The Coral reef ecology paper is definitely a major attraction in the diploma of marine studies course, not only do you learn how to manage a team in the field but it also provides one of the best introductions you'll have into marine industry."

Arianna Hemi

Pictured right: Ann Parkinson and Dean Carr coral surveying.



Bay of Plenty Polytechnic Coral Reef Ecology: Marine Studies

By Daniel Sharp: Senior Academic: PADI Course Director: daniel.sharp@boppoly.ac.nz

For a moment think of your normal working week. You might see 36 -40 hours spent at your desk, in meetings, discussing past and up and coming events with work mates. Now consider that same amount of time spent underwater with 15 kilograms strapped to your back, 4kgs around your waist and you are wet through; doesn't sound glamorous does it? That is the reality of a Marine Studies field trip, in particular the annual trip to a remote island in Papua New Guinea, a stone's throw from the Equator.

Well into its fifth year of two trips each year, the Coral Reef Ecology Paper is very popular with both students and staff. With the course fee separate

from the overseas field trip cost, students work hard over their summer holidays to save for what they say is a trip of a lifetime. With students completing up to 40 hours of bottom time amongst the corals, numerous fish, some animals best left to a James Cameron film and your reef sharks of course, how could this not be something to tell your grandchildren.

I often get asked why go all the way there (Papua New Guinea), why not Fiji, it's closer, cheaper and perceived to be more stable?.... Well it is not in all cases. Fiji is fantastic; I used to live there as a dive guide, but it isn't as adventuresome. Then there is usually a comment on the cost, and as I have said

numerous times to this response it is comparatively cheap. The current rate now in New Zealand for two dives at the Poor Knight Islands is between \$250 - \$280 per diver. Our students do approximately 40 dives whilst on their trip to PNG. To be precise we spent a total of 19524 minutes underwater and undertook 357 dives with an average dive time of 54.6 minutes (as you can see dive planning and safety is paramount). This means that each student pays the equivalent of \$100 a dive and then accommodation, food, transfers, flights are free and we haven't mentioned the "additional free extras!!"

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This year saw another two trips head off to PNG. Five years ago we thought we would be lucky to get one group yet alone two groups every year on this trip since then. In total, the Marine and Environmental Department have taken over 120 visitors to this small island roughly the size of three football fields. The history of the paper is simple, as part of the Diploma in Marine Studies students undertake a six-week project of their choosing. More and more students were heading off to the warmer waters of the Pacific to undertake positions researching within NGOs and also government departments, such as The Vanuatu Fisheries and Niue Fisheries

Now the saying “island time” is nice when you are on holiday but frustrating if you have spent your student holiday savings to undertake a project when no boat arrives or things that were set up for you actually weren’t. I remember this well when trying to survey a remote Island a few years ago for a potential marine reserve and being stuck on the mud flats for six hours whilst our pick-up boat had been used to collect supplies from town in Fiji. You can only play touch rugby with a coconut for so long! The solution to these problems – create our own tropical experience where the control is passed back to the department and in doing so give students real tropical survey skills that they actually go on to use. This has meant numerous ex-students are now in organisational roles in coral reef protection and monitoring.

By going to the tropics students can also benefit from developing the ability to stay for long

“It was really interesting to see all the theory that we learnt back in NZ in action on a coral reef right in front of my eyes. The trip has definitely reinforced all of the learning that we did in the classroom and it has helped to stick it in my brain, long term as these were experiences I will never forget.”

Carys Morgans

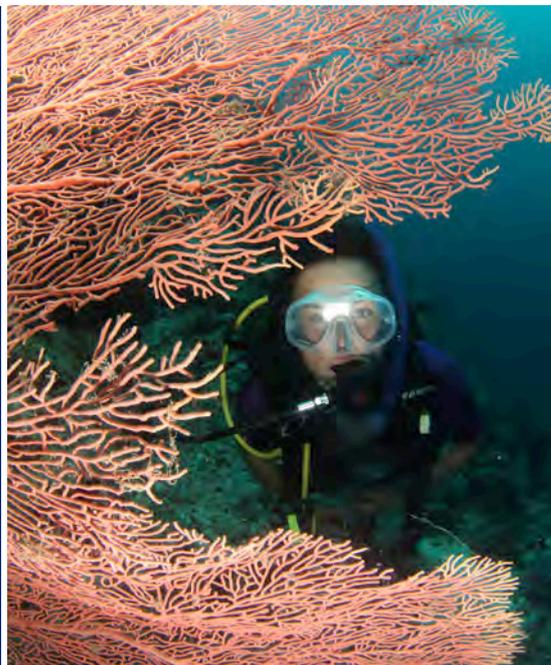
periods underwater, plenty of time to really learn and focus on the tasks and techniques at hand. Comparatively at 16° C the average human body could last 30-45 minutes in water before the onset of hypothermia. In the tropics where the water temperature is the same as the air temperature (30° C) staying underwater for 60 -70 -90 mineasy!

To convince you it isn’t a holiday (apart from 60 min of volley ball) this is a day on a Coral Reef Ecology field trip. Dawn dive, in the water 5:00am, it’s dark, it’s warm, it’s fun. Underwater environments like their terrestrial counterparts have a transition of day and night “workers”. When you are underwater at the time of “changing of the guard” the reef takes on a busy intersection type experience. Rivers of day fish appear from their sleeping reef crevices in schools of hundreds, which only 20 minutes prior were invisible in their hides. Nocturnal invertebrates that smothered the sandy reef floor disappear as if by magic into the sand, sea cucumbers that

**Nicole Hodgson,
Pictured right**

“Amazing! the trip itself teaches you something that can’t entirely be taught in a classroom, yet it seems to be the most valuable. Applying the knowledge and experiencing what it’s like to organize, direct and carry out surveying on the coral reef really ingrains and helps you to fully understand what was taught in the classroom. “

**Pictured far right,
Tristan Nilsen at the
Largo Island
Mariculture
Research Facility**





“The highlight for us was simply sharing the experience with like minded people on our own tropical paradise, with access to a really healthy and diverse house reef, learning from each other and being excited about what we did each day”

Ann Parkinson

Left: WWII Plane Wreck, Below: Students, Staff and Jonathan Knowles (middle)



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littered the seabed like rubbish after a football game have mysteriously disappeared into their day-time haunts. You take a double look because, in the disguise of darkness, what you thought were slow moving sea urchins have been replaced, in a few minutes, by the colourful coral they once hid under their army of spines. Then an hour later as you look at your depth gauge and your air contents you realise it's 6:30 am and breakfast is only 30 minutes away.

After breakfast at 7:00am and you are bloated from too much papaya, pineapple and bananas it's a quick reload of camera gear, lenses and preparing your underwater writing slate. At 8:30am one of the student groups are briefing you (yes, students tell staff what they want them to do) on a particular underwater survey technique. As part of the assessment in this paper, students are to project manage divers in collecting underwater data using different techniques then critique which technique best suits the environment and level of divers.

Now it is 9:00am and you have your orders, equipment and that third steel lung attached to your back. Did you know

the average scuba tank holds 2,200 litres of air, about the same volume as a small closet and the air compressed weighs approximately 2 kg's? This dive, depending on what you are counting, measuring describing or otherwise, can be up to two hours underwater! Two of these dives, and suddenly it is time for lunch.

After lunch we are not in Italy, no afternoon sleep on this trip! Again back in the water for another survey, then to finish the day's diving there may be an added bonus dive undertaking a dive of staff interest .

At 4:30pm the staff boat leaves the island and if the most serious international game of volley ball hasn't started by then there will be no breakfast for the guests the next day. It has always impressed me the way the staff where we stay love playing volley ball with our students, so much they stay past their leave time of 4:30pm until it gets too dark to play. The Lissenung island managers say that the BOP Polytechnic groups are the only ones that play volleyball. I am not convinced of this as they seem well practiced! No photo I have ever taken captures the energy and fun of these

evening volleyball games, language is no barrier as laughter has no accent!!

As the fruit bats descend to eat the fruits of the tropical trees and the staff leave for their home island 20 minutes away, the students have time for a shower then an hour write up of their reports before dinner at 7:00pm. Following from desert, it's off again to rig up and enter the water for a night dive by 8:30pm as everyone needs to be logged back onshore by 10:00pm. Now diving coral reefs by day is fantastic, diving by night brings a whole new level of interest. James Cameron's Avatar is not a new world, it is the underwater world ... a realisation I have had since I first saw it, little did I know that this year's PNG trip would cement this forever.....

Now consider night diving in a nightclub in the 1980's. One thing I did a few years ago was bring in from America two UV diving torches, the same bulbs as those in nightclubs that make white glow, your teeth glow and lint glow that you may have on your cool black top! This was also made famous by a few 80's bands, such as WHAM, and a lesser known stage performance by Cirque du Soleil. These lights radiate colours not visible to the naked eye and turn the reef into a three dimensional Planet of Pandora (for those Avatar followers). Anyway, once again time and air tell you that 70 minutes under water is long enough and back to your bed you must go... just in case you haven't been adding the hours up, we have been underwater today between four to five hours!

Earlier on I mentioned the additional extras to this trip, ones that you cannot plan for, include in brochures or promise to students. This year alone we were lucky enough to have our students be involved in:

A visit to the local fisheries research station, which allowed them full access to reef fish breeding rooms where they got to see thousands of baby "Nemos" from pin size all the way through to adults. They were shown intensive farming of corals to be sold to aquariums around the world and the full life cycle stages of sea cucumbers for the Asian market, from microscopic to the full unimpressive adult blob.

Students were also encouraged to partake in a survey around the entire



"The research skills are also transferable but much better putting them into practice in warm tropical waters. Love the course and the tutors are awesome. This paper was one of the main factors for us signing up to the Marine Studies course at BOPPOLY as no other institute offered such a cool opportunity"

Dean Carr

Pictured left: Daniel and Paul enjoying our work space

island looking for Anemone Fish, the latest victim to global warming and ocean acidification. There is a growing concern with the changing pH of coral waters that Anemone Fish will no longer be able to use their chemical queues to relocate "safe" anemones.

Lion-fish surveys, a popular photograph species that if reaching large populations can devastate the coral reef ecosystem balance.

Then there is the inclusion of the youth into history that doesn't appear so much on Facebook and Twitter. PNG, and especially Kavieng (the region where we are based), was the scene for some of World War II's most horrific war crimes. For students to visit underwater relics of Japanese bomber planes and exploded allied planes should be a thought provoking and sombre one mixed with excitement and adventure.

2015 also saw a new coral nursery being built by students. Hoping to give fragments of coral broken off by natural processes a helping hand so they can be placed back on the reef. The nursery also provides an opportunity to dye tag the coral, where corals are soaked in dye for 24 hours underwater. Then in subsequent visits the corals can be inspected for growth seen by the stained layer.

Students and staff were also included in turtle egg transportation, where the island owners try to relocate buried turtle eggs and "replant" them in purpose built nesting boxes in order to increase egg survival. It was a first for myself and many others to hold and re-bury Green and Hawkes Bill turtle eggs!

All too soon our 13 day field trip was drawing to a close, with a group total of nearly 400 hours spent underwater. Our last full day is always a no-dive day to allow our bodies to rid itself of built-up gases from diving. This is a great day to head to the local island village to see where the island workers live and go to school with the children for the morning, I stayed behind to pack the survey gear and help the island staff prepare for some visitors.

Mid-morning on our last day the Orion vessel pulled in off the island. On board was an invitation-only group of leading scientists, policy influencers, artists, innovators and activist, plus the TED film crew and producers!. The Orion is the National Geographic ocean-going cruise/science vessel. Its mission this trip was aptly named Mission Blue II. A mission conceived by award winner TED presenter and inspirational marine scientist Dr Sylvia Earle, whom was also on board. Their purpose to challenge and brainstorm global issues facing our planet, particularly our oceans.

By late morning most of the guests were on the small island that we were staying on, buffet lunch tables set up and international scientists were asking us where some good shore dives were!! For me this was quite a buzz, but being lucky enough to have dived this island close to 200 times, my favorite points on the reef and local fishy residents are more like pets. I was also lucky enough to meet a man named Jonathan Knowles, who seemed to have been involved in all sorts of amazing adventures (his business card read "explorer"). The one that sparked my



“I think it makes a huge difference to have the opportunity to apply what you've learned in classroom.”

Alin Misescu

Pictured bottom: Dean Carr colour tagging coral for future growth identification with Alin Misescu. Bottom left: Quote from Sylvia Earle’s awarding winning TED presentation which supported the Mission Blue II voyage aboard the National Geographic vessel pictured top left.



attention was his leading involvement in companies like Apple, Adobe, AutoCad and Autodesk. Autodesk ironically was one of the leading design companies the James Cameron approached in making Avatar. It was about this time that our students returned for their village trip and were asked to join the Mission Blue II lunch.

Once again lucky enough to sit on the beach eating a burger next to a leading marine scientist and underwater photographer, Richard Vevers, who is currently traveling the world taking 360 dimensional shots underwater so that people can visit reefs from their home, turns out he worked pretty closely with one of Marine Studies past students who won the Rolex Ambassador grant a couple of years ago.

After lunch we had a presentation by Jonathan Knowles (first presentation with sand as a floor!) on AutoDesk 3d modeling systems. Our Marine Studies team sat there in excitement. After the presentation Jonathan asked if anyone would like to submit photos into the system. We were off, swimming out to our newly made coral nursery with underwater cameras, bombarding it with rapid fire shots. A quick swim back, transferred data to stick, transferred stick to Jonathan’s laptop and before long with only a few shots a 3D image appeared of our reef. The remaining photos will be

taken back to America where Jonathan will put them through the main computer and send the final 3D image to me; which can be 3D printed and used against subsequent years images to see growth of corals.

As the Mission Blue II team were leaving (approximately 120 people), a comment was made that the Marine Studies team were going to sneak on board the Orion later that night to watch the filming of the TED talks. A finger was raised and a few whispers made to crew with their walkie talkies and ear pieces. “if you can make it to the boat by 5:45, sit at the back, you can come aboard and be part of the evening’s presentations.”

So imagine this - 10 marine studies students and staff, sitting on the back deck of the National Geographic vessel with camera crews surrounded by some of the world’s best in marine science and innovation, leaders such as Anote Tong, president of Kiribati, Sylvia Earle herself and designers of underwater robots, in a remote bay in PNG, listening to TED presentations. This was truly a highlight of an already amazing field trip with so many added bonuses! It definitely makes the 21 hours of travel, four flights, boat rides, late nights, heat and itchy bites worth it!