

2011 Philippine Biodiversity Expedition*

Part 1: Planning, Science and Surreality

Richard Ross

*Steinhart Aquarium, California Academy of Sciences, 55 Music Concourse Drive,
San Francisco, CA 94118. Email: rross@calacademy.org*

Researchers from the California Academy of Sciences have been visiting an area called the Verde Island Passage off the coast of Batangas Province on Luzon Island, Philippines for almost 20 years. Research by scientists during that period suggested that this area is the “center of the center” of marine biodiversity, and perhaps home to more documented species than any other marine habitat on Earth; there can be more species of soft corals at just one dive site in this area than in all of the Caribbean. Thus it was only natural that when the Steinhart’s 212,000 gallon reef tank was designed, the Academy decided to represent the reefs of Luzon. Ever since, Steinhart biologists have traveled to this area in small groups with the objective of acquiring first hand knowledge of the environments they hope to recreate in San Francisco.

The 2011 Philippine Biodiversity Expedition, however, was a trip of a completely different magnitude: the largest expedition in the Academy’s history covering both land and sea. Consisting of a Shallow Water team, Deep Water team and a Terrestrial/Fresh Water team, the 2011 Philippine Biodiversity expedition, funded by a generous gift from Margaret and Will Hearst, was the most comprehensive scientific survey effort ever conducted in the Philippines. Joining the expedition were over eighty scientists from the Academy, the University of the Philippines, De La Salle University, the National Museum of the Philippines and the Philippines Bureau of Fisheries and Aquatic Resources, as well as a team of Academy educators whose mission was to share the expedition’s findings with local community and conservation groups as the Expedition was happening.

As part of the Shallow Water team Bart Shepherd, Matt Wandell and I surveyed and further documented the underwater sites that served as the inspiration for the Steinhart’s Philippine Coral Reef exhibit. We also responsibly collected coral, cephalopods and other invertebrates for captive propagation, research and display at our Golden Gate Park facility. As the only public aquarium permitted to collect stony corals in the Philippines, we were to obtain these unique species for study, captive culture research, distribution to other institutions as well for display at the aquarium.¹

PLANNING

On previous trips to the Philippines, Steinhart biologists had been given special permission to collect and export small numbers of small coral fragments, most of them collected as ‘found frags’. The 2011 Expedition would continue this tradition, albeit with some modifications. In order to reduce stress on the organisms, we planned to adopt Ken Nedimyer’s work with the Coral Restoration Foundation (<http://www.coralrestoration.org/>) to create a system for holding our coral fragments offshore until transport. We mocked up the system using materials that we could travel easily with, or that we could find in the field - silicone airline tubing, zip ties, dive weights and empty

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¹ http://www.youtube.com/watch?feature=player_embedded&v=2_lswEIAcIU. This video by Bart Shepherd shows some of the reefs we encountered on the 2011 Philippine Biodiversity Expedition

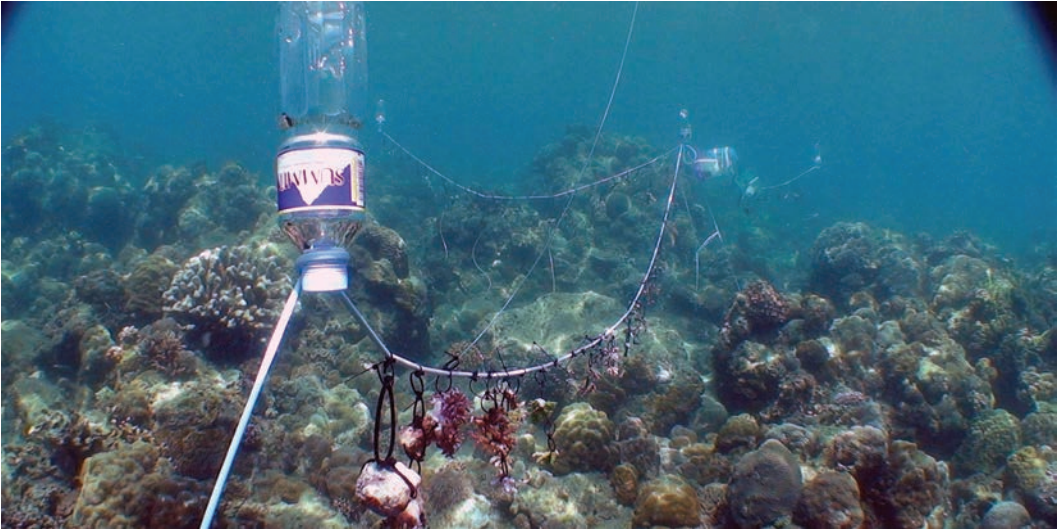


FIGURE 1: The 'Coral Clothesline', inspired by the Coral Restoration Foundation, in action about 50 meters offshore.

plastic water bottles as floats (after all, you can sadly find empty plastic water bottles on just about any beach in the world). The mock up went into our big reef tank for testing and was immediately dubbed 'the coral clothesline' by the aquarium's docents.

In addition to our clothesline supplies, we packed everything else we could think that we might possibly need. Some highlights: six large, low style plastic tanks that could be weighted and sunk offshore for holding larger fish and other inverts, as well as smaller plastic tanks that could be hung from the clothesline to hold small fish and other inverts. A backpack kit for harvesting jelly gonads (as removing the gonads doesn't impact the jellies long term and the gonads ship better than adult jellies). Fiberglass window screen to make lids for impromptu holding containers, as well as the rubber bands to hold those lids on. Dozens of tubes of super glue and rolls of duct tape. LCD microscope just in case we needed to look at something close up. Sharpies for note taking. Scissors for cutting everything. Needle nose pliers for coral fragmenting. Plastic rulers for scale in photographs. Deli cups for transport, collection and shipping or animals. All this stuff and more went into one fish shipping box and filled every empty space in our luggage.

After flying all night to Manila, all this gear, along with some very tired biologists, hit the ground running at 5 am, finding our checked items, finding our ride and driving 3 hours to Club Ocellaris, a world renowned SCUBA resort, which would be the base of operations for the shallow water team

SCIENCE WAS EVERYWHERE

When we arrived at Club Ocellaris, we found it had already been completely taken over by the Expedition. Science was everywhere. Across the resort, any flat space had already become some sort of makeshift lab, with equipment and apparatus piled all over the place. Every electrical outlet had a computer, camera, light or batteries charging. Containers of every conceivable kind from plastic bags, to lidded jars, to 5 gallon buckets waited everywhere to be filled with hunks of science. While all of that was exciting, we really wanted to get in the water. Within an hour of arriving our Diving Safety Officer, Elliott Jessup, got us suited up and on a boat for our first dive of the trip — we saw sea snakes, corals and fish galore. After our afternoon dive, we assembled our offshore holding about 50 meters offshore so we would be ready for whatever collecting we would do



FIGURE 2: Rich Mooi and Bob Van Syoc stand surrounded by the science that took over Club Ocellaris.



FIGURE 3: Sunset our first night at Club Ocellaris.

the next day. When we were done, we were treated to the most spectacular sunset I have seen in a long time. Not a bad way to start off the expedition.

The overall dive plan for the Steinhart Biologists was to dive and collect for 6 days, then drive

the animals we had obtained back to Manila for ship out on our ‘dry day’ (to give our bodies a chance to off gas Nitrogen in our tissues from diving), drive right back to Club Ocellaris for another 6 days of diving and collecting, then back to Manila for packing and shipping then fly home the next day. The daily schedule of activities would be a grueling marathon, but we couldn’t wait to get started.

LIFE IN THE EXPEDITION

Every morning, we woke at around 6 am for coffee and Skype video calls to home and work where it was 2 pm the previous day. Breakfast (ummm, mango shakes) and our dive briefing started at 7 am. With up to five dive boats going out each day, coming to agreement on where we would be diving was no small act of coordination. After breakfast we would collect and test our NITROX tanks for the day, get our cameras and collecting gear ready, and assemble & check our dive gear and load it onto the boats. Then we would suit up and zoom out to a good place to get under the water.

On each dive, we not only collected animals, but also completed multiple steps designed to track each specimen — every coral fragment was photographed and assigned a number that provided information on when it was collected, from what dive site and depth it was harvested, as well as the name of the biologist who collected it. Each coral got a tag attached to it so we would, in theory, be able to ID it later. The tagging was a learning experience and morphed over time, so much so, that next year we will most likely use heat stamped numbered zip ties as tracking id’s, but attach those zip ties to the coral with 20 gauge coated wire the tips of which are sealed with a rubberized plastic dip because the wire will be easier to manipulate and create less waste than other methods we tried.

After the second dive, we would head back to land and offload our animals. From the dock, we would change our scuba equipment for snorkels, and then swim our new specimens to the off shore holding facility, often making multiple trips. Then we would eat ravenously, then turn around and repeat the same process for the afternoon dives.



FIGURE 4: A red *Junceella* sp., tagged and ready to be placed on the Coral Clothline. This coral is now on display in the Steinhart’s Philippine Coral Reef Exhibit



FIGURE 5: Matt Wandell swimming a plastic tank filled with collected animals out to our offshore holding site



FIGURE 6: Even when bad weather kept us from diving, instead of relaxing, we were still science geeky. This is a time lapse shot of lightning and Matt Wandell writing CAS (California Academy of Sciences) in the air with a dive light.

We would finally climb out of the water at 6 pm for dinner . . . unless we were doing a night dive. On night dive days, dinner and dry-off was often as late as 10 pm.

After dinner, there was more sciencing to be done. The spreadsheet detailing what we had collected needed to be brought up to date, the Coral ID software needed to be consulted to identify each SPS coral to species. Paperwork for permits for export, and shipment/arrival details needed to be initiated and updated. When that was done, we were often drafted to help the researchers on other teams process specimens they had collected, take pictures, be all around helpful, and tend to whatever animals we were keeping onshore. Sometimes we even had a moment to geek out with Philippine scientists, or have a drink of the local rum (which I still think also contained Formalin). We were lucky if we fell into bed by 11:30.

THE SECOND NIGHT

Our first night dive was something special. The moon was full and the dive site was called Dead Palm. We hit the water just after the sun set to swim over stands of *Acropora* of all different kinds and *Turbinaria* colonies as large as a car. It was an SPS lover's dream dive. About halfway through the dive the particulate in the water started to gradually become noticeably thicker, and virtually at the same time the three of us looked at each other and yelled SPAWN through our regulators.

Many corals reproduce in coordinated mass orgies where they release millions of gametes into the water. None of us had ever seen a coral spawn in the wild, and it really is as cool as it looks in the documentaries. We traced the spawn to a huge thicket of *Acropora nobilis*, and watched in amazement as each egg/sperm bundle emerged from the branches and floated towards the surface where fertilization takes place. Within a few days the fertilized eggs change into a coral planula, coral larvae, which swim around (yes, swim!), until they find a suitable place to settle and develop into a mature coral.

Coral spawning is one of the new frontiers in captive coral reproduction, because collecting spawn instead of coral fragments can yield many more corals in captivity in an incredibly sustainable collection method. A group of public aquarists and coral scientists formed SECORE (SEXual-CORalREproduction — <http://www.secore.org/>) and they have been holding workshops in the Caribbean for the last several years to perfect spawning, fertilization and settling procedures. Building on the success of the Caribbean workshops the Steinhart Aquarium hopes to hold a SECORE workshop in the Philippines in the next few years. The most important part of such a workshop is of course timing it with the coral spawn. There is not much information on the timing of Philippine coral spawns, and none of the previous trips to the area had ever come across one, so actually observing coral spawning in the Philippines is a good and necessary start to bringing SECORE to the area.

We, along with some of the other California Academy of Sciences researchers and a Philippine television crew, returned to Dead Palm the next night where the coral spawn was in full swing yet again. We were able to find a colony of *Acropora willisae* when it was beginning to release gametes and set up around the coral to both collect some of the spawn and to document the event. I'll never forget filming Matt collecting gametes in a plastic bag while the television crew was filming me film him. We were able to collect several hundred sperm and egg bundles, and though completely unprepared for the labor intensive process of fertilization and settlement, we gave it a go.

A SURREAL NIGHT

After years of having the privilege of diving around the world practicing no impact diving, after collecting for the trade practicing and teaching having as little impact as possible, and after planning to take 'found frags' when possible, watching a scientific survey on the move takes a bit of getting used to. The researchers were collecting everything — worms, urchins, fish, nudibranchs — and just about every dive on the Expedition yielded at least one animal that seemed to be undescribed by science. The animals were being collected and preserved for scientific description, genetic analysis and as a way to be comprehensive in the survey, and being in the midst of a full on scientific survey lead to the Steinhart biologists to try to take advantage of the situation, and alter our plan regarding what we would try to bring back to San Francisco for our living collection.

On the third evening of our diving, Dr. Healy Hamilton showed us some ghost pipefish, *Solenostomus cyanopterus*, and some pygmy seahorses, *Hippocampus bargibanti*, that had been collected that day. These animals were going to be sacrificed for their genetic material. I know some people have a visceral reaction to that idea, but as Dr. Gerald Allen once said during a MACNA talk "It's a necessary part of science". Of course when we saw the ghost pipefish, a species that we had always wanted to work with but hadn't because of their dismal record of surviving collection and shipping through the trade, we immediately suggested that we try to keep them alive and that we try to ship them home and put them on display — if they didn't make it, we would still have their genetic material available for science. Though we weren't prepared for holding these kinds of animals, Bart, Matt and I had been trained in the ultimate McGyver proving ground — the reefkeeping hobby. We got to work setting up buckets aerated by scuba tanks, faux gargonian hitching posts for the seahorses made from zip ties, and prepared ourselves to do water changes as often as needed by slogging 5 gallon buckets up and down 2 flights of stairs.

Of course, the third night of diving was also the night we collected coral spawn, so while we were preparing to try to keep these amazing fish alive, we were also preparing to attempt to keep the coral spawn healthy and fertilized which included 'stirring' the gametes every hour or two. This led to the most surreal night of the trip. We had coral out on the clothesline, ghost pipefish in the offshore holding tanks, trays of coral eggs and sperm, and a bucket with two pygmy seahorses next

to our beds. Throughout the night we kept waking up and tending to these animals — a strange, wonderful and exhausting time.

In the end, we were successful keeping the ghost pipefish alive, and getting them home to the aquarium in Golden Gate Park. Sometime in the night we noticed that the pygmy seahorses were no longer living, and we preserved them. The coral spawn failed to thrive, and it seems that we were simply too unprepared and understaffed to have succeeded in that labor intensive realm. We learned a lot and helped move science forward. Of course, we plan that for next year's trip, we will be much more prepared for new surprises and opportunities.

In the next installment — coral collecting, octopus wrangling, shipping & packing for the trip home, and 300-500 new species discovered.

Special thanks to Bart Shepherd, Matt Wandell and Elizabeth Palomeque

2011 Philippine Biodiversity Expedition

Part 2: Collecting, Getting Stuff Home and New Discoveries³

Researchers from the California Academy of Sciences have been visiting the Verde Island Passage area off the coast of Batangas Province on Luzon Island, Philippines for almost 20 years. Research by scientists during this period has suggested that this area may be the “center of the center” of marine biodiversity, and perhaps home to more documented species than any other marine habitat on Earth; there can be more species of soft corals at just one dive site than in all of the Caribbean.

Funded by a generous gift from Margaret and Will Hearst, the 2011 expedition was not only the most comprehensive scientific survey effort ever conducted in the Philippines, but also the largest expedition in the history of the California Academy of Sciences. Over eighty scientists from the Academy, the University of the Philippines, De La Salle University, the National Museum of the Philippines, and the Philippines Bureau of Fisheries and Aquatic Resources came with a mission to survey and document various aspects of the various ecosystems in the area.

A further team of Academy educators attended with a mission to share the expedition's findings with local community and conservation groups as the Expedition was happening. As part of the expedition's shallow water team based at the renowned Club Ocellaris, Bart Shepherd, Matt Wandell and I focused upon the underwater sites that served as the inspiration for the Steinhart Aquarium in the California Academy of Sciences 212,000 gallon Philippine Coral Reef exhibit.

In part one of this series, we covered getting to the Philippines, the realities of being on an expedition and our lucky observation of hard coral spawning. In part two we'll look at how we collected octopus and corals, how we shipped those animals back home, and more.

8 ARMED COCONUTS⁴

In stark contrast to the beautiful obstreperous coral reefs of the Philippines, muck diving is like being on the moon. You float over seemingly endless plains of desolate grey substrate. But unlike the lunar landscape, the muck habitat is full of life; in the ‘center of the center of marine biodiversity’ the silty muck is packed with animals of all shapes and sizes. Commensal shrimp use tube anemone tentacles for protection. Flatfish, perfectly camouflaged in plain sight, become visible only when spurred into motion by your passing. Feather Stars move their arms in slow motion,

³<http://vimeo.com/36865036>. This video from the 2011 Philippine Biodiversity Expedition give you a good idea why the Verde Island Passage has been called ‘the center of the center of marine biodiversity’.

⁴<http://vimeo.com/24176960>. The Octopus in this video refuses to eat a crab that we generously caught for it.

revealing their own commensal shrimp and squat lobsters hiding amongst the ‘feathers’. Venomous predators like Lionfish, Stonefish and Seagoblines hide in the muck waiting patiently for their next meal. Ambush predators like the Stargazer lie mostly buried in the silt, with only their skeletal face showing as they wait for an unlucky fish to swim over their vacuum-like mouths.

One of the major goals for the Steinhart Aquariums during the expedition was the collection of the Coconut, or Veined Octopus, *Amphioctopus marginatus* that inhabits these shallow muck areas. The Coconut octopus captured media attention twice in the last few years, first walking only on two legs across the bottom of the sea while looking like a coconut, and more recently, as a candidate for possible tool use due to the octopus spreading itself over coconut shell “bowls,” raising the whole assembly to amble on eight ‘stilted’ arms across the seafloor. This little octopus is plentiful in the Philippines. Furthermore, it’s personable, tenacious, and has an amusing habit of using found objects as temporary homes, making it a great display animal. Clay pots, bottles, tin cans, clam and scallop shells are all used as mobile homes for these octopus, complete with doors to close themselves in tightly and safely. These eight armed mollusks also will defend their homes, batting away anything that comes too close; even pushing a probing finger away with surprising strength. Sometimes they extend their arms and crawl around in the muck with their temporary home on their back, as if they are transforming into snails. This octopus has never been on display before in the US, and perhaps not anywhere in the world (though it may be possible that it has been displayed in Japan) and is not available from commercial collectors, so we were very eager to collect specimens, put them on public view, and work on captive breeding behind the scenes.

It is important to mention that as a cephalopod enthusiast, I have been wanting to work with this species for well over a decade. They aren’t available in the trade, but I had been lucky enough to have observed them in the wild, and the idea of being able to work with them in captivity made giddy. So, when we entered the water around Anilao Pier just as the sun was going down I was brimming with anticipation. After 15 minutes we found no sign of octopus and I started to get depressed. This is the love hate relationship I have with muck diving — it is really like a safari because it is very possible that you will not see what you are looking for . . . even if it’s only a few feet away from you. When you dive to look at reefs, well, the reefs are kind of hard to miss. The muck, however, is by nature a more challenging landscape, and everything there is trying to not be seen. We kept searching. After another 15 minutes or so, we adjusted, and suddenly we saw Coconut octopus everywhere. We found sizes, as small as my thumb nail all the way to the size of a soft ball. We collected a variety of specimens and then enjoyed the dive by catching crabs and feeding them to other octopus.

There were some recreational divers in the area looking a little lost in the dark and muck. Matt and I, flushed with success, led one one of them over to a coconut octopus that had made its home in some shells. We figured that we would catch a crab and feed the octopus so this diver could get some interesting video. We motioned for him to stay with the octopus and went searching for prey. Turns out we were gone about 10 minutes, but the diver was still where we left him. Good! His wait would be worth

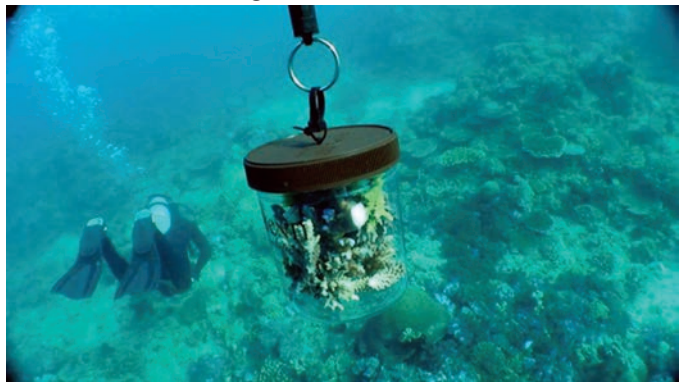


FIGURE 7: So many Acros, so little time.

it. We proudly showed him the crab, and, he obligingly began to film. Of course, as you might guess, the octopus wouldn't have anything to do with it and kept pushing it away. We shrugged our shoulders at the diver in apology and swam on.

KIDS IN A CORAL STORE

Our cephalopod duties complete, our focus shifted back to corals. Philippine coral reefs have long been in jeopardy due to human activities including dynamite and cyanide food fishing, over-collection for the curio trade, collection for the aquarium trade (this may only be a small percentage of the damage to Philippine coral reefs compared to other factors, but it is some of the most visible activity and thus comes under intense scrutiny) as well as a host of other impacts including development, sedimentation, run off, climate change and more. As a result, the Philippines has become very protective of their coral reef natural resources and has been working over the last several decades to make that protection more robust and more intelligent for economic and environmental reasons. All Philippine stony corals are protected by inclusion in CITES (the Convention on International Trade in Endangered Species of Wild Fauna and Flora) and there is currently no export of live corals from the area — unless permitted. As you can imagine those permits are not often approved. The Philippine government is interested in looking into what it would take to empower responsible and sustainable local aquaculture and mariculture efforts and granted the Steinhart Aquarium in the California Academy of Sciences CITES and Philippine permits for the export of live coral in order to help explore those efforts. On future trips to the area, The Academy hopes to present workshops on coral culturing techniques as well as coral sexual reproduction workshops as part of SECORE in order to facilitate the sustainable production of corals for research, restoration and perhaps one day to bring responsibly farmed corals to market.

Bart, Matt and I are all reef geeks, so being set loose to collect corals in an area where collection is prohibited was both a treat and a terrific responsibility. As the only public aquarium legally permitted to collect stony corals in the Philippines, the California Academy of Sciences wanted to obtain unique species for study, captive culture research, distribution to other institutions as well for display at the Steinhart aquarium. To support our efforts at sustainable collection building, the plan was to collect 'found fragments' (fragments that were naturally broken off the mother colony) of hard corals whenever possible. Fragments from larger mother colonies would be carefully harvested when there were no found fragments available. Our approach to soft corals was similar, focusing on found fragments, fragments taken from the growing margins of larger colonies, or, in the case of whip corals, taking small specimens from areas with many instances of the same coral. We tried to focus on corals that were exceptionally colored, oddly shaped, or animals generally unseen in captivity.

As we swam along the reefs we carefully collected corals that caught our eye, gently stacking hard corals into the easily accessible frag containers that Bart fabricated for us on site from empty plastic drink mix and ice cream containers. Due to the penchant for releasing toxins when disturbed, soft corals were collected into individual deli cups or plastic bags. There seemed to be corals that fit our collection criteria every few feet, so we were forced to be selective.

As soon as each dive was over each fragments was tagged, rinsed and separated into 5 gallon buckets filled with fresh sea water for the boat ride back to Club Ocellaris where they were strung on our offshore 'coral clothesline' apparatus covered in part one of this series.⁵

⁵http://www.youtube.com/watch?v=7K8feG_8bRM. This video explains our hard coral collecting methods

THE TRIP HOME

With all the collecting done, the only thing left was to ship all the animals home. Luckily for us the Academy has a great relationship with an exporter in the Manila, Aquascapes Philippines Co, a company that early on embraced the idea of responsible and sustainable collection evidence by their becoming one of the first companies to be MAC certified in 2002. This relationship really streamlined our exporting process. Using their facilities meant we didn't need to procure our own shipping boxes, shipping bags, rubber bands, oxygen, heat packs or any of the other essential supplies associated with successful shipping of live saltwater animals. They also arranged flights, getting boxes to the airport, and did all the running around to make sure all the export permits had their i's dotted and their t's crossed. All we had to do was arrange the stateside paperwork, state side inspections and get the animals from the collection spot to Manila.

The morning of our final pack out of the Expedition, we needed to hit the road by 9 am. Since many of the researchers were not going home yet, we enlisted them to help us pack up the seemingly infinite number of live specimens we had collected. Of course we had to pack up our personal stuff and our dive gear as well, so the morning was really go go go. We swam out to the offshore holding just after dawn, disassembled it and brought all the animals to shore. There we quickly packed them up in collecting bags for the 3-hour car ride to Manila. But before we could start our ride, we had to get everything to the cars: heavy boxes of animals, and luggage heavy with wet dive gear all needed to be lugged up the 4 flights of stairs from the living area of Club Ocellaris to the road. The locals, who are short even compared to me, made the exercise look easy; they flew up the stairs with several boxes and suitcases each as we huffed and puffed with our comparably teeny loads. Finally, every tub bag and box made it to the van. After a short stop at McDonalds for a McDo (a hamburger with some sort of brown sauce on it), we were on our way to Manila.

Once we arrived at Aquas-



FIGURE 8: Sitting on little wood blocks for hours at the Aquascapes facility as the rain beats on the roof



FIGURE 9: Bart and Flor check and double check the paperwork



FIGURE 10: Matt, Rich and the Aquascapes crew

capas, we sprung back into action. Since we had already packed up a shipment the week before, everyone knew the drill. The Aquascapes staff had everything ready for us including water at the right salinity and temperature as well styrofoam floats for the corals. Since they don't normally export corals, the staff and owners of Aquascapes were very interested in what we were packing, how we packed it and why we were doing what we were doing — they took copious notes and photographs. As a huge rainstorm let loose on the city, we got into a packing rhythm — Matt and I bagged everything while sitting on tiny stools, the Aquascapes crew would seal the bags with, or without, an air gap depending on the animal, and Bart worked with the office staff to make sure everything was packed and documented correctly. Three hours later we were done and on our way to the Dusit Manila for our first real shower in 16 days, and then the the airport the next day for the flight home.

PERI'S SNAKE EEL

Back in the States, the researchers are still processing and classifying specimens. The estimate of species new to science discovered on the Expedition is currently between 300 and 500. That list includes sharks, fish, polychetes, nudibranchs, corals and echinoderms. Personally, the new discovery that really stands out for me involves a new species of snake eel, and it stands out because we were directly involved in its collection.

Near the beginning of the Expedition, Matt, Bart and I were diving the shallows a at a site call LiagLiag, while some Academy researchers were deeper and further out on the reef slopes. The site had seemingly acres of non *Acropora* SPS corals in 2 to 15 feet of water. Excited over collecting a Soft Coral Anemone (*Heterodactyla hemprichii*) we were taking in the expansive site including the

incredible and visible change in water densities at the thermocline/heliocline (called a Schlieren) at about 4 feet when a lone diver appeared from deeper below us, swimming oddly. Fearing something had gone wrong the three of us made our way over to him. His hands were out in front of him and he seemed to be holding something in them. As we got closer we saw that the diver was one of the incredible local dive guides (seriously, these guys can find almost anything under water), Peri Paleracio. In Peri's hand was some sort of eel. Not really knowing what was going on, but knowing it was important, we opened one of the large collecting bags we were carrying and carefully helped get the eel into the bag and sealed it shut. Peri was excited, and quickly returned to the depths to rejoin the group he was diving with. Because the eel was important enough to be caught by hand and brought up from deeper water, we quickly got the animal onto the boat to make sure we didn't lose it.

Back at Club Ocellaris, as everyone oohed and aahed over the bucket containing the eel, the backstory unfolded. As it turns out, this was a suspected new species of Snake Eel that had been seen on a previous trip, and had actually been seen earlier in the expedition, but eluded collection. Peri had spotted it, grabbed and knew that we had a collection bag big enough to put it in. Dr. John McCosker and Dr. Gerald Allen named the fish Peri's Snake Eel, *Myrichthys paleracio*, in honor of Peri for this feat of SCUBA and ichthyological dexterity.

WHAT ABOUT THE FISHES?

The areas we visited on the trip had coral reefs in great shape — healthy and growing with almost no signs of bleaching, which is very exciting given the steps that the Philippines has taken to protect those animals. The fish populations in the area were a more complicated story. While the small fishes were swimming thick and diverse, there was a noticeable lack of anything larger than a foot or so. The reason for this absence was made clear when we dove on several of the protected areas where food fishing is prohibited. Only in these areas did we see larger fish including huge schools of jacks magnificent above the reef scape and sharks lurking in caves waiting for dusk. Currently, these protected areas are in place to drive eco tourism, but it is hoped that the future will see more of these fish safe havens, and that enough of them in close enough proximity to each other will not only boost the economy of tourism, but will allow these larger animals a safe place to live and breed, and ultimately result in the sustainable harvest of food fish by local peoples.



FIGURE 11: The newly described Peri's Snake Eel.

My job at the Steinhart Aquarium is pretty dreamy, and hardly a day goes by that I don't sit back with a big grin after diving in the 212,000 gallon tank, mating cephalopods, or hearing someone on the public floor of the aquarium say something like 'That's a Nautilus, they're my favorite but I've never seen one before' and think 'Wow, this is my job'. Being part of the 2011 Philippine Biodiversity Expedition was something special and hardly a moment went by — the late nights, the grueling days, or floating over rarely visited reefs - that I didn't think 'Wow, this is my job". I look forward to the continued collaboration between the research and aquarium departments of the California Academy of Sciences, the chance to work with amazing animals from the Philippines, and hopefully more opportunities for me and my fellow aquarium biologists to experience the majestic Phillipine reefs in person.