Saipanese VS The Water

By: Daphne Sablan Dela Cruz

How can any of us take part in trying to stop something we don't have the power to? I quote from my fellow intern that "If we can't fight it then the best we can do is prepare for it." Scientific research indicates sea levels worldwide have been rising at a rate of 0.14 inches per year since the early 1990s. The purpose of the beach atlas for Saipan is so that we, the residents, can view a map of the shoreline changes and prepare for what we think may come in the future. The beach atlas will always be a main project here on Saipan because every day, week, month, and year there are drastic changes in the climate and sea levels.

Rising water will do damage to our Island starting from Beach Road working its way up to villages. The National Geographic website says that parts of the Pacific will see the highest rates of rise, while some polar regions will actually experience falls in relative sea level due to the ways that sea, land and ice interact globally.

The data we've collected has shown changes on Saipan's shoreline since the 1990s. Before we actually make the beach atlas, we have to collect data from shorelines here on Saipan. We measure the tide level, the beach width, the grain size of sand, record the weather for the day, look for signs of accretion as well as short and long-term erosion, and we take a lot of pictures for further study of the beaches in our office. The tools we use are measuring tape, a sand grain size chart, and cameras. We will gather more notes and quotes from beachgoers and residents of the beach "Imagine what 50-100 years of sea level rise due to climate change will do. There's potential for the sea level to rise by three feet in the CNMI over the next 75-100 years. Understanding where the problems with natural processes are now will help us identify where

problems will worsen in the future," stated Robbie Greene, mentor and NOAA Coastal Fellow. We are scheduled for completion by the end of the summer.

Inside MMT

by: Julius Reyes, MMT-DEQ Intern

The blue of the sea, the colorful corals, the fascinating fishes, the majestic sea creatures, and the soft white sand; Saipan is home to all of these beautiful things that make our tiny island stand out in a tremendous way. All these things are connected in one way or another and are like one body, and our Marine Monitoring Team is its doctor. When there are signs of stress, the marine monitoring team is there to pin point the issue and take care of them. But the health of the reefs and the ocean is not strictly limited to the ocean, but the land as well. Natural phenomena from the land can also affect the sea, such as the discharge of submarine ground water.

The goal of CNMI's long-term coral reef monitoring program is to provide the information necessary for the wise management of our precious reef resources. We document how reef communities change over time in response to natural environmental fluctuations as well as those caused by people.

My name is Julius Reyes and I am the MMT intern under the Coral Reef Initiative. The project I am working on is variations of algae species and invertebrates in beach sites with submarine groundwater discharge or SGD's, which are fresh water streams that occur on the shores in our lagoon. I will be comparing sites with SGD to beaches without.

SGD's can carry nitrogen in its streams. The ocean has a minimal amount of nitrogen, also known as being nitrogen limited. Algae thrive in ocean water where the nitrogen levels are higher, like estuaries, or on the shore where SGD occurs. Algae populations can detrimentally harm coral reefs by blocking out sunlight essential to the growth of corals. People from all over

the world come to Saipan to dive and enjoy the coral reefs, therefore we must do all we can to protect them.

In order to keep our ocean and coral reefs pristine, we have to look into these small occurrences such as SGD's and look into them to prevent them from becoming problematic before it's too late. The MMT is doing their best to make sure that these practices are being done.

Photo credit: Jaques de Selliers

Napoleon Wrasse: Big in Size, Small in Number

By: Keena Leon Guerrero

On June 24, Mariana Islands Nature Alliance (MINA) welcomed its Coral Reef Initiative intern, Keena Leon Guerrero. As part of her summer internship, Keena was assigned an exciting project involving the Napoleon Wrasse (also known as the humphead wrasse), a large, majestic fish that can live up to 30 years, grow up to six and a half feet, and weigh up to 400 pounds. It is also one of the few species of fish that willingly associates with humans, making it likeable to divers and tourists worldwide. The humphead wrasse has many more unique characteristics, including the fact that it is one of the only species in the world that is able to eat the crown of thorns starfish- a venomous starfish that damages the coral it feasts on.

The overall purpose of Keena's project is to educate the general public on the importance of the Napoleon Wrasse and explain why we should protect it. This would involve creating outreach material explaining what the Napoleon Wrasse is, what is threatening it, and why it should be protected. She will also be going out on the field and conducting surveys, asking fishermen and fish market vendors how often the wrasse is seen or brought in to vendors to sell. According to Leon Guerrero, her mentors and coworkers were helpful in giving her important communication and research skills to help gather information for her project.

The Napoleon Wrasse is important in all aspects of the community: the coral reef ecosystem and the tourism industry. Helping them survive and thrive in their community will help us in our community as well. However, because of the damage to the coral reefs, spearfishing, and the lack of protective measures, their numbers are dwindling.

Aside from her project, Keena has been involved in beach clean ups and a trip to Mañgaha, where she assisted MINA's Micronesia Challenge Young Champion intern to inform elementary students about marine protected areas and the Micronesia Challenge. She will also be assisting with MINA's Managaha Pride Campaign that will be launched this fall, addressing illegal fishing in the sanctuary.

Defense against rising water

By: Kyanna Tenorio

How do you stop a force that you can neither control nor contain? As we speak, other islands in the Pacific are already fighting this unstoppable force, a rising water level. If you can't fight it, the next best thing would be to prepare for it. The purpose of a beach atlas is to have a map of Saipan's shorelines that can be updated annually to show changes. This is important because the data recorded can help predict future changes to Saipan shores which could have potentially negative effects on the people and wildlife. A rising water level has the potential to flood an area causing damage to beaches and people's property. A project such as this is important to the people of the CNMI as a whole, because it affects us all.

Before making a beach atlas, data must be gathered by going to each of Saipan's beaches to take measurements and pictures. Measuring tape is used to record the width of the beach and the grain size of the sand. Pictures of the beaches help scope out indicators of erosion and accretion as well as things that might be affecting the beach. The two types of erosion, long term and short term, have obvious signs that can be identified if you know what to look for. Many beaches on Saipan have vegetation not so far from the water that can help identify erosion and accretion. When new trees are growing close to the water, this is a sign of accretion. An example of erosion is when trees along the beach have exposed roots. Another important piece of information to take note of when doing beach surveys is the weather at the time of the data collection as well as the tide level.

All of this data is gathered together to create the final result, which is the beach atlas. This updated map will be focused on the shape of Saipan's shores and how it changes from year

to year. Additional notes and observations, made by beachgoers and residents near the beach, can be added allowing it to serve as a guide to the public as well. The compilation of the atlas is scheduled to be completed by the end of the summer.

Be the solution to Nonpoint Source Pollution

By: Melanie Licerio
Coral Reef Initiative Intern

Paradise – that is what most of us living in the CNMI refer to as home. We live on an island with white sandy beaches and generous amounts of resources. Well, to enjoy paradise we must also take care of paradise, and that may be done through the conservation of our natural resources.

NPS pollution is caused by runoff from rainfall moving over and into the ground within a watershed – A watershed is an area of land that drains into the ocean, lake or river. As runoff moves across the land, it picks up natural and man-made pollutants, which all end up in coastal and ground waters. This type of pollution consists of many things such as sediments, loose dirt, toxic chemicals, animal wastes, oils, trash and many more. All these pollutants accumulated in the water resulting in cloudy or discolored oceans; this is bad because not only does it affect marine life and our coral reefs, but also human health. Contaminated ground water, fish and other organisms can be dangerous if consumed. Polluted waters result in increased algae growth, suffocating the corals that greatly need sunlight in order to survive and reproduce.

My project is to create educational and outreach materials such as an activity book for students and a poster on watershed management to prevent nonpoint source pollution, which will be used in my mentors' campaigns.

This internship opportunity allowed me to work closely with the Non Point Source (NPS) pollution team at DEQ and develop a better understanding of its causes and consequences in the community and the environment. My mentors Jihan Buniag and Avra Heller both have previous and ongoing campaigns with DEQ, which will increase awareness in watershed and coastal management and allow the community to practice solutions to reduce nonpoint source pollution.

I am highly motivated to join the many who conserve and manage the sustainability of our natural resources for the benefit of our future generations, recreation and increase our tourism industry. What happens on land affects the sea, let us work together to keep the CNMI a beautiful place overall.

Loan a Box of Knowledge

Mon Morera

Times are changing, along with the environment. Coastal Resources Management (CRM) has been developing a loan box, or as we call it, treasure chests. These treasure chests provide a consistent way of learning by allowing the students to play a game called “Think-Tac-Toe.” This allows for a new alternative way to educate young minds through a series of different tasks. A lot of time and effort has been put into maintaining and updating this loan box by many educators, student teachers, other interns, and anyone interested in the environment, myself included.

What is Think-Tac-Toe? It is a strategy used to provide students a variety of different ways of understanding a topic in the form of a game. This is a fundamental concept because it appeals to the three different learning styles: auditory, visual, and kinesthetic. It is designed to be used as both an educational and entertaining tool for kids. Teachers around the CNMI will be able to rent these boxes to supplement and enhance their teaching plans in each subject area.

The significance lies on the content of the treasure chests. It contains information on many subjects. These include, but are not limited to, CNMI land, coral reefs, recycling, and watersheds. Creative games and activities were produced, ranging from origami to animal crafts to dioramas. The variety of items constructed emphasizes a different work method of each student that will better enhance their individual and teamwork skills.

This loan box provides a unique way of learning. They are meant for grades third to seventh, for each activity’s difficulty can be changed. Most importantly, they are free to rent out by teachers or schools. Be part of the movement by educating yourself and others on matters that affect our islands. You can start small in helping the environment just by renting these treasure chests full of knowledge.

Humans vs. Sharks

By: Nemesianne Gabi

Would you like some shark fins with your soup? I know I wouldn't. But there are many people in the world who eat shark fins as part of their tradition for special occasions like weddings and New Year's. The oceans top predator is being hunted by the food chains top predator, humans.

Every year we lose approximately 100 million sharks and 73 million of those are for shark fin soup. The actual number is unknown because people still catch sharks illegally. Shark fining is becoming a huge problem for shark populations, so much that it is declared a conservation act in many places like the Northern Marianas Islands and the Bahamas while other places like Guam and Fiji are pushing to achieve the same goal.

Shark fin soup costs up to more than a hundred dollars per pound and it is very difficult to process unlike any other soup ingredient. But what most people don't know is that sharks fins and meat contain high levels of the metal mercury. Mercury can harm the human body in extreme measures like fertility production failure, miscarriages, brain disease, heart disease, and loss of memory.

Sharks are not naturally contaminated with mercury. It is caused by human caused pollution that goes into the ocean. Different types of sea animals are exposed to the pollution and eat the garbage. Sharks are affected from this due to *bioaccumulation*. This is the process by which smaller fishes eating garbage, rusting metal, and other mercury polluted items are then eaten by sharks making them indirectly consume mercury. Who is next to ingest the mercury? People! This is a serious subject that should get more public exposure.

The fishing and consumption of sharks is not only hurting sharks but also us! Sharks are very important to the ocean because they maintain populations, keep the fishes that we eat healthy by eating the weak and sick fishes that carry diseases which results in healthier fish populations, and maintains the behavior of other sea animals from over grazing reefs and sea grass beds.

Education and outreach is essential to the public because a lot of people especially here in the CNMI don't know about the troubles with our oceans environment and about shark conservation. Here in the CNMI the practice of shark fining is rare, but other products from sharks like shark cartilage pills and shark liver oil are a regular site in stores. These products falsely advertise to cure diseases like cancer; there is no evidence of this claim! Education and outreach is the first step in helping CNMI residents make environmentally sound decisions when it comes to shopping for shark products.


Where did the trash come from?

Planting Trees Helps Our Seas: My CRI Internship

Amber Roberts

Let's think about how water travels after a rainstorm. It rolls down hills, picks up loose dirt and sediment, finds its way across pig farms and streets full of car oil, and then eventually ends up in our ocean. Would you want to swim in that? Didn't think so. Luckily, there is a way to mitigate this problem that both homeowners and businesses can turn to: rain gardens. Rain gardens are gardens that are specifically placed to help slow down, collect, and filter polluted rainwater. They are attractive and can even increase biodiversity of your landscape. Instead of the rainwater going straight into the ocean, water can be collected in rain gardens and given time to filter into the ground, which can benefit the health of our ecosystem.

I am just finishing my internship at the Division of Environmental Quality, and my project was to create a rain garden on island. Under the guidance of my mentor, Kaitlin Mattos, I learned more about stormwater management and actually set up and organized the installation of a new rain garden on-island. To get a rain garden started for this internship, I went from investigating potential sites, to connecting with the property owners, to organizing with different companies and organizations to help get tools and supplies, to finalizing the site and publicizing it.

I decided to install my rain garden at San Vicente Elementary School and with the help of the their Young Farmer's club and the surrounding community, the rain garden should prove to be a useful tool in conservation and sustainability. San Vicente Elementary School is a prime location for a rain garden, as it is situated above Laolao Bay. By placing a rain garden there, we will be helping Laolao Bay stay clean and healthy. Hopefully, this garden can inspire the youth to take on more projects that help the environment.

Just think: by planting a garden, a person can help protect our oceans.

For examples of local rain gardens, check out the rain garden at the CNMI Museum, right along Middle Road. Contact DEQ-NPS for more information about rain gardens and how you can install one at your own home or business.

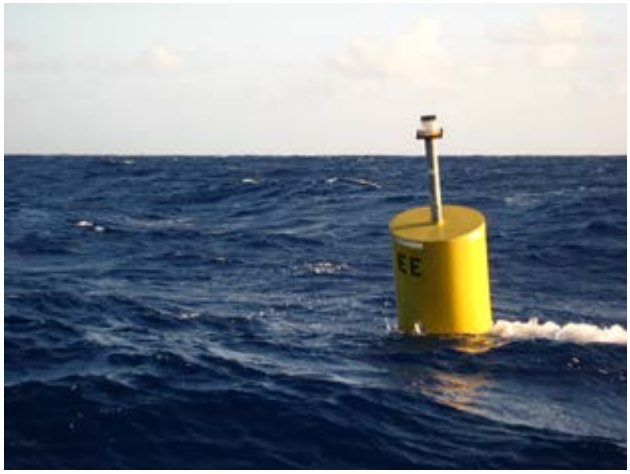
“Fishermen’s hopes high, FAD’-s Deploy”

By Phillipe Sablan

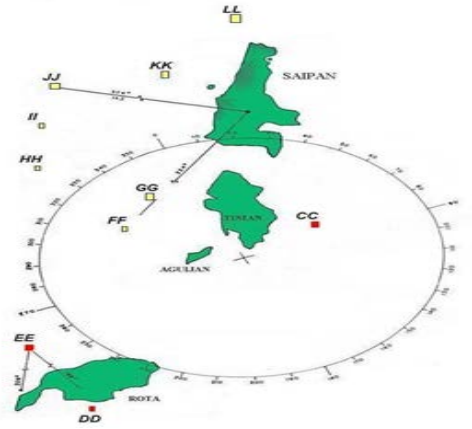
Fishermen! Grab your gear and be ready to retrieve the catch of a lifetime because the Division of Fish and Wildlife has recently deployed their new fish aggregating devices. The deployment started on July 6, 2013 and ended on July 9th. There are a total of 5 devices located on the Western side of Saipan. They are also going to add 2 more near Rota and 1 near Tinian. They are hoping to achieve sustainable fisheries production and also help fishermen focus their efforts in a smaller area when fishing for pelagic fish.

CNMI FAD’s are made of fiberglass that is attached to a large concrete anchor. These buoys are dropped in depths ranging from 500m-2,000m.

Types of fish that are most likely to be attracted to FAD’s are Skipjack tuna, Yellowfin tuna, rainbow runner, mahi-mahi, billfish, and sharks. Although there isn’t an exact explanation on why they attract fish, there are some theories. The two main theories are shelter and orientation. Many fish use the FAD’s mooring lines or other parts of it as shelter and protection against predators or can use it to navigate or orientate large areas of open water. FAD’s have been used since the 1900’s, and they are a successful tool used around the world.



Picture of CNMI FAD EE drifting with current



Map of FADs in CNMI region

News paper article

Managaha MPA; Don't feed the Fish

By: Thomas Rabauliman

As much as it may enhance a tourist attraction, feeding fish regularly can be harmful to the marine ecosystem at Managaha Marine Protected area (sanctuary). This can be seen through the fish behavior towards humans. The observation of fish at Managaha are more aggressive compared to other beaches in the island. One of the most apparent fish behavior at Managaha Marine Protected area is there swimming towards people in the water. This behavior makes the fish dependent on the tourist feeding them, rather than getting their own food such as algae, plankton, and other small fish. Fish provide an important role in the marine ecosystem by reducing algae cover on coral reefs and maintaining a balance in fish population in the marine environment.

The DFW Enforcement section continues to provide education and outreach to the users at Managaha Marine Protected area. Part of this education and outreach is providing detail information to the tourist on the rules and penalties involving the feeding of fish. My project involves educating our stakeholders and tourist at Managaha about feeding our fish inside a Marine Protected area. My project involves different tourist nationalities from Japanese, Chinese, Koreans and Russians that frequently visit Managaha sites. Posting of signs and passing out brochures relating to feeding in Japanese, Chinese, Korean and Russian is part of my project. Conservation officers will start issuing citation to tourist who do not comply with the regulations. The results of this project will be seen through the health and behavior of fish and corals. This project is important for the harmony and health of the fish and marine ecosystem. This will invite fishes at Managaha to migrate to Saipan, so we can have a healthier marine ecosystem.

This “fish” may ruin your day

By: Yoshihiro Yagi

The “fish” that may ruin your day is not a fish at all. Box jellyfish known for their distinct box shape and the lone tentacle that comes from each of their four corners. Since they are nearly invisible in the water they let their presence be known by the nasty sting inflicted on their victims. Fortunately the CNMI is not known to host the deadly box jellyfish *(Chironex fleckeri),* however Saipan’s waters do have other species of box jellyfish that can cause extreme pain and in rare cases hospitalization. What do we know about these sea creatures? What is causing them to appear in our waters? How do they affect us? These are just a few questions the Pacific Marine Resources Institute (PMRI) and their intern Yoshi Yagi have tried to answer with their recent research on box jellyfish.

One species of box jellyfish, *Alatina alata*, is known, in places such as Oahu, HI, to arrive in coastal waters approximately ten days after a full moon. In order to determine whether or not this phenomenon is occurring on Saipan, PMRI collected social science data on box jellyfish occurrences. According to interviews conducted with fishermen and tour operators the peak season for stings occurs during the “hottest months of the year”. We also collected data from tour operators on actual jellyfish stings between 2009 and 2013. A preliminary analysis of this sting data suggests a peak season between April and July, correlating well with the interview data.

According to sting data, 85% of recorded jellyfish stings occurred between ten to thirteen days after a full moon. Meaning, that we may be able to accurately predict up to 90% of jellyfish stings. Being able to predict when stings will occur is the first step to preventing stings.

Both fishermen and tour operators indicated that winds from the north-northeast play a factor in the appearance of box jellyfish. With additional data analysis we will compare sting data with wind data to see if a correlation exists. Ocean currents also play a role in jellyfish appearances.

Able to foresee jellyfish blooms, we can work on prevention. The most obvious way to prevent stings is through public awareness. If people know when jellyfish are likely to be present, they can take precautionary measures. Changes in swim wear such as long sleeve rash guards, dive skins, or even nylon stockings can all help to protect against stings. Another method of prevention includes avoiding swimming ten days after a full moon.