

May 2012

MESEISET

A Publication by Students at Chuuk Campus
College of Micronesia—Federated States of Micronesia

Volume 1 Issue 3



FOCUS ON SCIENCE CONCERNS AND ISSUES

This issue of *Meseiset* focuses on science concerns and issues, as observed and described by our students in two science courses: AG 101 (Agriculture) and SC 1i7 (Tropical Pacific Island Environment). We extend our gratitude to the student writers and their instructors Lolita Ragus and Kind Kanto.

CLIMATE CHANGE IMPACT ON SATOWAN

by Valerio Manuel

Climate change is the change of weather events or patterns in a specific region or location such as Chuuk. Human activities have resulted in global warming, or increased concentrations of greenhouse gases in our world's atmosphere. Effects include sea-level rising (and island-sinking), increased occurrence of El Nino (such as drought in Chuuk), and other man-made disasters on atolls like Satowan.

Sea-level rise causes unusually high tides and strong shoreline currents. Other than shoreline erosion, saltwater intrusion into the taro patches is a major social and economic disaster. After all, taro is an important food crop, and salt-water kills the taro and decreases local food consumption.

Drought on Satowan, with

limited and fragile freshwater resources, primarily in the underground water lens, lowers the water level in the taro patches and reduces freshwater for breadfruit trees and other staple food crops such as arrowroot. Once taro dies, it takes 3-10 years to grow anew and to harvest. The result is, of course, potential starvation and malnutrition, especially among our children.

Other man-made disasters include self-induced destruction of natural resources because we sponsor unwise community development projects. We are guilty of sand-mining, shoreline destruction, over-harvesting of coral-reef resources, dynamiting, and use of sarasko (bleach) for fishing.

We need to mitigate these disasters and to implement short-term activities, such as:

- educational awareness programs to understand the effects of climate change;
- government provision of financial assistance, including emergency food relief;
- replanting of more trees, especially those which provide local food; and
- taro-patch elevation.

Long-term measures also need to be implemented on Satowan:

- construction of typhoon-proof shelters;
- construction of water-catchment systems; and
- additional financial assistance.

If mitigation efforts and adaptation plans are not done, evacuation of our home islands will be the inevitable action in the coming years.

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CLIMATE CHANGE EFFECTS ON KUTTU

by Daeko Billy

Climate, referring to weather conditions prevailing in an area over a long period of time, includes patterns of precipitation, humidity, winds, and seasons.

We have these patterns on Kuttu (Mortlocks), and they have become concerns and problems. These problems are the effects of climate change, and they include crop pollination, food for migratory birds, fish spawn-

ing, drinking-water supplies, irrigation, forest health, and planting of crops such as taro, banana, and vegetables.

Our concerns on Kuttu are

(continued on page 2)

Special points of interest:

- Climate changes on our islands
- Organic gardening: Good for you
- Health watch: NCDs
- Coral Lab Report

several, because they are a series of causes and effects. Floods have occurred once or twice a year during sea-level rise. In 1976, Typhoon Pamela devastated our island. The shoreline moved inward, taro patches were filled with sea-water, and coral and fish died. On land, coconut palms, breadfruit trees, banana plants, and other food plants fell. Houses (partly and wholly), food crops, and animals became floating debris and carcasses in the lagoon. The soil was polluted for months and even years. Livelihood was lost, and even hope seemed lost.

We had to bound back, and so we did. We built sea walls around the taro patches. Mangrove trees were planted along shorelines to protect land from

surging waves. In addition, we were involved in both short-term and long-term programs to protect coastal infrastructure, water and transportation systems, agriculture, and community redevelopment. Finally, we had to learn and implement new strategies, such as coastal zone management, crop diversification, and the use of salt-water resistant crops.

However, let us all not rest at ease. What happened more than 35 years ago may well recur, and we must be ready. An ounce of prevention is worth a pound of cure. Or, unfortunately, we shall have no other choice but to retreat from a risk-prone area.

Taro Patch, Kuttu Islet, Satowan Atoll (Mortlocks)



Photo credit: Jerry Ayers & Russell Clayshulte, from Internet website http://weriguam.org/docs/tr_48.pdf.

CLIMATE CHANGE ISSUES ON POLOWAT

by A.J. Bisalen

Climate change is a global issue, even in the Federated States of Micronesia, including on my small home atoll of Polowat. The effects of global warming are not only geographic but also social. They include such issues as hunger, land dispute, and health-related suffering.

First, let me describe the geographic problems. When the sea-level rises, salt-water intrusion occurs in two ways. One is along the coastline as waves wash away beaches and bring salt water inland. Another way is through the underground fresh-water lens. Salt water seeps into the taro patches from the water lens.

Second, let me share with you the social problems. As taro resources decline, neighbors steal whatever taro remains alive. Everyone needs taro both for subsistence and for sale. With theft, people begin to distrust each other, incomes fall, and hunger prevails.

Land disputes become a new way of life. Land untouched by rising sea levels is property coveted by those

whose land has been destroyed. Legal or illegal, land disputes rage between and within family lineages. Disputes over land boundaries lead to land surveys, and survey findings are disputed in court.

At the same time, everyone gets hurt as we grow dependent on imported canned goods and suffer the inevitable diet-related sicknesses, such as diabetes and hypertension.

Climate change issues are new to us, and we have no traditional solutions. So, we call on professional and technical assistance to teach us how to elevate taro patches and replant taro stocks that are more salt-water resistant. We cannot go on like this for much longer, as our suffering skyrockets. Is anyone listening to our call for help?



Satowan Islet, Satowan Atoll, Mortlocks



Polowat Atoll, Pátti

ORGANIC GARDENING — WHAT'S THAT?

by Kathryn Ifa

Organic gardening? What is that? According to an Internet source and in our own traditional culture, it is *“the science and art of gardening by incorporating the entire landscape design and environment to improve and maximize the garden’s soil health, structure, texture, as well as maximize the production and health of developing plants without using synthetic commercial fertilizers, pesticides, or fungicides.”*¹ Did you know that we Chuukese were organic gardeners a

long time ago when we designed, developed, and used our taro patches! Think about it.

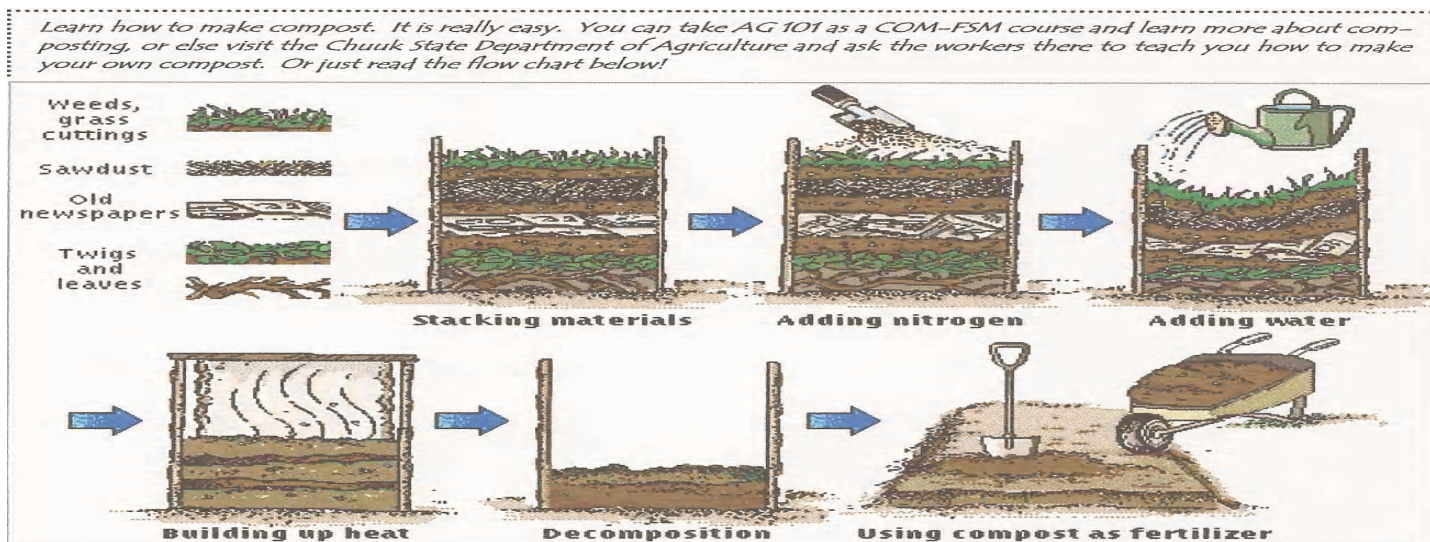
Now, what can we do in general? Four practices can work in Chuuk:

- First, choose local and tropical plants to fit a garden around the home, plants that can grow well without chemical compounds.
- Second, upgrade the soil with organic materials, such as compost,
- Third, plant things that attract beneficial

insects that pollinate flowers. Also, cultivate the soil to encourage certain bacteria and fungi to serve as good guys in fighting off bad guys.

- Fourth, never throw organic materials in the trash. Recycle them as natural fertilizer in the garden. In summary, let us go organic by maximizing the soil’s health, structure, and tenure and by not using harmful chemical fertilizers. Save Mother Nature, and save lives —yours and mine.

(1) <http://faq.gardenweb.com/faq/lists/>



Waste from the garden, yard, and table does not have to be thrown away. It may be reused as a fertilizer through a process called composting. A compost pile may be built by layering different kinds of waste in a bin, leaving space between the layers for air to circulate. Nitrogen is added to the pile in the form of manure, meal, or greenery to generate heat. Heat facilitates rotting and kills all undesirable organisms. Once the pile is slightly dampened, it is covered. As heat and steam build up, the waste decomposes over time into a nutrient-rich substance called compost. The compost is then applied to plants as a fertilizer.

Source: Microsoft ® Encarta ® Reference Library 2003. © 1993-2002 Microsoft Corporation.

COMMUNITY PARTICIPATION IN SOLID WASTE MANAGEMENT

by Reason Andrew

Solid waste management includes municipal (or governmental) waste collection, recycle programs, use of dump sites and landfills, and incinerators. Many irresponsible Chuukese throw their garbage along the streets. What we have is an eyesore as we turn our beautiful islands into ugly, unsightly, and smelly places. Whoever says that our islands in Chuuk are beautiful must be blind and cannot smell!

What are the negative effects of improper solid waste management (SWM)? Poorly designed and poorly managed landfills

create an adverse environment, such as wind-blown litter, a haven for vermin, and production of leachate, or liquid waste. The solid waste produces methane and carbon dioxide, two poisonous gases.

We need a solution. The first step is public awareness through education. The Environmental Protection Agency, working with public schools, must develop and deliver an awareness curriculum to teach students, but the same program must be taught to adults. The second step is public action in which everyone—adult and child — takes individual responsibility and community effort to clean up the

environment. The third step is law enforcement to punish community leaders who fail to participate in solid waste management.



Watch Out for NCDs!

by Mariot Sitorus

Non-Communicable Diseases (NCDs) are chronic conditions resulting from non-infectious causes. In other words, according to our Chuuk governor, “NCDs are caused by lifestyle activities, such as poor eating habits and disorders. Such diseases are borne by our own choice.”

Let me identify these NCDs. For one thing, they include diabetes, cardiovascular disease, cancer, respiratory disease, mental disorder, and high blood pressure. They are not contagious nor communicable. Instead, they are functionary impairments which we cause ourselves by smoking tobacco, abusing alcohol consumption, eating unhealthy food, and physical inactivity. In other words, currently we Chuukese prefer sitting around to exercising and doing physical work. We munch on snacks and love greasy foods, such as turkey tail. We become obese, and our immune system weakens.

We can prevent our own NCDs. Change our modern lifestyles back to more traditional work. Stop smoking cigarettes and drinking alcohol. Work in the garden or taro patch, go fishing and swimming. Walk, jog, run —just exercise a lot more!



SHARKS: ONE, 2,3,4 : The Health of the Marine Ecosystem

by by Muons Samor, Kerat Esechu, and Joshua Nokar

How do sharks keep the marine ecosystem healthy? Sharks are a group of fishes characterized by a cartilaginous skeleton, five to seven gill slits on the sides of the head, and pectoral fins that are not fused to the head. They play a very important role in the oceans in a way that an average fish does not. Sharks are at the top of the food chain in virtually every part of the ocean. In that role, they keep populations of other fish healthy and in proper proportion for their ecosystems. Sharks have evolved in a tight interdependency with their ecosystems.

Sharks are a very important factor in balancing our ocean's ecosystems. Sharks act as scavengers, preying upon dead or sick animals, and they act as apex predators thus controlling populations of species. They maintain species diversity by preying upon the most available species. They act as crowd control to help maintain the balance of the ecosystem. Sharks also act as a food source

for other sharks and killer whales. Without sharks, the balance of life in the ocean will topple, creating a devastating effect.

As islanders we should say no to foreigners coming in our islands to harvest sharks. This shortsighted view of the ocean ecosystem is dangerous; and a shortage of sharks could be disastrous to the health of the ocean's food chains, including, but certainly not limited to, the ones we rely upon as food resources. Harvesting sharks is a waste. They are killed only for their fins but meat of the whole

(body) is thrown away, wasted. This is like cutting down bananas, just to eat the skin and to throw away the fruit. It is a waste of resources; we must respect these animals and give them the space they need to live. Sharks really are beautiful animals, once we get to know them.



SHARKS: 1, TWO,3,4 : The Health of the Marine Ecosystem

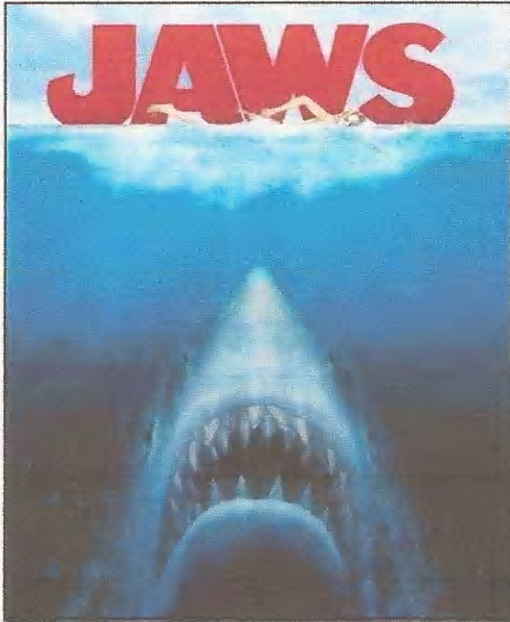
by Dorvy Daunny, Trisha Omwere,
Eliza Petewon, and Antonina Ezra

Sharks have one important role on the reef or in the ocean; that is to keep the reef/ocean healthy. Through interrelated ways, three of which will be discussed, sharks clean the ocean/reef, keep the population of species under control, and play a very vital role in the food chain.

How do sharks keep the reef clean?

Sharks kept the reef or the ocean clean by taking out bad fish. According to research, “[Shark] is important to the ecology of the seas by removing the weakest, sick and dead so that the fittest survive.” Sharks do not just eat the sick, weak, dead, or dying fish; they also eat the leftovers of other big fish. They even eat metal or cans, which is a good way to keep the reef from becoming polluted or, better yet, dying. Most

people do not like sharks and “consider them mean and menacing with their.. fearsome teeth and staring eyes.” Media are to be blamed for making people believe sharks are human-killers. The “Jaws” movie is one example of how media promote people’s fear of sharks, and yet sharks rarely attack people. The only time a shark attacks a person is when that person comes too close to the shark, carries fish or turtles, or smells of blood.



the movie poster (1975)



a movie scene of terror due to a shark attack

How do sharks keep the population under control? From research, we found that sharks have played several kind of roles. One of the roles they play is that of keeping the fish population under control. If sharks did not exist, the fish populations would be uncontrolled and the whole underwater ecosystem would fail. Sharks groom many different populations of marine life to the right size, so that those species do not cause harm to the ecosystem by becoming too populous. In other words, sharks are at the top of the food chain in almost every part of every ocean. According to scientists, “sharks were considered to be the ‘keystone’ species, meaning that removing them causes the whole to collapse.” In addition, another study declared that “by captivating sharks out of the coral reef ecosystem, larger predator fish, such as groupers, increase in abundance and feed on the herbivores.” With fewer herbi-

vores, macroalgae expand and coral can no longer compete, shifting the ecosystem to one of algae dominance or governance, thus affecting the continued existence of the reef ecosystem. Without sharks the oceans of the world will be completely destroyed, and the seas will become overrun with small fish, the aquatic plants will come under stress, and the world’s beautiful coral reefs will become overrun with algae.

What role do sharks have in the food chain? Organisms that live in the same place depend upon each other. For example, the shark and the remora fish depend upon each other as a part of the food chain. The shark attacks its prey and the remora that was always attached on the shark eats the leftovers. That is how they depend on each other. Indeed, a great white shark and a remora have a special relationship. According to Balfour, “Remoras eat parasites

on the shark’s skin.” In another way, the shark helps smaller animal or fish from being eaten by others. According to Yong, “Those at the top kill those in the middle, and stop them in turn, from killing those at the bottom. If the large sharks are missing in this food chain, the large predator fish population would grow.” For this reason, the vision of a food chain minus its top predators may mean the end of the line for many more species.

Therefore, we now understand the important role of sharks and how they protect the ocean’s life and every part of the reef. In Micronesia, most of our sources of food come from the ocean. So, we recommend that we protect the sharks.



Sharks: 1,2, THREE, 4: SAVE THE SHARKS!

by Abraham Inos, Kantaro Nethon,
and Turn Tume

In Chuuk State and throughout Micronesia, shark finning is becoming a very popular business. Businessmen from South-East Asia and China are buying shark fins from local fishermen. The local fishermen fish for sharks, cut their fins, and throw the carcasses into the lagoon. They dry the fins and sell them to the businessmen. For the fins, the sharks are killed; their carcasses are wasted. The local fishermen get a small amount of money from this transaction. The population of sharks is getting smaller. Should we protect the sharks?

Sharks live in waters all over the world, in every ocean, and even in some rivers and lakes. In the ocean ecosystem



there are intricate food webs and, based on what scientists have been studying, sharks are the apex predators, the very top of the food web in the ocean, and are considered by scientists as a “keystone” species. We can define the shark as the root, chief cornerstone, mainstay, and source of marine webs. This means that if they are removed the entire structure will collapse. The extinction of sharks will affect the entire ecosystem of the ocean, especially the order of the food webs. If we keep on eliminating sharks, the marine ecosystem will lose its balance, but if we show respect and try to protect sharks, we are actually taking one step towards protecting the entire ocean ecosystem. Sharks are being killed for their fins for shark fin soup, a food that has assumed cultural value, but is not important for human survival or health.

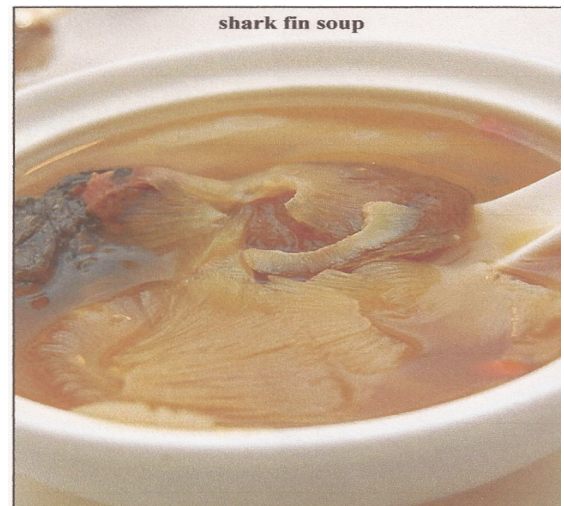
Commercial fisheries from abroad are having a great impact on local shark populations. The people of our nation do not realize how they affect our marine resources. They need only a little portion of our sharks for their own benefit, using shark fins to generate their island’s economy.

Tiger sharks in some way control the structure of sea grass beds, and ultimately bottom communities. Some Hawaiian shark scientists have shown that tiger sharks have a positive health impact on the sea grass beds because they regulate the behavior of prey species and prevent them from overgrazing vital habitat. For example, turtles forage on sea grasses. Tiger sharks control turtle populations by preying on them. Without the tiger sharks, the turtles will become too abundant and spend all of their time grazing



on the nutritious sea grass and eventually destroy them, thereby reducing the amount of sea grass other species can eat.

All in all, we can easily see how important sharks are to our marine ecosystem. If we keep killing them, we will lose the beauty and balance within that marine system. Sharks have been fished recently by the commercial fisheries for only a very small part, the fins. Government leaders should enact laws for the protection of these very important sharks.



Why Should Chuuk Become a Shark Sanctuary?

by Leyann, Krystal, and Tinisa

What do you think would happen if sharks became extinct? How would the marine ecosystem survive without sharks? What are sharks to us? According to the United Nations Food and Agriculture Organization (FAO), every year, up to 73 million or even 100 million sharks from the world’s oceans are being killed by fishermen. In the Pacific Ocean alone, Hawaiian shark scientists say that 90% of the sharks have already been

killed. The reason for this is their fins, which are used in making a popular shark fin soup in China that has been part of their cuisine since the late 1300s. This soup is very expensive and it is usually served during special occasions such as weddings, banquets, and expensive gatherings.

On September 25, 2009, the President of the Republic of Belau, the Honorable Johnson Toribiong, announced on the floor of

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the United Nations General Assembly the creation of the world's first 'shark sanctuary', forbidding all commercial shark fishing within Belau's 200-mile Exclusive Economic Zone (EEZ). In other words, it stopped harvesting sharks as well as the possession and sale of shark parts. Now, other island nations are taking the big step to establish shark sanctuaries in their territorial waters. So, going back to the question, what are sharks to us? Should Chuuk also establish a sanctuary for sharks in Chuuk State's territorial boundaries?

An article on Shark Savers quoted, *"Sharks are among the most essential animals on the planet and yet they are being systematically destroyed for a non-essential purpose: shark fin soup."* A study by Peter Knights, director of Wild Aid International, wrote in an article "Shark fin soup alters an ecosystem": *"Sharks are the top predators in the ocean and are vital to its ecosystem. The rapid reduction of sharks is disrupting the ocean's balance. These are ecosystems that have evolved over millions of years. As soon as you start to take out an important part of it, it's like a brick wall, you take out bricks [and] eventually it's going to collapse."* When sharks kill/attack humans, it makes a sexy story. But what really is reported is that sharks kill an average of 10 people annually, according to a study by Lisa Ling, a Special to CNN. On the other hand, humans kill around 100 million sharks every year - a number that has ballooned in recent years because of the enormous demand for shark fins to make shark fin soup.

Sharks have been part of our ocean's ecosystems for 420 million years. They are very important factors in balancing our ocean's ecosystems. They feed off phytoplankton and control the population of species in marine life. We must always keep in mind that earth depends on the oxygen of the ocean. In order for long-term survival on earth, we need sharks. Sharks do not go after healthy organisms; instead, they go after the old, sick, and slow fish which in turn keeps a very healthy aquatic world. Sharks keep a very healthy aquatic world. Sharks may sometimes be dangerous to humans but their role as marine species leans toward keeping a healthy marine ecosystem.

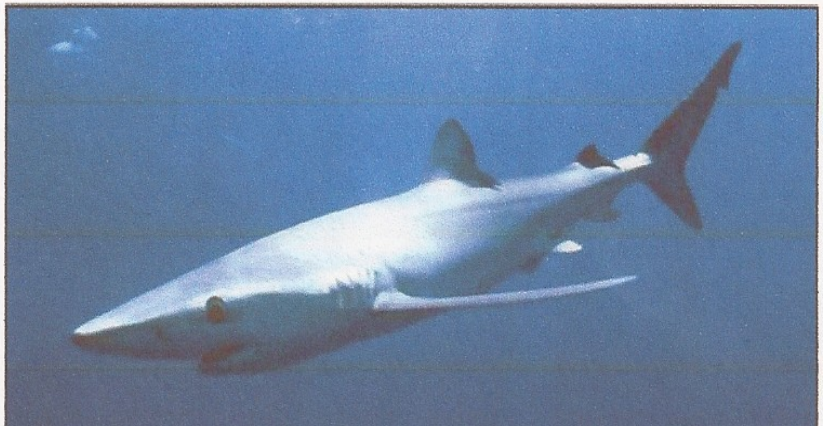
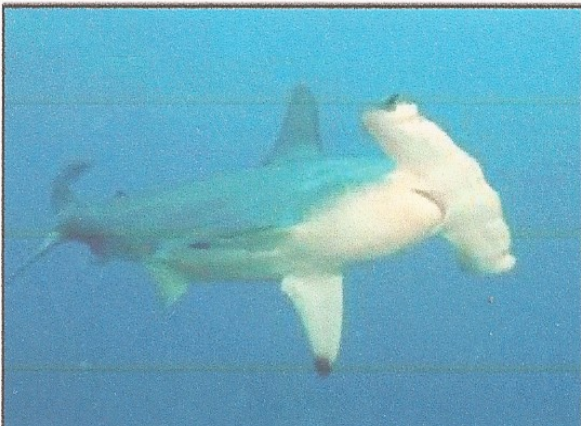
The director of global shark conservation for the Pew Environment Group, Mr. Mat Rand, said, *"Sharks are unlike any other fish. They grow slowly, reach sexual maturity relatively late in life and only give birth to a few pups"*. In our SC 117 class, we learned that sustainability means using our resources without destroying them for future generations. Sharks may be renewable resources. However, if we take more than what is being produced, our future is at stake. Our marine ecosystem will suffer consequences including the health of marine habitats, economically important fisheries will shut down, and coral reefs will shift to algae-dominated systems, sea grass beds will go into decline, and species diversity and abundance will decline with the loss of habitats.

The marine ecosystem will lose balance and will no longer remain healthy. So, we should not fear sharks, but fear the loss of

sharks within our oceans.

In conclusion, Chuuk is one of the many places with a variety of marine life, at the same time it is also one of the places that sharks are being hunted. When you think about it, Palau was the first of micro-islands to have a shark sanctuary, but two months later the Marshall Islands was declared as the largest shark sanctuary. Chuuk is right in the middle. A lot of times vessels that catch sharks say they catch them in our lagoon. Having a shark sanctuary here will stop the marauders from catching sharks anywhere in our territorial ocean. Lastly, it will bring more funds to our islands.

Sharks are vital to the marine ecosystem. They are also one of the keystones in our environment. They keep the marine life balanced and ongoing. Imagine what our lives would be without sharks, especially for us islanders who depend on the marine life. We may think that sharks are very dangerous but, if we sum up the deaths of people bitten by sharks and of those stricken by lightning, we can see a big difference between them. There are many more people dead because of lightning strikes than from shark bites. So, going back to the question "Should Chuuk establish a sanctuary for sharks?" We'd say yes! Why? Because we need sharks. The marine ecosystem, as well as humans, depends on sharks. So, if Chuuk does not take the big step in establishing a shark sanctuary, they will become extinct. And as Mr. Rand believes, *"There is no way, even in theory, to harvest [sharks] sustainably."*



Coral Polyps and Coral Reefs

by Leyann and Krystal

Problem:

An on-going road construction and sewer drainage upgrading project executed by P.I.I. (Pacific Islands, Inc.) is under way on the island of Weno in Chuuk, FSM. The operation has been going on for a few years, and progress is very slow. Problems arise not only from the slowness of the construction but also from the environmental damages being caused. One of the problems is the silt going out into the water near COM-Chuuk Campus. Large volumes of silt keep flowing into the water, and both P.I.I. and our Chuuk State Government do not even care about it. As students of COM, most of the time when we go to the sea wall, we see the silt coming out, changing the color of the water, making it look like coffee or chocolate which does not look good. But what will happen to the living organisms in the water? This leads us to our question:

How will the silt in the water near COM-FSM Chuuk Campus affect the coral polyps?

Hypothesis:

Our textbook Tropical Pacific Island Environments by Christopher S. Lobban and Maria Scheffer states that “...*sediments are deadly to coral reefs*” (page 214). The director of CCS (Chuuk Conservation Society), Mr. Wisney Nakayama, simply said during an interview that “*It will kill them all... if silt covers the coral polyps from the sun it will totally kill them all.*” In our SC 117 class at COM, our instructor Mr. Kind Kanto, explains how deadly silt or other sediments are to coral polyps. Corals are like plants that need light for photosynthesis. If silt or other sediments covers the corals, blocking the sunlight, it will kill the corals and reduce the recruitment of new corals. Having collected this information, we have come up with our hypothesis, as follows:

The silt will kill the coral polyps and will reduce the recruitment of new ones.

Materials:

- Computer internet research

Source 1: <http://www.int-res.com/articles/meps/62.m062p185.pdf>

Source 2: <http://soundwaves.usgs.ov/2004/11/>

Source 3: <http://www.globalcorals.org/sedimentation.html>

• Books

Source 4: Tropical Pacific Island Environment by Christopher S. Lobban and Maria Scheffer Source

5: Marine Biology by H.V Thurman Webber (1984)

- Additional materials: paper, pen, and digital camera.

Procedures:

- We conducted an interview with Mr. Nakayama of CCS on March 9, 2012.
- We went to the library, searched for books, and found Mr. Webber's book, dated but still timely.
- We did internet research on the computers in the library.

Findings and Results:

- According to Tropical Pacific Island Environment, sediments are deadly to coral reefs. It will choke the polyps and they will die.
- Mr. Nakayama stated, “*It will kill them all. Because like plants, coral polyps need sunlight in order to grow and reproduce. And if silt covers the coral polyps from the sun it will totally kill them all.*”
- An Internet source (Source 1) states, “*Excessive sedimentation can affect the complex food web on the reef by killing not only corals, but also sponges or other organisms which serve as food for commercially important ant fish and shellfish*” and “*Sedimentation is one of the several parameters which affect coral recruitment.*”
- Source 2: “*... sediment entering the pear shore ocean during runoff events affects corals in two ways (1) suspended in seawater, the sediment drastically reduces the amount of light reaching coral reefs and other shallow benthic systems; and (2) as the sediment settles, it can bury corals or cause them to expend a large amount of energy keeping their surfaces clean.*”
- Source 3: “*... excessive sediment smothers and kills coral tissue and reduces light levels and food supplied to the coral by symbiotic algae.*”

(Continued on page 9)

- We took digital-camera pictures of construction site production of muddy run-off and salt. We obtained additional pictures from various Internet sources.

Conclusion:

The answer to the problem is now already obvious. All of the sources we have gathered stated that silt sediment kills the corals and affects its recruitment process.

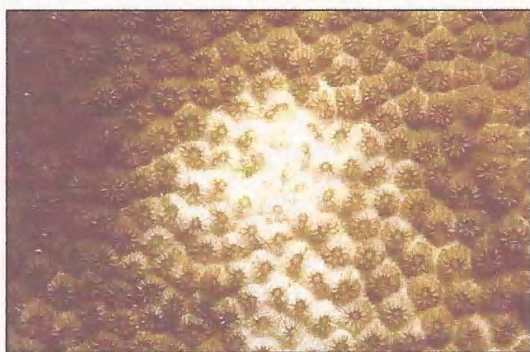
Corals are very important to our reef. They help protect our islands from strong waves, and they are a habitat for living organisms in the water. In order for them to be healthy, they must get sunlight for photosynthesis just like plants. And when they recruit, the polyps deposit new layers of calcium carbonate from their lower skin. Then the coral larvae settle out, and the reef looks for a place to settle and reproduce. *“Excessive sediment smothers and kills corals.” “If silt covers the coral polyps from the sun it will totally kill them all.” “Sedimentation is one of the several parameters which affect coral recruitment.”*

Excessive sediment is in the water near COM, and it is blocking the sunlight from coral polyps and coral reefs, and it will hinder /



Construction site muddy run-off brings silt along the shoreline into the Chuuk Lagoon.

reduce recruitment because the polyps cannot settle on sediments. If it cannot settle, it will eventually die. According to Mr. Robert H. Richmond, author of a book entitled Recovering Populations and Restoring Ecosystems, *“Ecosystems throughout the world have been degraded as a result of human activities.”*



Silt/sediment covers and smothers coral polyps.



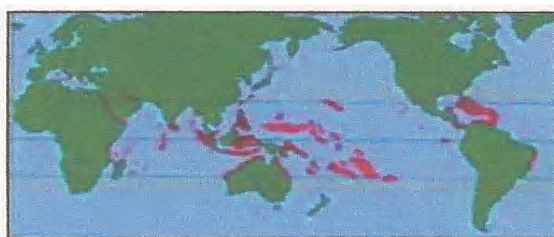
The coral reef then slowly but surely dies.

P.I.I. Construction Company obviously does not seem to care about our environment. It just pumps out the silt into the ocean without any filtration or silt fences to prevent erosion. It breaks our hearts when we see the silt coming out. As it states in a book (Source 4), *“A reef in a sediment plume is in a similar situation to a human village downwind of a volcano that*

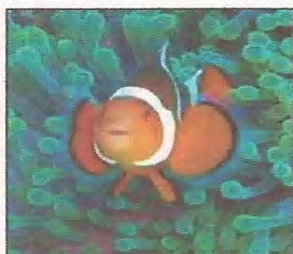
is erupting ash.” So, with deep confirmation, the silt coming out in the water near COM is killing the coral polyps.



Before and After



Coral Reef Hotspots in the World



Please help me.

Save my home.