

PAGTÁOB

Is a Visayan term for the rising of the tide. Every flood of the tide brings with it new nutrients and other important components that sustain the numerous denizens in the intertidal zone. Just as these nutrients nourish marine life, the nutrients that are being brought in, information is also vital for marine scientists.

PAGTÁOB

THE OFFICIAL NEWSLETTER OF THE McKEOUGH MARINE CENTER XAVIER UNIVERSITY

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REMEMBERING FR. JAMES McKEOUGH SJ: PIONEER MARINE SCIENTIST IN NORTHERN MINDANAO

by Dr. Dulce R. Dawang

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Fr. James A. McKeough, SJ believed in the importance of the marine sciences for an archipelagic country that is the Philippines. Because of this conviction, he established the first undergraduate marine biology program in the Philippines at Xavier University. He also co-founded the Federation of Institutions for Marine Sciences with other educators from four leading universities in the Visayas-Mindanao (Ateneo de Davao, Mindanao State University, Silliman University and University of San Carlos) to strengthen research capabilities of members as well as provide a forum for scientific researches. This Federation has evolved into the Federation of Institutions for Marine and Freshwater Sciences (FIMFS) and currently has 23 member institutions from all over the country.

Fr. McK, as he was fondly called, led the pioneer researches in the field of marine sciences in Macajalar Bay in the late 60s. Preliminary studies on the bay conducted with Mr. Wilfredo Yap in 1969 established baseline data for selected physio-chemical parameters, plankton and dominant fishery species. This was expanded

into a more comprehensive hydro biological study of Macajalar Bay and was funded by then National Science Development Board (now DOST). NSDB's Dr. Elvira O. Tan served as research consultant for this project which officially started in July 1970 and was completed in December 1972. The study dealt with hydrography of the Macajalar Bay and recorded monthly data on temperature, salinity, dissolved oxygen, and pH from various stations (shallow and deepwater) between the months of September 1970 and August 1972. The biology of select fishery species (sardines (Clupeidae) and flying fishes (Exocoetidae), and plankton were also studied over the period. The contribution of the fishery species in the local market was assessed.

Another noteworthy research contribution was the pollution and ecological study of Macajalar Bay

conducted from June 1977 to May 1979 and funded by the National Pollution Control Commission of BFAR. In addition to the bay's chemical profile, fisheries and plankton, the study also added a benthic

representative, the meiofaunal community. As the study also aimed to establish the extent of pollution in the area, it included a greater number of environmental parameters such as grain size, phosphates, pesticides and wastes. At the time, the research team reported that although there were already signs of pollution, these were not serious enough to cause alarm. ✨



MBDA goes coastal law enforcement

by Kristine A. Galarrita

The Macajalar Bay Development Alliance (MBDA) through its 15 LGU's signed a memorandum of agreement for the creation of a Coastal Law Enforcement Team (CLET). The teams from each LGU were grouped into MBDA clusters. Each cluster team includes the following: bantay dagat/deputized fish warden, municipal CRM law enforcement officers, local Philippine National Police (PNP) and coordinating staff from each LGU. For easy communication and interaction among the LGUs, coastal law enforcement coordinators from each cluster were also included. Each cluster team was composed of 12-16 persons with a total of 57 persons for the whole MBDA CLET.

Last March 2012, Xavier University - McKeough Marine Center (XU-MMC) and the MBDA Project Management Office (PMO) conducted a Training Needs Assessment (TNA) on CLE to the member-LGUs. Participants from each LGU were asked to make a map pointing areas where illegal activities occur. This training was also attended by the MBDA Technical Working Group (TWG) on CLE which includes, the



Phil Coast Guard Northern Mindanao together with the LGU participants.

Bureau of Fisheries and Aquatic Resources (BFAR), PNP Maritime Group, and the Philippine Coast Guard (PCG). From the needs-assessment results, it was noted that the common components not familiar to the LGUs were the boat boarding procedures and the rules of engagement.

A 3-day CLE training was then organized by the MMC and the MBDA-PMO from October to November for each of the four clusters. The Philippine Maritime Group (PMG) and the Philippine Coast Guard (PCG) teams conducted the training. The CLETs were first oriented on the Barangay Intelligence Network (BIN), Barangay Peacekeeping Operation (BPO) and the Barangay Peacekeeping Action Team (BPAT), highlighting the role of local communities in law enforcement. The bulk of the training focused on correct procedures in handling hostile and non-hostile offenders,

proper ways to conduct search and seizure operations, reading and locating coordinates on the map, and filing complaints and cases. Other components of the training included first aid, water survival, basic rescue, knot tying, and boat handling.

This first module of the CLE training was made possible through the MMC project entitled "Enhancing Resiliency to Climate Change in Macajalar Bay," funded by the German organization, Gesellschaft für Internationale Zusammenarbeit (GIZ) and the Adaptation to Climate Change and Conservation of the Coast Areas (ACCCoast), with counterparts from the MBDA and the MMC. The project aims to enhance the resiliency of Macajalar Bay to climate change by establishing a network of marine protected areas while capacitating the LGUs in the protection and management of the MPA network. ✨



Field exercise for pre-boarding and boarding procedures



Exercise on reading of coordinates and locating the nearest shoreline by PNP Maritime 10



Phil Coast Guard Nor Min showing techniques on basic rescue and water survival

Marine Corner



- Sea urchin or locally called “suwake” is a marine invertebrate with a round body covered by spines.
- They are omnivorous animals, feeding on both animal and plant matter.
- They can be found in Macajalar Bay especially in rocky substrate.



Photograph by: Fergus Kennedy

- *Dugong dugon* known as sea cow is a large marine mammal that can grow up to 3 meters or 9.8 ft.
- They are one of the few large herbivorous mammals and are important in maintaining balance in the ecosystem.
- They have excellent hearing but poor eyesight. Like other mammals, they go to surface to breath.
- They are known to occur in Mindanao from Siargao Islands all the way to the Zamboanga peninsula. But unfortunately latest surveys point to localized extinction in some areas already.

Sea urchin grow-out: A potential alternative livelihood

by Warwin O. Sabasaja

As part of its overall goal, Ecosystem Alliance-International Union for Conservation of Nature (EA-IUCN) through XU-McKeough Marine Center (MMC) is looking at the possibility of developing sea urchin grow-out cultures in Murciellagos Bay as alternative livelihood for coastal communities. However, we also found out that certain municipalities in Macajalar Bay are home to “suwake.” So we are exploring opportunities to conduct grow-out culture there to check its feasibility.

Sea urchins or locally known as “suwake” are benthic organisms with spiny bodies found on sandy to rocky intertidal areas. These organisms are favored for its delicious gonads termed as roe and are said to have an aphrodisiac effect when eaten. Along with this, these macro-invertebrates are also found to be rich in glycogen, carotenoids, alanine, valine, glycine and other amino acids. *Tripneustes gratilla* is the most commercially exploited sea urchin species in the Philippines. This kind of sea urchin is locally abundant in both bays particularly in Rizal, Zamboanga del Norte and in Laguindingan, Jasaan and Binuangan, Misamis Oriental. However, excessive overfishing of sea urchins

reaching up to more than 7kg of roe/person/day during the peak season and 4-5kg of roe/person/day during the lean season (Resilient SEAS, 2011) has threatened the wild stocks to depletion in Murciellagos Bay. Meanwhile, sea urchin farming in Macajalar Bay is unexplored yet of great potential. Some municipalities (i.e. Binuangan, Misamis Oriental) already have sea urchin processing practices but are perceived to be unsustainable as urchins are acquired in the wild; thus threatening the local urchin stocks. With this continuing pressure, local urchin population could eventually decline in the future. A management strategy is therefore needed to address this issue. One strategic approach is through grow-out culture. This will not only lessen the pressure on local fishery but will also provide a sustainable alternative source of income, albeit smaller in scale. Furthermore, this would eventually replenish the area with new seed stocks as the cages facilitate a better recruitment of juveniles. In the process, the grow-out culture will both educate the local and engage the fisher-cooperators in coastal resource management practices.

The sea urchin industry is not new in the Philippines. In fact, this has been developed in many parts of the country, particularly in Bicol and Ilocos Regions as an alternative source of income for many coastal residents. We want to see if this successful practice can be replicated in both bays by testing the feasibility of the said grow-out. Currently, the project team is communicating with the local government units in Murciellagos and Macajalar Bay for the selection of feasible sites and local fisherfolks as trainees in the said workshop. We are also linking up with MBDA to help us develop the social initiative later on. ✨

MBDA receives BFAR special award

by Vanessa Gorra

The Macajalar Bay Development Alliance, a project of the McKeough Marine Center for integrated coastal management in partnership with local government units

(LGUs) in Misamis Oriental, has been selected to receive a special award as one of the fisheries stakeholders in Northern Mindanao from the Bureau of Fisheries and Aquatic Resources (BFAR).

The awarding ceremony was held on Oct 19 at the Stakeholders' Fellowship Night of the 49th Fish Conservation Week Celebration in Quezon City. The award recognizes and commends the efforts of various institutions who are partners of BFAR in implementing projects that conserve and manage our fisheries and aquatic resources. ✨

GIANT CLAMS IN AGUTAYAN ISLAND: WHAT HAPPENED AND WHY?

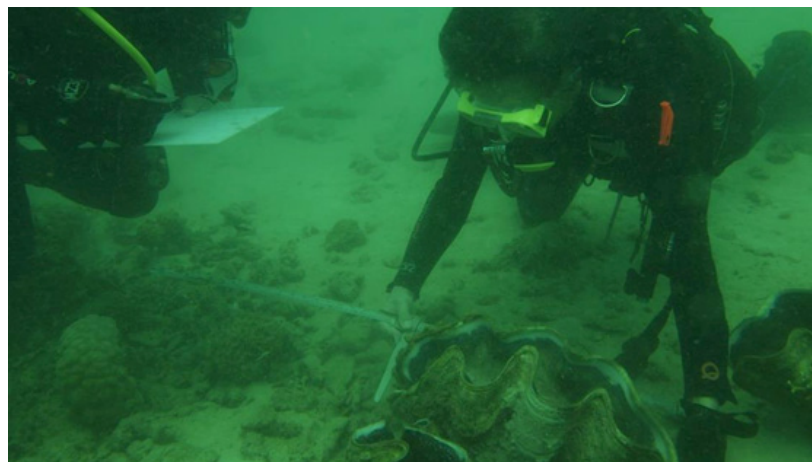
by Julie Mae T. Acero & Fr. Mars P. Tan, SJ

To verify the number of live giant clams in Agutayan Island, Jasaan, Misamis Oriental, McKeough Marine Center (MMC) conducted another monitoring activity on September 20, 2012. This third monitoring (for this year) was prompted by an alleged report about a cooked giant clam flesh offered to guests in the local area. The other reason for this unscheduled monitoring was to finish what was started in July that was not completed due to strong surface currents and low visibility underwater. In this monitoring activity, the MMC team was ably assisted by volunteers from the PNP-Maritime 10, Philippine Coast Guard NorMin, STEAG State Power Inc., and MBDA LGU clusters.

The objectives of the monitoring activity were to recount, re-measure and re-arrange the live clams. Volunteers were grouped into two teams: divers and non-divers. Non-divers were assigned to only one site (seagrass meadows in shallow area) while the divers covered four sites, namely, artificial reef, two (2) rock sites and reef crest. Both teams were given orientations on the objectives of the activity and the methods to employ for individual clam counting and measurement. Patrice Bianca Roa and Julie Mae Acero briefed the teams before deployment to their respective sites.

The teams were the following:

Divers	
Group 1	Group 2
Patrice Bianca Roa	Fra-and Timothy
3 Phil. Coast Guards	Lyra Salta-Quimpo
2 PNP-Maritime	Johnny Cabreira
4 MBDA Cluster Divers	
2 STEAG Divers	
Ferit Temur	
Non Divers	
Henry Trugillo	Julie Mae Acero
Ace Cardeño	4 PNP- Maritime
2 Phil Coast Guard	



Scuba diver volunteers during the giant clam monitoring. The other one is measuring the length of the clam while the other one is recording the data.



MMC staff together with PNP-Maritime 10 and Phil Coast Guard Nor Min volunteers

A total of 163 live giant clams: 114 in shallow area and 49 in deep water sites were counted and measured. Five(5) clams in shallow area were noted to have started bleaching. In the same area, 37 empty shells were found piled up in a certain part of the area.

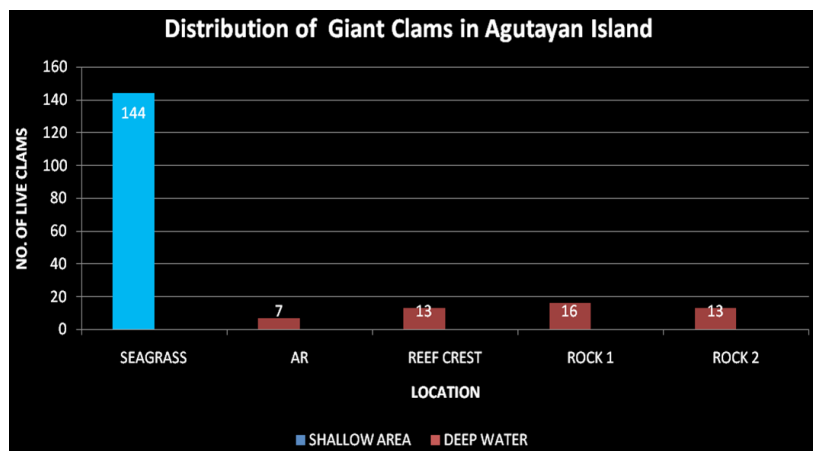


Figure 1. Distribution of live giant clams in Agutayan Island, Jampason, Jasaan, Misamis Oriental during the September 2012 monitoring

Comparing the previous and last monitoring activities, Figure 2 shows a big decrease in the number of live clams in shallow areas from February to September while the decrease in deep water areas in the same period of time is only slight.

Over a decade, the survival growth of giant clam is fast decreasing. Aside from deaths it's still unknown if there are other causes that contributed to the decline in the number of clams. To determine the cause of deaths, further studies have to be included in the Center's research project with other stakeholders.

Figure 3 shows the number of live and dead giant clams each year. From 574 clams reseeded last 2001, only 163 clams are left this year. This is alarming since the

objective of the study is to reseed them; yet they are slowly dying in the area. Giant clams are considered endangered species by the Convention of International Trade in Endangered Species of Wild Fauna and Flora (CITES). If there were more than hundreds of clams dead or presumed dead in the area, where did the empty shells go? Why is it that in the last monitoring, there were only 37 shells found in the sites? The clam shells are big and heavy and could not be transported easily by mere waves or tides to distant locations. Given that only 37 empty shells

were found, could this mean that 374 were taken away or removed physically from their habitats? Why?

The shells alone are valuable as decorative items. But more than the shells are the cooked flesh that sells expensive and tastes exotic. There are no clear answers to these questions for now. Further investigations should be done and stricter implementation of policies to safeguard the clam community has to be enforced and observed by all stakeholders. ❄️

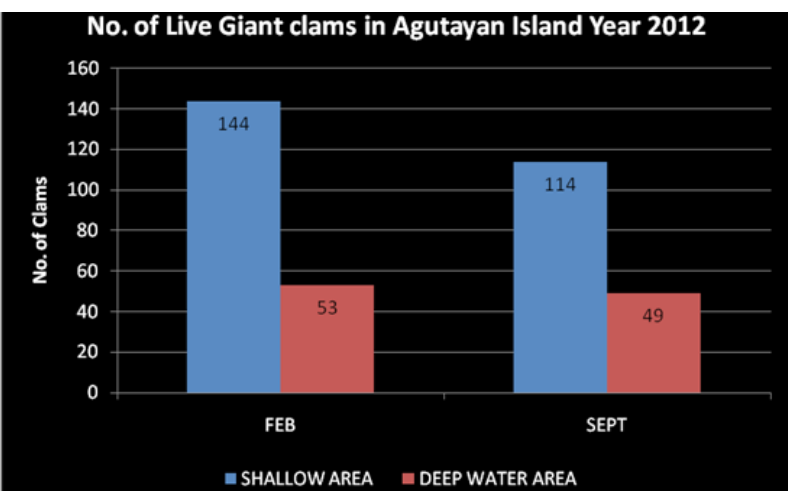


Figure 2. Comparison of Live Giant Clams between February and September 2012.

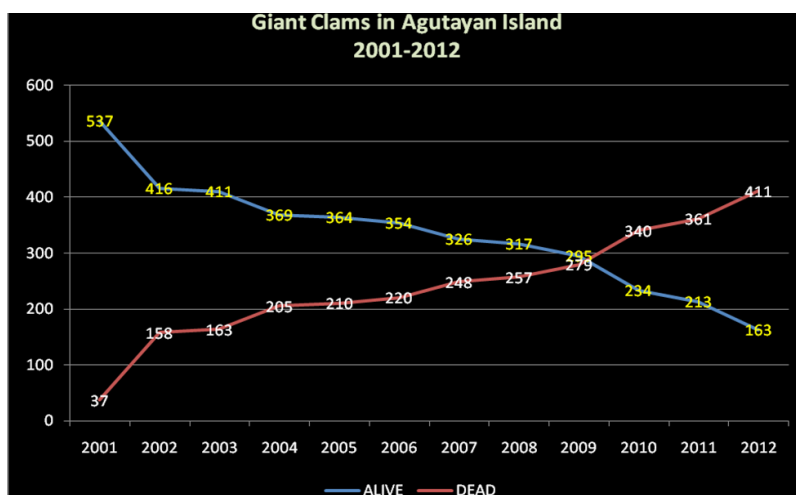


Figure 3. No. of dead and live clams each year in Agutayan Island Jampason, Jasaan, Misamis Oriental from 2001 - 2012

WHAT'S YOUR COURSE AGAIN?

by Mariel Jugador, BS Marine Biology 4

XU Main Gate. Monday, 7:30 AM

My eyes widen in anxiety as I immediately shift from my normally slow-paced walk to a somewhat poised run while heading towards the Science Center building. My huge backpack and ridiculously thick textbooks are enough to warn the other students to make way for me. I reach the ground floor of the building. The shrill sound of the second bell eagerly reminds me that I am already late for class. As I sprint my way up the four flights of stairs to my classroom, I pray to God that my professor has not yet started her lecture. I pant as I finally reach my destination. Then I try to catch my breath and wipe off the sweat from my sunburned face with the back of my hand before I reluctantly poke my head through the slightly open doorway of the classroom. I see my professor still busy setting up her laptop and my four other

classmates signalling me to come inside. I breathe out a small sigh of relief and quietly let myself in. "Good morning, Ma'am," I say, as I pass by my professor and proceed to the nearest vacant armchair. I unload all the necessary materials I need for this class and I sit down and wait for my professor to start the morning prayer before the class officially begins.

Ah, yes. This is just another typical Monday morning for a regular Marine Biology student. But let's not forget to mention what happened a few days before: several chapters from both major and minor subjects to be read in advance, sketches of different specimens that need to be labeled accordingly, a PowerPoint presentation to be created for your class report and comprehensive laboratory reports to be handwritten after that fieldwork you had last Saturday. As challenging as it may seem, BS Marine Biology is not only an interesting course, but is also a rewarding one. Even as freshmen, we are already trained to work hard, study diligently and think critically

when doing our tasks in school. And as we proceed to being upperclassmen, we develop our skills as scientists in the making and further excel in scholarly works. Although there are only a few of us taking up this course, this actually gives us an advantage when it comes to capacity for learning. And in return for all our hard work, we give back by contributing our knowledge from different fields of science—Oceanography, Phycology, Ichthyology, Marine Ecology, Coastal Resource Management, Invertebrate Zoology, Aquaculture and Environmental Science, to name a few—and applying it in real life situations, especially in the local areas. Our goal is to assess these problems and try to find possible solutions, as well as to discover new things and make new friends along the way. So what's my course again? I am taking up BS Marine Biology and no, I do not simply "swim in the ocean all day and study fishes." ❄️

LET'S TALK ABOUT TRASH: A COASTAL CLEAN-UP REPORT

by Julie Mae T. Acero & Fr. Mars P. Tan, SJ

From households to canals, canals to rivers, and then rivers to the seas, that is the ugly journey of our trash.

Two coastal clean-up activities were done last September 2012 in celebration of the International Coastal Clean-Up Day. The first activity on September 22 was organized by McKeough Marine Center, and was conducted in three sites: the marine sanctuary, mangrove area, and beaches of the municipality of Opol, Misamis Oriental. 326 volunteers (divers and non-divers) participated in the activity. The participants were volunteers from the following groups: Dive Special, Philippine Army 4th Infantry Division, Philippine Coast Guard NorMin, Coast Guard Special Operations Group, Tactical Operations Group Philippine Airforce, Marine Bio Students, PNP Maritime, STEAG Power State Inc., MBDA Cluster Divers (Villanueva, Jasaan & Salay), XU-National Service Training Program (NSTP) Students Classes YA & YC, XU- Research and Social Outreach, XU-Center for Legal Assistance, Jesuit scholastic, XU-Red Cross Youth, AJIS Aquasports, and local communities of Opol. The groups hauled a total of 1,684 pounds (765.65 kgs) of garbage from the three sites.

The second coastal clean-up activity was organized by Kong Hua School, with the assistance from McKeough Marine Center, on September 29 in the beaches and mangrove area of Barangay Bonbon, Cagayan de Oro City. The school activity was participated in by 360 volunteers composed of faculty, staff, and high school students of Kong Hua School. The entire school collected a total of 1,370 pounds (621.7 kgs) of garbage from the two sites.

Volunteers were given data card to record the kinds of debris they collected. So what sorts of debris did they collect? Almost $\frac{3}{4}$ of the total marine debris collected were plastic materials. This was followed at a distant second by metals with 6.08% and third by glass and ceramics with 4.97%.

McKeough Marine Center evaluated the two activities and recommended another major clean up activity next year with various stakeholders from the local communities as part of the core working team.

This will enlist many more participants for the clean-up activity. It was also suggested for the Center to formulate an IEC module with target local communities to keep the marine and coastal areas clean and safe even after major clean-up activities have concluded. 🌸



Kong Hua High School students cleaning up the coast of Bonbon, CDO.



Scuba divers cleaning up the Opol Marine Sanctuary

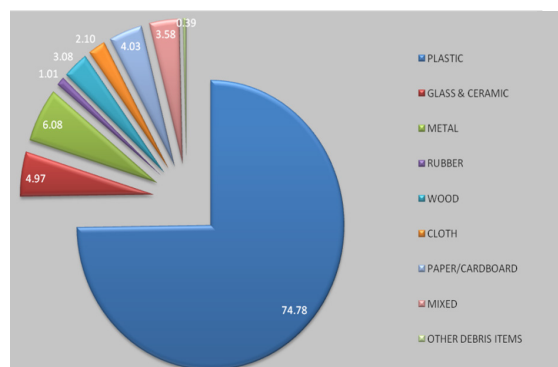
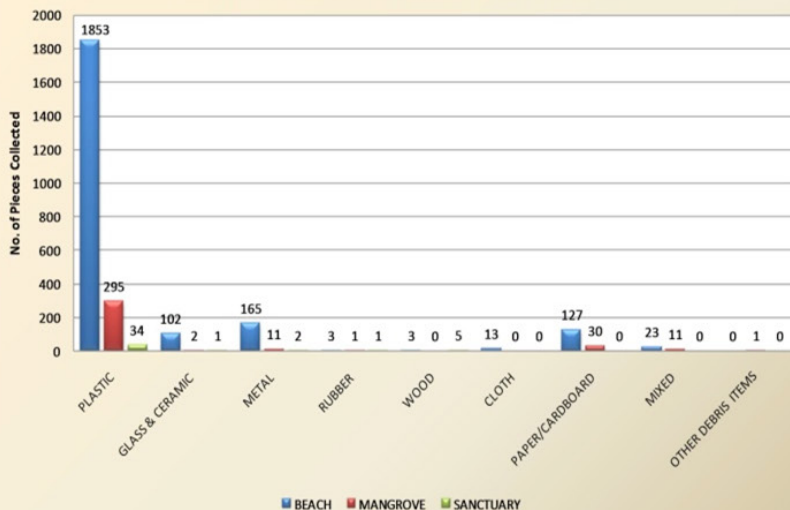


FIGURE 1. Percentage total of debris collected in Opol, Misamis Oriental and Bonbon, CDO

Debris Collected in Opol, Misamis Oriental



Debris Collected in Bonbon, CDO

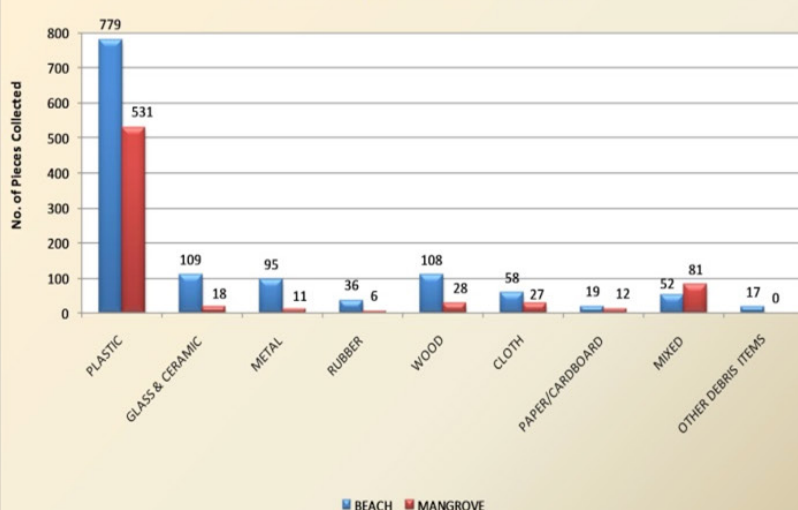


Figure 2. No. of pieces of marine debris collected in two different areas, Opol Misamis Oriental and Bonbon, CDO.

AS THE RIVER RUNS THROUGH THE BAY

by Fr. Mars P. Tan, SJ

A few hours ago, Typhoon “Pablo” had just passed Cagayan de Oro City. With the curious onlookers, I stood watching in amazement the furious brown water flowing continuously along the river channel out into Macajalar Bay. The strength and speed of cascading brown water could easily carry tons of vehicles and houses up to the mid-section of the inner bay. The heavy debris would submerge underneath quickly. But the brown plume might persist on the water surface for a day or more.

In many bays in the Philippines, the brown sediment plume is a common sight after a heavy pour in the mountains; more so, when physical disturbances in the uplands are rampant. The fluvial sediment may take a few kilometers stretch straight from the river mouth or it may sway towards either side. Whichever side, the brown plume adversely affects the marine organisms on the surface or underwater. It lessens sunlight supply to marine ecosystems and suffocates marine organisms.

A plume sampling was conducted in Macajalar Bay on November 23, 2012 on both sides parallel to the Macabalan coasts. The goal of the sampling was to determine impacts of river plume on bay water characteristics. Four parameters were measured: turbidity, salinity, temperature, and total suspended solids (TSS). Data collections were done from 6am to 11am on board a motorized boat. The study sites were the 1000mx300m area to the left and the right sides of river mouth running parallel to the coastal areas. At the first site (right), sampling points started from nearest the river mouth going through layers of an extended S-like route connecting a total of 19 points. At the next site (left), same measurements were collected and same route pattern of 16 sampling points was followed within plume cover but starting from the farthest. The morning’s sun heat coupled with tosses by waves just wore

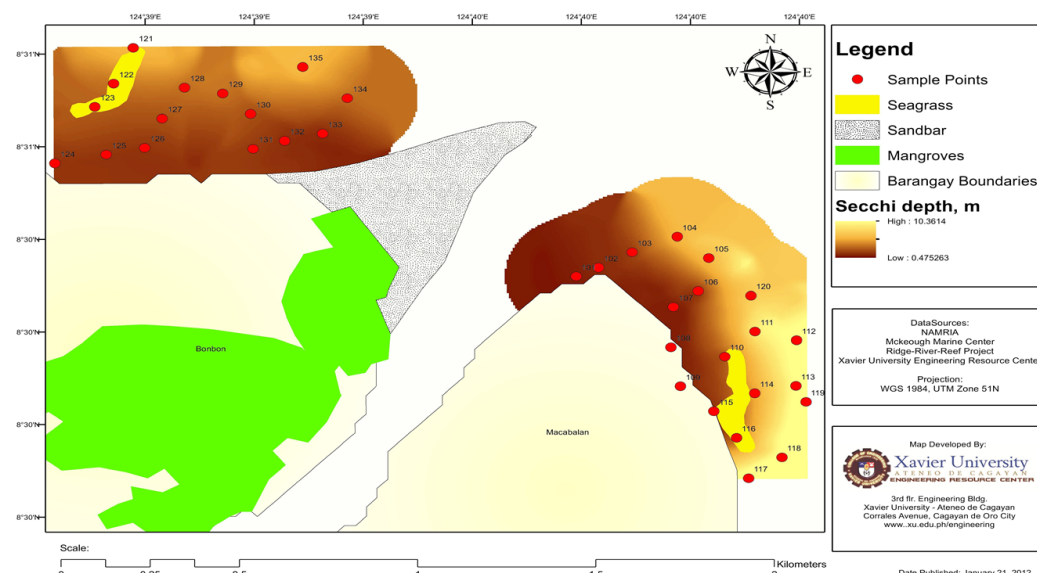
us down onboard (except the sun-tanned boatman). Each was in-charge of something: James Borcillo for TSS, Julie Mae Acero for salinity, Jeff Vallente for GPS (Global Positioning System), and I for turbidity.

The two sites showed different sets of results. On the right-side site, turbidity decreased as distance from the river mouth increased. Highest Secchi depth (instrument used to measure turbidity) reading was 9.25 meters. Similar salinity and temperature patterns were shown but with the former’s range of increase at 29 °C within a kilometer-long stretch from the mouth to the opposite edge. Temperature range of increase was 3.7°C. As for TSS, shorezone sampling points measured much higher than in deeper parts. Coastal activities may have contributed more suspended particles in the shallow waters. The early morning south-southeast (SSE) wind was not strong enough to push the water seaward.

On the left-side site, visibility was low with highest Secchi depth reading of only 5.5 meters. Shallow parts due to low tide made it hard to rely on Secchi disk measurements. Salinity did not change much with distance from river mouth but pattern looked strange with salinity slightly increasing at sampling points closer to the river mouth. It should be noted, however, that a long sandbar (courtesy of Typhoon “Sendong” and later of “Pablo”) perpendicular to the coastal line blocked upland river water from

immediately turning left side. Temperatures at a little below or above 29°C were noted all throughout the study site. For TSS, no clear pattern could be observed from results. But very high measurements were collected at certain points close to the sandbar. Probably, stronger mid-morning wind from west (W) and northwest (NW) pushed water back to shore areas.

Clearly, the right-side site was much influenced by river water given that freshwater could mix freely and fully with the bay water. Results showed a certain pattern, and changes in salinity and TSS were quite pronounced. The left side exhibited little change suggesting a more homogenous salinity and temperature readings on site. The sandbar must have made the difference.



Credits: Jeff Vallente - Engineering Resource Center (ERC)
CdeO River Plume Map (Turbidity) - November 2012 Survey

UNDERWATER 3D-MAPPING AND BATHYMETRIC SURVEYS, NOW A REALITY IN XU

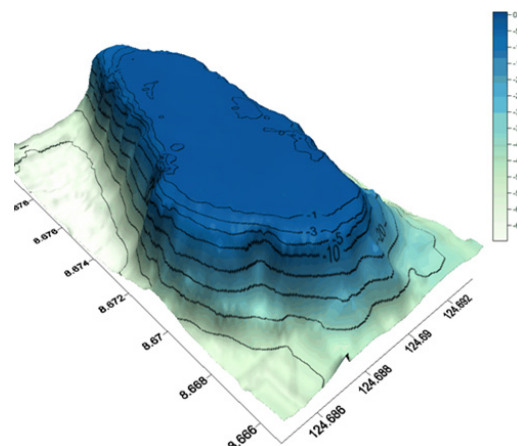
by Fra-and Timothy S. Quimpo

You might wonder what Agutayan Island looks like underwater. You would need to do numerous dives to find out, and even with diving, there are certain limitations such as depth and visibility, aside from the fact that you can't create the whole picture of its underwater topography. The best way to answer that question is to do topographic mapping. But topographic mapping underwater? Is it even possible? Once limited to the

terrestrial environment only because of the level of difficulty, environmental topographic mapping underwater is now possible here. The McKeough Marine Center has taken another step up the ladder in technological advancement and is now equipped to conduct bathymetric surveys. Bathymetric surveys are essential in providing broadscale information about the topography of the area underneath the water. The potential for bathymetric surveys is not limited only to biological research but is also relevant for industrial purposes. Describing the slope, the influence of the slope to the water movements, and the distance at depth are important attributes of both ecological and industrial studies. 3D mapping is also possible with this technology, giving the observer a good perspective of the underwater terrain without even getting wet. For more queries please visit the McKeough Marine Center. ✨



Google map of Agutayan Island.



The southwest view of a digital 3D map of Agutayan Island generated by the McKeough Marine Center.



Setting of sediment traps

For over a decade, the coral cover in the bay has declined from good (59%) to fair (38%), with siltation as the major factor in the deterioration of the reef areas (Roa-Quiaoit et al, 2010). Coral reefs are an important resource ecologically and economically. The research component of the ER-PROGRAM (Enhancing Resiliency in Macajalar Bay through Policy

SEDIMENTS IN MACBAY

by: Patrice Bianca L. Roa

Recommendation, Outreach, Governance, Research and Adaptive Management) has a duration of two years, which started last December 2011. The first year being the sampling stage of the project, where selected sites were chosen to determine their sediment accumulation rate in order to assess the effects of sedimentation (and other parameters) on the coral composition of Macajalar Bay.

The sites that were selected includes: Molocboloc, Alubijid; Sinaloc and Burias Island, El Salvador; Looc, Villanueva; Jampason, Jasaan; and Poblacion, Kinoguitan. There are also two control sites: Tubajon, Laguindingan and Agutayan Island, Jasaan.

Samples have already been collected since March 2012 and will cease on February 2013. Of the samples, analyses have been done until July 2012. The preliminary report showed that from the Amihan

season (usually December to February) the accumulation rate slowly dropped as it entered the "hot" months or summer season, except that for Tubajon, Laguindingan (a control site), where the accumulation rate continued to drop. All the other areas showed an increase once the "wet" months or rainy season arrived, with Looc, Villanueva showing a considerable amount compared to all others.

Future activities will involve further laboratory analyses and sediment characterization in tandem with statistical analyses that will show which of the parameters greatly affects the coral composition of the bay.

The result of this study will be used to establish a network of Marine Protected Area (MPA) and strengthen its management efforts. ✨

SPREADING ENVIRONMENTAL AWARENESS: A NSTP-ISDA APPROACH

by Julie Mae T. Acero

The IEC Student Development Advocates or known as Program was designed by McKeough Marine Center in 2007 to provide the National Service Training Program (NSTP) with modular lectures on the importance of the marine environment and its ecosystems. At present, the program is given as a series of lecture and activities to second year college students. Resource persons are tapped from the McKeough Marine Center and the Biology Department. Students are given pre-test and post-test to evaluate their knowledge about the marine environment. In the second semester, students are sent to do volunteer teaching work to pupils in ISDA partner public schools.

On November 8, 2012, after a semester of lecture series, the students of NSTP-ISDA Program started their area work in different partner schools. The volunteer area work was conducted every Saturday from 8:00 am to 12:00 noon. Two sections of NSTP were grouped into six and were assigned to the following public schools: West City Central School (Grade V), Bulua Central School (Grade V), North City Central School (Grades



NSTP-ISDA students showing and explaining one of the major ecosystem in the marine environment, the Mangrove Ecosystem

IV & V), Macabalan Elementary School (Grade V) and Cugman Elementary School (Grade V). The elementary students of each school were given pre-tests to determine their knowledge about marine environment. In classes, the young elementary students showed eagerness to learn something new from their older counterparts from the university. NSTP students also realized that they needed to study the matters well and be more creative in presenting them to the young and dynamic bunch of school children.

Last December 22, the NSTP volunteers celebrated the "Pasko sa Erya" together with their students in their respective partner schools. Area work resumed last January 5, 2013. A post-test evaluation will be given to

the students on February 2 before the area work ends. The last day of class (February 16) will feature a traditional role playing of a comical skit entitled "Si Armando ug ang Dinamita" to be followed by the Recognition/ Graduation Activity. The comical skit is already in print forms published the other year by MMC.

For many NSTP students, the experience of teaching and being with public school children was their contribution to spread environmental awareness to the next generation. It was also a living out of the Ignatian charism of Magis, not anymore a mere Atenean byword. ❀



Left: Students of West City Central School start to draw the Mangrove Ecosystem. Right: The students describe their drawing of the coastal zone

XAVIER UNIVERSITY COLLEGE FACULTY AND STAFF ATTEND WATER SAFETY WORKSHOP

by Marianne Mira Katrina E. Macapelit

Accidents in pools and beaches happen every day and to persons of all ages. But drowning can be prevented and lives can be saved. Who knows someday the life you save could be yours or your son's or daughter's?

The Philippine Aquatic Safety Society (PASS) in coordination with the XU McKeough Marine Center organized a Water Safety Workshop on November 21 and 22, 2012. As an aquatic organization, PASS leads the efforts to prevent drowning. They recognize, address, and support drowning prevention efforts in all types of water.

MMC extended the invitation to other units and colleges in the university who could benefit from the aquatic safety symposium and training due to the nature of their work activities.

Those who attended were faculty and staff representatives from the Athletics department, Computing and Information Systems Office, National Service Training Program, Nursing Admin Office, Security office, School of Education, and some marine biology students and XU alumni, who at the end of the training claimed to have learned and enjoyed a lot from the actual skills trainings.

Workshop participants went through interactive discussion and lecture on aquatic safety on the first day and were taught basic survival swimming skills and water safety procedures on the second day. Indeed the learning could be applied anywhere and under any circumstance when safety in bodies of water is involved. ✨



The aquatic safety workshop participants with PASS instructors.

GIZ-ENRD

For the past four decades, the Philippines witnessed a grave deterioration of its natural resources. This is due to rapid population growth and uncontrolled and unequal access to natural resources. In addition, natural disasters such as typhoons, floods and landslides destroy valuable agricultural lands, a situation which will most likely be aggravated by climate change. The destruction of forests and coral reefs, loss of biodiversity and degradation of crucial watersheds greatly affects the rural communities. A large portion of the rural population depends on natural resources for their livelihood. Half of them continue to live below the poverty line; whereas poverty is notably problematic in the upland.

In response, the Government of the Philippines and the German Government conceived the Environment and Rural Development (EnRD) Program. The main objective of the program is to improve the livelihood of the rural population through better management of land and water resources. This will be done through capacity building of rural development agencies to sustainably manage natural resources and promote rural development.

Program interventions consist of technical advice, capacity building, studies and pilot projects for improved environment and agriculture related services.

EnRD is jointly being implemented with the Convergence Initiative, composed of the: Department of Agriculture (DA), Department of Agrarian Reform (DAR), Department of Environment and Natural Resources (DENR), Department of Interior and Local Government and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH Source: www.gizenrd.gz ✨

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Environment and
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Program



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&

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Adaptation to Climate Change in Coastal Areas

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in the publication of
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The Deutsche Gesellschaft für Internationale Zusammenarbeit (German Agency for International Cooperation) or GIZ is an international enterprise owned by the German Federal Government, operating in many fields across more than 130 countries. It primarily works for public-sector organizations. It's headquarter is located in Bonn and Eschborn, Germany. GIZ works on a public-benefit basis. All surpluses generated are channeled back into its own international cooperation projects for sustainable development. One basic principle that GIZ respects in all its activities

is the need to deal responsibly with the environment and natural resources.

GIZ country offices in partner countries are also committed to protecting the environment. More than half of our country offices have already produced environmental balance sheets and conducted environmental audits. These provide a basis for action plans designed to make our activities more environmentally sound. ✨

SIMPLE

Sustainable Integrated Management and
Planning for Local Government Ecosystems

SIMPLE is an integrated ecosystem planning and management approach. It is designed to help local governments to plan and manage their entire land territory, be it public, private or ancestral lands. The needs of the fast growing population of the Philippines have put heavy stress on forests, agricultural lands, coastal areas and settlements. This has forced local governments to assign new land areas for commercial use, residential developments or other social and economic activities. Unsustainable practices, such as logging, illegal fishing or land conversion are often the consequences and aggravate the pressure on natural resources or infrastructures.

FIVE REASONS TO USE SIMPLE:

- **SIMPLE is an integrated ecosystem planning and management approach** that enables municipalities and cities to manage or co-manage their entire territory from ridge-to-reef, be it public lands, private lands or ancestral domains.
- **SIMPLE empowers the local communities**, because it builds on a participatory land use and development planning process starting at the barangay level.
- **SIMPLE develops long-term capacity at the local level at affordable costs** because it provides long-term capacity building along with tools adjusted to locally available knowledge and capabilities.
- **SIMPLE links investment plans with budgets and expenditures** and monitors the compliance with the zoning ordinance.
- **SIMPLE helps reduce impacts from disasters and climate change** by providing tools and instruments for local governments to cope with such risks.

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Source: SIMPLE publication GIZ 2012



"It was easy for us to produce maps with calculations of land uses for certain areas and present them to the barangay constituents based on their proposals because we use GIS." Errol Ripalda, GIS staff of Municipality of Alangalang, Leyte
(picture taken from SIMPLE Publication, page 19)

PUBLISHED BOOKS

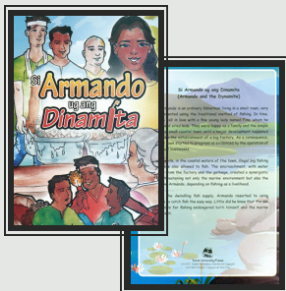
Ridge to Reef in the Philippines

by Knowledge
Networking and
Learning of
Ecosystem-based
Research and
Development:
A Ridge to Reef
Initiative in the PH
Project



Si Armando ug ang Dinamita

by IEC Student
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Advocates
(ISDA) Project



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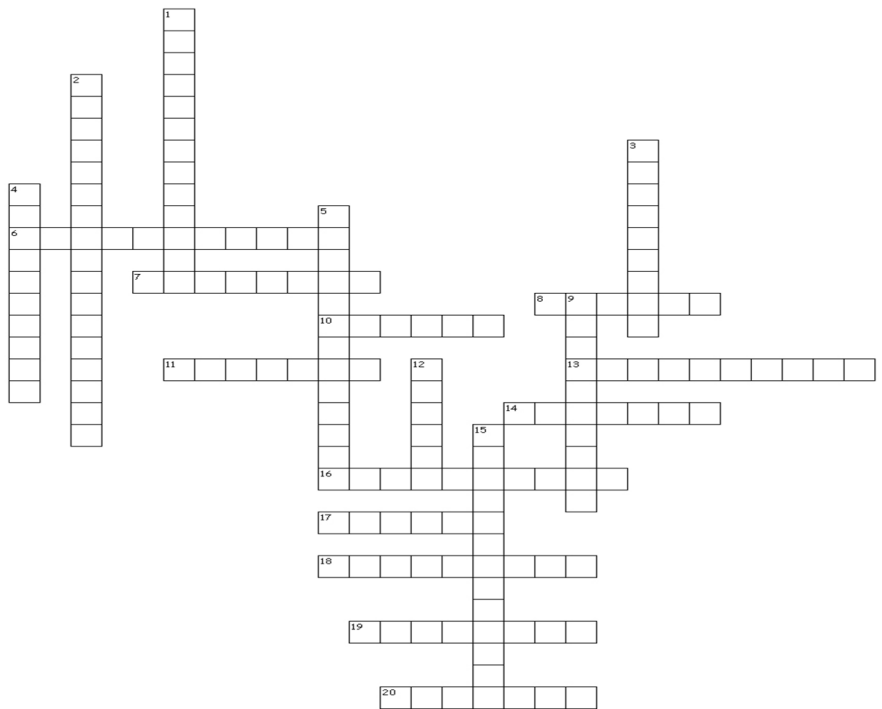


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WHAT INVERTEBRATE AM I?



Across

6. sausage-shaped invertebrate
7. feather star
8. decapod crustacean
10. colonies of polyps
11. have 5 arms radiating from the body
13. a seashell who was once used as coins
14. most intelligent invertebrate
16. looks like a large coin with short spines covering its skin
17. named after a Greek God, son of Poseidon
18. an umbrella-like invertebrate with no heart and brain
19. marine polychaete worm
20. with hard protective exoskeleton

Down

1. notably named for a flamenco dancer
2. a tree shaped serpulid
3. spiny hard-shelled animal
4. specialized type of brittle star
5. true giant clam
9. not a true crab
12. a crustacean that has equal number of feet/legs on both sides
15. venomous starfish

Source: <http://puzzlemaker.discoveryeducation.com/CrissCrossSetupForm.asp>

KOMIKS

