

GTA 21

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 like the nutrients that are being brought in, information is also vital for marine scientists.

This newsletter aims to update the XU community and our partners on the different programs and activities of the McKeough Marine Center.

INSIDE THIS ISSUE

1	First dive to Benham Rise!
2	Ang Panagtagbo sa Tigbantay sa Lasang, Suba ug Dagat
3	XU opens marine station in Jasaan
4	Study tour in SEAFDEC
5	Celebrating the Month of the Ocean 2014
6	Enhancing Resiliency to Climate Change in Macaialar Bay

THE OFFICIAL NEWSLETTER OF THE MCKEOUGH MARINE CENTER XAVIER UNIVERSITY

"The dive could have felt like any other first deep dive, but somehow it was special, because as far as you know, no one has been there before."

~ Patrice Roa-Chio

he United Nations Convention on the Law of the Sea (UNCLOS) officially confirmed that Benham Rise, a 13-million-hectare underwater plateau, off the coast of Aurora and is bigger than Luzon is now part of the Philippine continental shelf and territory on April 12, 2012, three years after it has been solely claimed by the country. It was named after an American geologist who discovered it, Andrew Benham, way back in 1933.

FIRST DIVE TO BENHAM RISE!

By Ria Duana A. Roble

Two senior researchers from Xavier University -McKeough Marine Center namely, Fra-and Timothy Quimpo and Patrice Bianca Roa-Chio joined a team of researchers and divers in an expedition to Benham Rise on May 3-17. The team was led by Dr. Hildie Nacorda of the University of the Philippines Los Baños-School of Environmental Science and Management (UPLB-SESAM). Other participants were from UP-Marine Science Institute (UP-MSI), the Bureau of Fisheries and Aquatic Resources (BFAR), UPLB-SESAM and Institute of Biological Sciences, UP Mindanao, UP Baguio and Ateneo de Manila University (AdMU).

The team reached, for the first time, the 50-m deep Benham Bank, the shallowest part of Benham Rise.

"From the many marine biologists and scientists in the Philippines, there were only a handful of us chosen to be part of the expedition so it was really an honor to be part of the exploratory team of Benham Rise, being the first to see and grab the bottom of Benham so to

speak," Quimpo said. Difficulties were encountered in the dive trip because the area was beyond the recreational and open circuit scuba diving limits. Resources are abundant (energy, food, water, etc.) but studies must be done to further know and emphasize their value.

"The impact is not only on the resources but I believe on the morale of future Filipino explorers and scientists. But resource-wise, it all depends on how this generation will utilize this speculated availability, which can either make this country richer or make it even poorer than ever," Chio remarked.

The depths of the Benham Rise are dangerous and unpredictable, however, being part of the first team to explore our country's newly-acquired territory is undeniably rewarding.

Photos from Dr. Hildie Nacorda and Fra-and Timothy Quimpo



Fra-and Quimpo (left) and Patrice Chio (right) take a pose underwater.



Datu Macmac (right most) shares his experiences on forest protection.

ANG PANAGTAGBO SA TIGBANTAY SA LASANG, SUBA UG DAGAT

(The convergence of the custodians of the mountains, river and the sea) By Ria Duana A. Roble and Warwin O. Sabasaje

s humans, we are essentially linked with nature. What we do to our environment significantly affects the nature's balance. The slew of environmental problems nowadays have challenged us to do our part, enforcing programs and actions for the conservation of our natural ecosystems, and maintaining it to develop better and sustainable resources.

Different programs in our region had already started to preserve and develop the natural ecosystem and prevent further damage to the remaining forest and aquatic resources. Learning exposure trips to the different areas in Bukidnon and Misamis Oriental were held on March 7-12 which gave the participants a realization that all their efforts in maintaining and protecting their respective areas of responsibilities are all interconnected through the ridge-river-reef (R3) landscape principle.

Different resource managers joined the activity: the Kitanglad Guards Volunteers (KGVs) of Kitanglad Integrated NGOs (KIN) for the forest and watersheds, Cagayan de Oro River Basin Management Council (CDORBMC) for the river; and the Macajalar Bay Development Alliance (MBDA) and McKeough Marine Center (MMC) for the coastal area. For the coastal and marine areas, an onsite exposure and a short lecture on the different marine resources (giant clams, seagrass, seaweeds, macroinvertebrates, fishes, corals and mangroves), including a brief demonstration on how to wear snorkeling were conducted by the MMC staff. Participants explored the coastal barangays of Laguindingan, MisOr and look for ways on how to manage and utilize their resources, and develop livelihood opportunities for the coastal community.

A river cruise for the group took place at the Cagayan de Oro River hosted by a member of the CDORBMC, the Safer River Life Saver Foundation, Inc. (SRLSF). The tour started near Liceo de Cagayan University (LdCU) all the way to the river mouth and back, witnessing the people dwelling along the riverbanks as well as the ruins brought about by Typhoon Sendong. Rehabilitation and research works in the area were also explained during the tour.

Bukidnon was their last stop wherein the participants ventured on the planted trees in the Center for Ecological Development and Recreation (CEDAR) including its characteristics and uses. The KGVs also imparted their efforts and interventions on forest management. The participants also attended a lecture on the biophysical



The KGVs listen as an MMC staff explains a marine organism.



The participants enjoy the river cruise along the Cagayan de Oro River.

characteristics of Mt. Kitanglad and Mt. Kalatungan at Central Mindanao University (CMU). Introducing some sustainable farming strategies and proper management practices, they went to Unifruti farm in Valencia City, the Cinchona eagle nest site and Binahon Agroforestry Farm in Malaybalay City.

The six-day activity started with a sacred ritual called "Pamuhat Alang sa Kinaiyahan: Pamumulakaw" held in Talakag-Dansolihon boundary, participated in by various indigenous people community and leaders of Higaonon tribe with the presence of Archbishop Antonio J. Ledesma SJ, DD. It culminated at the Perrine Farm in Manolo Fortich, Bukidnon.

To wrap up the whole learning exposure, a series of talks, sharing of individual experiences and practices in protecting and conserving the environment were done at the end of each trip. The cross visit was indeed a huge success! Coastal protection is ineffective if the river and upland areas are taken for granted, thus, there must be solidarity among all the environmental guardians to combat the threats of destruction caused by natural and man-made calamities.



XU OPENS MARINE STATION IN JASAAN

ou cannot be a Jesuit University if you don't have a clear environmental program," said Xavier University president Fr. Bobby Yap SJ, emphasizing that caring for the environment is part of the Jesuit mission.

With the University's expanding approach on research and outreach work, XU formally inaugurated the XU Marine Station in Barangay Solana, Jasaan, Misamis Oriental on May 6. It will be managed by the McKeough Marine Center (MMC).

Intended to support courses in Biology and Marine Biology, classes could be held here for on-site lectures and fieldwork, and to conduct small-scale experiments for research studies of students with undergraduate or graduate theses.

"MMC has already generated 3D bathymetric and resource map of the coastal site as a source of baseline information for present and future studies," said Fr. Mars Tan SJ, MMC director.

In addition, the marine station serves as: (1) a facility to propel the awareness of the local communities and schools in the Municipality of Jasaan and nearby towns on coastal and marine conservation, (2) a venue for hatchery for the mass culture and farming of marine resources such as sea urchin and sea cucumber, (3) a nesting site for the sea turtles (*Eretmochelys imbricata* – a Hawksbill turtle) considering that the unique characteristic of sea turtles is to go back and lay eggs from where they have been hatched.

Aside from being a research facility, the marine station has other functional structures such as a multi-purpose hall, a dormitory and several cottages for trainings, meetings and other capacity-building activities.

The blessing and inauguration of the marine station was attended by the members of the Macajalar Bay Development Alliance (MBDA), local government units (LGUs) of Misamis Oriental, the Bureau of Fisheries and Aquatic Resources (BFAR), the Philippine Coast Guard (PCG), Samdhana Institute, XU Marine Biology alumni, MMC staff and other members of the XU community.

As the kick-off activity of the marine station was successfully held, it will now cater various resources to help students and researchers obtain a higher level of learning, and to aid them in their mission to rally for sustainability not only in the coastal and aquatic areas but for the environment as a whole.









STUDY TOUR AT SEAFDEC

ncluded in the Macajalar Bay Development Alliance (MBDA) strategies for sustainable coastal management is livelihood assistance among the coastal communities. Already started with the sea urchin grow out and sea urchin roe processing training in 2013, the alliance had a study tour at the South East Asian Fisheries Development Center (SEAFDEC) Aquaculture Department in Tigbauan, Iloilo on June 2-6.

SEAFDEC conducts scientific research to generate aquaculture technologies appropriate for Southeast Asia; develops managerial, technical and skilled manpower for the aquaculture sector; and disseminates aquaculture information. During the 5-day tour, the participants visited the marine stations in Tigbauan and Dumangas in lloilo, and Igang in Guimaras province. They were able to see the brood stock, hatchery, nursery and grow out facilities of different cultured organisms. Among the organisms housed at SEAFDEC were lapu-lapu (giant grouper), bangus (milkfish), balat (sandfish), sea horse, mud crab, kapinan (abalone) and guso (seaweeds). A consultation with an expert and a series of lectures were conducted on some cultured organisms. Preparation, initial capital, and the environmental requirements and precautions to start the aquaculture activities were among the concerns discussed.

The tour gave the LGUs ideas of possible aquaculture activities and projects to set up in their respective areas. Updates for improvement were also given to those with existing aquaculture facilities. The participants were interested on the aquaculture technologies and are planning to apply for a training course at SEAFDEC.





MARINE CORNER



Scientists extract the blue blood of the horseshoe crab in a laboratory. (A still shot from the PBS Nature documentary "Crash: A Tale of Two Species")

Horseshoe Crab's Big Role in Medicine

orseshoe crabs before were used as a bait for catching conchs (shell of a snail) and eels. They are also being dried to be used as fertilizer and poultry food supplements. Now, it has a special value in medicinal research and pharmaceutical industry—using it to test for bacterial contamination of drugs and medical equipment.

Its blue blood (with presence of copper) contains a substance called Limulus Amoebocyte Lysate (LAL) which forms a protective clot in the presence of bacteria. It creates a sticky mass around the infective agents, and prevents them from spreading.

Even though crabs used for this purpose are returned to the ocean, approximately 10-30% die as a result of the process. A quart of the horseshoe crab's blood is worth approximately \$15,000.

Horseshoe crabs are marine arthropods that live in the shallow waters. It has a horseshoe-shaped carapace (shell) and a spike-like tail. There are four species of horseshoe crabs, three of them can be found in Asia and the other in North America.

Source: Madrigal, A.C. 2014. The blood harvest. http:// www.theatlantic.com/.technology/archive/2014/02/theblood-harvest/284078/



A Horseshoe Crab | Photo by PerO the Viking



his year, the Macajalar Bay Development Alliance (MBDA) celebrated the Month of the Ocean with the rest of the country to advocate the importance of the mangrove ecosystem.

The MBDA, composed of 15 local government units situated along the Macajalar Bay in Northern Mindanao, was established in 2008 by Xavier University to implement baywide coastal management. It is comprised of 12 municipalities: Alubijid, Balingasag, Binuangan, Jasaan, Kinoguitan, Lagonglong, Laguindingan, Opol, Salay, Sugbongcogon, Tagoloan and Villanueva; 1 component city: El Salvador; 1 chartered city: Cagayan de Oro and the provincial government of Misamis Oriental.

The member-LGUs of the MBDA actively participated in the cleanup of the mangrove areas in Tubajon, Laguindingan on May 23 with the slogan translated in the local dialect, "Ang bakhaw manalipud, panalipdan ang bakhaw". Its partners such as the Department of Environment and Natural Resources X (DENR), Bureau of Fisheries and Aquatic Resources X (BFAR), PNP-Maritime, Philippine Coast Guard (PCG) and Xavier University also joined in gathering trash and other undesirable materials near and in the mangrove forests. Common trash collected were food wrappers, cans, bottles, used diapers and plastic materials. This activity has showed that the MBDA and its partner agencies are one in the protection and conservation of these natural structures. Our unity stands as our first defense against storms and other disturbances.

Some of the LGUs also initiated other events in connection to the Month of the Ocean celebration. The city of Cagayan de Oro has conducted a number of mangrove planting activities in Barangay Bonbon for 4 days involving the units of the City Local Environment and Natural Resources Office (CLENRO), Agriculture Production Office (APO), Philippine Air Force, Nestle Philippines, summer job students and high school alumni. A total of 3,750 propagules were planted in 1.5 hectares of coastal area. The other LGUs, such as Alubijid also conducted mangrove area cleanup which was participated in by different stakeholders including the barangays in the upland areas. This has also given the participants a chance to visit the newly constructed mangrove boardwalk in the municipality.

Mangrove conservation will be continued in the bay by the MBDA together with its partners. With the technical expertise and support of DENR and BFAR, the alliance will be establishing mangrove nurseries in the west and east sides of the bay to also assist the LGUs, people's organizations and other stakeholders in the management and development of the coastal areas and its resources.

A map illustrating identified mangrove planting areas for each municipality and city has been developed by the MBDA. It shows that Macajalar Bay has a total of 213.35 hectares of mangrove area including old forest and newly planted mangroves as of 2012. Mangrove planting and cleanup were incorporated in the programs of each member-LGUs raising awareness to the community with the slew of benefits the ocean provides for us.



Various groups participate in mangrove planting in Cagayan de Oro City.



BFAR, DENR, PCG and the PNP-Maritime Group join the MBDA in mangrove cleanup.

ENHANCING RESILIENCY TO CLIMATE CHANGE IN MACAJALAR BAY y Meliusa Marie N. Kitche and Dr. Hilly Ann Roa

he 2-year ER-PROGRAM (Enhancing Resiliency through Policy Recommendation. Outreach. Governance. Research. Adaptive Management in Macajalar Bay to Climate Change) project of XU-McKeough Marine Center (MMC), funded by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH and the Adaptation to Climate Change in Coastal Areas (ACCCoast) culminated in December 2013.

ER-PROGRAM is a comprehensive approach for a bay-wide integrated management in Macajalar Bay, Misamis Oriental, Northern Mindanao. It attempts to enhance the resiliency of Macajalar

Bay by establishing a network of Marine Protected Areas (MPAs) and through strengthening the management of the network. It covers organizational development of the existing Macajalar Bav Development Alliance (MBDA) of the 14 local government units (LGUs) in the bay, solution research for MPA management, policy reviews, social marketing campaigns and enhancing the capabilities of the local constituents. The project is divided into 6 components: Research, MPA Management, Monitoring and Evaluation, Enforcement, Information, Education and Communication (IEC), and Policy.



Research. Ecological assessments (coral and reef fish community), vulnerability to sedimentation, and genetic connectivity study (using a simple reef fish, Dascyllus trimaculatus, or the three-spotted damselfish) were conducted in selected sites within Macajalar Bay wherein the results will be used as basis for the establishment of the MPA network in the bay. The information derived from these studies will complement the MBDA to come up with appropriate measures to maintain the functions and services of the coral reefs in the bay against climate change and anthropogenic disturbances.

Highlights of the project activities and outcomes



MPA Management. Formation and strengthening management mechanism of its constituents is an essential requirement in establishing an MPA network. Training Needs Assessment (TNA) was conducted to the MPA managers of LGU-members of MBDA. The conduct of MPA Management Effectiveness Assessment Tool (MEAT) was also helpful in gauging the management level of each MPA in the bay to facilitate member-LGUs of MBDA towards an effective MPA.

Capacity-building activities-conducted to the Integrated Coastal Management (ICM), MPA managers and technical working groups (TWGs) of MBDA-include management trainings, MPA Network Training and Planning Workshop, field work in different operational MPAs in Macajalar Bay, and a learning visit at the Lanuza Bay Development Alliance (LBDA) in Lanuza Bay, Surigao del Sur.



Monitoring and Evaluation. The

Participatory Coastal Resource Assessment (PCRA) is a science-based methodology in collecting data on key coastal resources and analyzing this to determine the status and health of the marine ecosystem. To enhance the capacities of the MBDA to efficiently manage the Macajalar Bay and the resources therein, PCRA training was conducted to selected LGU personnel which concluded with the formation of the composite Monitoring and Evaluation (M&E) teams of the MBDA. They were trained to identify, assess, record and report data on the coastal resources, specifically on mangroves, seaweeds, seagrasses, macroinvertebrates, fishes and corals.



The success of the project is not possible without the support of the key partner organizations, which include XU Units (Center for Legal Assistance, Governance and Leadership Institute, Development Communications), Marine Science Institute of University of the Philippines-Diliman Quezon City, MBDA, Cagayan de Oro River Basin Management Council (CDORBMC), Department of Environment and Natural Resources (DENR) Region 10, BFAR Region 10, PCGDNM,

International Union for the Conservation of Nature - Ecosystem Alliance (IUCN-EA) and Samdhana Institute. Alongside MBDA's "Partnership for Climate Resilience" with the key business sectors through their corporate social responsibility (CSR) and the public sector. The civic organizations in Macajalar Bay optimistically support the alliance's programs and projects for a sustainable protection and management of the bay.



Enforcement. With the establishment of the MBDA-Project Management Office and the TWGs on law enforcement, a memorandum of agreement (MOA) was signed for the creation of the Macajalar Bay Law Enforcement and Prosecution Unit (MBLEPU). CLE assessments and TNA were conducted, where the series of CLE trainings were programmed based on the results of each assessment. Along with partner national government agencies (NGAs), such as the PNP-Maritime Group, Philippine Coast Guard Division Northern Mindanao (PCGDNM) and the Bureau of Fisheries and Aquatic Resources (BFAR-X), four CLE training sessions were conducted. Topics covered include basic rescue, boat handling and boarding procedures, Fisheries Code of the Philippines (RA 8550), proper apprehension and documentation of cases and evidence.



IEC. Social marketing, a communication strategy which seeks to influence social behaviors to benefit the target audience and the general society, is aimed towards protecting and preserving the marine sanctuaries or MPAs along Macajalar Bay. A Knowledge, Attitude and Practices (KAP) survey was conducted, where the data generated served as the basis for the design of the produced IEC materials (posters, brochures, tarpaulins, video/AVP). The social marketing campaign on MPA was launched with its banner message, "Ang marine sanctuary ampingan alang sa malahutayong panginabuhian" ("Care for the marine sanctuary assures sustainable livelihood").



Policy. This component was required to come up with recommendations and draft policies that would strengthen protection of the MPAs through a participatory process. These have been carried out through the conduct of series of workshops; the outputs of which would be advocated for support to respective legislators and policy-makers from the barangay to the regional levels. Policy consultation and action-planning workshops were conducted per LGU cluster of MBDA with the identified participants based on the stakeholders profile produced under this component. A review of pertinent national and local laws was made to determine some of the policy gaps in the implementation of MPAs in Macajalar Bay.

DID YOU KNOW?



A male seahorse has a pouch like a kangaroo where the baby seahorses grow until it is time for them to be released. The male seahorse "gives birth" and cares for the young (not the female seahorse).



A starfish isn't really a fish at all. It is part of a group of marine animals called echinoderms which include the sea urchins and sea cucumbers. It is best to call it a sea star.



A sailfish is the fastest fish in the ocean. Notable characteristics of a sailfish are its erectile dorsal fin known as a "sail" and its elongated bill. It feeds on schooling fishes such as sardines, anchovies and mackerel.



Blue whales are the largest animals in our planet (exceeding the size of the greatest known dinosaurs). Their heart is about as big as the size of a car.



A day at the Beach is nice Away from the City's stressful life As the waves call your name to the sand The water surrounds where you stand.

Standing and looking at the horizon Didn't you wonder what's beneath the ocean? Underneath all the sea water There's a whole new world of color.

Where different shapes and sizes that you can see A place those amazing creatures are living free The beauty of the sea is incomparable Destroying it is indeed unforgivable.

> Love and protect the reef For that is our belief It is the home of many living creature Will you harm such beautiful nature?

To change our deeds is not too late We can still make things straight. Believe me when I say, There won't be us without the sea.

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