

Is the 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.

It is the aim of this newsletter to update XU community and our partners on the different programs and activities of the MMC.

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THE OFFICIAL NEWSLETTER OF THE MCKEOUGH MARINE CENTER XAVIER UNIVERSITY

STOP THE SILENT KILLER: A MACBAY-WIDE APPROACH

by Czarmayne Escoro

In last year's International Coastal Cleanup Day, September 21, Xavier University McKeough Marine Center (XU MMC), in collaboration with the Macajalar Bay Development Alliance (MBDA) and Pawikan Culture Awareness, supported and assisted the bay-wide coastal clean up in Macajalar bay with the leadership and the constituents of respective local government units (LGUs). The bay, comprising of 14 LGUs, extends from the Municipality of Laguindingan to the Municipality of Kinoguitan, with a total of 80 coastal barangays. The bay area is undergoing industrialization, rapid coastal development and coastal migration making it vulnerable to pollution. This debris is composed mostly of any persistent, manufactured or processed solid material discarded, disposed or abandoned in the marine environment (United Nations Environment Programme, UNEP). Marine debris pollution degrades marine ecosystems, kills its inhabitants and diminishes the aesthetic value of the marine environment.

Bay-wide approach

Marine debris pollution is a global concern, and in particular, a Macajalar Bay-wide problem. Since everyone is sharing the same bay and its resources, this should be addressed in a bay-wide manner and by all stakeholders. Any activity in other parts of the bay contributing to the marine debris will eventually affect the whole bay through decline in resources and more. Hence, bay-wide cooperation among all stakeholders in the bay is imperative.

Collaborative efforts

Coastal cleanups are not new to local communities as many activities of this kind are being conducted by various groups of people. Majority of these groups work separate from one another and have only short term and small scale effects. Working together as an alliance, on the other hand, allows common strategic action planning, sharing of more information, and collaborative action on the ground leading to wider participation and sustainable results. Moreover, collaboration empowers the activity through participation of more volunteers, bigger financial support, and wider coverage of education and information campaign among other stakeholders.

Participants of the last coastal cleanup included 26 coastal barangays of 8 LGUs (Alubijid, Balingasag, Binuangan, Kinoguitan, Laguindingan, Opol, Salay and Villanueva). Volunteers were from various groups-government, academe, private and line agencies.

Debris data recording

Actual cleaning of the coast, however, yields less results if nothing is done to stop the root causes of its pollution. One mistake in most cleanups is the lack of marine debris data recording. Recording this data provides ways to identify and monitor the different types of debris collected and their respective compositions from the most abundant to the least. The results and analysis of the debris data help local managers and planners in planning for right policies and effective IEC activities.

Figure 1 shows that plastic materials comprise the bulk of the collected debris (global records show similar findings). These plastics came in various types (mainly grocery bags, cigarette butts and diapers) and quantities from barangay to barangay. Plastic resistance to decay for a very long period of time allows them to dominate garbage composition; hence use of plastic products is a present environmental issue. In many countries and in some Philippine cities, use of plastic bags is already banned. Next to plastic debris were metal and wooden materials.

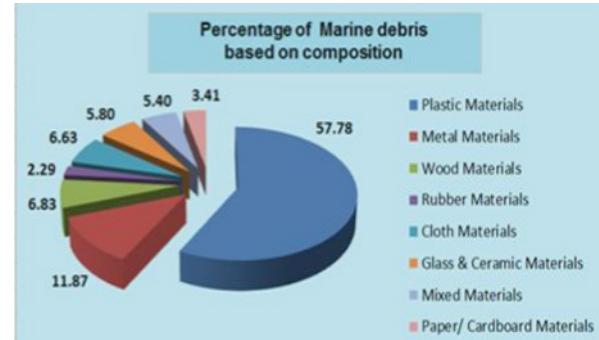


Fig. 1. Pie-chart of coastal and marine debris collected

Good practices - reduce, reuse, and recycle

Knowledge is a key for people to make good responsible choices. Articles on marine debris pollution are commonly found in books, magazines, and the internet, and explain the causes and effects of this kind of pollution and give practical ways to alleviate its impacts on the coast and the waters. To help lessen Macajalar Bay's pollution, local residents are strongly enjoined to practice the "3Rs" (Reduce, Re-use, and Recycle). Everyone should reduce consumption of goods that used plastic materials. Consumers should go for reusable bags as opposed to the disposable ones; and all should recycle old materials. For smokers, they should throw their cigarette butts in the bin or temporarily in a film canister. And for everyone to take note – this challenge is not only for residents along the coasts. The debris we throw anywhere will eventually find its way to the sea.

Cleaning the coastline of debris is a difficult and a long-term task. But with the cooperation of communities, the able leadership of all LGUs, and with constant support from private institutions, the academe, NGOs, and church groups, the work can progress well to making our marine environment cleaner and more productive. *





MUNICIPAL/CITY WATER DELINEATION AND COASTAL ZONING OF MACAJALAR BAY

by Kristine Galarrita, Ria Duana Roble and Czarmayne Escoro

Boat trip to the coastal terminal point shared by Municipalities of Kinoguitan and Sugbongocogon

One major plan of the Macajalar Bay Development Alliance (MBDA) is the delineation of the municipal waters of its 14 member-LGU's. The plan came about because the municipal waters of Macajalar Bay are not yet officially and properly delineated. MBDA anticipated boundary conflicts in the planning and development of the areas and in the implementation of the Bay's policies and regulations. In fact, no LGU could establish its own fishing zones because the municipal waters' boundaries have not yet been clearly established.

Thus, on October 14-18, 2013, Engr. Aaron Andro V. Ching and Mr. Edyson P. Henson from the Hydrography Department of the National Mapping and Resource Information Authority (NAMRIA) conducted field validation of the coastal terminal points of each municipality/city along Macajalar Bay. They were accompanied by the Program

Manager of the MBDA, research staff of McKeough Marine Center (MMC) and the respective officials representing the neighboring LGUs. NAMRIA has sent the revised technical descriptions and maps subject for approval by the concerned LGUs through their local chief executives. After the approval by all 14 LGUs, Macajalar Bay will get its certification for its municipal waters from NAMRIA giving the member-LGU's the authority and accountability in spatial terms.

A follow-up activity to the field validation was the coastal zoning management and planning workshop conducted last October 21-25, 2013 by the DENR Protected Areas, Wildlife, and Coastal Zone Management Services (PAWCZMS). Coastal zoning provides integrated planning framework to minimize resource use conflicts that threaten the marine environment's sustainability. Each LGU identified

its different resources and established its proposed zones (restricted, exclusive, multiple use, waterfront, restoration, protected area, and ecotourism). The LGUs agreed to use uniform codes and legend for their individual coastal zones which would also be used for the bay-wide map. The creation of Macajalar Bay and municipal/city coastal zone maps will assist the coastal users and different stakeholders in the planning and management of the coastal areas.

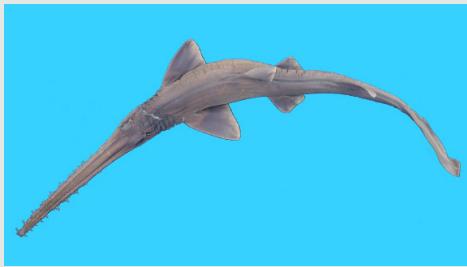
Certification from NAMRIA of the delineation of municipal/city waters and creation of coastal zone maps of Macajalar Bay is expected to be done in the first quarter of 2014. The two MBDA-organized activities are funded by the Deutsche Gesellschaft Für Internationale Zusammenarbeit— Adaptation to Climate Change in Coastal Areas (GIZ-ACCCoast) with logistical assistance from the XU-MMC. *



Field validation of coastal terminal points conducted by NAMRIA



Participants of the Coastal Zoning Management Planning Workshop



- A new species of **saw shark**, *Pristiophorus lanae* sp. nov. was discovered in the Philippines last year 2013.
- *Pristiophorus lanae* is a slender-bodied five-gilled saw shark, measuring up to 80-85 cm in length including a narrow, long rostrum.
- A saw shark is distinguished by its saw-like snout edged with teeth and a pair of long barbels. It has two dorsal fins, no anal fin and a short mouth.

Source: Ebert, D. and H. Wilms (2013).
<http://www.mapress.com/zootaxa/2013/f/zt03752p100.pdf>



- The **manta ray** is one of the largest marine animals next to sharks and whales.
- It is a cartilaginous fish that has a horizontally flattened body.
- It has an average length of 25 ft. and weighs as much as 3,000 lbs.
- The name “Manta” means blanket, and this creature looks like a blanket as it moves in the water.
- They keep themselves clean with the help of “cleaner fish” that nibble parasites and dead skin off their bodies.
- It is currently classified as ‘vulnerable’ by the International Union for Conservation of Nature (IUCN) due to threats of pollution, entanglement in fishing nets, and overfishing.



During the time of Fr. Jose T. Villarin, SJ as president of Xavier University in 2005, faculty formation, basic education, and research/social development were the three focal points he expressed for his administration with the passion of moving the University into a big leap of becoming genuine men and women for others. There were several strategic decisions and innovations made that time which included the clustering of the different departments and units of the University. One of these is the Research and Social Outreach (RSO) cluster tasked to translate the University Development Goals (UDGs) on Greater Societal Engagement.

The RSO's history began with the institutionalization of the Office of the Vice President (VP) for Social Development with Fr. Tony Moreno, SJ as VP in 2005. A lot of consultations and recommendations were made to concretize and define its function in the University. When Fr. Moreno became President of Ateneo de Zamboanga, Mr. Ermin Stan Pimentel served as interim VP in the summer to October of 2006. After thorough deliberations and drafting of the organizational structure and social research agenda, in 2007, the Office of the Vice President for Social Development was changed into the Office of the Assistant to the President for Social Development headed by Atty. Antoinette Royo-Fay.

In 2008, one of the University's unique features was the coupling of research with social outreach to foster ways and means in addressing the crucial concerns in Mindanao such as, but not limited to, poverty, hunger, and hostilities, eventually institutionalizing it as a cluster with Atty. Antoinette Royo-Fay as the 1st VP of RSO. Convergence or ‘Tagbuan’ is the over-arching strategic direction of the RSO cluster which reflects a multi-disciplined approach in confronting contemporary and context-based issues and concerns in the region. Encouraging researches as solution sciences to address societal concerns, the RSO cluster's goals were summarized into five thematic agenda:

(1) Food Security, (2) Health, (3) Environment, (4) Governance and (5) Peace. As a cluster, RSO envisions a food-secure, climate change resilient and sustainable Mindanao. It will harness teaching, research and social outreach in advancing peace and development in Mindanao.

Moreover, the RSO cluster has its 3 big pillars namely: Kinaadman Research Center (KRC) for research management and development, Kristohanong Katilingban sa Pagpakabana - Social Involvement Office (KKP-SIO) for community engagement and social development, and XU Press for knowledge product publication. These groups form part of a well-mobilized RSO cluster today and in order to put all plans into action, the RSO Council was organized which serves as a consultative and recommendatory body. The RSO cluster is divided into college based and non-college based units listed in the table below, working hand-in-hand in achieving its five thematic goals. It also has a special project in 2011, Xavier Ecoville, implemented for the resettlement of the survivors of Typhoon ‘Sendong’.

An RSO month is celebrated every 3rd week of January up to the end of the 2nd week of February. For this year, the theme is entitled: “Food, Family and the Future: Strengthening Research and Social Outreach in Challenging Times”. All units showcase different research and outreach activities relevant to the five thematic.

Dr. Hilly Ann Roa-Quiaoit has been the VP of the RSO cluster since 2010 up to present. Fr. Roberto Yap SJ, the incumbent University President, continues to uphold the same commitment to bring XU to a higher level of competence and effectiveness in the field of research and societal engagements.

The vision and mission of RSO continue as it manages and ensures access to sustainable food, health and sanitation, protection of the environment, effective governance and a peaceful community to live in. *

College based	Non-college / Community based
Sustainable Agriculture Resource Center (SARC)	McKeough Marine Center (MMC)
Engineering Resource Center (ERC)	National Service Training Program (NSTP)
Regional Center of Expertise – Education for Sustainable Development (RCE - ESD)	Peace Program
Student Entrepreneurship Center (SEC)	Year of Service (YOS)
Department of Preventive & Community Medicine – Research Unit (DPCM-RU)	
Sustainable Sanitation Center (SUSAN)	
XU Center for Legal Assistance (XUCLA)	
Governance and Leadership Institute (GLI)	

WHERE HAVE ALL THE SEAGRASSES AND CORALS IN THE CAGAYAN RIVER MOUTH GONE?

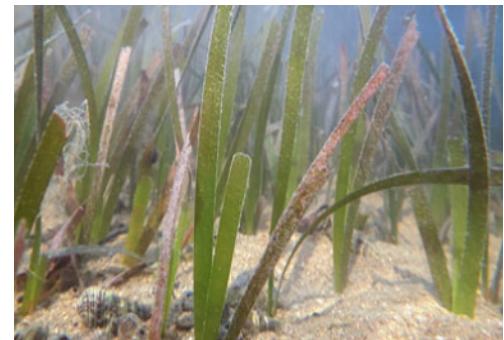
by Fr. Mars P. Tan, SJ

Map 1. Aerial view showing the distribution of seagrasses and corals in the mouth of Cagayan River (Macajalar Bay). Blue dots are coral reefs & green squares are seagrasses.

The 90-km long Cagayan de Oro River carries water and terrestrial runoff along a meandering route over Bukidnon uplands, down to the lowlands and finally empties into the bay. The approximately 1000-km² Macajalar Bay catches the upland discharge. On rainy days, the bay receives continuous inflow of brown sediment plume and during summer months the greenish freshwater sluggishly mixes with seawater. But on abnormal weathers such as the typhoons *Sendong* and *Pablo*, the river flow gushes out violently from the channel into the sea discharging reddish brown sediment plume and hauls of debris.

One may wonder what marine habitats could survive in a bay continuously disturbed physically and degraded biologically with upland discharge the year round. The sustained inflow from three rivers (Iponan on the western part and Tagaloan on the eastern) could overburden and eventually kill whatever marine resources in the bay. Sediments and other suspended particles due to tidal current pushing inland would likely remain near the coastal zone where seagrasses naturally thrive. Sometimes, the plume takes a straight path seaward and turns either to the west or to the east where located a site frequented by fisher folks for early morning catch. The boatman pointed to the site as the big rock which could be a cluster of coral reefs.

By the way, what are seagrasses and corals? Why should we be interested in them? Seagrasses are marine plants known as "ecosystem engineers," for they create and manage their own habitat: (1) its leaves act as filter of too much nutrients in the water, (2) a nursery for juvenile fishes, crabs and shrimps (3) provides shelter against predators and (4) its dense network of roots and rhizomes binds sediments together to protect the coastline from



erosion (Ocean Focus, 2011). Of all the marine habitats, coral reefs are the most diverse and most beautiful. These are home to millions of fishes and varied marine animals getting their food therein and taking shelter there from. This beautiful habitat also acts as a barrier from storms and strong waves saving the coasts from flooding, erosion and loss of property in the shore. An estimated one billion people have some dependence on coral reefs for food and income from fishing and if properly managed, reefs can yield around 15 tons of fish and other seafood per square kilometer each year (WWF Global, 2014).

The McKeough Marine Center (MMC) Team conducted a survey of the river mouth for presence of live seagrass beds and coral reefs. We presumed that these marine ecosystems existed in small patches quite distant from dispersed plume cover. We employed the manta tow method covering separately the two 4,000 m² offshore areas on both sides of the river mouth. Ten layers of survey routes covered each of the entire 2 sampling areas. Sightings of seagrasses and corals were given GPS coordinates and these data locations were transported on a Google Map. Survey results (Map 1) revealed that seagrasses (colored green mini squares) were

mainly a large meadow and not patches found in abundance at the far eastern side from the plume source. So far, we've found 4 seagrass species in the area, *Enhalus acoroides*, *Halophila ovalis*, *Halodule wrightii*, and *Cymodocea serrulata*. To the farther western side a few hundred meters away from shoreline was a stretch of live corals (colored blue dots) that looked like scattered pieces but could just be one huge structure before.

Surprising is how these seagrasses and corals could have survived the muddy substrate, the silted and turbid water, and the impacts of upland sediment plume intrusion. Is it possible that the resilient species have adapted successfully to the degraded water condition? Or possibly the pollution is not as bad as how it looks like? For further research topics, it will be good to look into the correlation between series of plume direction and marine habitats' locations. Or to survey fish catch per unit effort of randomly selected local fisher folks in the bay for the past 10 years. Or just simply conduct water sampling analysis near the river mouth. *



XU MARINE STATION IN ITS FINISHING TOUCHES

by Friday Atilano



The construction of the XU Marine Station started in June last year. Though expected to be finished in November, the construction had to be extended for a few more months to ensure its stability. A few revisions were necessary, and structural designs were added to meet the adjustments. The type of construction materials, equipment, and fixtures to be installed were repeatedly evaluated and closely monitored during the weekly visit and coordination meeting. Considering its location along the coast of Jasaan, and in line with our campaign efforts for climate change resiliency, the marine station facility is expected to be resilient enough to withstand extreme weather conditions.

Now in its 8th month, the construction is close to its final touch. Furniture and fixtures were already installed. Mounting of tiles and paintings in the building is currently ongoing. Laboratory and office equipment are now in the process of procurement. Furthermore, to reinforce the technical aspects of the station, MMC invited an external consultant to solicit practical advice and recommendations to ensure functionality and sustainability of the experimental facilities.

The XU Marine Station will be the first and perhaps the only Marine Station facility among Ateneo schools in the country. ☀

XU MMC AT THE NATIONAL SYMPOSIUM ON MARINE SCIENCES (PAMS)

by Ria Duana A. Roble

Xavier University – McKeough Marine Center (XU-MMC) attended the 12th National Symposium on Marine Sciences organized by the Philippine Association of Marine Science (PAMS) at UP Visayas, Tacloban City last October 24-26, 2013. The Symposium's theme was "Marine Biodiversity Conservation: Key for Sustaining Ecosystem Goods and Services." Four (4) research staff of MMC presented their research in four different topics on enhancing resiliency to climate change in Macajalar Bay.

PAMS Conference is a bi-annual gathering of marine scientists, academicians, government agency personnel, and faculty and student researchers all over the country. This year's symposium emphasized issues affecting the present marine biodiversity. It also serves as a venue for sharing of knowledge and experiences on the proper management of our coastal and marine natural resources. ☀

Presentors	Title of the Presentation
Daniel Alberto C. Linog	Enhancing Resiliency to Climate Change in Macajalar Bay through Marine Protected Area-Management Effectiveness Assessment Tool (MPA-MEAT)
Kristine A. Galarrita	Enhancing Resiliency to Climate Change in Macajalar Bay through Capacity-Building of the Macajalar Bay Development Alliance (MBDA)
Meliusa Marie N. Kitche	Enhancing Resiliency to Climate Change through Policy Recommendation, Outreach, Governance, Research and Adaptive Management in Macajalar Bay
Patrice Bianca Roa-Chio	Enhancing Resiliency to Climate Change in Macajalar Bay (Research Component)



SEA URCHINS FOR COASTAL COMMUNITIES

by Warwin Sabasaje

Sea urchins are marine organisms that inhabit the shallow waters of coral reefs, seagrass beds and seaweed flats. Some of their species are dreaded for their spikes that sting and can produce a severe painful sensation. However, sea urchins can also become commercially beneficial especially to mariculturists. In fact, several municipalities here in the Philippines have been rearing sea urchins for their gonads. The roes, commonly known as the gonads, are the edible part of urchin. In the Ilocos region for example, sea urchin farming has become one of the alternative sources of income of local fisher folks and coastal residents.

In addition, sea urchin cages were also found to act as mini reproductive reserves by producing seed stocks. They also give recruitment cues to planktonic juveniles which then settle and grow near the installation area of the cages. Today, more and more coastal communities have ventured to sea urchin farming to alleviate immense local harvest on sea urchin stocks and to prevent future decline of these organisms.

Murcielagos Bay is a small embayment located at the Misamis Occidental-Zamboanga del Norte boundary. Sea urchins are locally abundant in the said bay and are a great prospect for farming. However, extensive urchin fishery in the area is threatening the population of urchins. On the other hand, Macajalar Bay, located in Misamis Oriental, has some of these commercially important urchins. The same threat also puts urchins in critical condition.

Because of this, Xavier University-McKeough Marine Center (XU-MMC), through Ecosystem Alliance-International Union for Conservation of Nature (EA-IUCN) and with the help of XU Food Technology and Agribusiness, conducted a workshop on Sea Urchin's Roe Processing and Marketing last November 5-6, 2013 held at the Food Tech Center, Manresa Complex, Cagayan de Oro City. This was participated by the Local Government Unit (LGU) representative and Women's Association of Rizal, Zamboanga del Norte; and some fisher folks and LGU representatives from Macajalar Bay. This activity is the sequel to the first phase of the project which was the Sea Urchin Grow-Out training held on April

10-12, 2013 at XU MMC Activity Center, Jasaan, Misamis Oriental.

The workshop was facilitated by the XU Food Tech. Chairperson Ms. Sylvia Aguhab for the processing and Mr. Elenito Duran from XU Agribusiness for the marketing. All participants were introduced to the different sea urchins' roe dishes and did hands-on in proper handling, preparation of spices, proper cooking and packing of the roe. Afterwards, they were taught with several marketing strategies, proper branding and packaging. Everyone enjoyed the workshop and felt they were in the TV program "Junior Master Chef".

The main objective of this project was to train individual coastal residents especially fisher folks on how to utilize and maximize the potential of sea urchins as a sustainable alternative source of income, albeit in small-scale. Ecologically, this would also help lessen the pressure from extensive harvest of urchins in the areas. Hopefully, this can be replicated in other communities to address economic and environmental issues. *

TOWARDS BAY RESILIENCY AND SUSTAINABILITY THROUGH MPA NETWORK

by Meliusa Marie Kitche and Ria Duana Roble

Mangrove cutting, coral bleaching and illegal fishing activities will result in declining fish catch, marine habitat degradation and unsustainable resources. These are just some of the threats to our coastal and marine environments. One of the conservation tools that would prevent these dangers is the establishment of a Marine Protected Area (MPA). According to World Conservation Union (IUCN-WCPA, 2008), an MPA is a clearly defined geographical space, managed through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values. In the Philippines, it is commonly known as a "No Take Zone" with buffers or nearby zones in which extractive and non-extractive uses are regulated.

There are existing MPAs along the Macajalar Bay. However, only few are operational and the small and unconnected MPAs are insufficient to meet the goal of, for example, increased fish yields. It is known that MPA networks can enhance management of fisheries and biodiversity conservation beyond what individual MPAs can achieve alone (Palumbi, 2003), thus increasing the importance of networks of MPA as management tools. An MPA Network can be defined as a collection of individual MPAs or reserves operating cooperatively and synergistically at various spatial scales, and with a range of protection levels that are designed to meet objectives that a single reserve cannot achieve (IUCN-WCPA, 2008). A network of MPAs are not just any collection of MPAs, but they are individual MPAs that share a common ecosystem, work towards a common social goal such as increased fish yields, and are willing to collaborate institutionally to manage the network.

Building MPA networks takes time. As support for the Macajalar Bay Development Alliance's (MBDA) efforts towards the establishment of MPA Networks in

Macajalar Bay, the Xavier University-McKeough Marine Center (XU-MMC) through its Deutsche Gesellschaft Für Internationale Zusammenarbeit (GIZ) funded project entitled "Enhancing Resiliency to Climate Change in Macajalar Bay or ER-Program" conducted a two-day MPA Network Training and Planning Workshop at Philtown Hotel, Cagayan de Oro city on October 29-30, 2013. In addition, MBDA reached out through its Partnership for Climate Resilience Program to the corporate sector to engage and fund the said activity. The STEAG, Misamis Oriental Electric Cooperative, Inc. (MORESCO I), Mindanao Development Authority (MinDA) and former congressman Gov. Yevgeny Vincente B. Emano have supported the activity. The activity was the 2nd in the series of MPA trainings in conjunction with the MPA Management Training conducted last September 10-12, 2013 from CCEF, a Cebu based NGO with long experience in coastal management and capacity building and a new partner for MBDA to enhance its services to the alliance members and stakeholders. Participants of the training included the ICM/MPA Management Committee, MPA Managers of LGU-members of MBDA, IFARMC officers, Private Sector, Department of Environment and Natural Resources (DENR), Bureau of Fisheries and Aquatic Resources (BFAR) and Philippine National Police (PNP)-Maritime.

One of the outputs of the activity was a draft action plan for the MPA Network management of MBDA. The training highlighted that the establishment of an MPA network is a strategic mechanism to enhance the resiliency of the ecosystem in the bay to be able to respond to climate change associated disturbances such as continuous upland sedimentation due to increased rainfall. Moreover, an established and well-managed MPA network can improve and sustain the ecological, social and economic benefits most especially on biodiversity conservation and fisheries enhancement. *



Participants' planning and sharing of insights for MPA Network management



Atty. Jarley Trugillo giving a review on relevant ordinances of existing MPAs and Coastal Resources



Participants of the MPA Network Training and Planning Workshop



By Ydja Lou Generalao

THANK YOU!

For the generous support of our corporate partners during the Coastal Cleanup 2013:



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