MAN LAND SEA

a publication by Guam Coastal Management Program

In this issue:

Districts combat flooding and erosion

Learn about plastic in our food chain

NOAA Okeanos Explorer to be arriving in Guam

Challenges in Watershed Restoration

Page 4

Man, Land, and Sea Newsletter
April 2016

Bureau of Statistics and Plans
Guam Coastal Management Program

For newsletter information, please contact Brenda Atalig at 671-475-9647 or email brenda.atalig@bsp.guam.gov or Edwin Reyes at edwin.reyes@bsp.guam.gov

This Man, Land, and Sea newsletter was prepared by the Bureau of Statistics and Plans, Guam Coastal Management Program using federal funds, under award NA15NOS4190218 from the Office of Ocean and Coastal Resource Management, National Oceanic and Atmospheric Administration, U.S. Department of Commerce. This statement, findings, conclusions, and recommendations are those of the BSP and GCMP, and do not necessarily reflect the views of the OCRM, NOAA, or the Department of Commerce.

Message from the Director

Hafa Adai!

The Bureau of Statistics and Plans is happy to provide this edition of the Taotao, Tano, yan Tasi newsletter. The Chamorro culture is directly tied into the protection of our natural resources and with FestPac steadily approaching this is a pivotal time to educate the public on the challenges and successes faced by the natural resource agencies. This issue touches on a few challenges, but for more in-depth information on key issues you can visit www.bsp3.guam.gov and see presentations conducted at the Assembly of Planners in which smart development, conservation, and protection were among the discussions.

In this newsletter, we feature resilient volunteers and our natural resource partners fighting fires and erosion through plantings and education. We also feature environmental hazards, from the Brown tree Snake to Plastics, impacts and actions concerning our coral reefs, and highlight just some of the great work our partners are doing to help our island and its people.

Si Yu'os Ma'ase'
William M. Castro

Local and federal partners prepare to respond to severe threats to Guam's coral reefs

By Whitney Hoot, BSP

Guam's coastline, which has over 27 square miles of coral reef habitat, is home to more than 1,000 fish species and nearly 400 species of reef-building corals.

These near-shore ecosystems have vast economic, cultural, and social significance and provide important ecosystem services, such as shoreline protection from storm surge. Unfortunately, Guam's reefs are being degraded by chronic impacts including heavy fishing pressure, land-based sources of pollution, and recreational misuse and overuse, in addition to damage caused by acute threats such as coral bleaching and outbreaks of nuisance species like the crown of thorns starfish. To combat these acute impacts on Guam's coral reefs, local and federal partners have united to form the coral reef response team. While several agencies and organizations have partnered to carry out response activities in recent years, members of the team convened this February to make the collaboration official. During this meeting, the team drafted short and long term goals, which include developing standard operating procedures to address acute reef impacts; executing trainings and exercises to build our capacity to cooperatively respond to these impacts; and increasing public awareness of the threats facing coral reefs while engaging communities in conservation activities. In early March, an interagency memorandum of agreement was signed by BSP, GEPA, DOAG, and UOG to formalize the activities of the coral reef response team.

Bleached corals in Pago Bay during the 2013 bleaching event. Photo by Dave Burdick

Over the next two years, the response team will create response plans to address coral bleaching, outbreaks of nuisance and invasive species, oil spills, vessel groundings, and coral disease outbreaks that affect Guam's reefs. These response plans and standard operating procedures will become part of an overall reef resilience strategy that is being developed by BSP. Given that the US National Oceanic and Atmospheric Administration (NOAA) has already declared the third worldwide coral bleaching event in 2015-2016, the response team is currently focused on drafting a detailed plan to respond to the bleaching that is expected to impact Guam's reefs in the coming years. A sea temperature increase of just a few degrees above average can cause coral bleaching, which occurs when coral polyps – the term for individual coral animals – eject the symbiotic algae that live within their tissues; these algae are what give corals their vibrant colors, so their absence causes corals appear bright white or "bleached." Without these algae, the corals lose their main source of nutrition, which reduces coral growth rates and makes them more vulnerable to other stressors, such as coral disease and nutrient pollution. One priority of the reef response team is to identify which coral species and specific reef areas may be most resilient to coral bleaching, and thus should be protected to ensure that Guam's reefs survive for future generations. The coral reef response team will be holding a bleaching event table top exercise and coral bleaching symposium in May to pilot the new bleaching response plan.

If you are interested in learning more about the coral reef response team, the upcoming coral bleaching table top and symposium, or how you can get involved in response activities, contact Whitney Hoot at whitney.hoot@bsp.guam.gov. ▲

Plastic in our food chain!

By Cathleen Moore-Lin, Commodore, Marianas Yacht Club and Laura Biggs, Assistant Professor, University of Guam

Plastic. Convenient to use and even easier to throw away. Most of us don't give the many plastic containers and wrappers we use on a daily basis a second thought.

That's the problem.

Plastic accounts for 80% of marine pollution across the globe. A vast majority of the plastic that enters the ocean breaks down into small pieces as it travels with major ocean currents and collects in gyres like the Great Pacific Gyre located in the middle of the Pacific Ocean. A beautiful Mahi Mahi caught off the shores of Guam has traveled the oceans in search of food. How can we be so sure that this fish, and others consumed around the world, has not eaten plastic and in turn is sharing it with us? We don't fully understand the impacts of plastic pollution in our food chain. However, we do know that plastic contains chemicals that can disrupt our bodies in a multitude of ways (think: fertility issues, metabolic disruption, and cancer).

Prompted to action by this global plastic pollution problem, the international organization Race for Water began a worldwide voyage in July 2015 to measure plastic pollution on the shores of 21 countries around the world. The Marianas Yacht Club organized the Guam visit in July 2015 and connected the team of international scientists to University of Guam scientists who assisted the group in collecting debris on the south shore of Pago Bay known as Ensa Beach as well as two other sites. Race for Water and

local volunteers collected macrodebris (items larger than a bottle cap) and microdebris (items smaller than a bottle cap). The microdebris is now being processed in a lab to identify the type of plastic and to determine if the plastic came from a shoe, water bottle, or other container. Using a systematic scientific protocol established by National Oceanic and Atmospheric Administration (NOAA), the group is able to compare debris collected from each of the 21 sites around the world.

Over 90% of the debris collected at Ensa Beach came from the ocean. Race for water was able to help us by identifying: per 100m2 area of Ensa Beach there were 72 pieces of macroplastics and 375 pieces of microplastics. Of the identifiable items collected a number of the items seemed to originate from Indonesia and the Philippines. So how does this data rank among other sites? Guam seems to have significantly less marine debris on its shores relative to Kahuku and Kamilo beaches in Hawaii and Guam seems most similar to Rodrigues Island within the Republic of Mauritius in the Indian Ocean. Regular beach clean ups are the main method for reducing marine debris that comes ashore. How can future generations help to identify innovative methods to reduce the immediate impact of plastics on our shores and ocean, and also think forward to removing plastics from our food chain for good?

We look forward to additional results provided by the Race for Water Organization. Find out more about how you can protect our oceans from plastic pollution by visiting www.raceforwater.com.

After all, who wants to eat plastic? ▲

Community members and partners recognized at R.E.E.F. Celebration

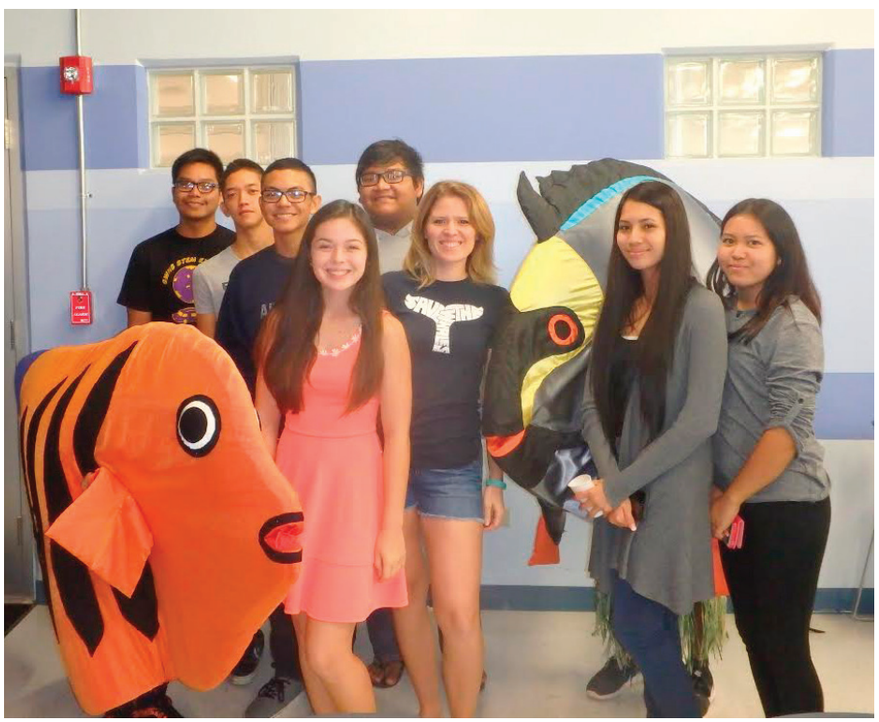
By Marybelle Quinata, NOAA

On November 7th 2015, community partners and members attended the Reef Exploration, Experiences and Fun (R.E.E.F.) Celebration hosted by the Guam Community Coral Reef Monitoring Program (GCCRMP). This timely milestone marked GCCRMP's third birthday to celebrate community involvement and stewardship of our island's coral reefs.

The event brought together nearly 100 attendees and partners to exchange stories and experiences in coral reef conservation. Attendees visited a Mini Fair, which featured Guam Department of Agriculture's Living Reef exhibit as well as local programs and clubs that offer opportunities to get involved in environmental stewardship. The R.E.E.F. Celebration buzzed with excitement about our island's environment and community involvement! A series of presentations followed to showcase work accomplished by volunteers.

GCCRMP Science Coordinator, Valerie Brown, presented preliminary results from two case studies based on data collected by program members in Piti, Merizo, Umatac, and Yona. Results featured biological monitoring data, such as algae, coral, and substrate cover along with sea cucumber (balåti'), sea snails, and other macroinverte-

Continued on page 7 ➔



GW High School's Marine Mania pose with Piti Pete and Frank the Flamefish. Photo by Tanya Sortor, Pacific Historic Parks

Students and partners planting at the Manell Watershed

Manell Watershed and the Resilient Partners

By Christine Fejeran, Cooperative Fire Program Manager, Guam DoAg-FSRD; Adrienne Loerzel, Guam Coral Management Liaison and Coastal Specialist, NOAA Office for Coastal Management; and Linda Tatreu, GNA Chairman

Manell-Geus is normally a picturesque watershed encompassing over 4,000 acres of southern lands in the village of Merizo. Natural resource partners, students, and community members have held Manell-Geus as a long-time priority site.

It has been a local coral priority site and a NOAA fisheries Habitat Blueprint Focus Area. The designations are helping to secure funding for restoration work in the site, where resource professionals hope to improve terrestrial and marine habitats and mitigate some of the flooding problems experienced by village residents.

The new site off of Quinene Road boasts scenic views of the surrounding community to include the Achang Bay Marine Preserve. Partners in this effort included, but were not limited to the Bureau of Statistics and Plans, Department of Land Management, and NOAA, Department of Agriculture, school children and community members. The site was selected due to the frequent occurrence of wildland fires, erosion, and flooding – issues that plague the southern villages of Guam.

The most recent tree planting on the site took place last year October 2015. Students from George Washington High School, Simon Sanchez High School, Guam Community College, and the University of Guam participated in a service learning event which over 2,000 trees were planted in an 8 acre footprint. Students battled heavy wind, rain, hot sun and a nearly vertical 300 foot hike to plant thousands of seedlings. Participants hiked and worked throughout the day with smiles and an eagerness to be a part of a new legacy; the effort to convert sword grass savannahs and preventing the expansion of badlands and non-native grasslands, in hopes that in the future, their work could potentially yield healthier soils, greater water retention upland, less erosion, and reduce wild fires and flooding problems for the residence of Merizo.

In early 2016, the division's Cooperative Fire Program installed fire breaks to try to reduce the threat of fire as dry season approached. On February 18, 2016 at approximately 1:00 p.m., fire raged through the Manell Project site overtaking a 25 foot fire break and sweeping across the landscape burning approximately 90 acres of land. The firefights was hampered by winds and steep terrain but Forestry Fire Crews hiked ➔

Reforestation site after the two burning event

up and down the mountain working to stop the spread of the fire. Homes, community members, private properties, and livestock were threatened by fire and smoke. Arson was identified as the main cause for the fire. The Guam Fire Department assisted Forestry Fire Crews in this fire fight enabling Forestry Fire to hike and suppress the fire from the mountain tops while GFD maintained vigilance among the residences. The partnership between GFD and Forestry Fire supports our community from a full "Ridge-to-Reef" or in the case of fire, "Ridge-to-Street" approach. More than three-fourths of the site was destroyed. What took close to 100 volunteers; over 2,000 plants and approximately 1,157 hours (779 staff and 378 volunteer hours) invested, was destroyed in a day. The firefight lasted roughly 5.5 hours and had crews working while into the early evening to secure the site.

Selected as a habitat focus area by NOAA, the Manell Watershed contains extensive seagrass beds, coral reefs, mangrove forests, native plants and wildlife. The main rivers in Manell Watershed include Ajayan River, Nelansa River, Laolao River, Fintasa River, Liyog River and Asgalao Creek.

On March 17, 2016 at approximately 2 p.m., a second fire was reported at the site. The fire burned approximately 7 acres. Forestry fire trucks were able to access the fire and suppress it. Unfortunately, the site has burned twice already this year and is not a new scenario facing the southern watersheds. The Marine Mania group of GW and the UOG's 4H Program know this all too well, with over 24, 780 trees planted since 2001and most if not all have been since burnt by arsonists again and again. Retired science teacher and resident of Merizo, Linda Tatreau stated, "Arsonists destroyed the students and volunteers' efforts before the trees even had time to set roots. It does get discouraging, but we will keep planting and keep working to educate hunters who burn. I just want to say to all the volunteers please don't give up and to the arsonists please do not burn."

Cooperative Fire Program Manager Christine Fejeran stated, "This does not conclude the story for the Manell Forestry Project site, forestry crews, volunteers and partners. We will be back next planting season and will continue to strive to restore the forests to our southern watersheds to protect and enhance our communities – "Munga masongge Guahan, Don't burn Guam!" ▲

Manell ridge to reef. Photo by Dave Burdick

ABOVE: *Residents deal with "ash rain" on Easter Sunday 2016*

LEFT: *Manell site planting students and volunteers.*

Kontra I Kulepbla Challenge the Brown Treesnake

By the Division of Aquatic & Wildlife Resources

The brown tree snake (Boiga irregularis, BTS) is an invasive predator and pest that was accidentally introduced to Guam.

It has had devastating impacts on native wildlife populations. The snake is responsible for declines in Guam's native forest birds, lizards and fruit bat colonies, as well as losses in agriculture and domestic pets. Snakes crawling on electrical lines frequently cause power outages and damage electrical equipment. Although not a risk to healthy adults, interactions with small children and babies have resulted in hospitalization.

Eradication of snakes on the island of Guam is currently not feasible. However, reduction in discrete locations is possible. At present, the best management strategy is to keep brown tree snakes from becoming established in new locations. To reduce the risk of snakes dispersing from Guam, trapping and visual searches are conducted in and around high-risk locations such as

port facilities and cargo loading areas.

Large-scale population suppression across broad landscapes will reduce impacts of BTS to Guam residents and support efforts to prevent the spread of the snake to other Micronesian islands. However, it will not be feasible without the support of Guam residents.

Kontra I Kulepbla is a campaign geared towards raising awareness of the benefits of snake suppression, gaining public support for BTS projects on Guam, and promoting behaviors that sustain snake suppression. The Wildlife Section of Guam Department of Agriculture will give talks, workshops and promote public events to inform the public on natural history as well as current tools and technology to "challenge the snake." ▲

Changes in boring algae may signal coral stress

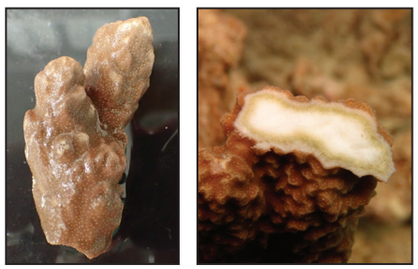
By Adrian Kense

Coral reefs are critical to humans because they are sources of food, revenue, and natural beauty. But, coral reefs are dying worldwide.

Irresponsible human activities and environmental stressors have already destroyed roughly 20 percent of the world's coral reefs, and it is estimated that 60 percent may be lost by 2030.

Despite this rapid decline, coral reefs do not disappear overnight – they get sick first. Marine scientists are learning that there might be signals hidden in the coral reef system that could indicate imminent threats to coral health. One of possible signals is the change in composition of boring algal communities.

Stony coral colonies are groups of identical coral polyps, which look like tiny jellyfish, living together on top of a solid limestone skeleton they create. Coral colonies have many different types of microorganisms – some helpful, some harmful – living inside of them. For this reason many



The stony coral Porites rus and its associated endolithic algae. Left: A pillar that was collected to sample endolithic algae. Zooxanthellae, single-celled algae that live inside coral tissues, give the coral pillar its brown color. Right: A green band of endolithic algae is visible in the coral skeleton, directly beneath the brown coral tissue. This image was taken underwater in Apra Harbor.

scientists now consider each coral colony a metaorganism, consisting of the coral host and its associated microbial communities.

Researchers at the University of Guam Marine Laboratory have been studying boring algae, one of the groups of microorganisms in the coral metaorganism. So-called because of their boring, or digging, into skeletons of living and dead stony corals, boring algae produce energy from the small amount of light that penetrates coral skeletons.

The work of boring algae

Boring algae can help corals survive. When the surrounding ocean water gets too hot, corals become stressed, and expel from their tissues a type of algae called zooxanthellae. Zooxanthellae, which provide their coral hosts with sugars that they make using sunlight, contain pigments that gives corals their color, so when they are ejected, stressed corals become transparent, or "bleached." When coral tissues are bleached, more light than usual passes into the coral skeletons. The additional light causes boring algae to grow much faster and assume the job of the absent zooxanthellae by passing sugars to the coral tissues.

Boring algae are also bioeroders, meaning they break down complex structures. After corals die, boring algae and other bioeroders remove their skeletons from the reef, making space for new corals to grow. Their boring activity also releases calcium carbonate into the water, where it becomes available to other shell-building animals who need this compound.

To comprehend the roles of boring algae in the coral metaorganism, scientists must first assess how many types there are and which species of corals they live in. This is complicated to do because there are hundreds of boring alga types, many similar in appearance, all living together as a microbial community in the same coral skeleton.

So, UOG researchers examine the deoxyribose nucleic acid, or DNA, of boring algae, to precisely differentiate them and understand how each one is related to the others.

By examining DNA, biologists found that the plate-and-pillar coral, Porites rus, abundant on the reefs of Apra Harbor, houses a diverse and unique community of boring algae. Every coral sample they collected contained various types of green algae, red algae, brown algae, and cyanobacteria.

This knowledge provides a baseline for the composition of boring algal communities in Porites rus. Baselines are necessary for detecting compositional shifts – when, for example, one normally rare alga suddenly becomes abundant. Rapid shifts may indicate that the coral hosts, and even the whole coral reef, are being negatively affected by stressors or environmental issues, before those effects are outwardly visible. With regular monitoring of boring algal communities, marine scientists and managers could keep one step ahead of coral reef sickness and decline. ▲

Districts combat flooding and erosion

By Marie Auyong

Chalan La Chance families wade through water, but not because they're at the beach. Yigo's Chalan La Chance residents find themselves ankle-deep in oil-slicked brown water that collects because of how the area has been developed over the years.

Participants from the 2013 Northern and Southern Soil and Water Conservation Districts' Educators Symposium. Teachers learned about natural resources and how to incorporate environmental education into their curricula.

Plant removal, land levelling, and road building have permanently changed where surface water flows and where it stays.

Twenty-six miles south, Malesso villagers find themselves in a similar situation during rainy season or heavy storms. Unlike Yigo, Malesso flooding occurs in part because of the village's shoreline location – beautiful, but subject to water levels that can rise and flow quickly in nearby rivers and ocean.

Flood control and its cousin, erosion, are the primary issues two local elected government boards must address.

Established over 30 years ago by the Government of Guam, Soil and Water Conservation Districts (SWCDs) represent the island's northern and southern regions. Each district maintains a locally elected board and staff who support education and policy activities promoting soil and water conservation.

Midwestern roots

While Guam's districts address flooding and erosion locally, they trace their origins to ecological catastrophe in the Depression-era United States.

Federal policy after 1865 encouraged intensive farming throughout the Midwest. Among other factors, deep plowing and native vegetation clearing, plus several droughts, contributed to the loss of rich, stable topsoil. Underlying soils turned to dust and were stirred up by winds, creating infamous far-reaching black clouds called the Dust Bowl.

After subsequent crop failures and economic collapse, in 1935 the U.S. government formed the Soil Conservation Service (SCS). SCS employees assisted private landowners in ecosystem recovery, promoting soil preserving land use practices like tree planting, ground covers, and no-till farming.

Soil and water conservation districts later formed to link private landowners to federal programs, representing their regions' environmental and land use interests.

Lessons learned, locally applied

As in the U.S. Midwest, Guam's soil and water problems are caused, or worsened, by human decisions and actions.

Some natural features, like the South's steep hills, can compound flooding. Roads, parking lots, and buildings further prevent the ground from absorbing water; surface water then tends to move soils to the ocean and harm reefs. Removal of trees and other vegetation, which could both disperse heavy rain energy and hold soil, have also made Guam landscapes flood and erosion-prone.

Soil and Water Conservation Districts' work includes outreach and education on specific techniques to prevent or lessen the most severe impacts of flood and erosion.

Most recently, the districts recruited prospective and new farmers to a nine-part workshop series called "The Veteran and New Farmer Program." Attendees learned how to build healthy soil, plant on slopes, and use plants to prevent soil run-off.

But homeowners can also apply the techniques, such as landscape contouring, on a smaller scale. Implementing soil erosion prevention or mitigation techniques, yard by yard, in an area such as Chalan La Chance, could reduce flooding or lessen the damage.

An annual district signature event is the annual Educators Symposium, where teachers from all over Guam learn how to include conservation promotion into their classroom lessons. So far over 100 teachers have attended these symposia in the past three years.

Other activities in the past year include legislative tours to show erosion effects in the Ugum watershed, national conference visits to advocate for local environmental threats like feral pigs, and tree maintenance in Inalåhan.

For more information about district activities, email the Northern SWCD at northernguamswcd@gmail.com or Southern SWCD at southernguamswcd@gmail.com. Staff are available via phone at 735-2014. ▲

Continued from page 3

brate counts both inside and outside of Marine Protected areas. The full process captured the fun training process, data collection, scientific input and analysis, and conclusive statements drawn by GCCRMP volunteer members.

As the program enters its fourth year, Marybelle Quinata, GCCRMP Coordinator, shared new program activities that the community can expect to see this year, such as Eyes of the Reef Marianas and Human-Use Monitoring.

A live showcase featured two of GCCRMP's Adopt-A-Reef partners, War in the Pacific's Preservation Ranger program and the Umatac Coral Reef Ambassadors, that conduct coral reef monitoring at beach sites that are culturally and historically important. In addition, these Adopt-A-Reef groups participate in other stewardship and conservation activities within their sites. Partnership built among community partners and natural resource management agencies is one facet that GCCRMP continues to cultivate moving forward.

Program and community partners received certificates that recognized their efforts in working with GCCRMP and more importantly, community-based efforts to care for Guam's environment. The R.E.E.F. Celebration was a small way for GCCRMP to say "Si Yu'os Ma'åse" (Thank You) to everyone for making the program a continued success and reminds us that on Guam – it takes a community to take action and affect change.

To become a member or keep up with GCCRMP, visit guamreefmonitoring.wordpress.com, like them on Facebook, or email gureefmonitoring@gmail.com. ▲

NOAA Okeanos Explorer to be arriving in Guam

UnderWater World announced as Mock Control Center!

By Andrea Pierce,
Senior aquarist at
Underwater World Guam

The exciting world of deep sea exploration is coming to Guam!

NOAA Ship Okeanos Explorer, shown at left; and at right, the launch party for the NOAA Okeanos Explorer Expedition, was hosted by UnderWater World Guam in the new Marianas Trench Exploration Command Center. Pictured are UnderWater World staff, NOAA Scientists, and partners DOCOMO and Outrigger.

The NOAA research vessel Okeanos Explorer will be conducting a variety of scientific studies from April 20th to July 10th within the Commonwealth of the Northern Marianas Islands and the Marianas Trench Marine National Monument. This expedition will focus on hydrothermal vent sites, mud volcanoes, trench and subduction zone areas, seamounts and more! For many of these sites, this will be the first time they have been seen by humans. "We are very excited for the upcoming Okeanos Explorer expedition to the Marianas and look forward to new discoveries and learning more about the amazing geologic features and marine resources found in these deep water ecosystems. Thanks goes to the staff at Guam UnderWater World for supporting this exploration and learning adventure with the community." Heidi Hirsh, Natural Resource Management Specialist, NOAA Fisheries Monuments Program.

Underwater World will be acting as the Mock Control Center for this expedition. This control center will offer real time video feeds from the ship and remotely operated vehicles (ROVs), and students, teachers and visitors will have the chance to talk with NOAA scientists on the ship. There will be a host of events in the community for everyone to get involved with this trailblazing science, such as "Meet the Scientist" events at Underwater World, where the public will get a chance to listen to the scientists speak about their research and answer questions. "Everyone here at Underwater World is very excited for this opportunity to be involved with the Okeanos and the groundbreaking research that will be happening in local waters", said Jeff Schindler, General Manager, UnderWater World. So come out and meet the scientists that are taking part in this exciting expedition as it happens in our very own backyard.

The UnderWater World Facebook page, https://www.facebook.com/underwaterworldguam, will be updated regularly with a schedule of community events. You can also check out the NOAA website, http://oceanexplorer.noaa.gov/okeanos, for more information on the expedition, including updates for the research the Okeanos is currently conducting. ▲

ABOVE: *Okkodo High School students, Bank of Guam employees, Guam Coastal Management and Forestry team after the service learning event at Cotal Conservation Area.*

LEFT: *Students weed around native plants and fertilize them to encourage growth and better chance of survival.*

Education and protection through service

By GCMP

About 20 Okkodo High School students and several Bank of Guam employees joined the Guam Coastal Management Program and Department of Agriculture Forestry & Soil Resources Division at the Cotal Conservation Area in the village of Santa Rita to provide watershed and forest health management by focusing on native plants and fuel load reduction. Students were taught a history of Guam forestry, tropical forest ecology, as well as forestry practices and methods used to protect against arson set fires. Fires set by humans are the main-cause behind Guam's forest fires. In order to prevent future fires in the area, the students removed green and dead plant debris (ladder fuels) along existing fire-breaks. Students were also shown how to weed invasive plants and fertilize native trees to encourage the propagation and health of Guam's native plant species.

Support Guam's wildland fire campaign – "Munga masongge Guåhan, Don't burn Guam!" For more information on Forestry related topics and wildland fire on Guam contact 300-7977/6/5 or email christine.fejeran@agriculture.guam.gov. ▲