



# Coastline newsletter



## Caribbean Coastal Capital Center Of Excellence Workshop *By: Arlene Young, Director*

A workshop entitled “Caribbean Coastal Capital Center of Excellence (CCCCE)” was held on October 11 and 12, 2016 in Christ Church, Barbados. The workshop was organized by the Inter-American Development Bank (IDB) through its Technical Cooperation Initiative to develop a mechanism to strengthen Caribbean regional capacity for the monitoring, valuation, assessment and restoration of coastal natural capital. The specific objective is to build regional consensus on the scope of activities, functions, institutional arrangements and level of support required for the sustainability of the proposed CCCCE.

The workshop was attended by approximately 25 persons from countries in the Caribbean including Belize, Barbados, St. Lucia, Trinidad and Tobago, Cayman Islands, Guyana and Jamaica. Several persons from Belize attended and included representatives from the Fisheries Department, the Caribbean Community Climate Change Centre, and the Caribbean Regional Fisheries Mechanism.

The main discussions were centred around the key roles for the Center such as resource mobilization and capacity building as well as the housing arrangements, governance, staffing, revenue structure and key implementing partners. on recently approved Belize Integrated Coastal Zone Management (ICZM) Plan as well as CZMAI’s role and mandate in Belize. The workshop was well facilitated and valuable information was shared on the state of knowledge and institutional expertise in the region as it relates to monitoring, valuation, assessment and restoration of coastal capital. In addition, the workshop provided the opportunity to network with key agencies in the Caribbean as well as to share information on recently approved Belize Integrated Coastal Zone Management (ICZM) Plan as well as CZMAI’s role and mandate in Belize.

An important observation from the workshop is need for the development of a regional framework for coordination as it relates to monitoring, valuation, assessment and restoration of coastal capital as well as sharing of data and information across the various countries. As a result, the establishment of the Caribbean Coastal Capital Center of Excellence is very much needed and should be prioritized as a regional initiative to support sustainable management and use our coastal capital.

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**Special Point of Interest:**

- Sustainable Development
- Education and Outreach
- Climate Change Adaptation
- Climate Change Vulnerability
- Youth and the Environment



## Message from the CEO

Dear Partners, Colleagues, Friends:

Season's Greetings!

I am pleased to share the final issue of our semi-annual Coastline Newsletter for 2016 as we draw close to the end of this year. CZMAI is grateful for your support, interest and commitment during 2016.

As I reflect on this year's accomplishments, I would like to share a few highlights that we are especially proud of:

- Final approval of the National Integrated Coastal Zone Management Plan (ICZM) for Belize by the National Assembly of Belize;
- Successful implementation of our annual Coastal Awareness Week 2016, observed under the theme, "The Coast is ours...let's climate-proof it!";
- Initiation of a consultancy that will conduct a comprehensive institutional assessment, and review and revision of CZMAI's legislative framework; and
- Regular convening of the Coastal Zone Management Advisory Council that is serving a critical function of monitoring the effectiveness of the ICZM Plan

As we celebrate the successes of 2016, we are keen to build on them for 2017 and beyond. CZMAI, under the leadership of its Board of Directors, and with the support of the Ministry of Agriculture, Fisheries, Forestry, the Environment and Sustainable Development, looks forward to the outcome of both the institutional review and legislative framework revision. These processes will aid us in charting a new strategic direction in order to improve upon our capacity to effectively fulfil our mandate for improved coastal area management in this country.

I encourage you to stay in touch with us as we throughout the year for updates on our accomplishments and the outlook for the foreseeable future. Sign up for our bi-annual Coastline Newsletter or connect with us on our website social media.

On behalf of CZMAI, I wish you and your loved ones Happy Holidays and a prosperous New Year!

With very best wishes,

Chantalle Samuels  
Chief Executive Officer





Participants at the Caribbean Coastal Capital Center of Excellence Workshop

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CZMAI



# World GIS Day Expo 2016

*By: Maritza Canto, GIS Data Manager*

Geography Awareness Week (GeoWeek) is an annual celebration of geography and the important role it plays in our lives. GeoWeek is observed during the third week of November of each year. Geographic Information System (GIS) is an important tool that has the potential to greatly improve the population's geo-literacy. Its spatial focus embraces the idea of interconnectedness, and it can be used to solve many of the problems GeoWeek addresses. Therefore, GIS Day was incorporated into GeoWeek in 1999 and has taken place every year.

In Belize, Total Business Solutions (TBSL) through partnership with ESRI hosted its annual World GIS Day Expo on November 16th, 2016 under the theme, "Discovering the World through GIS." TBSL raises awareness in Belizean students to understand the role of GIS in education and learn about careers in Science, Technology, Engineering and Mathematics (STEM) and the ability to apply that understanding to decision-making and problem solving through GIS.



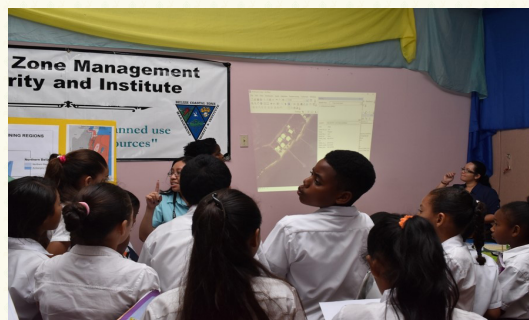
CZMAI Data Centre Team at World GIS Day Expo 2016

TBSL officially organizes the World GIS Day event in Belize, and many government and non-governmental organizations throughout the country support it. This year the Coastal Zone Management Authority & Institute (CZMAI) participated in the event to show case how CZMAI's Data Centre uses GIS to develop the inventory of development sites as a baseline for monitoring the implementation of the Belize Integrated Coastal Zone Management Plan. In order to demonstrate how the Data Centre is creating this inventory, the team (comprised of GIS/Data Manager, GIS Technician, and Marketing Assistant) illustrated the methodology, data collection and data analysis process.

The expo was conducted in the following manner:

1. A brief introduction about CZMAI was given to students by CZMAI. This introduction highlighted CZMAI mission, vision, program areas etc.
2. The team chose the Ambergris Caye Region as a case study to illustrate development of inventory for development sites.
3. The team showcased equipment such as: Garmin Monterra gps, Samsung tablet and ArcGIS software used for data collection and analysis.
4. In addition, the team displayed a 3D Coastal Planning Model of Ambergris Caye.
5. Pamphlets and promotional items were given to students.

Spatial thinking allows students to comprehend and analyze phenomena related to the places and spaces around them—and at scales from what they can touch and see in a room or their neighborhood to a world map or globe. It also provides a complete understanding of history and spatial thinking is linked to success in math and science. Students who develop robust spatial thinking skills will be at an advantage in our ever increasing global and technological society. This initiative has already been initiated by TBSL must be strongly supported and continued by Belize's education system so that students become more engage with this emerging technology.



Students learning about CZMAI's mission and its application of GIS to achieve their organizations goals





## Launch of The Sport Fishing Program By: Victor Sho, Sportfishing Coordinator

In June of 2016, the Coastal Zone Management Authority and Institute launched its sport fishing program with the goal of working with stakeholders across the country to develop the industry in a sustainable and economically viable way. The new program includes six functional elements that are meant to address the main areas of concerns within the industry. These functional elements are; Research, Monitoring and Enforcement; Education and Outreach; Marketing and Service Development; Capacity Building; Financial Management; and Partnerships.

The Coastal Zone Management Authority and Institute recognizes the importance of stakeholder support in the development and implementation of its sport fishing program, hence stakeholder meetings are being done in each of the four sportfishing regions of Belize (i.e. North, Central, South, and Cayes). Through these meetings CZMAI intends to identify both local and national concerns/issues of stakeholders as well as identify potential solutions for these concerns/issues. We are constantly working towards engaging more stakeholders, allowing all to have an equal opportunity to raise concerns and have them addressed. The relationships we share with different local associations within various communities of Belize is also being strengthened as we work towards guiding the development of the sport fishing industry into a sustainable future. To this end, proper research and monitoring is needed to inform better managerial decisions for the environment, the economy and the people of Belize; thus, we are also forming and strengthening new working relationships with local, national, regional and international NGO's and research institutions. Through these partnerships, we intend to increase our knowledge base about sportfishing fish species and gain a better understanding of their interactions with the environment and how best to manage these resources.

Furthermore, to better equip CZMAI to carry out its role in managing the sport fishing industry; CZMAI is undergoing a legislative review to re-align the sportfishing regulations with the current state of the sport fishing industry. During this legislative review CZMAI is working with all stakeholders to identify both the challenges and opportunities of the industry as well as potential recommendations on how to resolve the challenges and take advantage of the opportunities. This will help the institution and authority to better deal with the current and future challenges of the industry as well as taking full advantage of the opportunities within the industry for the benefit of all Belizeans and the global community.



Consultations with the Sarteneja United Local Fishermen Association



(Left to Right) Bonefish and Permit





# Drone mapping pilot study within the Belize Central Region

By: *Andria Rosado, GIS Technician*

Earlier this year, CZMAI's Data Centre was tasked with conducting the inventory of development sites and activities for cayes for coastal areas under the Marine Conservation and Climate Change Adaption Project (MCCAP). This inventory is based on specific guidelines which will assist with monitoring and assessing compliance within the Integrated Coastal Zone Management Plan. The first phase of the inventory of development sites include Ambergris Caye, Caye Caulker and the Belize Central Region. Aerial survey has been completed for all three regions, however, ground-truthing efforts have only begun on Ambergris Caye and Caye Caulker.

In early October of this year, CZMAI's Data Centre was approached by the Open Reef Mapping Society (ORMS), a team from the University of Central Florida (UCF), seeking possible collaboration in providing high resolution drone imagery for the Belize's cayes. ORMS's goal is to map all islands on the Belize Barrier Reef using open source data, drones and Geographic Information Systems (GIS) to increase scientific discovery and educational outreach.

During October 23 to October 25 2016, CZMAI partnered with ORMS, the University of Belize, and the Belize Port Authority to conduct a 3-day drone mapping pilot study for the Belize Central Region. The main objective of this pilot was to examine the feasibility of the use of drone technology to collect aerial imagery for Belize's cayes. The study used a DJI Phantom3 Standard drone and two DJI Phantom4 Quadcopter drone for mapping and aerial photographs were captured at 150m flight height, in 20 to 25 minutes fly time.

Although the objective was to map all the cayes within the Central Region; inclement weather, radio interference and technical errors only allowed for 16 of 32 cayes within the Central Region to be mapped. Data processing and image analysis of the drone imagery will be completed by ORMS in collaboration



Map illustrating the cayes within the Belize Central Region

with students from UB. After processing, the photomosaics will be used by CZMAI's Data Centre for ground-truthing and aerial maps will be used for verification within the Belize Central Region.

Overall, the results of the study proved that the visual quality of the drone imagery is adequate and it enables the production for highly detailed aerial photographic maps that can easily be applied in mapping land use boundaries as the guiding features such as structures and piers were clearly visible.



On the left is current open source Bing aerial imagery in comparison to high resolution drone imagery of Goff's Caye on the right.





## The Transforming Island- One of the Hidden Wonders of the World

*By: Monique Goldson, Assistant Marketing Officer*

Situated approximately 30 minutes away and 12 nautical miles east of Belize City, Goff's Caye is one of the few islands in Belize which is not privately owned. Minimum vegetation such as a few scattered coconut palm trees and vines across the terrain, and a mangrove patch south of the island can be found. Colonial era influence resulted in Goff's Caye being designated as an Archaeological Site, primarily due to the island serving as a fishing camp, a trade center and a cemetery. It was stated that some crew members aboard the Royal Navy HMS Blossom, which is the United Kingdom's (UK) principal naval warfare force, visited the colony in August 1830 and after suffering from Yellow Fever were interred on the island.

Over the decades, visits to Goff's Caye have increased as locals as well as cruise ship passengers frequent to enjoy its amenities which includes: snorkelling, swimming, sailing, paddle boarding, camping, sunbathing, or simply relaxing.



With the increased traffic to the island, the risk of the environment becoming more vulnerable to the effects of misguided activities by humans has greatly increased over the years. After evaluating the dynamics of this archaeological site, it is with these unique characteristics and the high vulnerability status that the Coastal Zone Management Authority and Institute (CZMAI) was assigned management of the island to ensure the preservation of this glorious tourist attraction. CZMAI has been managing the area since 2004 and has assigned two rangers to the island to assist with this objective. Water Quality Testing is also scheduled to take place in the early part of 2017 by members of CZMAI's Water Quality Department.



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...Continued from page 7: *The Transforming Island - One of the Hidden Wonders of the World*

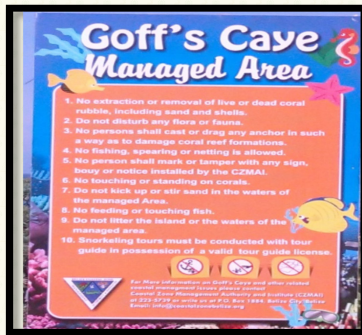
Improvements have been done on Goff's Caye, particularly post Hurricane Earl. The dedicated staff of CZMAI chipped in to assist along with various of the stakeholders who utilize the island. Coral rubble had to be removed from the island, the concrete foundation which was damaged was restored, the rails of the hut were replaced, the Barbeque pit was upgraded, and the painting of the structures and picnic benches are just a few of the renovations that took place.

Improvements to the island over the years include signage, bathroom facilities, a changing room and a Selfie frame to enhance visitors' experience.



At different times of the year, Goff's Caye exhibits different appearances. This shifting island has had dimensions ranging from 0.7-1.2 acres in size on any other day or season. The constant shift in its shape and size may be a result of wind and current patterns occurring both eastward and westward concurrently and intersecting in the northern portion of the island. This intersection is perhaps what leads to the formation of the sandy beach protruding outwards to the pristine waters. Climate change may also serve as a contributing factor for the change in shape of the island.

So the next time you visit the island, pay keen attention to your surroundings. You may observe a shape as shown in the first image and if you went back on the next day, or at a later time, a shape seen in the second image may be observed. The length of time it takes the island to shift to another shape and size all depends on the weather, season and other environmental factors. This natural process has been occurring for years, perhaps decades, and by the miraculous power of nature the island always transform between different shapes.



Let's leave nature to craft its work of art. Experience Goff's Caye! Experience nature's transforming island in the little paradise of Belize!







## Yamaha Engine Overview

By: Ellis Requena, Boat Captain

Yamaha Outboards is the most favoured and highly recommended engine for Belize's environment. This engine is revered by a huge sector of the fishing industry likewise law enforcement agencies throughout Belize for its performance, endurance and quick trouble shooting features. The engine is user friendly and has quick identification features in its unique labelling system. This feature allow users to accurately identify what type of outboard engine they have, which is important for item ordering from the catalogue provided. Additionally, it aids in knowing the limitations of your unit and requirements for operation since the different types of Yamaha's vary and are specialized.

On the 17th of November 2016, Yamaha's Authorized Agent in Belize presented an Identification course at the Coastal Zone training room facilitated by MCCAP for captains from the Fisheries Department, Coastal Zone, and other co-managers from Marine Protected areas.

At the completion of this course, participants were tested and verified for identification, trouble shooting and maintenance of these units. The participants also received a certificate of completion from the Authorized Agent. Yamaha encourages all customers to these trainings by request and emphasises that users become friendly with your unit for a smooth operation and general safety at sea! The main purpose is to enjoy and utilize the unit as recommended and also be safe at the same time.



## MCCAP Update: Belize River Study

By: Gilbert Andrews, Environmental Lab Analyst

As I put pen to paper I am beginning to become convinced that Belize is gearing up for the 21st century. The Belize Coastal Zone Management Authority & Institute (CZMAI) is taking the lead on long term studies in the Belize River, making use of technology to help monitor and manage water quality. Through the use of three YSI Exo 2 Sondes, CZMAI will continuously monitor changes in temperature, conductivity, pH/ORP, turbidity, dissolved oxygen and chlorophyll-a over a one year period. This data set will be analyzed against corresponding flow measurements and modelled to determine seasonal changes in nutrient loading as a result of nearby land use activities (i.e. farming and ranching). With the Sondes the need for traditionally monitoring of water samples by lab analysis is eliminated, thereby reducing time and resource costs. Thus CZMAI, under the MCCAP, began data collection using this methodology which began with the deployment of the Sondes acquired.

On Friday 21st October 2016, the CZMAI Water Quality Monitoring Unit, along with a representative from PACT and the University of Belize, deployed the three YSI EXO II Sondes in the Belize River. The first sonde was deployed in the village of Davis Bank. It was placed within a customized stainless steel cage and embedded into the river bed using stainless steel legs attached to the cage. To ensure proper function, the sonde was submerged completely, with the top of the cage being approximately one foot beneath the surface of the water to account for variations in river levels. For security, the cage was attached to a nearby Blackberry tree (*Eugenia* sp., MYRTACEAE) as a secondary precaution.

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The CPMU installing the first Sonde on the bank of the Belize River near Davis Bank Village

At approximately 12:45pm the team arrived at the second sampling site in Burrell Boom Village to deploy and install the second sonde. The team proceeded toward the north side of the property on the edge of the Belize River. Similarly, the sonde was placed in a customized stainless steel cage and was submerged to a depth of 6 feet. However, in this case, the cage was suspended in the water column using stainless-steel cable welded on to the edge of the Pontoon boat. The team departed at 1:30 pm and headed towards the final sample site.



Installation of second sonde near Burrell Boom Village

Finally, the team arrived at the third sample, at the Belize River Mouth at 2:00 pm to deploy the third sonde. Installation was completed in a similar fashion to the second sonde as the cage containing the sonde was submerged 5 ft. and attached to a suspended pier using stainless-steel cable.



Installation of the Final Sonde near the mouth of the Belize River

After deployment and installation, the CZMAI Coastal Planning and Monitoring Unit visited each sonde on a weekly basis for the first month to ensure that Sondes were still in place and functioning properly. Following this time period, the Sondes will only be serviced once a month for data download, calibration and cleaning. On November 18th 2016, we performed our first servicing of the sonde. We downloaded data and exchanged batteries.





## The Inaugural Meeting of the Coastal Advisory Committee The Guardians of the Coast

*By: Kleon Coleman, Research Technician*

The integrated Coastal Zone Management Plan is a living document created by CZMAI to improve the management of Belize's coastal resources. To better facilitate the plan, the country was divided into 9 regions namely: Southern, South Northern, South Central, Northern, Lighthouse Reef Atoll, Central, Ambergris Caye, Caye Caulker, and Turneff Region. Each region is guided by a Coastal Advisory Committee (CAC) who played a vital role in the development of the plan, in each area. The committees are manifestations of a partnerships between stakeholders and the CZMAI in the coastal management process. Previously, the main function of these CACs included the development of Coastal Zone Management (CZM) Guidelines for each of their respective regions. However, with the legal adoption of the Plan by Cabinet and the House of Representatives & Senate in February and August of 2016 respectively, the function of the CACs will change as they will now work along with the CZMAI to monitor and implement the CZM Guidelines. Therefore, the CACs will now fulfill their role as the eyes and ears of their region.

To lend additional specificity to the monitoring and implementation process, a community wardens program will be developed to increase monitoring in specific communities. These wardens will be on the lookout for any issues related to coastal resource use in their communities and will be informed by the ICZMP. Once an issue is identified they will make reports which will be forwarded to the CAC and then to CZMAI. The wardens of this program will consist of volunteers either from the community, the University of Belize or Sixth form who want to make a change in their community's coastal issues. They are the "Guardians of the Coastal Zone".

CZMAI is actively engaging the Coastal Advisory Committee, since we are in the implementation stage, which is the second stage of the plan. As a result, on December 1st, CZMAI hosted its first CAC meeting beginning with the Southern Region CAC. The meeting was held at the Conference Room of the Toledo Institute for Development and Environment (TIDE). Present were representatives from TIDE, University of Belize, fishing community as well as tour guides around Punta Gorda town, Punta Gorda Town Council and Sarstoon Temash Institute for Indigenous Management (SATIM) and PGTV. The session covered a wide range of topics including the roles of the members of the committee. These forums serve as great opportunities for individuals to voice concerns in regards to different coastal issues they are facing in their region.



Meeting with the Southern Region CAC

The second meeting was held on December 2nd, at the Southern Environment Association (SEA), for the member of South-Central region. The meeting was a success since participants were eager to carry out their duties in the Terms of Reference (TOR). The members voiced their concerns about the different coastal developmental issues that are taking place in their region.

CAC meetings for the remaining 7 regions will be set for the 2017. The sustainability of our Coastal Zone is set in the hands of the people of Belize. The Committees and wardens program are great ways to get everybody involved. So, when reading this if you are a part of one of these regions and want to be one of the "Guardian of the Coast". Look out for us in the upcoming year.



## New Faces at the CZMAI



Andria Rosado

Ms. Rosado is the most recent addition to the CZMAI's Coastal & Marine Data Centre. As the GIS Technician, she is responsible for providing technical support which guides planning and decision-making for sustainable use and management of Belize's coastal resources. Ms. Rosado holds a Bachelor's degree in Environmental Science (Hons) from Galen University and an Associate degree in Biology from Corozal Junior College (Hons). Her work experience includes GIS application in Forest Management and Environmental Education. As a person who is passionate about the environment, her favorite quote is, "I am glad I will not be young in a future without wilderness." –Aldo Leopold



Kachiri Flores

Born and raised in Corozal Town, Kachiri completed her high school education in Business. She later moved to Orange Walk where she pursued a double major in Business Science with Concentrations in Economics and Management at Muffles Junior College. It is her hope to continue her studies by earning a Bachelors degree in Economics with a minor in Management and to set a positive example for her son.

## CZMAI Services

**CREATE YOUR VERY OWN**  
*Goff's Caye*  
**EXPERIENCE**

For a limited time only, Coastal Zone Management Authority and Institute (CZMAI) wishes to advise the public that there is now a 20% discount available to Belizeans for the private rental of Goff's Caye. Goff's Caye boasts approximately 0.5 acres of tropical terrain. Managed by the CZMAI, this registered archaeological site is a one of a kind island with untouched natural features. Goff's Caye has long been enjoyed by both tourists and locals, and its crystalline blue waters and close proximity from mainland makes it a favourite of many and it can be all yours for an entire day. As we wish to preserve the natural heritage and sustainability of the island, we want to remind the general public that any usage of Goff's Caye should be under the consent of CZMAI.

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**The Training Room:** can seat up 40 persons training room style or accessible to over 80 person for a conference. This room is equipped with projector, screen, and is internet ready. Clients have access to a PA system, stage and can be provided with flip charts on request.

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Or email us at [info@coastalzonebelize.org](mailto:info@coastalzonebelize.org)



## *Mission Statement:*

Our Mission is to lead the sustainable use and planned development of Belize's coastal resources through increased knowledge and the building of alliances for the benefit of all Belizeans and the global community.

### *CZMAI Team*



Chantolle Samuels Chief Executive Officer

Arlene Young Director

#### FINANCE, ADMINISTRATIVE, & OPERATIONS STAFF

Rosanne Constantino Administrative Officer

Whitney Requena Accounts Clerk I

Kachiri Flores Administrative Clerk

Hazel Oshon Jamitress

Jason Ferguson Ranger/Boat Captain

Kashiff Stevens Assistant Boat Captain

David Sedasey Driver

#### MARKETING

Chad Bowman Marketing Officer

Monique Goldson Sales & Marketing Assistant

#### SPORTFISHING

Victor Sho Sportfishing Coordinator

#### GIS DATA MANAGEMENT

Maritza Canto GIS Data Manager

Andria Rosado GIS Technician

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Gilbert Andrews Water Quality Analyst

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