# IMA NEWS

DECEMBER 2020 **VOLUME 10 - ISSUE 3**

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INSTITUTE OF MARINE AFFAIRS

# IMA Launches New SeaiTT Mobile App

Alicia Kwok
Communications Assistant (On the Job Trainee)

There is a new environmental app in Trinidad and Tobago. The IMA in collaboration with CARIRI launched an integrated environmental incident software and mobile application called SeaiTT. This app was funded by the Green Fund of Trinidad and Tobago and is now available for both iOS and Android devices.

The much-anticipated app was unveiled virtually on November 6th 2020. The event was open to stakeholders and members of the public, and streamed on the IMA's Facebook and YouTube platforms.

Speaking at the event, Andre Hanief, Information Technology Manager, said "The app will allow citizens to report any environmental incident they observe and will bring value to the user as it will also serve as a one-stop mobile shop for information related to all local and marine coastal matters and even research published by the IMA."

Keon Paul, App Developer, CARIRI, demonstrated how to use the app and its various features. Stakeholders can make a report on invasive species, oil spills and coral bleaching, to list a few. The SeaiTT app features easy calendar, map controls and options lists, increasing user friendliness says Mr. Paul.

Users can access information for educational and recreational purposes. Information on local beaches, the IMA's 'Beyond the Blue' podcast series, and articles published by IMA researchers are available on the app. The app also keeps users up to date on the IMA's newest discoveries, and daily tidal information.

Stakeholders and business folk with marine interests may find this app particularly useful. Ariene Mohan of Playhooky868 says, "One of my favourite features would be the report feature because when we go out to sea, we see things like oil spills or dead marine life and we are not sure who to report this to. It affects our business and how people view us out there. We also like the tidal information provided because it helps us plan our cruises in a safe manner."

Innovation at the IMA has continued to push forward as SeaiTT is the first mobile app of its kind in Trinidad and Tobago. SeaiTT makes collecting, analysing and disseminating information relating to the marine environment easier and more efficient.

The IMA wishes to recognise members of CARIRI including Lynette Akong, ICT Business Co-ordinator, Simeon Moore, App Testing Co-ordinator, Sharda Ramdass, Technologist, and Keon Paul.

*For more information, please visit http://www.ima.gov.tt/SeaiTT*

# IOC UNESCO Project Activities on Marine Spatial Planning and a Sustainable Blue Economy in Trinidad and Tobago

Ryan S. Mohammed PhD
National Consultant for the IOC UNESCO

During September 2020, the Intergovernmental Oceanographic Commission of United Nation Education Science Organisation (IOC UNESCO) two National Consultants, Ms. Sarah Mahadeo and Dr. Ryan S. Mohammed undertook capacity development activities and stakeholder consultations on Marine Spatial Planning (MSP) and sustainable Blue Economy in Trinidad and Tobago. These activities worked in tandem with the Institute of Marine Affairs. The project was funded by the Government of Sweden and facilitated by the MSP global 2030 initiative, as part of activities under the IOC UNESCO-European Commission Joint Roadmap to accelerate MSP processes worldwide. The Joint Roadmap defines five priority areas for moving the global ocean agenda forward, which include:

1. Transboundary MSP
2. Sustainable Blue Economy
3. Ecosystem-based MSP
4. Capacity building
5. Building mutual understanding and communicating MSP

The United Nations has proclaimed 2021-2030 a Decade of Ocean Science for Sustainable Development. This is aimed at supporting efforts to reverse the cycle of decline in ocean health and gather ocean stakeholders worldwide behind a common framework. This in turn will ensure ocean science can fully support countries in creating improved conditions for sustainable development of the Ocean. The marine realm is the largest component of the Earth's system that stabilises climate and support life on Earth and human well-being. However, the First World Ocean Assessment released in 2016 found that much of the ocean is now seriously degraded, with changes and losses in the structure, function and benefits from marine systems. The Blue Economy has the potential to touch on all 17 Sustainable Development Goals (SDGs) of the UN.

The First Sustainable Blue Economy Conference was held Nairobi, Kenya from 26th – 28th November 2018. Delegates from Trinidad and Tobago included representatives from the IMA, the Tobago House of Assembly, Maritime Services Division, Council of Presidents for the Environment, Ambassador Penelope Beckles and His Honour Sunil Sookraj of the Environmental Commission. Following this, the IMA has taken the lead in piloting us towards the Blue Economy. In Tobago, the Division of Infrastructure, Quarries and Environment has taken stewardship in that aspect as they work together with the IMA via the Integrated Coastal Zone Management Committee. As recently as July 2020, the IMA hosted Distinguished Lecture and Panel Discussion on the Blue Economy in observance of World Ocean's Day 2020 and the UN Decade of Ocean Science for Sustainable Development. These events paved the way for Sarah Mahadeo and myself to function in the capacity of the IOC UNESCO's National Consultants.

We were jointly tasked with the following activities:

1. Organisation of an Inter-agency meeting with national public authorities on marine spatial planning and sustainable blue economy strategies;

2. Organisation of a national webinar on marine spatial planning and sustainable blue economy;

3. Organisation of an Inter-institutional meeting with public authorities at local level;

4. Organisation of consultation meetings with national experts to define recommendations on marine spatial planning and sustainable blue economy from an ecosystem point of view.

5. Organisation of an open day at the marine institute to present the Institute's essential work in the development of sustainable blue economy strategies in Trinidad and Tobago, especially for young and university students;

6. Open day with maritime sectors representatives (port authorities, public authorities, fisheries/aquaculture, tourism, research centers);

7. Organisation of visit to primary and secondary schools to promote ocean literacy and the importance of the maritime sectors in TT economy and prosperity, in accordance with the guidelines of the National authorities.

However, in light of the COVID-19 restrictions all of these activities were re-structured. Task 1 to 3 became online webinars. A meeting of government representatives from state agencies, Ministries and the Tobago House of Assembly (THA) was held on 26th October 2020. Among the issues discussed were the legal framework for MSP, data needs and gaps, capacity building to support MSP and key sectoral issues to be addressed in planning. The acquisition and management of data was a common concern, as well as how MSP will be legislated and enforced. Cold stacking and other marine services in the Gulf of Paria were cited as having tremendous potential in developing the Blue Economy.

Following this, a session was held with the regional, borough and city corporations and members of the THA on 2nd November 2020, with the aim of introducing the concepts of a Blue Economy and MSP and encouraging dialogue regarding the challenges local government faces with respect to coastal zone management. Participants identified waste management, and flooding and coastal drainage infrastructure as the most pressing issues to be addressed.

*Presentation of the IOC UNESCO MSP banner to Dr. Rahanna Juman, Director (Ag), IMA*

Online activities culminated with a National Webinar on MSP and the Blue Economy on 5th November 2020. The webinar featured local, regional and international experts in ocean policy and planning and resource management. Dr. Howard Nelson (University of Cambridge) gave insights on the possibilities and challenges of implementing Marine Protected Areas in Trinidad and Tobago and Dr. Rahanna Juman (IMA) spoke on how ocean governance can foster a Blue Economy for the country. A good example of MSP from the region was presented by Ms. Susanna DeBeauville-Scott (Organisation of the Eastern Caribbean States (OECS)) who introduced the Caribbean Regional Oceanscape Project, a pioneering project involving MSP currently underway in the Eastern Caribbean. Mr. Kishan Kumarsingh (Ministry of Planning and Development) presented on developing a Blue Economy and Mr. Aljoscha Wothke (Environmental Research Institute Charlotteville (ERIC)) gave an overview on MSP and sustainable Blue Economy development in the context of North East Tobago UNESCO Man and the Biosphere Reserve and Blue Flag Beach Pilot Status. Presentations on MSP and our project activities were given by both Sarah and myself. The webinar was live streamed on the IMA's Facebook page and the video remains accessible for viewing. The PowerPoint presentations for all three online events can be found on the project page of MSPglobal. These can be downloaded at:

**IOC-UNESCO and European Commission boost development of Marine Spatial Planning and Sustainable Blue Economy worldwide – MSPGLOBAL2030**

*Daniel Robinson, Research Officer (Aquaculture)*
*Photo: IMA Archive*

Task 4 was led by Ms. Mahadeo who interviewed several experts from the IMA, The University of the West Indies (UWI), The University of Trinidad and Tobago (UTT) and The Caribbean Natural Resources Institute (CANARI). The discussions focused on ocean science and research for sustainable ocean management, and included a wide range of topics such as data collection, analysis and management, stakeholder engagement, marine ecology, conservation, spatial planning, law and economics. MSP and its role in developing a sustainable Blue Economy for Trinidad and Tobago were discussed in relation to these disciplines. The discussions also focused on key sectoral activities such as aquaculture, fisheries and the oil and gas industry. Tasks 5 to 7 were re-engineered where instead of a typical science fair with face-to-face interactions and an open day event, they became video documentary productions. The first documentary focused on highlighting the work of the IMA in relation to MSP and development of a Blue Economy in Trinidad and Tobago.

The documentaries are available to the public via the links below:

**https://www.facebook.com/IMAgovTT/videos/181395466819753**
Trinidad and Tobago's Marine Spatial Plan for the Blue Economy – IMA

**https://www.facebook.com/IMAgovTT/videos/870397937061570**
Trinidad and Tobago's Marine Spatial Planning for the Blue Economy- State Agencies

In this regard, the documentaries are intended to sensitise the general public about the role of the various agencies, including the IMA, in sustainable ocean management. It is also hoped that the documentaries generate interest in ocean science and sustainable development among students at both the secondary and tertiary levels, as they are the human capacity for developing a sustainable Blue Economy for Trinidad and Tobago in the coming decades. Additionally, two promotional banners were gifted to the DIQE and IMA on behalf of the IOC UNESCO for promoting MSP for the Blue Economy.

Major issues highlighted during our discussions at the webinars were:

1. Communication among Regional Corporations for coordinated efforts to deal with coastal flooding, waste management and unregulated housing is lacking.

2. Communication and coordination among state agencies is lacking. Several state agencies have overlapping duties and eventually no agency takes responsibility, thereby the need for an ICZM Policy.

3. There is no single agency given the task to manage the Blue Economy or create a road map with milestones.

4. Soft engineering options for coastal protection is not considered.

5. Decisions regarding coastal regions are still being made without proper data being collected or processed to influence the outcome.

6. All stakeholders are still not considered when implementing Protected Areas, such as fishermen's access to ports via PAs. Whilst transit permits are being discussed, there is still management issues via jurisdiction among, Coast Guard, Maritime and Fisheries Division. This justifies the need for a specific committee to address Blue Economy and Marine Spatial Planning issues.

7. Health care for rural coastal communities is severely lacking particularly in Tobago. These are also the communities where charter fishing, SCUBA diving and snorkelling activities occur. The current health care systems regarding hypobaric chamber usage and doctors who are trained in diving matters are not easily available.

8. Wifi and data connectivity and coverage for rural communities are lacking creating villages that are isolated in the cyber world as well. This limits citizen and community based science activities as well as limits the use of technology for digital management of the protected regions.

9. Waste management is still not implemented. The concepts of land activities influencing the coastal near shore areas is still not wildly appreciated.

10. Wild fish stock management is not being considered, regarding quotas and fishing effort e.g. Lobster and queen conch, although a shark and ray management plan is being discussed for Tobago.

Globally, the impact of multiple stressors on the ocean is projected to increase as the human population grows towards the projected 9 billion by 2050. Therefore, adaptation strategies and science-informed policy responses to global change are urgently needed. Scientific understanding of the ocean's responses to pressures and management action is fundamental for sustainable development. Ocean observations and research are also essential to predict the consequences of change, design mitigation and guide adaptation. As mandated by the UN General Assembly, the Intergovernmental Oceanographic Commission (IOC) of UNESCO will coordinate the Decade's preparatory process, inviting the global ocean community to plan for the next ten years in ocean science and technology to deliver, together, the ocean we need for the future we want! Marine Spatial Planning affects us all, whether we go to the beach or not! It is clear there is a synergistic effect among state agencies that collect data and other private and public agencies using the data in Marine Spatial Planning. Our maritime, port facilities, fisheries management and security of coastal waters pivots on MSP to form the major support for the Blue Economy.

The Blue Economy can provide multiple opportunities such as bunkering liquid natural gas for sale to the modern cargo vessels with less polluting capabilities. Zoning our waters for fishing, diving, shipping as well as mapping threats such as oil spills and Sargassum seaweed influx will help fishermen reduce losses, and the inter-island ferry services reduce vessel maintenance cost.

North East Tobago received the designation of a UNESCO Man and the Biosphere Reserve. In addition to this, three beaches in Tobago (Mt. Irvine to the South West, King's Beach and Bloody Bay in the North East) are recipients of Blue Flag pilot status approval. If these designations are to remain intact, the implementation of ICZM and MSP policies are of utmost importance.

Other plans and legislation such as the Fisheries Management (No.2) Bill, 2020 and Sustainable Shark and Ray Monitoring Plans for Tobago will also fit into the larger MSP for our Blue Economy. This has potential to encourage foreign finances through eco-tourism and science-based tourism. Likewise, proposals for pilot MSP for Chaguaramas (which is a naturally calm bay area) are being discussed as this location has multiple stakeholders and users ranging from recreational to industrial and fisheries trade.

With the IMA adequately taking the lead, by providing evidence – based policy advice and the DIQE of the THA taking a firm structured approach, Trinidad and Tobago can have a future in the global Blue Economy.

*Presentation of the IOC UNESCO MSP banner to Mr. Kwesi Des Vignes, Secretary, Division of Infrastructure, Quarries and Environment (DIQE), Tobago House of Assembly (THA).*

# Sustaining the CLME+EBM Project Intervention through Multi-stakeholder Programmes and Policy Implementation

Ruqayyah Thompson
Research Officer (Policy), Institute of Marine Affairs

*Participants at Farmers Training Workshop, Felicity, July 2020*

The recently concluded Caribbean Large Marine Ecosystem+ Ecosystem Based Management (CLME+EBM) Project sought to develop and test various governance arrangements to enable effective management of mangroves. The EBM intervention was aimed at reducing pollution from agricultural production in the southern section of the Caroni Swamp through the implementation of community-based conservation activities.

EBM is an environmental management approach that considers the full range of interactions among actions within an ecosystem, including humans, rather than considering issues in species or ecosystem services in isolation. A core characteristic of EBM is the inclusion, collaboration and participation of stakeholders. The Institute of Marine Affairs engaged stakeholders throughout the project's lifecycle, terminating with two (2) stakeholder meetings hosted on September 28th and October 22nd, 2020.

*Ms. Delezia Singh (UWI) conducts rapid pesticide residue testing with farmers*

Meetings were held virtually because of the national response to the Covid 19 pandemic. Some key stakeholders including farmers were unable to participate. The IMA in keeping with its commitment to facilitate an inclusive, participatory stakeholder engagement will re-engage these stakeholders post-project using alternative and appropriate media.

The project's virtual termination meeting was attended by over thirty-five (35) participants representing a number of key partner organisations including Forestry and Fisheries Divisions of the Ministry of Agriculture, Land and Fisheries, The National Agricultural Marketing and Development Corporation (NAMDEVCO), Environmental Management Authority (EMA), Ministry of Health, Water Resources Agency (WRA), Trinidad and Tobago Bureau of Standards (TTBS), San Juan/Laventille Regional Corporation and The University of the West Indies (UWI).

The research findings were presented to the group. Increases in nitrogen loads attributed to agriculture, and reduced tidal exchanges were observed and created hypoxic conditions in the Caroni Swamp. Faecal indicator bacteria levels in water and oyster samples exceeded accepted limits during both the wet and dry seasons at one sampling location, and concentrations of heavy metals (zinc and copper) exceeded local permissible levels in the blue land crab. The research findings generated concern for both public health as well as for the availability and quality of water used in agricultural production, among participants.

Adequate water resources is a major limiting factor for agricultural activities in the study area. The Draft Integrated Water Resources Management (IWRM)

*Cross section of participants at Farmers' Training Workshop, Felicity*

*Dr. Adesh Ramsubhag sensitises farmers on alternative biological inputs*

Policy 2017 seeks to support socio-economic development through the integrated management of water resources to satisfy and manage the growing demands of all water users. The draft policy states that water together with land, labour and capital are necessary conditions for successful agricultural production. Waste-water management is also recognised as a critical risk-reducing, production enhancing agricultural strategy. In addition, the Draft Integrated Coastal Zone Management (ICZM) Policy Framework 2020 seeks to facilitate integrated management of the coastal zone areas in a bid to maintain and enhance coastal resource systems, while enabling sustainable economic development. A strategy of the draft policy is to promote sustainable agriculture in the coastal zone through the promotion of Good Agricultural Practices (GAPs).

The Food and Agricultural Organization (FAO) of the United Nations defines GAPs as a collection of principles to be applied, both on-farm production and post-production processes, resulting in safe and healthy food and non-food agricultural products, while taking into account economic, social and environmental sustainability. Adopting Good Agricultural Practices (GAPs) require institutional infrastructure and standards as well as their implementation, certification and accreditation. NAMDEVCO, a key project partner in collaboration with TTBS, is currently expanding its farm certification programme and developing a National GAPs Programme.

Farmers involved in the NAMDEVCO's farm certification programme and interested participants were actively engaged in the project's conservation activities which included workshop participation and field demonstrations. This component of the project was spearheaded by the UWI, and preliminary findings were presented. Preliminary findings from the dry season indicated that the alternative to the use of high chemicals (i.e. the use of ⅓ of the amount of chemicals normally used by farmers, substituted by alternative inputs such as bio-pesticides, nutrient mixtures and seaweed extracts), resulted in significantly improved effects on mean plant height, mean fruit number and fruit yield than plants treated with chemicals only, as per current farming practice.

No significant reduction of agricultural pollution in the Caroni Swamp is anticipated to occur in the short term. This is partially due to the small number of farmers undertaking training, COVID-19 restrictions and the life span of the project.

Therefore, it is necessary for multi-stakeholder activities to sustain the CLME+EBM Project Intervention to continue post-project including the finalisation and implementation of the National GAPs Programme, as well as the adoption and implementation of the Draft IWRM 2017 and Draft ICZM 2020 Policies. Without completing the policy cycle by closing the policy implementation gap, it is impossible to monitor and evaluate the effectiveness of the policies or determine how implementation can be strengthened to achieve desired outcomes.

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# Biodiversity matters, Even worms!

Attish Kanhai
Research Officer (Benthic Ecology), Institute of Marine Affairs

*Caenorhabditis elegans*
*Photo credit: Heiti Paves / Shutterstock.com*

*Caenorhabditis elegans* is a transparent worm 1 millimetre long with no eyes that eats bacteria. It is an organism the vast majority of human beings will probably never interact with but in the unlikely event that you do, its unremarkable appearance will probably not make an impression in your mind. Beauty as they say is in the eyes of the beholder, and discovery is in the mind of the adventurer. *C elegans*, in the world of genetic biology, is an A-list celebrity. It is Rihanna and Beyonce combined. The impact of these creatures is undeniable.

Despite their simplicity and two to three week life cycle, these creatures have been responsible for the awarding of Nobel prizes on three separate occasions: 2002, 2006 and 2008 to six different scientists for genetic studies. This humble worm was the first multicellular organism to have its entire genome sequenced. The first of its Nobel Prizes awarded in 2002 was for its contribution to apoptosis (from the Greek for "falling off" as in leaves of a tree) or "programmed cell death". The process of apoptosis is important in the treatment of diseases such as cancer, something that would not have been possible without *C.elegans*. Without its discovery, chances are, the treatment of a number of diseases would not be as advanced as they are today. To say lives have been saved thanks to this nematode would not be an exaggeration.

Herein lies a real world example as to why the continued discovery of biodiversity and the many gifts that remain to be unopened by humans is so crucial. There are an estimated 8.7 million living organisms on Planet Earth.[1] To date, only an estimated 1.2 million[1] have been identified meaning the vast majority of living organisms on Earth remain as yet, undiscovered. All of Earth's estimated 8.7 million species work together in harmonious existence to maintain the various ecosystems and services we rely on to live. It goes far beyond just the potential for treatment of diseases. This coupled with the Global Assessment Report on Biodiversity and Ecosystem Services'[2] assertion that one million species are at risk for extinction and we begin to see the problem.

When we hear about animals going extinct our minds tend to wander to furry, lovable creatures such as tigers, pandas and polar bears. This is no coincidence as wildlife organisations have capitalised on the charisma of these endangered species to make the case as to the seriousness of biodiversity loss. However, there is more to it than losing animals we're fond of seeing. Potential medical discoveries, the provision of ecosystem services and any number of opportunities can potentially be lost forever.

Craig Mello, Nobel Prize winner and collaborator with C.elegans understandably has a great appreciation of all living things and not just those that are aesthetically pleasing. *"All living things are masters of information assimilation and integration,"* he said during a visit to the University of Delaware. *"We think there is such a thing as 'higher organisms' — and we're them. But every organism is equally high. All have sophisticated systems."*[3].

In other words, there is value in all living organisms. But will we only understand this value after it has disappeared? Nature still has many new stories to tell, solutions to provide and prizes to give. Imagine all that we could lose that we have not yet discovered. Maybe nature's greatest lesson is one of equality. Nothing exists without a purpose, therefore everything that exists is invaluable. Also, maybe it is time we stop giving worms such a bad rap. Sentiments echoed by Craig Mello, who reminds us, *"If you've ever felt lower than a worm, stop that. And if you've ever felt superior to a worm, you can stop that, too,"* There is an equal stratification across nature that renders the function of each creature an integral part of the whole. All living organisms should never be underestimated or undervalued even if they are just worms.

To paraphrase a hymn from my primary school, *"All things bright and beautiful, all creatures great and small, all things wise and wonderful, there is value in them all."*


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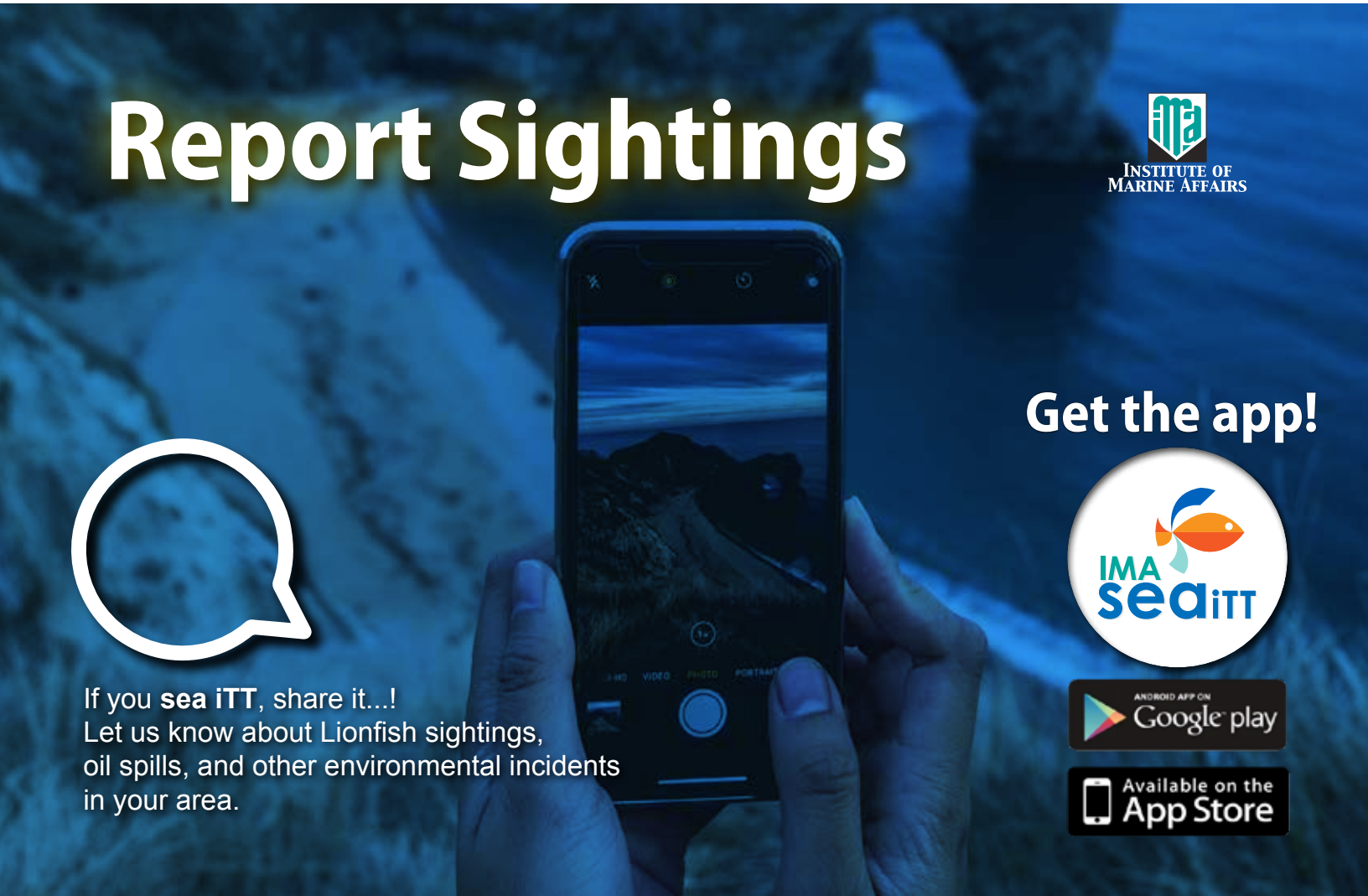
3. https://www.udel.edu/udaily/2019/may/Biology-life-science-craig-mello-nobel-laureate/Nobel Laureate Craig Mello shares Joy of Discovery Article by Beth Miller, May 08, 2019





# Impact of Climate Change on the Sandy Shorelines of the Caribbean: Alternatives for its Control and Resilience- The Sandy Shorelines Project -KOICA.

Cassandra Nanlal PhD
Research Officer (Physical Oceanography), Institute of Marine Affairs

*Participants during Capacity Building sessions of the Sandy Shoreline Project*

Sun, sand and sea are unmistakable characteristics of the Caribbean and in particular that of its beaches. More than twenty percent of the Caribbean population lives in low elevation coastal zones (LECZ), less than ten metres above sea level, and in some islands the number is far greater. In Trinidad and Tobago, for example, over seventy percent of the population live within the coastal zone. Living in close proximity to the beach is one of the privileges of island life and it is not uncommon to see hashtags **#saltlife #welivewhereyouvacation**, accompanying social media posts describing Caribbean life. However, our shorelines are much more than a good liming spot; they contribute to the economy through tourism and fishing and host valuable ecosystems such as mangrove swamps and seagrass beds. It is estimated that over eighty percent of all socio-economic activities in Trinidad and Tobago occur in the coastal zone. Beaches play an important role as they act as a natural barrier, protecting the densely populated coastlines, including infrastructure, from erosion and inundation.

Beach erosion refers to the removal of material from the shoreline and adjacent areas. It results in a landward displacement of the shoreline, either temporarily or semi-permanently. This can directly expose coastal infrastructure to the impacts of waves or reduce the foundation capacity of coastal land which may lead to the undermining and collapse of built assets. While sandy shorelines are typically very dynamic because of the influence of natural environmental boundary conditions, such as waves, winds and tides, they are also influenced by human activity including construction, land reclamation, and beach nourishment. Possibly, the greatest human influence on coastal morphodynamics, is climate change, which alters the overarching natural boundary conditions.

*Aaron Mohammed, IMA, during Sediment Analysis Training, Panama*

Unfortunately, Caribbean shorelines are vulnerable to erosion and many islands are already experiencing accelerated beach erosion. With this realisation, the Korean International Cooperation Agency's (KOICA) Sandy Shorelines Project was born in 2017. The project entitled: **Impact of Climate Change on the Sandy Shorelines of the Caribbean: Alternatives for its Control and Resilience** is more simply known as the

*Figure 1 Components of the Sandy Shorelines Project*

Sandy Shorelines Project. It currently includes nine participating Caribbean states: Trinidad and Tobago, Costa Rica, Cuba, Dominican Republic, Guatemala, Haiti, Jamaica, Nicaragua and Panama.

The Sandy Shorelines Project which is coordinated by the Caribbean Sea Commission (CSC) of the Association of Caribbean States (ACS), is divided into six components all with the overarching aim of better managing our beaches. In the first component of the project, a focal point network was established with representatives from all the countries involved contributing to the needs assessment and developing the way forward for the project. The IMA was appointed the focal point for Trinidad and Tobago, and the Institute Acting Director, Dr. Rahanna Juman, represents the organisation. Component II - Capacity Building, included training courses and seminars in Panama and Cuba. Researchers of the Oceanography and Coastal Processes Department (OCP) at the IMA, Mr. Christopher Alexis received training in Coastal Processes and Methodological Criteria for Beach Recovery and Mr. Aaron Mohammed was trained in Sediment Analysis in Panama in 2018. Mr. Alexis also attended the 4th Focal Point Meeting and Workshop of the Technical Advisory Group in Cuba 2019.

At the meeting held in Panama, IMA staff highlighted the IMA's long-term beach monitoring programme. This led to Trinidad and Tobago being selected as one of three pilot sites in the Caribbean for beach rehabilitation works alongside Antigua and Barbuda and Panama. Bonasse Bay, Cedros was selected as our pilot site for beach rehabilitation. In this component, the IMA together with the GAMMA Inversiones of Cuba, will design and implement a programme in Bonasse Bay, Cedros to mitigate ongoing erosion. The lessons learnt from this study will be shared with other Caribbean states for the development of a best practice manual for beach rehabilitation in the Caribbean region.

*Field activity during training session to demonstrate coastal erosion, Panama*

Another significant component of this project is the regional monitoring network. Countries involved will receive approximately USD 50,000.00 worth of shoreline monitoring equipment to aid in the monitoring of beaches in a bid to enhance the understanding of the impacts of climate change on the region, and develop best practices to mitigate any negative impacts. The Sandy Shorelines project, like the rest of the world, has been negatively impacted by restrictions due to the Covid 19 pandemic. In September 2020, at the 5th Focal Point virtual meeting, many participating countries indicated that they have experienced setbacks because of the pandemic. Reduced resources, work from home protocols and closure of beaches have prevented monitoring exercises. The IMA was similarly impacted but has adapted by reducing the frequency of beach monitoring from monthly to quarterly. The CSC, is seeking an extension of the Sandy Shorelines Project owing to the delays arising from the global pandemic.

*Christopher Alexis, IMA, receiving his certificate from Dr. Juanes*

Dr. Cassandra Nanlal joined the IMA and the Sandy Shorelines project in June 2020 in the capacity of Physical Oceanographer. The OCP team continues to monitor twenty-five beaches in Trinidad and twenty-six beaches in Tobago, quarterly, to maintain the continuity of its coastal conservation and monitoring record since 1988.

There is evidence that our sandy shorelines are under threat and while short and medium term solutions such as the construction of sea walls and breakwaters are important for the protection of valuable coastal resources and infrastructure, sustainable solutions are required for the long term. The Sandy Shorelines Project will investigate hydrodynamics and long term geomorphology in the study area and provide a holistic approach to effectively mitigate erosion. This is what is required for sustainable and informed coastal management. Though our sandy shorelines are at risk of erosion, efficient management can save the day!

# End of The Decade of Biodiversity What has been achieved?

Attish Kanhai
Research Officer (Benthic Ecology), Institute of Marine Affairs

*Puffer fish among prop roots*

Where were you ten years ago? On the surface it seems like a simple enough question. It might be easy enough to recall any significant life events that may have happened to you personally but how much do you remember about what was going on in the world? Allow me to jog your memory a bit. Apple had now launched the iphone 4 and its biggest competitor at the time was not called Samsung but rather Blackberry. Social media was on the up with Facebook beginning to cement its place as the hot new website. Speaking of social media, Instagram had not been invented yet and people still had MySpace profiles. The Harry Potter franchise was now approaching its zenith with the release of the first part of the Deathly Hallows. A hairstlye started back then that still exists today called the man bun.

On December 20th, 2010, Katy Perry's Firework was the number one single on the pop charts. Also on this day, the United Nations held its 65th General Assembly passing Resolution 65/161 which declared 2011-2020 "The Decade of Biodiversity". Fun fact, the new decade begins in 2021 and not 2020 as may have been previously celebrated. During this meeting, 20 biodiversity targets were set out, to be achieved by the year 2020. These would later become known as the Aichi Biodiversity targets.

Under-Secretary-General for Communications and Public Information, Kiyo Akasaka at the launch of the decade remarked, "With the world undergoing a youth bulge, sustainable use of biodiversity is not an isolated 'ecological' green approach, but an indispensable pillar

of sustainable development for future generations. Human activities have caused the extinction of plants and animals at some hundreds or thousands of times faster than what the natural rate would have been," Mr. Akasaka pointed out.

The science bears out Mr. Akasaka's point. Even without humans, extinction of species is a naturally occurring phenomenon. Fossil records have shown that on average, 0.1 species per year for every 1 million species on Planet Earth goes extinct. For example if 10 million species existed on planet Earth, then each year, 1 species would go extinct. Species are now going extinct at rates 1,000 times higher than that. There are now 100 probable extinctions per million species per year. We have barely begun recording the number of species present on Planet Earth, (1 million of an estimated 8 million have been described) and we are already losing them, some will never be discovered. Is there a greater tragedy than to disappear without ever having been known?

At the start of the decade Mr. Akasaka presented some lofty goals, "We cannot reverse extinction. We can, however, prevent future extinction of other species right now. For the next 10 years our commitment to protecting more than eight million species, and our wisdom in contributing to a balance of life, will be put to a test," he said.

And put to the test they were. The protection of eight million species is no small task, and undoubtedly, ten years is far too short a timeframe in which to achieve such an ambitious goal. Unsurprisingly, then, the achievements for the decade of biodiversity makes for pretty grim reading. In the past decade, 467 species have been declared extinct (though they might have gone extinct in decades prior), according to the International Union for Conservation of Nature, or IUCN. Others have been brought to the brink and still more are seeing serious declines in their population numbers.

In all, the UN's Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services estimates as many as 1 million species are now at risk of extinction if we don't act to save them; that number includes 40 percent of all amphibian species, 33 percent of corals, and around 10 percent of insects. The reasons for this continued loss of species can be placed into 5 categories as itemised in the fifth edition of the UN's Global Biodiversity Outlook report published by the Convention of Biological diversity (CBD):

- Changes in land and sea use: As demand for housing, agriculture, farming, etc increases, land has become a premium resource. Conversely, this means there is less land available for nature. A third of the world's land, the report finds, is currently reserved for agriculture or livestock.

- Climate change: everyone has seen the pictures of forlorn polar bears stranded on an ever-shrinking sea of Arctic ice. This succinctly demonstrates the climate change threat. Climate change modifies habitats, behavioural patterns of animals and the physical makeup of the planet all of which undeniably affect the ability of many species to survive.

- Direct exploitation of organisms: Increasing human populations also leads to an increased need for food and resources. Overfishing, overhunting and overexploitation are direct threats to biodiversity.

- Pollution: From plastic pollution to polluted air, polluted oceans, polluted landscapes, parts of the planet are becoming increasingly unliveable for many of Earth's species.

- Invasive alien species. Due to increased globalization, species can move from one region to another with no naturally occurring predators. This leads to them becoming threats to the native species in these habitats.

While threats continue to increase, has any progress at all been made? There has in fact been progress in one area. The global community has achieved Aichi Biodiversity Target 11 on protecting 10% of its coasts and marine areas by 2020. In fact, 3.6 million square kilometres of ocean, an area larger than India, has been designated as marine protected areas since April 2016. Achieving one target of 19 may not seem like much but this one is significant. Protected areas are a cornerstone of biodiversity conservation. Progress has been made in expanding coverage of protected and conserved areas, with marine coverage increasing faster than terrestrial coverage.

The many services provided by protected areas include being reliable sources of food, fuel, fresh water and herbal medicines. Protected areas provide livelihoods for nearly 1.1 billion people. They are the primary source of drinking water for over a third of the world's largest cities and are a major factor in ensuring global food security. Protected areas can also potentially contribute to poverty reduction and sustainable development including the achievement of the Sustainable Development Goals.

Including watersheds as protected areas has the added benefit of conserving fresh water for irrigation and downstream water supplies. Urban and rural populations are afforded a supply of freshwater due to the natural filtration provided by watersheds. Human welfare is undeniably linked to ecological services such as these and the need for conservation is eminently apparent.

Where does this leave us for the decade ahead? Will K-Pop overtake all other genres of music? Will we finally see flying cars? Will Covid 19 disappear or will the world being trying to emerge from the tenth iteration, Covid 29? Will the Fast and the Furious franchise still be churning out movies? But most importantly will we learn from our recent history?

With only 1 of 20 Aichi biodiversity targets being realised, it is tempting to want to scale back efforts in an attempt to make targets more achievable. This is the wrong approach. There is an argument to be made for an even more aggressive approach as we can ill afford to keep losing ground. A coherent and focused information campaign and the continued war on factors affecting loss of species are crucial to biodiversity preservation.

Not only is the next decade important but all decades to come in the future should be dubbed decades of biodiversity, in fact let's go ahead and call it a century of biodiversity, even a millennium. Biodiversity preservation is not an issue to be solved but rather an integral part to life as we know it on Earth. Other species not only help sustain our own lives but add many intangibles to our own existence. The other species with which we share the planet have the same rights to exist as we do.

Physician and anthropologist Paul Farmer and advocate for health as human right once uttered his most famous quote "The idea that some lives matter less is the root of all that's wrong with the world." Can't the same be said of all of Earth's creatures?

# Start of the Decade of Ocean Science for Sustainable Development

The new year 2021 marks the official start of the Decade of Ocean Science for Sustainable Development, as declared by the United Nations Educational, Scientific and Cultural Organisation (UNESCO). Ocean science within the framework of sustainability considers categories such as marine ecosystems functions and processes, ocean and climate, human health and well-being, blue growth, ocean technology, and marine data. The Decade of Ocean Science provides an opportunity for the ocean community to work together to reverse the decline in ocean health and contribute to a significant change in the way the ocean is managed.

With a global population projected at nine billion by 2050, there is increasing pressure on ocean resources. The ocean provides food, recreation, medicine, supports biodiversity, produces the oxygen we breath and even regulates our climate, therefore an in-depth understanding of the ocean serves as an avenue to potentially solve many problems facing humanity such as food shortages, social development, poverty and climate change. During this ten-year period, there is a unique opportunity to manage fish populations, restore biodiversity, reduce and control pollution, and attempt to reverse the negative impacts of climate change.

The upcoming decade will provide favourable circumstances for nations to build their scientific and institutional capacity to achieve the United Nations Development Goal #14: to conserve and sustainably manage ocean and marine resources by 2030. **Affirmed by UNESCO**, improved management of these resources can be attained through six objectives :

i. **A clean ocean,** whereby sources of pollution are identified, quantified and reduced, and pollutants are removed from the ocean

ii. **A healthy and resilient ocean,** where marine ecosystems are mapped and protected, while provisioning services are maintained

iii. **A predicted ocean,** where society has the capacity to understand current and future ocean conditions, as well as the impact on livelihoods and well-being of all

iv. **A safe ocean,** where people and their communities are protected from ocean hazards, and the safety of humans during operations at sea is guaranteed

v. **A sustainably harvested and productive ocean, w**hich ensures the provision of food supply and alternative livelihoods, and

vi. **A transparent and accessible ocean,** whereby all stakeholders have access to ocean data, technologies and information.

The Decade seeks to strengthen cooperation among nations to improve scientific knowledge and to develop innovative technologies that connect ocean science with the needs of society. Management of coastal zones is of utmost importance to Small Island Developing States, such as Trinidad and Tobago and various key applications will be utilised throughout the decade. Through ecosystem-based approaches such as **Marine Spatial Planning**, a more rational use of marine space and the interaction among its users is offered, which balances the demand for development with conservation of the environment. Through the global development of the **Blue Economy**, both traditional ocean industries such as fishing, tourism, and maritime transport and new emerging activities such as offshore renewable energy, aquaculture and marine biotechnology can all be incorporated to support ocean sustainability.

Two-thirds of the world's cities occur on the coast and approximately seventy percent of the world's population reside near coastal waters therefore coastal management is essential. By developing **National Ocean Policies**, such as the draft Integrated Coastal Zone Management (ICZM) Policy Framework, conflicts amongst coastal users are addressed, human activities are managed in balance with conservation, and through ICZM, a strategy is provided to adapt to climate change impacts and to reduce vulnerability to coastal hazards.

The Institute of Marine Affairs remains steadfast in its commitment to national development through marine research. Through the creation of new ideas, formation of new partnerships and the application of additional tools, advances in sustainable management of our coastal areas will be made over the coming decade, with citizens more informed about our reliance and connectivity to the ocean.

For more information on the Decade of Ocean Science for Sustainable Development, please visit **www.oceandecade.org.**

# Memorial for Mr. Kishore Boodram

We fondly remember a long standing colleague of the IMA, Mr. Kishore Boodram.

Mr. Boodram passed away after a brief illness on November 9th 2020. He was a third generation fisherman, starting while still at elementary school, helping his family and his father who owned a 'seine boat', to catch fish and vend. He later owned several fishing vessels and became the President of the Claxton Bay Fishing Association Limited. He held this position for over twenty-five (25) years, taking over from his uncle. He was also elected the Vice-President of the umbrella fishing organisation, the Trinidad and Tobago United Fisherfolk.

Mr. Boodram was passionate about fishing and the importance of the Claxton Bay fishing landing site. Based largely on his influence, several facilities were built at the site and up until the time of his death, he was still pursuing their improvements. As President, he ensured fishers as well as community members received training on fish processing, and navigation at sea and more.

Mr. Boodram was a mentor to many fishers and others in the community. If he saw young men liming at the landing site, he would encourage them to go out to sea to fish or learn a trade. He taught youngsters how to mend nets. He was an undeniable advocate for improving the lives and livelihoods of his fishing community. Mr Boodram was synonymous with the Claxton Bay Fish landing site and several persons have called for it to be renamed in his honour.

For us at the IMA, Mr Boodram was a champion. He was not only passionate about fishing, he understood the need to protect and conserve our fish resources. His pride and joy was the seagrass bed and mangroves within Claxton Bay. He would expound on the importance of these systems as a nursery area for fishes, paying special attention to his beloved mullets. His cousin and Vice-President of the Claxton Bay Fishing Association Limited, said that many students from high schools and universities including those from the United States of America and United Kingdom came to him to gain a better understanding of these systems. He was also a loquacious advocate of several environmental concerns and his network spanned not only from within the fishing communities but also across technocrats, government ministry and ministers of government, NGOs and persons with business interests.

At the IMA, we were always calling on him, for information, for advice, and research proposal development. He had such a larger-than-life personality. At our 2018 research community symposium in Chaguanas, he was part of the panel. Mr. Boodram never stood at the podium, instead he held court from the floor and had the audience captivated, one of his famous phrases "Well let me explain something, this is how it is…"

Mr. Boodram has left a large legacy for others to follow. He will truly be missed.

# Merry Christmas and Happy New Year !

As 2020 draws to an end, we take this opportunity to share warmest wishes to all our stakeholders during this Christmas season.

During this season may you and your loved ones be filled with good health and peace and may the New Year bring hope and joy. We hope that the true spirit of Christmas may fill your hearts and homes during this most wonderful time of year.

# Tidal Calendar 2021

The Decade of
Ocean Science for Sustainable Development 2021-2030

Available at:

- R.I.K. Services Ltd
- Mohammed's Book Stores
- UWI Bookshop
- Craneum Agencies, Tobago

This issue, highlighting the various objectives of the United Nations Decade of Ocean Science for Sustainable Development, also includes:

- Captivating photographs of local coastal and marine places of interest
- Daily tidal forecasts
- Moon phases

INSTITUTE OF MARINE AFFAIRS

# THE BLUE CORNER

*Marine Plankton exist in a variety of shapes and sizes - sample from the Mediterranean Sea.*

## Tiny, but powerful Plankton

Plankton – derived from the Greek root planktos, meaning "drifter" or "wanderer", are microscopic plants and animals, unable to swim against currents and tides. The two main groups are phytoplankton (plants) found near the water's surface to access sunlight for photosynthesis; and zooplankton which include microscopic animals such as copepods and krill. Plankton play a critical role in the ocean ecosystem as they help to maintain the balance and health of the oceanic food web and may also be indicators of ecosystem change.

Despite their tiny size, phytoplankton cells - smaller in diameter than a strand of human hair - are primary producers and the foundation of the aquatic food web. They are numerous and account for approximately 50% of all photosynthesis on Earth, producing 50% of the oxygen we breathe!

*References:*
*https://oceanservice.noaa.gov/*
*https://www.whoi.edu/know-your-ocean*
*https://www.nationalgeographic.org/*
*Photo: https://www.facebook.com/PlanktonPlanet*

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*Published by*

INSTITUTE OF MARINE AFFAIRS

**established by Act of Parliament**
*(Chap. 37:01 of the Revised Laws of the Republic of Trinidad and Tobago, as amended by Act No. 13 of 1990).*

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