IMA NEWS

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INSTITUTE OF MARINE AFFAIRS

IMA - 1st Regional Marine Environmental Research Organisation with International Laboratory Accreditation for Nitrate/Nitrite Testing

Research Block at the Institute of Marine Affairs, Chaguaramas, Trinidad

The Institute of Marine Affairs (IMA) has been successful in attaining ISO/IEC 17025:2017, which is an international accreditation and standard for the 'General Requirements for the Competence of Testing and Calibration Laboratories' specific to the nitrate/nitrite test. Notice of accreditation was issued by letter in December 2022 by the Trinidad and Tobago Bureau of Standards. The Trinidad and Tobago Laboratory Accreditation Service (TTLABS) conducted the accreditation exercise.

This certification serves as the international reference for the testing and calibration laboratories, that demonstrate their capacity to deliver reliable results and is a reliable indicator of laboratory's technical competence. Accreditation therefore enhances the public confidence in test results, and provides underlying assurance that the organisation adheres to internationally recognised standards.

As a marine scientific research organisation, the IMA's Environmental Quality Program Laboratory (EQPL) supports the IMA's core research operation. Environmental monitoring is a major activity conducted in areas of microbiology, hydrocarbons, trace metal and nutrients to access environmental quality The results of tests assist in providing Trinidad and Tobago with an accurate snap shot of the state of its marine and coastal environment. During the accreditation process, all aspects of the laboratory's facilities and operations were assessed, to ensure the production of accurate test data. Areas for improvement were identified and the laboratory technicians took all the corrective actions needed to improve performance quality to meet the international standards. The Trinidad and Tobago Bureau of Standards worked with the IMA to review and provide guidance as to the requirements needed to meet the international standards in the following areas:

- Technical competence of laboratory staff;
- Validity and appropriateness of test methods;
- Suitability, calibration and maintenance of test equipment;
- Quality assurance of test and calibration data; and
- Record keeping and documentation.

Meeting this international standard and achieving the accreditation is of strategic importance for the IMA since it improves the Institute's global competitiveness.

The IMA can now provide comparable, technically valid and quality nitrate/nitrite test results. This enhances the organisation's ability to access grant funding, participate in research fellowships and collaborations both here and abroad.

Being ISO/IEC 17025:2017 accredited also signals that the organisation has a well-structured management system in place to minimise risks and support quality and proficiency, and confirms the technical and ethical competency of the Institute's staff.

The two-year accreditation process was led by Mr. Kyle Williams - Laboratory Supervisor/Quality Manager, Mrs. Wendy Nelson - Senior Research Officer and Mr. Shane Ramsammy – Technician who was supported by a consultant, Mrs Lori Ann Keane. Funding was provided through the Public Sector Investment Programme -Accreditation Programme for Public Laboratories executed by the Trinidad and Tobago Bureau of Standards. The IMA looks forward to utilizing our accredited status to support the work of our stakeholders.

Community and Ecosystem Connections

Improving Human Wellbeing Sustaining Livelihoods

IMA's 7th Community Symposium
"Community and Ecosystem Connections – Improving Human Wellbeing, Sustaining Livelihood"

IMA/UWI Scientists call for 50-70% Reduction in Chemical Use in Agriculture as Part of Strategy to Promote a Healthier Aquatic Ecosystem in and around the Caroni Swamp.

Cut chemical use in agriculture by 50 to 70 percent, as part of the strategy to improve the impact of agricultural practices on the health of the aquatic environment in and around the Caroni Swamp. This from Professor Jayaraj Jayaraman of The University of the West Indies, St Augustine Campus. The Institute of Marine Affairs and The University of the West Indies collaborated on a project to ascertain the impacts of chemical based pesticides and fertilisers on the aquatic environment from farms located near and around the Caroni Swamp, which is a wetland of international importance having been declared a Ramsar Site (under the Ramsar Convention) in 2005. The results of the joint study were delivered on Tuesday 20th September 2022, at the IMA's 7th Community Research Symposium at the Warrenville Regional Complex, Cunupia. Themed "Community and Ecosystem Connections – Improving Human Wellbeing, Sustaining Livelihood" the symposium attracted the attendance of the Minister of Planning and Development, the Honourable Pennelope Beckles, His Worship the Mayor of Chaguanas, representatives of the area's local government bodies and a number of the catchment area farmers and fishers.

Professor Jayaraj Jayaraman

The study was part of a Caribbean Large Marine Ecosystem (CLME+) implemented by the United Nations Development Programme (UNDP) and funded by the Global Environment Facility (GEF). The CLME + initiative is aimed at helping participating territories improve the management of their shared living marine resources using an Ecosystem-Based Management approach.

The study unearthed:

1. poor water quality arising from the presence of nutrients such as ammonia and phosphates in the watercourses;

The Honourable Minister of Planning and Development Penelope Beckles greets attendees

2. concerning bacteriological pollutants impacting water and oyster quality; and

3. heavy metal contamination of blue crabs and other fisheries above recommended levels in the seventeen (17) test stations located near and in the Caroni Swamp. It was however noted that the heavy metal contaminants posed no major health risk.

Among the recommendations promoted was the use of more biologically based extracts such as an organic seaweed extract (formulated by the University of the West Indies) made from Sargassum seaweed, for application on vegetable crops, roots, tubers and ornamental plants as a replacement for chemically based pesticidesand fertilisers which have been found to have a deleterious impact on the natural environment. The scientists observed that the seaweed biostimulant, which is environmentally friendly, promoted better plant growth and yield and enhanced the plants resistance to pest and disease when compared to the chemically-based compounds. Professor Jayaraman also noted that there is room for local entrepreneurs to commercialise some of these biological inputs being developed by the University, bringing them to market; so that what is done in the lab can benefit the farmers.

Regarding the contamination of food sources, the scientists recommended that fishers harvest the molluscs in areas where there is a reduced risk of contamination. Oysters can also be boiled or flushed with clean water before ingesting to remove bacterial contaminants and should be kept on ice before ingestion, to reduce bacterial load.

The study is significant because diverse and productive ecosystems such mangrove forests play a significant role in providing food such as fish and shellfish. The Caroni Swamp supports livelihood opportunities such as ecotourism and fisheries, (harvesting of fish, crabs, oysters) however marine resources have become increasingly impacted by habitat degradation, unsustainable fisheries practices and pollution. The Caroni River Basin, the largest river basin in Trinidad and Tobago, receives land based discharges from agricultural, industrial and domestic sources from the most densely populated area within Trinidad. Pollutants within the basin are from sources such as agricultural and industrial activities, sewage and domestic waste from planned and unplanned housing settlements and runoff.

Addressing attendees, the Mayor of the Chaguanas Borough Corporation His Worship, Faaiq Mohammed, Mayor indicated its “our obligation to pursue synergy between growth and development with the health of the natural environment [in order] to propel food security and to preserve the natural infrastructure of our tourism sector.” The Honourable Minister in giving her closing remarks said that the session was an indication of the government’s continued commitment to evidence-based decision and policy making and stakeholder consultation.

It is expected that discussions generated from the presentations at the symposium will contribute to good agricultural practices in the future as the Ministries of Agriculture Land and Fisheries and Health were among the stakeholders receiving the report.

A recording of the event may be viewed at https://www.facebook.com/IMAgovTT

Cleaning up our shorelines - International Coastal Clean-up 2022

Staff members from IMA, EPPD, and EMA with volunteers at the 2022 ICC, Foreshore, P.O.S.

"A clean ocean where sources of pollution are spotted and removed" is one of the goals identified under the United Nations' Decade of Ocean Science for Sustainable Development. On Saturday 17th September 2022, one hundred and thirty six (136) dedicated and enthusiastic volunteers removed more than 2,270 pounds of garbage from the Foreshore, Port of Spain. The garbage collected at this site filled 121 garbage bags and consisted of plastics, glass and miscellaneous items.

IMA partnered with the Ministry of Planning and Development's Environmental Policy and Planning Division, and the Environmental Management Authority to bring awareness to the issue of marine pollution and the detrimental effects it has on our environment. The event also served to highlight the prevalence of the problem in the Trinidad and Tobago's context and of course address the issue, as far as possible, with a cleanup activity. Marine pollution from human activities, specifically plastics, constitute significant proportions of marine debris which have a negative impact on economies, ecosystems, animal welfare and human health worldwide. Single-use plastic has become an environmental catastrophe, with an estimated 50% of consumer plastics being single use. The activity on the Foreshore in Port of Spain on the 17th, September 2022, highlighted the problem of single use plastics.

Here is what was collected on that day:

- Plastic Beverage bottles – 1,323
- Forks/Knives/Spoons – 628
- Plastic Bags – 572
- Food Wrappers - 420
- Beverage cans - 376
- Textiles-Clothing – 372
- Foam packaging material – 345
- Plastic Bottle Caps – 323
- Glass Beverage bottles – 225
- Plastic Cups and Plates – 168

Unusual items also collected included a pool pump, toaster oven, vacuum cleaner, car parts and a suitcase. Reducing one's daily use of single use plastics can make a difference in the global battle against plastic pollution. Environmental awareness and action, can improve the health and integrity of our oceans and coastal spaces. Government policies, global awareness and advocacy can turn the tide on marine debris and its impact.

The International Coastal Clean-up (ICC) is spearheaded by the Ocean Conservancy, a global network that began more than 30 years ago, when communities rallied together with the common goal to collect and document garbage on their coastlines. It has become the world's largest effort to carry out beach clean-up exercises and record data on garbage collect on coastlines all around the world.

The Caribbean Network for Integrated Rural Development (CNIRD), is the national coordinator for International Coastal Clean-up in Trinidad and Tobago and IMA has been a member of the National Planning Committee since 2002.

For more information about the ICC initiative, please visit https://oceanconservancy.org/trash-free-seas/

The Hon. Penelope Beckles, and Hayden Alexander, Chairman, IMA Board of Governors flanked by the IMA team and volunteers from the Queen's Royal College Old Boys' Association at the 2022 ICC.

Supporting Trinidad and Tobago's Transition to a Sustainable Blue Economy

Rahanna Juman, PhD
Director (Ag.),

Workshop participants together with the Honourable Pennelope Beckles, Minister of Planning and Development (center in blue)

The Sustainable Blue Economy Transition Framework-Rapid Readiness Assessment Workshop was hosted at the Institute of Marine Affairs on October 18-19, 2022. The workshop, which was opened by the Honourable Pennelope Beckles, Minister of Planning and Development, was attended by stakeholders from across government, academia, non-governmental organisations and private sector with interest in fostering a sustainable blue economy for Trinidad and Tobago.

Across the world, there is growing awareness about the blue economy as a potential source of economic diversification and growth. The blue economy construct centres on developing ocean-based activity while emphasising improved human well-being, social justice and equity, ensuring conservation of natural resources and ecological sustainability. Currently, the approaches to ocean governance are fragmented and non-strategic, generating outcomes in which economic development can result in long-lasting damage to the social fabric of coastal communities, as well as to ocean and coastal ecosystems. Transitioning to a Sustainable Blue Economy (SBE) can support progress towards the UN Sustainable Development Goals and preserve the ocean's environmental, social and economic benefits for future generations.

As part of the United Nations Environment Programme's (UNEP's) work to promote and enable a SBE, UNEP has developed a prototype Sustainable Blue Economy Transition Framework to support countries and stakeholders to identify and develop tangible actions and opportunities to transition towards a SBE.

The Honourable Pennelope Beckles, Minister of Planning and Development (third from L), Dr Rahanna Juman, Director (Ag.) (second from L) with Commonwealth representatives Mr Subaskar Sitsabeshan (L) and Dr Jeff Ardron (R)

To assess a nation's readiness to embark on the transition to a SBE, a 'Rapid Readiness Assessment' (RRA) has been developed by the project partners: Howell Marine Consulting (HMC), the Commonwealth Secretariat (ComSec), and the University of Portsmouth (UoP), in partnership with UNEP. The project is being coordinated under the Commonwealth Blue Charter programme and the Governments of Trinidad & Tobago and Antigua & Barbuda have agreed to trial the RRA, receive the results, and work with expert analysts to better understand the possible next steps for a SBE transition.

The purpose of the workshop was to support Trinidad & Tobago to:

- Collectively understand the current situation in relation to a Sustainable Blue Economy (SBE)
- Identify direction of travel and key steps needed to improve the existing Blue Economy
- Assess readiness for taking forward the Transition Framework approach
- Develop a plan of enabling actions to advance the transition.

The pilot RRAs will consider the following indicators of readiness:

- Institutional infrastructure & culture
- Laws and policies
- Sustainable finance
- Leadership
- Stakeholder engagement and coalitions
- Data, baselines, monitoring & analysis
- Transformative strategies

Through a series of engagements, including virtual and in-country stakeholder workshops and interviews and informed by desk-based analysis, the RRA process will result in individual country SBE readiness assessment reports which will:

- Identify the need for change (what the SBE-TF can do for the nation); and,
- Propose actions to reach a state of readiness; or,
- Identify enabling actions, resources and next steps needed to start the SBE-TF process.

The Development of a Lionfish Fishpot Fishery in Tobago, W.I.

Farahnaz N. Solomon , PhD
Research Officer, F&ARP

Diver culling lionfish
Photo credit: Ron Tiah

2022 marks ten years since the invasive lionfish was first sighted in Tobago's waters. First introduced from the Indo-Pacific into the Atlantic, in Florida waters in the late 1980s, it took less than 30 years to spread to parts of the eastern US, throughout the Gulf of Mexico and the Caribbean. With ideal invader characteristics such as the ability to occupy a wide range of habitats and water depths, a fast growth rate, early size at maturity and high fecundity, the lionfish invasion of the Atlantic is regarded as one of the most successful marine invasions in recent times. Impacts result mainly from its voracious, generalist appetite negatively impacting native fish populations including those of commercial and ecological importance, with downstream impacts on coral reef health and the fisheries and tourism sectors they sustain – especially on many of the small Caribbean islands such as Tobago.

Pterois Volitans, Lionfish

Following its sighting locally, the Institute of Marine Affairs took the lead in controlling and managing the invasion through scientific research and public education and awareness. Many of these activities were implemented under a Green Fund Project "The Control and Management of the Invasive Lionfish in Trinidad and Tobago" during 2014 – 2020.

Like with any marine invasion however, long-term monitoring and control is needed and the IMA continues to take a lead role with a follow-up Green Fund Project 'The Development of a Lionfish Fishpot Fishery in Tobago, W.I.' This project which commenced in September 2022, focuses on modifying the existing fishpot design in Tobago to increase the capture of lionfish and to facilitate removal in areas (deeper waters) not accessible by recreational divers.

Other essential activities in this project include: lionfish population density surveys at sites around Tobago, which would give an update of the population levels and determine strategies for long-term control; the determination of possible impacts of the invasion on native fish populations through stomach content analysis; and heavy metal testing of lionfish to ensure that its safe for human consumption.

Field work will commence in February 2023, kicking off with stakeholder interviews in Tobago, followed by the population density surveys. To learn more about the project and to keep updated on the latest project activities, visit the IMA's social media platforms and our website, where we will provide regular updates.

Marine Technician dissecting lionfish

Protecting Tobago from Stony Coral Tissue Loss Disease

Cruise ship season is here again after a long break due to the COVID-19 pandemic. As we welcome visitors to experience our beautiful twin islands, there is one passenger we hope is not on board any cruise ship - the lethal pathogen that causes Stony Coral Tissue Loss Disease (SCTLD)! This pathogen can be transported via ballast water in ships and is extremely virulent causing its own underwater coral epidemic having already decimated coral reefs in the region.

Potential spread of SCTLD

When a ship is preparing for a voyage, it often takes in saltwater into large holding tanks in its base to help with stabilisation. When the ship reaches its destination, it discharges this ballast water into the sea at the new site. This can result in the rapid spread of invasive species, bacteria, and other pests which can harm our valuable coastal ecosystems. Many countries, including Trinidad and Tobago, have agreed to join the International Convention for the Control and Management of Ships' Ballast Water and Sediments, which stipulates that all ships must have a ballast water treatment plan. In Trinidad and Tobago, the Shipping (Marine Pollution) Bill (2004) is presently being updated and represents National Legislation towards management of Ballast Water.

Common ballast water treatment strategies include mechanical filtration, oxygen reduction, ultraviolet (UV) radiation, chemical treatment, ozonation or a combination of methods. According to regional ballast water requirements, the exchange or discharge of ballast water must be done at least 50 nautical miles from shore, at a depth no less than 200 metres.

What is Stony Coral Tissue Loss Disease (SCTLD)?

In 2014, scientists observed hard corals losing tissue and dying at alarming rates in Florida. As the situation worsened, scientists suspected that the disease is caused by bacteria, although the exact cause is still unknown. Infected hard corals usually develop multiple lesions where tissue begins to slough off the coral, hence giving the name Stony Coral Tissue Loss Disease. Tissue loss occurs rapidly, and corals can die within a few days to weeks.

Fig 1 Ship discharging ballast water (Photo credit: iStock)

This disease affects approximately 20 hard coral species present in the Caribbean region. The coral species primarily affected include the pillar coral, the symmetrical brain coral, the boulder brain coral, boulder star coral and the lettuce coral. All these species are found in Tobago with the latter four being very common on our reefs. So far, SCTLD does not affect finger corals or the endangered elkhorn and staghorn corals. The pathogen can be transmitted via direct contact with an infected colony or through the water column. Once present, it spreads rapidly across coral reef sites.

Although SCTLD has not yet been recorded in Trinidad and Tobago, it may be more a matter of "when" it arrives rather than "if" it arrives. Currently, the Institute of Marine Affairs (IMA) monitors the health of ten coral reef sites around Tobago on an annual basis and assesses disease presence and prevalence.

As we continue to host cruise ships, it is crucial that we ensure ballast water rules are followed, especially as these tours tend to island-hop through the Caribbean where many islands are now affected by the disease. Oftentimes, the reefs where the disease is first observed are located close to ports.

As of December 2022, 26 countries in the region are affected by SCTLD, with Grenada being the nearest affected island. Notably, recent data published by marine scientists at the University of Miami indicates that UV radiation as a treatment for ballast water to kill SCTLD pathogens is not as effective as presumed.

SCTLD emergency response teams throughout the region have been activated, spearheaded by the National Oceanographic and Atmospheric Administration's (NOAA) Coral Reef Conservation Program and the Atlantic and Gulf Rapid Reef Assessment (AGRRA) organisation. These agencies aid in capacity building, education, and training in SCTLD identification,

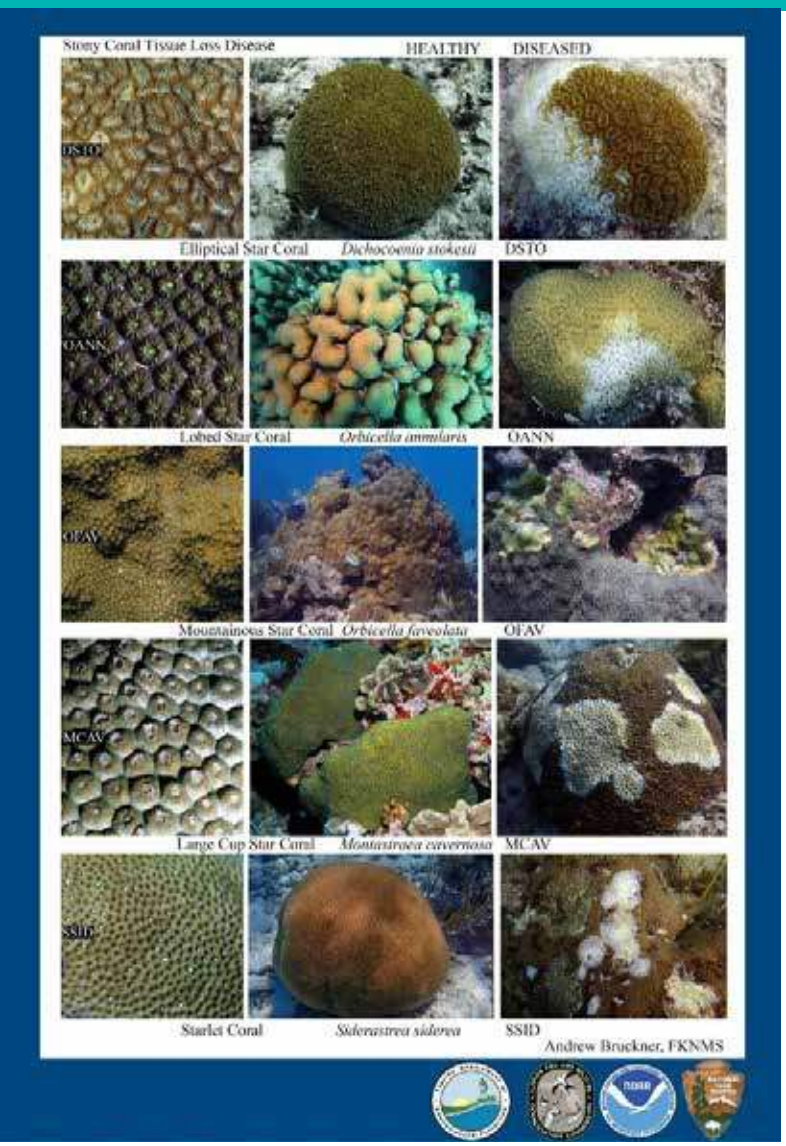


Fig 2 Infographic of corals affected by SCTLD (Photo credit: Andrew Bruckner, Florida Keys National Marine Sanctuary)

monitoring and treatment. Currently of the 26 countries affected by SCTLD, 12 countries are engaged in administering antibiotic treatments to affected coral colonies. This involves actively applying broad-spectrum antibiotic paste onto the corals in hopes that it will reduce the spread of disease and lower coral mortality rates. Though successful in some territories, it is an expensive and very labour intensive

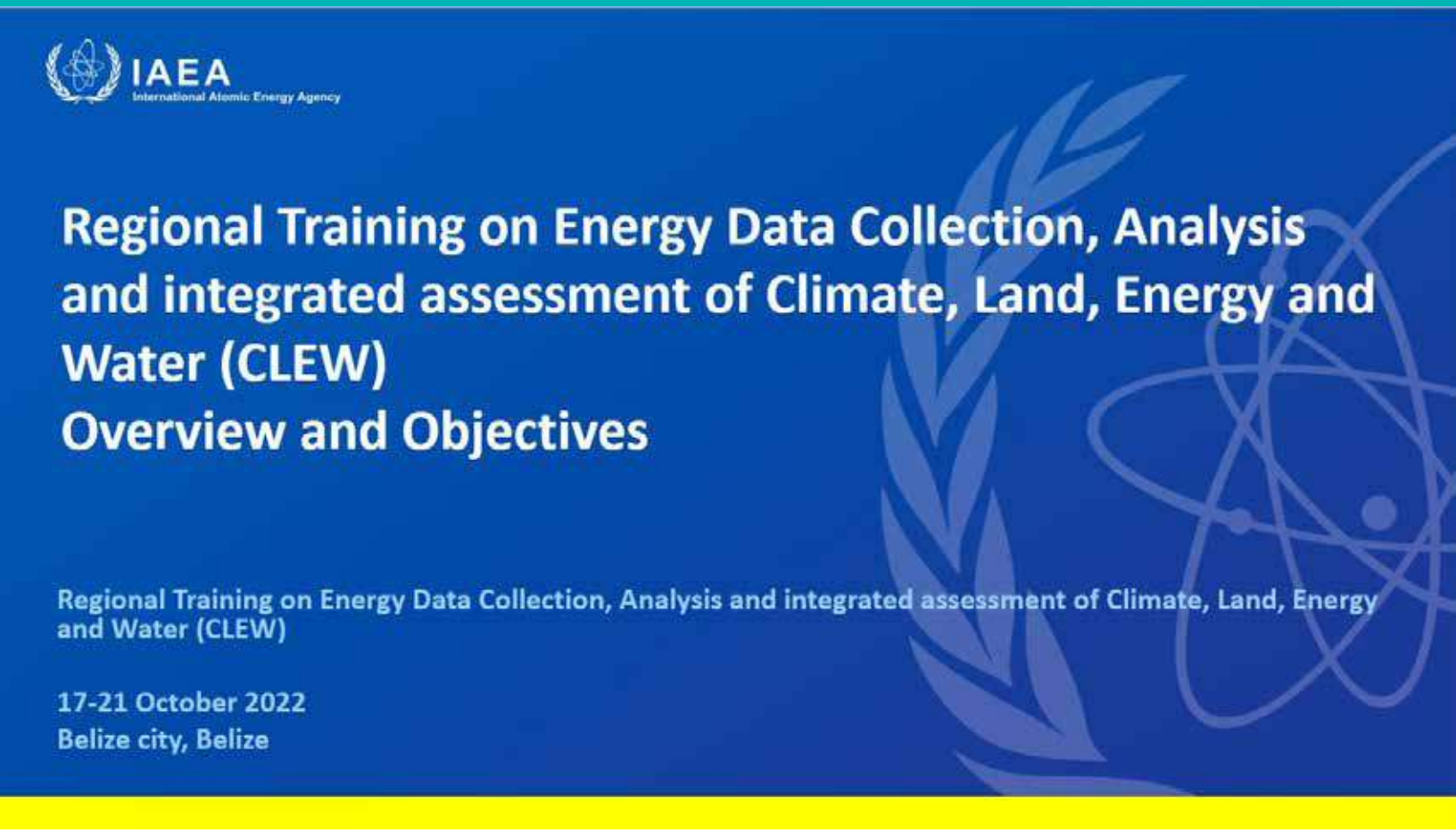
What else can we do?

Keep a look out! If snorkelling or diving in Tobago and you observe something you think may be SCTLD, snap a picture if possible and submit a report to the IMA directly or via the SeaiTT app (available for free on the PlayStore). Reports will be investigated. Early detection will allow for monitoring, and treatment strategies can be implemented as soon as possible.

Important to note, SCTLD may be confused with coral bleaching as the coral appears white in both instances as the coral skeleton is exposed. However, bleached coral usually has visible tissue remnants whereas in SCTLD infected corals, tissue would be completely dead or sloughed off the coral, comparable to skin falling off bone. The rate of tissue loss and mortality is much faster in SCTLD affected corals. Bleached corals are usually only observed during periods of higher water temperature, whereas SCTLD is active throughout the year and is often more virulent in winter months. Additionally, do not touch infected corals and clean gear! If you have snorkelled or dived on reefs in other islands affected by SCTLD, ensure your gear is properly rinsed and bleached to prevent cross contamination of the disease at other sites. Gear should be cleaned between sites and before diving in another country.

While these fragile coral reef ecosystems face so many threats, we must still acknowledge what we gain from them and cherish the roles they play ecologically, socially, and economically. By raising awareness, we must do what we can to protect our own resources as nobody else will do it for us. After all, “We will only conserve what we love, we will only love what we understand, and we will only understand what we are taught”- Baba Dioum, 1968.

Fig 3 Map showing locations of SCTLD outbreaks within the Caribbean region.
Green= SCTLD absent at this site,
Red= SCTLD present at this site,
Yellow= SCTLD may be present at this site and
Purple= New submission of SCTLD report- under review
(Photo credit: Kramer et al., 2019)



Energy Data Collection, Analysis and Integrated Assessment of Climate, Land Energy and Water

The International Atomic Energy Agency (IAEA) seeks to assist member states in reinforcing national capabilities to conduct energy system analysis so that countries can assess options, and develop their own sustainable energy strategies. As part of the IAEA project 'Using Nuclear Techniques for Climate Change Adaption and Mitigation', a Regional Training workshop on Energy Data Collection, Analysis and Integrated assessment of Climate, Land, Energy and Water (CLEW) was held from October 17-21, 2022 in Belize City, Belize and was hosted by the Belizean Ministry of the Environment and Sustainable Development. The workshop aimed to support the development of local capacities and skills for the integrated assessment of Climate, Land, Energy and Water (CLEW). Ms Nikia Gooding, GIS Officer represented IMA at this workshop.

The CLEW framework also known as the nexus approach to energy modelling and system assessment provides a mechanism to:

- bring together experts and decision makers across sectors;
- provide insights into key inter-linkages and dynamics of the climate-energy-food-water nexus;
- generate robust findings to support cohesion in policies and actions; and
- build capacity for energy system assessment

Some countries that have benefitted from Capacity Building in CLEW from 2016-2021 were: Mauritius, Nicaragua, Paraguay, Uganda, Bolivia, Costa Rica, Ghana, Mexico, Vietnam, Cameroon, Ethiopia, Mongolia, Senegal and Indonesia.

The workshop objectives:

- Conceptual understanding of the CLEWs framework and its methodologies
- Knowledge on the data requirements for CLEWs analysis
- Familiarity with the MESSAGE tool and its most important parameters and variables
- Practical experience in data preparation, model building, data entry and scenario design for CLEWs model: demonstration case with MESSAGE
- Exchange of experiences

Instruction took the form of lectures in the morning and the practical sessions with modelling software to mirror the lecture topics covered in the morning period. The hands-on afternoon sessions were particularly helpful as it demonstrated the application of the theory in terms of introductions of variables or inclusion of climate change scenarios and their impacts.

Thematic Focal Areas included:

- Energy Sector - Renewable sources, demand, and technologies
- Land use Modelling – agriculture focused and biofuel production
- Water use Modelling – water use interactions with different resource systems (water availability under climate change impacts), desalinisation and hydropower
- GHG emissions and assessing climate change impacts on energy and other systems

Collaborative agencies include:

- UNDESA – CLEW work (Thomas Alfred)
- OLADE – Energy Information Systems: Support to energy planning and decision making oriented on energy transition in LAC (Adrian Moreno)
- CCREEE – Integrated Resource and Resilience Planning Programme

Potential Possibilities and Application to the IMA

IMA's unique scope places research at a juxtaposition to be afforded a myriad of capacity and network building opportunities. Using past GHG inventory workshops and engagements with the EPPD, the IMA can negotiate with the IAEA for further training with national bodies where the CLEW framework can be applied and implemented in daily activities. Its integration in MESSAGE has demonstrated a wealth of utility. Its application as a credible source for climate change and spatiotemporal analyses for land use and water modelling in the energy sphere provides a valid perspective and output. For instance, forested areas are seen as a negative GHG emission source. This bolsters our argument for conservation as it now illustrates a data modelling output to support the stance of protecting our national carbon sinks.

IMA attends FAO meeting on reporting & conservation measures in the Marine Fisheries Sector

The Food and Agriculture Organisation (FAO) of the United Nation held a Workshop in Rome, Italy from 18-19 October 2022 on Identifying, Assessing and Reporting on Other Effective Conservation Measures (OECMs) in the Marine Fisheries Sector.

The aim of the workshop was to review the draft document "A Handbook for Identifying, Assessing and Reporting on Other Effective Conservation Measures (OECMs) in Marine Fisheries" previously prepared by the Fisheries and Aquaculture Division of the FAO and to seek feedback on its content and format. Selected invitees to this workshop were experts who actively work – or have the capacity – to support stakeholders in evaluating potential Fisheries OECMs against the OECM criteria in a specific country or set of countries. Participants represented countries in each major region of the world and crossed cultures and genders. Ms. Rosemarie Kishore, Senior Research Officer in the Fisheries and Aquaculture Research Programme, was invited by the FAO to participate in the Workshop.

OECMs is a relatively new concept and was formally defined by the Convention on Biological Diversity (CBD) at the 14th CBD Conference of the Parties in 2018 as "a geographically defined area other than a Protected Area, which is governed and managed in ways that achieve positive and sustained long term outcomes for the in situ conservation of biodiversity, with associated ecosystem functions and services and, where applicable, cultural, spiritual, socioeconomic, and other locally relevant values." There is particular interest in the role OECMs can play alongside more traditional protected areas in achieving global marine biodiversity conservation targets.

Marine conservation is critical to all sustainable development efforts and initiatives. The use of spatial management and area-based management tools (ABMTs) to target sustainable use and conservation simultaneously have both received considerable attention, especially within the Convention on Biological Diversity (CBD).

The fisheries sector has been utilising management measures, including ABMTs that aims to maintain ocean health, richness and productivity. Some fisheries ABMTs that may qualify as fisheries OECMs include vulnerable marine ecosystems, area-based fishery closures, community-based areas and territorial use rights areas, rotational closures and seasonal closures, gear-restricted areas and Marine Conservation agreements (MCAs). The latter though is more of a framework for ABMTs of various types, and are contractual arrangements that aim to achieve ocean or coastal conservation goals that take place in prescribed spaces.

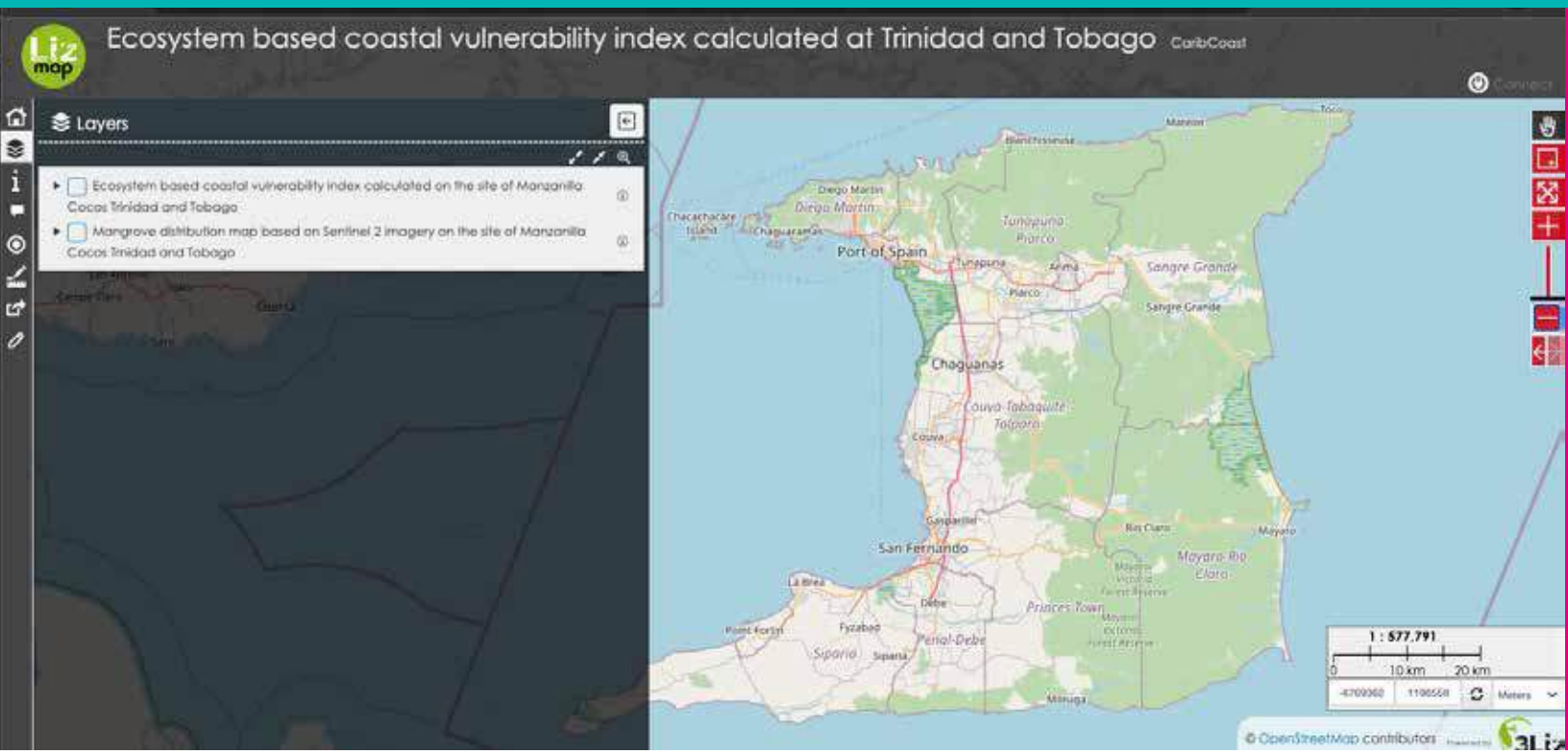
The application of these fisheries ABMTs into the creation of fisheries OECMs based on the newly defined criteria by the CBD has the potential for these fisheries initiatives to not only contribute to fisheries management but also to contribute jointly to biodiversity conservation goals and SGDs. It will give the fisheries sector, including agencies, fishers, and communities, the recognition they deserve for the contribution they make to conserving biodiversity. Recognizing these contributions will allow countries to advance toward targets and make commitments but it will also help mainstream biodiversity in fisheries management, and help foster fisheries sector engagement in conservation discussions and actions (reciprocal mainstreaming).

Fisheries OECMs that align with the CBD definition and criteria can be reported to the CBD and to the World Database on OECMs (WD-OECM), and therefore count towards CBD spatial coverage targets. These include the former Aichi Biodiversity Target 11, and the new area-based target under the Post-2020 Global Biodiversity Framework. In addition, qualifying Fisheries OECMs can show that progress is being made towards other global targets such as the SDGs, as well as national environment and development goals.

The operationalisation of OECMs will evolve over the next decade. However, targeted sector-specific guidance in various formats and languages continues to be needed. The Handbook is designed to help the fisheries sector take the first step towards operationalizing OECMs, by clarifying how to identify existing management measures that could be designated as OECMs.

The guidelines outlined in this handbook is intended to help countries and agencies by laying out a simple process to move forward with Fisheries OECM identification, addressing any confusions that arise, and highlighting important considerations. The primary intended audience for the handbook includes fisheries management agencies and the stakeholder groups and rights holders with whom they work. However, it is also meant to be useful for policymakers and marine managers, the fishing industry, other maritime sectors, scientific advisors to government (and intergovernmental bodies), fisheries and conservation scientists, marine planners, civil society and communities.

The handbook has now been finalised and is available on the FAO website. Here is the link to download it: https://www.fao.org/documents/card/en/c/cc3307en



Screenshot of map/interface "Ecosystem based coastal vulnerability index calculated at Trinidad and Tobago", via https://www.carib-coast.com/en/project-deliverables/

Final Steering Committee Meeting of the INTERREG Caribbean "CARIB-COAST" (Caribbean Network for Coastal Risks related with Climate Change) Project

Dr. Rahanna Juman, Director (Ag.) and Mr. Lester W. Doodnath, Project Implementation Officer attended the final Steering Committee Meeting of the CARIB-COAST Project from 12-14, October 2022 at the Créole Beach Hotel, Gosier, Guadeloupe. In fact, they were the only non-French Caribbean attendees.

Carib –Coast was a collaborative project led by the French Geological Survey (BRGM) and financed by the European program INTERREG Caribbean that ran from November 2018 to October 2022. Its ambition was to pool, co-construct and disseminate monitoring and coastal risk prevention approaches and adaptation to climate change. The associated challenges primarily concern the safety of goods and persons, but also the tourism economy linked to the preservation of beaches and the natural heritage of these interface environments, rich in biodiversity (mangroves, coral reefs, sea grass beds).

Its major deliverable is a Coastal Vulnerability Platform that can be viewed at https://www.carib-coast.com/en/

Dr Juman did an interview highlighting IMA's interaction with the Carib Coast activities and the need for further regional collaboration when it comes to addressing risks associated with climate change impacts. On the 1st day there was the official opening and then the subsequent presentation of the results. On the 2nd day, there was a field visit to a beach that had been impacted by Sargassum influx and beach erosion and was a pilot site for soft mitigation measures-planting of beach vegetation.

While in Guadeloupe, the IMA team visited staff at the Regional Activity Centre (RAC) for the Specially Protected Area and Wildlife (SPAW) Protocol under the Cartagena Convention to discuss possible collaboration on project on Sargassum, marine mammals and turtles.

Welcome back, Dr. Kahlil Hassanali !

Kahlil Hassanali, a long-standing employee and researcher at the Institute of Marine Affairs (IMA), recently earned his PhD in Maritime Affairs from the World Maritime University (WMU) in Malmö, Sweden. Kahlil took study leave from the Institute in September 2019 to begin his PhD journey and returned in November 2022 having successfully graduated in October 2022. Prior to beginning his PhD studies, Kahlil was a coral reef researcher at the IMA before transitioning into the field of marine policy and governance.

A scholarship from the World Maritime University's Sasakawa Global Ocean Institute, under its Land to Ocean Leadership Program, brought Kahlil to the southern Swedish coastal city of Malmö. There he examined the negotiation of a new international agreement being developed under the United Nations Convention on the Law of the Sea on the conservation and sustainable use of marine biological diversity in areas beyond national jurisdiction (the BBNJ agreement). He explored the Caribbean Community's (CARICOM) engagement in the negotiations from a blue economy perspective.

Completing the PhD was, of course, not without challenges. Adjusting to the Swedish climate and culture was made easier because of the international character of WMU and the fact that there were many Caribbean friends in his cohort. Perhaps, the biggest challenge was the COVID-19 pandemic which caused a delay in the formal negotiation process of the BBNJ agreement for two years. This inevitably forced Kahlil to adapt his research and pivot to suit the fluid and often uncertain circumstances.

At the end of it all however, Kahlil is now delighted to be back in Trinidad and Tobago and the IMA and is eager to continue helping improve ocean governance in the country and wider region. He is also excited to help CARICOM and the international community conclude negotiations of a fair, equitable and progressive BBNJ agreement, hopefully in March of 2023.

A link to Kahlil's PhD thesis can be found here:
https://bit.ly/3vDX5Ce

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THE BLUE CORNER

A Christmas tree that is a worm

The Christmas tree worm, also known as Spirobranchus giganteus, won't be consuming your presents this year. These worms' popular name is based more on how they look than where they live or what they eat.

Two colourful crowns protrude from the tube-shaped bodies of each worm. The radioles, or hair-like appendages that radiate from the worm's central spine, are what make up these crowns that resemble Christmas trees. These appendages are utilized for breathing and for catching food, which is often small plants floating in the water, or phytoplankton.

Since these worms are sedentary, once they choose a location they enjoy, they don't move around much. The majority of these worms' bodies are really rooted in burrows that they bore into live coral, despite the fact that their beautiful crowns are visible. Christmas tree worms quickly retreat into their burrows to hide from potential predators when frightened.

Christmas tree worms are available in a range of vivid hues. They are not particularly large, measuring about 3.8 cm on average. However, these worms are easy to identify due to their unique shape, attractiveness, and colour. They are among the most well-known polychaetes, or segmented marine burrowing worms, on the planet.

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