INSTITUTE OF MARINE AFFAIRS

Annual Administrative Report

October 2016 - September 2017

Institute of Marine Affairs
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IMAgovTT

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VISION

To be the premier marine research organisation in the Caribbean

MISSION STATEMENT

To conduct and foster research and to provide advice for the sustainable management of the coastal and marine areas and resources of Trinidad and Tobago

ACKNOWLEDGEMENTS

The achievements highlighted in the Annual Report were made possible by the hard work and commitment of Management and Staff. I acknowledge and express my sincere gratitude to Management, Research and Support Departments, who generously gave of their time to provide valuable information, support and overall contributions in the preparation of this Annual Report.

HER SIGNATURE
Mrs. Toylan Arneaud
Director, IMA (Ag.)

BOARD OF GOVERNORS

CHAIRMAN

- HAYDEN ALEXANDER

MEMBERS

- Governor Nadia Jardine
- Governor Ricardo Alfred, Deputy Chair,
- Governor Paul Gabbadon,
- Chairman Hayden Alexander,
- Governor Dave Elliot
- Governor Andrea Julien

'The Honourable Camille Robinson-Regis, Minister of Planning and Development (centre) is flanked by IMA Board Members in July 2017.

(L-R) Paul Gabbadon, Andrea Julien, Hayden Alexander (Chairman), Ricardo Alfredo, Nadine Jardine, Dave Elliott

Chairman's Remarks

I am pleased to present our Annual Report for the fiscal period ended September 2017. This year, there were a few milestones beginning with the installation of the Institute's seventh Board of Governors in July 2017, since Act No. 13 of 1990 streamlined the structure of the Institute. From inception, the Board of Governors (BOG) moved to fill management positions within the organisation in order to facilitate delivery critical of the Government's policy directions for the environmental sector.

It is expected that the new management team will begin the task of planning, evaluating and steering the activities of the Institute's to bring about greater alignment between the organisation's research work and the Governments 2030 development agenda as well as signal to the national community, the importance and relevance of the IMA's policy recommendations and research initiatives. The development of a strategic plan for the period 2018-2023 was therefore a key deliverable tasked of the newly appointed management team.

The Institute delivered and published the first ***State of the Marine Environment Report of the Republic of Trinidad and Tobago 2016 (SOME 2016)*** report in October, 2017. The report was well received by the Executive which mandated the compilation of future such documents, biennially. It is noteworthy that in the absence of policy direction during the period without a sitting Board, the Acting Director and Senior Officers of the Institute continued to deliver on its mandate our Government and people of Trinidad and Tobago. The BOG commends the Acting Director and Senior Officers of the Institute for their commitment to the sustainable management of our marine resources through the policy advice advanced to the nation's decision makers.

The period also saw the IMA embarking on many research initiatives and collaborative projects with the private sector in fiscal 2017; most notably, a public-private sector partnership with Microsoft and Fujitsu to develop a Proof of Concept which saw the installation of a buoy fitted with various sensors to collect and transmit water quality data, real time. The IMA also collaborated with Sustain T&T to produce two short narrative videos to raise awareness on marine litter. The IMA is also proud of its accomplishment of being recognized at the Regional Activity Centre (RAC) for land-based sources of pollution under the Caribbean Environment Programme of the United Nations Environment Programme (UNEP) following the successful staging of a regional Workshop for the United Nations Development Programme (UNDP) and the Global Environmental Facility (GEF) project entitled Catalysing Implementation of the Strategic Action Programme for the Sustainable Management of Shared Living Marine Resources in the Caribbean and North Brazil Shelf Large Marine Ecosystems (CLME).

The Board is cognizant that consultation and stakeholder engagement are important to the public awareness and education function of the IMA. The Board has applauded the IMA's hosting of community research symposia for the period under review. These community symposia disseminated pertinent information on the marine environment to our fisherfolk, coastline communities, academia, Government and the private sector.

Much was accomplished in fiscal 2017 and the Board of Governors looks forward to working with the management and staff of the IMA to provide world class services, information products and policy advice to the Government and people of Trinidad and Tobago.

Mr. Hayden Alexander
Chairman
Board of Governors
Institute of Marine Affairs

Director's Remarks

On behalf of Management and Staff of the Institute of Marine Affairs (IMA), I am pleased to present the Institute's Annual Report 2016-2017. In accordance with Section 66 A-D of the Constitution of the Republic of Trinidad and Tobago and Act No. 29 of 1999, this Annual Report attempts to inform the Ministry of Planning and Development and the public of its research outputs and achievements for the fiscal period October 2016 to September 2017.

Despite budgetary limitations and operating in the absence of a Board of Governors for the majority of the period under review, the IMA had another productive year, thanks to the efforts of our Management, Research and Support Departments.

The first State of the Marine Environment (SOME) Report for Trinidad and Tobago was launched in May 2017. This report provided a comprehensive and scientifically based assessment of the overall condition of Trinidad and Tobago's marine and coastal environment. We were privileged that our line Minister, The Honourable Camille Robinson- Regis, Minister of Planning and Development, attended the launch and applauded the IMA for this report. An action plan to address the issues highlighted in the SOME and an Inter- ministerial Committee to oversee the implementation of the plan was approved by Cabinet.

Ongoing monitoring and research on along the coastal and marine environments of the country proceeded as planned for fiscal 2017. Research was conducted in the following thematic areas of Biodiversity and Ecology; Fisheries and Aquaculture; Oceanography and Coastal Processes; Environmental Quality and Geomatics. In addition, the Institute partnered with the Marine Biological Laboratory (Woods Hole), Boston, and conducted isotopic analysis of nitrogen species to determine the source, transport and fate of nutrient pollutant in the Caroni River Basin. The results of the research and monitoring conducted were presented at two community research symposia: Chatham in March and Mayaro in September 2017. There, the IMA delivered meaningful presentations and engaged the community, district secondary schools and fisherfolk.
The Board of Governors (BOG) was installed on 27th July 2017 and began working assiduously to plan the strategic direction of the Institute.

Our public awareness, outreach and educational programs continued to broaden in scope with the utilisation of social media, as this year saw the first ever Lionfish Tasting Event, which was streamed live from the Brian Lara Promenade. Over one hundred (100) persons not only became aware of the impact of this invasive species, but also tasted some of the lionfish which was caught and prepared by and enthusiastic diving community and the staff of the IMA. Another significant highlight was the production of two short narrative videos pertaining to marine pollution entitled ***'Nature Man'*** and the ***'Bottle'*** were produced in the period. These videos were launched at the 7th Edition of the Green Screen, which was organised by Sustain T&T. The Information Centre engaged over fifty (50) schools, at primary and secondary levels, and over three hundred (300) students benefitted from lectures and presentations on the topics of Marine Pollution, Lionfish (an invasive specie), Coral Reefs, Eutrophication and Mangroves.

The support departments worked diligently to help sustain the research activities and to maintain the facilities. In 2017, the auditorium at the Institute's head office was refurbished and the IMA moved closer to making a field station in Tobago a reality.

Looking ahead, we acknowledge that we have more work to do as we continue to address marine and coastal issues in our twin nation. Collaboration with our stakeholders is key. Provision of timely and accurate data, relevant information products and advice to support government agencies, civil society and environmental organisations are paramount, as we continue to strive to sustainably manage Trinidad and Tobago's marine and coastal resources for the benefit of the nation.

Mrs. Toylan Arneaud
Director (Ag.)

ABBREVIATIONS AND ACRONYMS

BWM	Ballast Water Management
CARICOMP	Caribbean Coastal Marine Productivity
CEHI	Caribbean Environmental Health Institute
CREWS	Coral Reef Early Warning System
GEF	Global Environment Facility
GIS	Geographic Information Systems
F&ARP	Fisheries and Aquaculture Research Programme
FOI	Freedom of Information
IAS	Invasive Alien Species
ICC	International Coastal Cleanup
ICZM	Integrated Coastal Zone Management
IFREMER	Institut français de recherche pour l'exploitation de la mer (French Research Institute for Exploitation of the Sea)
IMA	Institute of Marine Affairs
LB-IMTA	Land Based Integrated Multi-trophic Aquaculture
LBS	Land Based Sources
MSP	Marine Spatial Plan
NOSCP	National Oil Spill Contingency Plan
OCP	Oceanography and Coastal Programmes
PAHS	Polycyclic Aromatic Hydrocarbons
PBBS	Port Biological Baseline Survey
RAS	Recirculating Aquaculture System
UNEP	United Nations Environment Programme
UWI	University of the West Indies

1.0 RESEARCH PROGRAMMES

Research block at IMA

INTRODUCTION

The Institute of Marine Affairs (IMA) is a multi-disciplinary coastal and marine research organisation in the Caribbean Community (CARICOM) established "to develop and implement programmes and projects that translate the marine and related policies of the Government into activities that contribute to national development" of the Government of the Republic of Trinidad and Tobago. The IMA has pioneered and participated in numerous research programmes both locally and regionally.

During the **2016-2017** fiscal year, research was conducted under five programmes, namely: Biodiversity and Ecology; Fisheries and Aquaculture; Oceanography and Coastal Processes; Environmental Quality and Geomatics. The study following areas were explored:

i. Coastal Geology;
ii. Microbiology;
iii. Marine Ecology (benthic, wetlands and coral reefs);
iv. Fish Biology;
v. Aquaculture; and
vi. Geographic Information System (GIS)

The IMA has state-of-the-art research equipment, laboratories, vessels (one 14 metre vessel for near-shore oceanographic work and 3 smaller vessels for wetlands research, thirteen (13) vehicles, 2 licensed boat trailers) and a commercial-scale marine and freshwater aquaculture re-circulating system, all of which enable delivery of the IMA's mandate.

RESEARCH ACTIVITIES

1.1 BIODIVERSITY AND ECOLOGY RESEARCH PROGRAMME

The Biodiversity Research Programme conducts fundamental and applied research on wetlands (mangroves and seagrasses), coral reefs, benthic communities, invasive marine species, taxonomy and marine policy. The benefits of this programme to the Government and people of Trinidad and Tobago include the provision of up-to-date data and information on the state of marine ecosystems inclusive of mangrove forests, seagrass beds, coral reefs, and the beaches and the bays of Trinidad and Tobago for the purpose of apprising policy makers of appropriate management interventions to conserve these vital resources. Data from these research efforts adds to the international body of knowledge and supports the Institute's biennial reporting on the state of the marine environment and the Environmental Management Authority's State of the Environment report.

Checkered Pufferfish, Sphoeroides testudineus, Scotland Bay, Trinidad - Erin Fedewa

Additionally, the ongoing monitoring of selected mangrove systems around Trinidad and Tobago to determine anthropogenic or climate change related impacts on these systems, are critical to providing the most up to date information to inform planned coastal development, particularly those areas earmarked in around Northeast and South Trinidad, such as Moruga.

1.1.1 CARIBBEAN COASTAL MARINE PRODUCTIVITY (CARICOMP)

The Caribbean Marine Productivity Monitoring Programme (CARICOMP) began in 1992 as a regional programme to determine the dominant influences on coastal productivity in the Caribbean Region and to discriminate between human disturbances and long-term natural variation. Caribbean countries including Trinidad and Tobago have conducted standardised, synoptic sets of measurements of the structure, productivity and associated physical parameters of relatively undisturbed coral reefs, seagrass beds and mangrove swamps. Though the network is no longer active, the IMA continues to monitor sites within the Buccoo and Bon Accord Lagoon Marine Park. The project was expanded in 2008 to include monitoring of the Speyside Reef for climate change impacts. In November 2013, two Coral Reef Early Warning Systems (CREWS) were installed at Speyside and Buccoo Reefs. A regional assessment of the physical characteristics of CARICOMP sites were also undertaken during this fiscal year. The Coral Reef Programme not only establishes a baseline, but also monitors spatial and temporal changes and enhances our understanding of coral reef response to environmental changes. The programme contributes to research literature on our coral reef communities and marine ecosystems. Information from this research programme provides decision and policy makers with the necessary tools to enable evidence-based management of our marine ecosystems in Trinidad and more so, Tobago.

1.1.2 MONITORING OF THE SEAGRASS COMMUNITIES AROUND TRINIDAD AND TOBAGO

An inventory of the seagrass communities around Trinidad and Tobago was completed in 2001 and a monitoring programme was developed and implemented in 2002. Seagrass density, biomass and areal productivity were monitored at sites around Tobago, four times per year. In 2006, the monitoring programme was expanded to include water quality sampling. For the period under review, the seagrass macrobenthic community was surveyed in William's Bay, Trinidad and compared to a baseline survey conducted in 2008. The data derived from this project was used to determine the status of seagrass communities around Trinidad and Tobago and analyse the health of those communities longitudinally. This led to two peer-reviewed scientific publications. These publications addressed the functioning, status and trends in the health of the benthic communities as well as provided information regarding potential anthropogenic impacts on these seagrass communities. This research project aligns with Goal 1 (strengthening of environmental governance and management systems)– Theme V (Placing the Environment at the centre of social and economic development) of the Vision 2030 National Development Strategy. The research reports and data will contribute to the review of the national environmental policy and update of the relevant legislative framework.

1.1.3 MONITORING OF CORAL REEFS

Baseline studies on coral reefs in Tobago were conducted in the 1980's and repeated again in 2008. Arising from the recommendations of the 2008 report, a monitoring programme was developed, which included a high resolution examination of the stability of the coral community structure and the demography (recruitment, growth, survivorship, etc.) of major coral reef organisms on an impacted systems; specifically the Buccoo Reef, the Culloden Reef, and the reef system at Speyside Reef. Additional monitoring of coral sites at Charlotteville, Castara and Plymouth were established in 2015. Fish, macroalgal and macroinvertebrate (principally including corals, gorgonians and sea urchins) populations were studied at the same permanent transects on an annual basis, and annual monitoring reports were produced providing insight into the dynamics of coral reef communities. The data and detailed analyses derived from this project correspond to and support effective management strategies that would increase coral reef resilience to climate change, thereby contributing to Goal 3 (Climate Vulnerability Assessment) of Theme V of the Vision 2030 National Development Strategy. The overall information garnered from the project would also support management efforts to protect coastal and marine areas, which is aligned with Goal 5.2 (Protection of coastal and marine areas through the development of an integrated coastal zone management plan) and 5.4 (reduction in the loss of natural habitats) of Theme V (Placing the Environment and the centre of social and economic development) of the Vision 2030 National Development Strategy; and, significantly contribute to national efforts to effectively manage biodiversity, which is aligned with Goal 5.3 (improvement in the use of data for biodiversity management) of Theme V of the Vision 2030 National Plan.

Ocean Surgeonfish, Speyside, Tobago - Jonathan Gomez

1.1.4 AN INVESTIGATION OF THE BENTHIC COMMUNITY STRUCTURE ALONG THE SOUTH EAST COAST AND GALEOTA PORT, TRINIDAD

Trinidad and Tobago acceded to the International Convention for the Control and Management of Ships' Ballast Water and Sediments (BWM Convention) in January 2012. The BWM Convention, which came into force in 2017, requires new and existing ships carrying ballast water to control and manage their ballast in compliance with Convention standards. Article 6 of the BWM Convention (Scientific and Technical Research and Monitoring) states parties shall endeavour, individually or jointly, to monitor the effects of ballast water management in waters under their jurisdiction where such research and monitoring can include observation, measurement, sampling, evaluation and analysis of technology and organisms and pathogens identified in the transfer of ships' ballast water. A Port Biological Baseline Survey (PBBS) can provide inventories of marine life in and around commercial ports frequented by ships carrying ballast water. The Port of Galeota was selected as the study location for a macro-benthic survey as it is relatively new and assumed to be less impacted than the other major ports in Trinidad. The purpose of this benthic survey is to gather information on marine biodiversity within the port, with a particular emphasis on establishing the presence of non-indigenous species. The detailed analyses and data derived from this project would provide information on the structure, function, diversity, distribution and viability of benthic communities, which are necessary for the conservation of our natural marine and coastal resources. The project contributes to Goal 5, Natural Resources Management, of Theme V of the Vision 2030 National Development Strategy.

1.1.5 DEVELOPMENT OF AN INTEGRATED COASTAL ZONE MANAGEMENT (ICZM) PLAN AND MARINE SPATIAL PLAN FOR THE NORTH WEST PENINSULA OF TRINIDAD

A draft Integrated Coastal Zone Management Policy Framework was developed in 2014 by a Multi-sectoral Steering Committee appointed by Cabinet in 2012. This initiative was led by the IMA. The implementation of the ICZM policy framework will require regional plans to be developed collaboratively with key stakeholders. The Northwest Peninsula of Trinidad, extending from Scotland Bay to the mouth of the Diego Martin River, was selected as the pilot area for the development of an ICZM and Marine Spatial Plan (MSP) since this coastal area has a myriad of coastal uses and users, both onshore and offshore, as well as many coastal issues that need to be addressed. Once this pilot is completed, the intention is to develop a MSP for the entire Gulf of Paria. The project would enable an ecosystem-based integrated approach to marine resource management aimed at maintaining, and where necessary, enhancing ecosystem services, while facilitating economic development through evidence-based decision-making and planning. This project contributes to Government's initiative to implement an Integrated Coastal Zone Management Policy Framework in Trinidad and Tobago. This is aligned to the United Nations Development Goals – Goal No. 14 'Life under Water'. The data and information reports derived from this project would facilitate improved management of coastal and marine ecosystems that would enable an uninterrupted ecosystem service for present and future generations.

1.1.6 AN INVESTIGATION INTO THE INCREASE IN PREVALENCE OF YELLOW BAND DISEASE IN ORBICELLA FAVEOLATA UNDER INCREASING NUTRIENT ENRICHMENT

Whilst Caribbean coral reefs have been negatively impacted by coral diseases leading to severe declines in hard coral cover, very few studies have been conducted in Tobago. This project will establish the first baseline Yellow-band disease dataset for ***Orbicella faveolata***, a major reef building species in Tobago. It will determine the water quality parameters that make a significant contribution to poor coral health and identify areas at greatest risk of Yellow-band disease outbreaks. The detailed analyses anticipated from this project would contribute to management efforts to reduce the island's vulnerability to climate change and is aligned to Goal 3 (Climate Vulnerability Assessment) of Theme V of the Vision 2030 National Development Strategy Plan.

1.1.7 RELOCATION OF MARINE REFERENCE COLLECTION

The IMA established a Marine Reference Collection in the 1990s. It is the only one of its kind in Trinidad and Tobago. The reference collection project was however dormant for several years and was restarted in 2016. For the period under review, the location of the Marine Reference Collection did not meet the climatic requirements necessary for a natural history collection of its kind, requiring its relocation. A pre-fabricated building situated adjacent to the research building on the IMA campus was acquired to house the collection and a database of some of the deep-sea fish and invertebrates started. The Institute accessed training for the research officer charged with the responsibility of managing this collection at the **Institut français de recherche pour l'exploitation de la mer** or IFREMER, Brest, France during the period May – July 2017. The course provided suitable training on the use of genetic methods to identify organisms and the

knowledge accessed by the officer will be critical to the future development of the collection. This collection is of national, regional and global significance owing to the uniqueness of holdings as some of the species in the collection are no longer found in the Caribbean's natural environment. The collection is the only one of its kind in the Caribbean region. The IMA hopes to develop the holdings into a curated collection of marine specimens for Trinidad and Tobago for scientific research and education at all levels. The collection will not only assist in educating on the richness of local biodiversity but assist in making the linkages between environmental impacts such as climate change and marine pollution on the health of that biodiversity .

1.2 FISHERIES AND AQUACULTURE PROGRAMME

Lane snapper, Lutjanus synagris, catch on ice, Mayaro, Trinidad - Rosemarie Kishor

The Fisheries and Aquaculture Research Programme (F&ARP) comprises two principal thematic areas; namely: the Fisheries Programme which focuses on age and growth studies and reproductive biology; and the Aquaculture Programme, which comprises marine and freshwater recirculating systems in a bid to promote alternative fish supplies through culture technology. The F&ARP also includes research in marine turtle conservation and responds to environmental incidences such as mammal stranding and reported fish kills.

1.2.1 AGE AND GROWTH STUDIES OF THE MARINE INVASIVE PTEROIS VOLITANS (LIONFISH) FROM EARLY INVASION IN TOBAGO WATERS

The second known marine Invasive Alien Species (IAS) in Trinidad and Tobago, is the Lionfish, ***Pterois volitans.*** Introduced into the Atlantic Ocean from the Indo-Pacific, the Lionfish was first captured in Castara, Tobago in July 2012 and at Saut D'eau, on the north coast of Trinidad in July 2013, completing its spread throughout the region. Within the Caribbean, predicted impacts include competition with native species for prey and habitat, direct predation on native species, and altered native fish community structure. Research aimed at managing these impacts requires improved information on trophic biology and life history parameters, used in models predicting removal rates that will reduce lionfish densities. Since the invasion is a recent one, only a few age and growth studies has been conducted mainly from the northern Atlantic region. This study represents the first age and growth study from the most southern limit of its distribution. Otolith samples collected from derbies and recreational tournaments in Tobago during the period January 2014 to June 2016 have been processed, sectioned and imaged for age readings. Primary and secondary age readings (n= 561) have been completed. This research project is scheduled to be completed in 2017-2018 when growth curves and age and growth parameters will be determined based on these age readings. The age and growth studies will help to streamline the removal of lionfish and manage lionfish densities in our waters. This project has implications for food security, fisheries management, tracking and monitoring and planning lionfish invasion,

thereby contributing significantly to Goal 1 (Environmental Governance and Management Systems) and Goal 5 (Natural Resource Management) of Theme V of Vision 2030 National Development Strategy.

1.2.2 SOCIO-ECONOMIC BASELINE ASSESSMENT OF THE SHELLFISH (OYSTER AND CRAB) HARVESTING ACTIVITIES IN THE GULF OF PARIA

Anthropogenic pressure exerted upon wetlands situated on the west coast Trinidad (Caroni Swamp, Godineau and Rousillac) has shown an adverse impact on the livelihoods of those working in the shellfish industry. To further our understanding of these impacts on livelihoods dependent on wetlands, research was conducted to establish a socio-economic baseline on shellfish gatherers working in the wetlands of the west coast of Trinidad. An interim report was produced based on the analysis of feedback obtained via a questionnaire administered to selected respondents of the affected communities located along the west coast.

1.2.3 FEASIBILITY STUDY ON THE PERFORMANCE OF PENAEUS VANNAMEI IN A CLEARWATER RAS SETTING USING SALINITY MANIPULATION

This project is geared towards improving alternative culture practices for food production. The focus is mariculture of high valued species (shrimp) in tanks using a clear-water marine re-circulating system. It seeks to determine the feasibility (biological and economic characteristics) for the grow-out of ***Penaeus vannamei*** in a Clearwater marine Recirculating Aquaculture System (RAS) unit using salinity manipulations. The implementation of this production system was documented, including the challenges faced and remediation actions taken. This project is significant as the Institute has provided a best-practice approach and a model that can be adapted to small-sized farming initiatives and will contribute to food security in the long term.

1.2.4 FEASIBILITY STUDY ON THE USE OF A LAND-BASED INTEGRATED MULTI-TROPHIC AQUACULTURE (LB-IMTA) SYSTEM IN THE TREATMENT OF WASTEWATER RELEASED FROM A MARINE RAS UNIT

This project is geared to improving the operations of the marine Recirculating Aquaculture System (RAS). A land-based integrated multi-trophic aquaculture (LB-IMTA) system capable of treating nutrient-rich water exuded from the ***Penaeus vannamei*** culture tanks within the marine RAS was installed in an attempt to reuse water. The infrastructure was introduced to improve economic viability by creating a stand-alone marine production model capable of being situated irrespective of location to the coast. Macroalgae ***(Gracilaria sp)*** and oysters ***(Crassotrea virginica)*** were introduced to help clean the wastewater which would then be recirculated into the system. Various key traits of the LB-IMTA system will be noted such as feeding efficiency, survival, growth rates of all organisms used in the bio-treatment process. This project is beneficial to sustainable development by enabling an opportunity to provide sustainable livelihoods as it provides an economic model of the LB-IMTA Marine RAS. This can be utilised by small to medium-sized farmers, farming cooperatives and other investors.

1.2.5 JUMPSTART- GREENWATER HAPA-BASED TILAPIA FINGERLING PRODUCTION SYSTEM

The 2015-2016 Jumpstart Programme was designed to support on-going activities to boost tilapia production in Trinidad through the delivery of technical advice and the provision of fingerlings to fish farmers. A Hapa-based Greenwater Nursery System was implemented in 2016 for tilapia fingerling production. The environmental, biological and economic aspect of such a fingerling production system was documented and will be used to produce a manual which will be made available to tilapia farmers, thereby supporting opportunities for food security.

Tilapia production facilities tour, conducted by Fisheries and Aquaculture Programme staff

1.3 OCEANOGRAPHY AND COASTAL PROCESSES

Oceanography and Coastal Processes (OCP) Research Programme conducts research in the following areas: oceanography/hydrography, sedimentology and coastal dynamics. The data generated from the research are used to inform management plans and environmental policies and to advise on development plans.

1.3.1 COASTAL CONSERVATION PROJECT FOR TRINIDAD AND TOBAGO - COASTAL DYNAMICS

Beaches are dynamic coastal features that respond differently to storms, wind, waves, currents and tides depending on its geology. Notwithstanding the protection afforded by reefs, beaches are generally the primary defense for any coastal development. Sand and sediment are critical in the protection of the coastline by facilitating the dissipation of energy from wave attack thereby acting as a buffer to erosion. However, beaches are subject to damage and deterioration caused by sand removal, improper building of coastal protection structures and any activity that prevents new sediment sources from replenishing them. Furthermore, beach erosion is expected to be exacerbated by impacts arising from climate change. This monitoring project, which commenced in 1988, monitors and documents the erosion and accretion rates of selected beaches and bays in Trinidad and Tobago. It also identifies likely causes and impacts. Twenty-seven (27) bays in Trinidad (70 stations) and 27 bays in Tobago (55 stations) were monitored for the fiscal period under review. As this project is ongoing, littoral and beach profile data are collected on a monthly or quarterly basis for trend analysis. The information is beneficial as it is used to advise the Coastal Protection Unit of the Ministry of Works and Transport on possible coastal defense structures and the Ministry of Planning and Development on coastal development. This project is aligned to Goal 3 (Climate Vulnerability) of Theme V of Vision 2030 National Development Strategy.

1.3.2 DEPLOYMENT AND MAINTENANCE OF TIDE GAUGES AT SPECIFIC LOCATIONS IN TRINIDAD & TOBAGO. A COLLABORATION BETWEEN IMA AND METEOROLOGICAL SERVICES OF TRINIDAD AND TOBAGO

Sea level rise (SLR) is a major concern for a small island developing state like Trinidad and Tobago, which has limited land space and intense coastal development. The effect of SLR could potentially have long-term disastrous consequences especially to coastal interests. The IMA in collaboration with the Meteorological Office of Trinidad and Tobago identified areas for implementing a sea level rise national monitoring programme. A tide gauge was installed at Pointe-a-Pierre Jetty in the Central Gulf of Paria and plans are being made to install another gauge in Toco. Once this monitoring programme is established, baseline conditions can be determined to inform developmental planning. Data and detailed analyses derived from this project would contribute to Goal 3 (Climate Vulnerability) of Theme V of the National Development Strategy.

Ocean and Coastal Process staff measure the slope of a beach and monitor changes caused by erosion.

1.4 ENVIRONMENTAL QUALITY PROGRAMME

The Environmental Quality Programme (EQP) conducts research to determine water, sediment and biota quality in the coastal and marine environments. This includes monitoring of pollutants such as nutrients, heavy metals, bacteria, and hydrocarbons. Data generated provide ***inter alia***; information on the effectiveness of pollution reduction strategies and mitigation control and assist in the interpretation of pollutant effects on natural systems by identifying possible sources, and impacts such as bioaccumulation and eutrophication.

1.4.1 LONG-TERM ENVIRONMENTAL MONITORING OF SELECTED 'HOT SPOTS'

At a Wider Caribbean Regional Workshop entitled, ***'Assessment of Land Based Sources of Pollution and Methodologies in Land Based Sources'***, which was held in Venezuela in 2005, representatives identified the need to establish an environmental monitoring project . Such a project would identify changes or adverse impacts on the marine and coastal areas from which information derived would guide timely policy formulation. Results of the monitoring programme in Trinidad revealed areas of elevated pollution levels or hotspots. In 2017, monitoring of marine areas continued in the Gulf of Paria at locations off Claxton Bay, Pt. Lisas, Caroni, Port of Spain, and along the rivers at Maraval and Diego Martin. Land-based discharges were monitored at locations in Pt. Lisas and Caroni. Water quality data was submitted to the United Nations Environment Programme (UNEP), for inclusion in the State of Convention Area Report (SOCAR). The data will support the IMA's biennial reporting in its State of the Marine Environment (SOME) Report. It will also support the Environmental Management Authority's (EMA's) annual State of the Environment reporting requirement. This long-term monitoring programme will determine whether pollution reduction strategies are effective, identify weaknesses and recommend appropriate mitigatory mechanisms. The data will add to the international body of knowledge on impacts of pollution. It would also enhance the IMA's ability to serve its mandate as one of the Regional Activity Centers for the Land Based Sources of Pollution (LBS) Protocol. Lessons learnt from this project will be shared with countries of the wider Caribbean Region. This project is aligned to Goal 4 (Comprehensive Waste and Pollution Management Systems) of Theme V of the Vision 2030 National Development Strategy,

1.4.2 TESTING OF HYDROCARBONS LEVELS IN OYSTERS BOUGHT FROM VENDORS

There were a number of oil spills and fish kills in the Gulf of Paria in 2016. These events led to concerns by members of the public on possible hydrocarbon contamination of fish and shellfish. In response, the IMA sampled oysters from twelve major vendors at locations in Curepe, St Augustine, Tacarigua, Freeport, Preysal, Marabella, Gasparillo, Palmiste and Debe for the period under review. The samples were analysed for polycyclic aromatic hydrocarbons (PAHs) which are known carcinogens. Samples of oysters were extracted and preliminary analysis of hydrocarbon levels were performed to optimized instrumental conditions for analysis.

1.4.3 BACTERIOLOGICAL WATER QUALITY AT POPULAR RECREATIONAL WATER-USE AREAS IN TRINIDAD AND TOBAGO

Water-based recreation is an important component of leisure activities and tourism in Trinidad and Tobago. Since 1981, bacteriological water quality surveys conducted by the IMA have indicated that there is sewage contamination at some of the beaches in Trinidad and Tobago. Several international studies have found that there is an increased risk of contracting gastrointestinal illness, acute febrile respiratory illness and infections of the eye, ear, nose and throat from swimming in sewage contaminated water. The existence of poor water quality at beaches and rivers would therefore impact negatively on public health and tourism. During the period October 2016 to September 2017, there were reconnaissance trips for bacteriological water quality surveys at Columbus Bay and Granville Beach. Bacteriological water quality surveys commenced at Balandra Bay and at Columbus Bay. A research report was prepared on the findings of bacteriological water quality surveys conducted at Bonasse Beach and at Fullerton Beach. Information on bathing water quality at the nation's beaches will aid in enhancing public health protection by enabling beachgoers to make informed choices. Data on bathing water quality and sources of sewage contamination for popular beaches will also guide managers of beach facilities, the relevant government agencies and other stakeholders when implementing mitigatory measures to improve water quality at adversely impacted sites. The identification of predictors of bathing water quality will also enable beachgoers to assess the potential for possible health risks in the absence of available real-time beach water quality information. The availability of bathing water quality data for popular local beaches will enhance Trinidad and Tobago's tourism product especially for ecologically/environmentally sensitive tourists. This project is aligned to Goal 4 (Comprehensive Waste and Pollution Management Systems) of Theme V of the Vision 2030 National Development Strategy.

1.4.4 ASSESSMENT OF HEAVY METAL ACCUMULATION IN THE GULF OF PARIA USING DATED SEDIMENT CORES

The Gulf of Paria is subject to heavy metal contamination from industrial and agricultural activities, sewage, domestic waste and urban run-off. These metals can bio-accumulate in aquatic organisms and pose a risk to human health. Historical information on heavy metal contamination can be used to establish baseline conditions and to evaluate how contaminant concentrations have responded to changes in population, land use and human activities including pollution reduction strategies. While monitoring programs can provide valuable historical information, these programmes cannot evaluate conditions that existed before they were initiated, and advances in sampling and analytical techniques can make comparison with past data difficult. These limitations can be surmounted through the analysis of dated sediment cores, which allows for the reconstruction of extended records of pollutant concentrations. This study will evaluate how heavy metal concentrations have responded to industrialization, urbanization and the various pollution control strategies implemented in Trinidad and Tobago over the years. The findings from the studies will assist in improving management strategies. In 2017, surficial sediments from the Gulf of Paria were sampled during the dry season for heavy metals analysis and a bathymetric survey to guide the selection of sediment core sampling sites in the Gulf of Paria was completed. The data and detailed analyses derived from the report will significantly contribute to Government's efforts to improve management systems for pollution, which is Goal 4 (Waste and Pollution Management Systems) of Theme V of Vision 2030 National Development Strategy.

1.4.5 PRELIMINARY INVESTIGATION ON HEAVY METALS IN FISH AND THE MOBILE/ BIOAVAILABLE PHASE OF SEDIMENTS FROM TRINIDAD AND TOBAGO

Although many studies have focused on heavy metals pollution in the Gulf of Paria, an important fisheries area for commercial species of fish and shellfish and a nursery and feeding area for several aquatic species, few studies have quantified concentrations in the biota in the Gulf of Paria. There is generally a lack of information for biota in coastal waters of Trinidad and Tobago. The study provides information on heavy metal contamination of (edible) commercial fish species, which constitute an important economic resource for Trinidad and Tobago. Very little work has been done on sediments off the north, east, south coasts of Trinidad, off the coasts of Tobago or on metal distribution among the various geochemical phases- exchangeable, carbonate bound, iron-manganese oxide bound, organic matter and sulphide bound. Examination of the distribution of the non-residual metal among these phases is important in assessing the potential impact of metal-contaminated sediments in the environment. During the fiscal year, two technical reports based on the sediment data were finalized and a technical report based on the fish tissue data was completed. These reports will significantly contribute to Government's efforts to improve management systems for pollution, which is Goal 4 (Waste and Pollution Management Systems) of Theme V of Vision 2030 National Development Strategy.

1.4.6 THE ASSESSMENT AND EVALUATION OF RAPID MICROBIOLOGICAL TECHNIQUES FOR THE DETERMINATION OF BACTERIAL CONTAMINATION IN MARINE WATERS, TRINIDAD AND TOBAGO

There is a need for rapid assessment techniques for the determination of all types of environmental contamination. Traditionally, faecal pollution in Trinidad and Tobago is assessed on the basis of concentrations of bacterial indicator organisms such as ***Enterococcus spp***. and ***E.coli.*** Faecal-indicator bacterial concentrations have been measured using culture-based methods such as membrane filtration, which are slow and require long hours of preparation and analysis. The need for rapid, reliable tests for recreational water quality is of great importance to protect public health in a timely manner. In 2016, Colilert 18 that uses Defined Substrate Technology® (DST®) nutrient indicators ONPG and MUG to detect coliforms and E. coli, was used to monitor water quality at sites in Trinidad and Tobago. Coliforms use their β-galactosidase enzyme to metabolize ONPG and change it from colorless to yellow giving results in 24 hours. In 2017, the project was completed with samples analysed for both the wet and dry seasons from two popular bathing sites; Maracas Beach and the Chaguaramas Peninsula. The research reports generated from the project will significantly contribute to Government's efforts to improve management systems for pollution, which is Goal 4 (Waste and Pollution Management Systems) of Theme V of Vision 2030 National Development Strategy.

1.4.7 METAGENOMIC ANALYSIS OF MICROBIAL COMMUNITIES FROM THREE COASTAL ENVIRONMENTS (CORAL REEF, MANGROVE SWAMP, AND SEAGRASS BED) IN BON ACCORD, TOBAGO

The microbial community plays an important role in the biogeochemical dynamics of marine ecosystems, yet it is understudied. Microorganisms which are unique to each ecosystem underpin most of the geochemical cycles that were once previously thought to be driven by inorganic processes. The microorganisms function by forming symbiotic relationships with eukaryotes, communicating with other microorganisms, acquiring

nutrients and producing energy. By identifying the microbial community and their function within an ecosystem, beneficial microorganisms can be isolated and reproduced to facilitate the healthy growth of a particular ecosystem. In this study, three coastal ecosystems (coral reef, seagrasses and mangrove forest) in the Bon Accord Lagoon, Tobago were sampled and their microbial communities were described. This study has never been conducted in Trinidad and Tobago, and will be useful in the rehabilitation of the ecosystems which are currently under threat. In 2017, dry and wet season sampling were conducted and laboratory trials were initiated. Further sampling and analyses are planned in 2018.

1.5 GEOMATICS

The Geomatics Unit supports the research initiatives of the IMA by providing geographically referenced spatial imagery in maps and diagrams via Geographical Information System (GIS) and Remote Sensing functions.

1.5.1 SPATIAL DATA RESOURCE MANAGEMENT

Spatial information and its functions have evolved. More and more it is integrated into various levels of the research process and scientific practice. Improvements in the accessibility to the technology, its utility and application has led to the widespread expansion of the use of GIS technologies. In this regard and to support the development of research ideas through Spatial Data & Products, an intranet web-based system was created to increase the availability, presentation and usefulness of data and products housed in the IMA. This system will contribute to and ensure that the IMA complies with the National Spatial Data Infrastructure (NSDI) initiative and the Caribbean Marine Atlas.

Satellite image of the Buccoo Reef / Bon Accord Lagoon Complex, Tobago - Hamish Asmath

1.6 MULTI-DISCIPLINARY PROJECT

1.6.1 HYDROLOGICAL STUDY OF THE CARONI RIVER BASIN TO DETERMINE TRANSPORT AND FATE OF LAND-BASED SOURCES OF POLLUTANTS, AND TO RESTORE FRESHWATER HABITATS

The Caroni River Basin, the hydrometric area that encompasses the Caroni Swamp, covers a total of about 883.4 km2, equivalent to 22% of the land surface area of the island and is the most populated and developed area of Trinidad. The hydrological regime in this river basin has been altered to facilitate human habitation and activities, including water harvesting for human consumption, flood mitigation and irrigation for agriculture. The Caroni and associated Rivers discharge into the Caroni Swamp, the largest mangrove forest in Trinidad. The Swamp is important economically for oyster and crab harvesting, for hunting and for ecotourism. This study proposes to model the hydrological regime within the Caroni Basin to determine the transport and fate of land-based pollutants particularly nutrients (N and P isotopes), heavy metals and bacteria. The study will also determine the level of pollutants in the mangrove oyster ***(Crassotrea rhizophorae)*** and crab species harvested in the swamp for human consumption. The study also examines the land-sea interface and identify the impact of sea level rise (saltwater intrusion) on the coastal ecosystems and provide data indicating areas where freshwater habitat could potentially be restored.

1.6.2 STATE OF MARINE ENVIRONMENT REPORT 2016

In 2016, the first State of the Marine Environment Report was prepared by the IMA and launched in May 2017. The report provides a scientifically grounded understanding of the condition of Trinidad and Tobago's coastal and marine ecosystems, habitats and species, which are extremely important for its development and sustainability. It also details how the status of these resources have been and are being affected by the range of natural and human pressures to which they are subjected such as land-based pollution and other impacts arising from climate change. The degradation of coastal and marine ecosystems (coral reefs, mangrove swamps, seagrass beds, beaches), mainly from anthropogenic impacts, such as pollution, has made them more vulnerable to impacts from climate change, invasive alien species (IAS) and ***Sargassum*** blooms. Within the context of the "ocean-based economy" this report shows the imperative need to safeguard Trinidad and Tobago's fisheries resources – a source of livelihood and nutrition for some of this country's most marginalised groups and communities. Several species of commercially important fish have been found to be fully exploited or overexploited. Fish and shellfish nursery habitats such as mangrove swamps and seagrass beds also need to be conserved to ensure food security. Although based on sound science, the report is written in non–technical language so that it can be easily used by decision and policy makers to inform decisions on development planning. Given the current state of our marine and coastal environment, there is an urgent 'call for action' to arrest impacts and restore ecosystems. The report provides a snapshot of the state of Trinidad and Tobago's marine environment and further evaluates whether management interventions are working. This report contributes significantly to Vision 2030 National Development Strategy – Theme V: Placing the Environment at the Centre of Social and Economic Development.

Honourable Camille Robinson-Regis, Minister of Planning and Development (c) Deputy Director of Research Dr. Rahanna Juman - Ag. (L) Director Ms. Toyland Arneaud - Ag. (R)

TRAINING WORKSHOPS

- R- Statistical Training - 26 & 27 October, 2016. Facilitated by Ms. Erin Fedewa, Fulbright Fellow.
- Basic training on the Shimadzu Atomic Absorption Spectrometer - 15, 16 and 30 November 2016.
- Isotopic and Water Quality Analysis Training workshop - 7th March 2017. "An Investigation of the Source and Fate of Nitrogen Species using Isotopic Analysis in the Caroni River Basin." Facilitated by Dr. Ivan Valiela and Dr. Elizabeth Elmstorm, Marine Biological Laboratory, University of Boston.
- Caribbean Marine Atlas 2 (CMA2) Introductory Meeting, -May 2nd 2017
- Mastering Public Speaking and Power Point Presentations facilitated by the School of Business and Computer Science Ltd. - 6 & 7; 13 & 14 July, 2017.
- Elder and Associates- Employee Assistance Programme- Supervisory Management Training – Date?

EXTERNAL WORKSHOPS

- International Maritime Organisation Workshop on Regional Port Reception Facility, Oct 4-6th, Port of Spain (R. Juman)
- Inter-American Development Bank Caribbean Coastal Capital Centre of Excellence Workshop Barbados, October 11-12, 2016. (R. Juman)
- Applying GIS in your job workshop at UWI - 16 November 2016. (H. Asmath)
- Writing workshop at UWI - 24 November 2016. (R. Amoroso)
- CANARI Community Climate Resilience Workshop - Dec 14th 2016 (R. Juman)
- The Environmentally Sound Management of Mercury Wastes Workshop - 18 January 2017, Courtyard by Marriott Hotel (W. Nelson)
- Updating the National Implementation Plan and Inventory for the Stockholm Convention on Persistent Organic Pollutants in Trinidad and Tobago, Eric Williams Financial Complex, Port-of-Spain- 24 January 2017. (W. Nelson, D. Banjoo).
- Sustainable Ocean Initiative Conference and Workshop - Feb 20-24th 2017. Costa Rica (R. Juman)
- CARICOM Regional Workshop on the Conservation and Sustainable Use of Marine Biological Diversity of Areas Beyond National Jurisdiction, Belize-20-22nd Feb 2017 (K. Hassanali)
- UNDP/GEF Large Marine Ecosystem (CLME+) Project Ecosystem Based Management Project; UNEP's State of the convention Area Report Meeting; UNEPS's Third Meeting of the Contracting Parties to the Protocol concerning Pollution form Land Based sources and Activities in the Wider Caribbean Region (LBS); UNEP's Seventeenth Intergovernmental Meeting on the Action Plan for the Caribbean Environment Programme and fourteenth Meeting of the contracting Parties to the Convention for the Protection and Development of the Marine Environmental of the Wider Caribbean Region being held in Cayenne, French Guiana - March 10-17th, 2017. (D. Banjoo, T. Arneaud).
- National Inception Workshop and Mercury Inventory Toolkit and Training, Cara Suites, Claxton Bay- 21 March 2017. (D. Banjoo).
- Regional Workshop on Climate change induced loss and damages in artisanal fisheries in the Caribbean – Bay Gardens Hotel, Rodney Bay, St. Lucia – 19 April 2017. (F. Solomon).
- Training Workshop on Marine Scientific Research organised by the Division for Ocean Affairs and the Law of the Sea of the UN Office of Legal Affairs (DOALOS) in partnership with the Intergovernmental Oceanographic Commission of UNESCO (IOC-UNESCO) including IOCARIBE, and the Korean Maritime Institute. St Lucia. May 01-05 2017. (R. Kishore).
- Linking the Amazon Basin and the Caribbean Sea- Proposal preparation Workshop in Belem, Brazil. - May 8-12th 2017 (R. Juman, D. Banjoo)
- Economic Development Advisory Board Road-mapping Workshop on Economic Diversification - June 8-9th 2017 (R. Juman and T. Arneaud)
- National Plan of Action (NPoA) – Shark Validation Workshop – Arthur Lok Jack, Mt. Hope – 25 August 2017. (F. Solomon)
- Sustainable Ocean Initiative (SOI) Training of Trainers Workshop, South Korea - 25 - 29 September 2017. (F. Solomon)

INTERNATIONAL CONFERENCES/ SYMPOSIA

- IOC Marine Science Conference on Data Accessibility. April 24-25th 2017, Cartagena, Columbia (R. Juman).
- International Oceanographic Commission- 14th Sub Regional Meeting (IOCARIBE), April 26-28th 2017, Cartagena, Columbia (R. Juman)
- UN Ocean Conference, New York. R. Juman was invited on a panel for a Partnership Dialogue on Ocean Acidification - June 6th 2017.
- Nippon Alumni Meeting at UN Ocean Conference, New York - June 5-9th 2017 (K. Hassanali).
- Enhancing Ocean Governance in the Caribbean Region Symposium – UTT, Chaguaramas – 29 & 30th June 2017. Presentation on "IMA's Role in Coastal and Ocean Governance in Trinidad and Tobago by R. Juman.
- UN Biodiversity Beyond National Jurisdiction (BBNJ) PrepCoMM 4 New York -July 2017. (K. Hassanali)
- Protection of Coastal Ecosystem along the Guiana Shield Conference – Aug 1-4th 2017, Paramaribo, Surinam. Rahanna Juman presented on Mangrove Forests for Disaster Risk Reduction: A Case Study for Trinidad and Tobago. (R. Juman)
- IDB's Caribbean Coastal Resilience Conference Bahamas Sept 26-27th 2017. R. Juman gave presentation on ICZM Experience in Trinidad and Tobago (R. Juman)

PUBLIC CONSULTATIONS ATTENDED

- DeNovo 2nd Public consultation for the Environmental Impact Assessment being conducted for Development of Blocks 1(a) and 1(b) Offshore West Coast Trinidad, the Cara Suites Hotel and Conference Centre, Claxton Bay - 1 September 2016.
- Sustainable Management of Bycatch in Latin America and the Caribbean Trawl Fisheries (REBYC-II LAC) Pierre Road Community Meeting - 16 November 2016.
- Stakeholder Consultation for "The Design of an Eco-system Based Management Project Document for UNDP/GEF CLME+ Project in the Southern Caribbean. Waterloo Community Center – 13 December 2016.
- National Consultation on the Draft CARICOM Environmental and Natural Resources Policy and Draft Environment Action Plan, 2017-2022: Hilton Trinidad & Conference Centre 21 & 22 August 2017.
- National Stakeholder Consultation for the Draft Ionising Radiation Bill and Ionising Radiation Regulations- 4th - 5th, September 2017. Multipurpose Hall of the Ministry of Works, London Street, Port of Spain.
- **Khalil Hassanali and Lester Doodnath** represented the IMA at the second public consultation hosted by Nu-Iron Unlimited on 20th January 2017 at Cara Suites Hotel and Conference Centre.

Lester W. Doodnath (2nd from right) representing IMA at the National Consultation on the Draft CARICOM Environmental and Natural Resources Policy and Draft Environment Action Plan, 2017-2022. Hilton Trinidad & Conference Centre 21 & 22 August 2017 - Ministry of Planning and Development

PRESENTATIONS

- Semester at Sea Program on Lionfish Research at the Institute of Marine Affairs to the University of Maryland, 14 November 2016.
- "Nearshore Recreational Water Quality from Bonasse to Fullerton at Cedros Bay: Are There Health Risks?" Presented at IMA's 2nd Community Symposium at Chatham Community Centre- 29 March, 2017.
- "The Environmental Quality on the Southwestern Peninsula, Trinidad after the December 2013 Oil Spills", IMA 2nd Community Research Symposium Wednesday 29th March, Chatham Community Centre, in Chatham.
- "Heavy Metal distribution in Sediments from the Southwestern Peninsula of Trinidad." IMA 2nd Community Research Symposium Wednesday 29th March, Chatham Community Centre, in Chatham. "Fish Kill Investigations along the Southwest Peninsula – Characteristics, Challenges and the way Forward." IMA 2nd Community Research Symposium Wednesday 29th March, Chatham Community Centre, in Chatham.
- "Impacts of Wastewater on the Marine Environment." Presented at Atlantic LNG Office in Port of Spain on 21 March, 2017.
- "Cocos Bay and Mayaro Bay Bathing Water Quality: Together Preventing Potential Health Risks." Presented at IMA's 3rd Community Symposium at Mayaro Learning Resource Centre, 20 September 2017.
- "Achieving the Aichi Biodiversity Targets – Trinidad and Tobago". SOI Training of Trainers Workshop, South Korea, 25 September 2017.

PUBLICATIONS

BOOK

- Linardich, G. Ralph, K. Carpenter, N. Cox, D.R. Robertson, H. Harwell, A. Acero P., W. Anderson Jr., F. Barthelat, J.-L. Bouchereau, J. J. Brown, J. Buchanan, D. Buddo, B. Collette,M. Comeros-Raynal, M. Craig, M. Curtis, T. Defex, J. Dooley, W. Driggers III, C. Elfes Livsey, T.Fraser, R. Gilmore Jr., L. Grijalba Bendeck, A. Hines, R. Kishore, K. Lindeman, J.-P. Maréchal, J. McEachran, R. McManus, J. Moore, T. Munroe, H. Oxenford, F. Pezold, F. Pina Amargós, A. Polanco Fernandez, B. Polidoro, C. Pollock, R. Robins, B. Russell, C. Sayer, S. Singh-Renton, W. Smith-Vaniz, L. Tornabene, J. Van Tassell, J.-C. Vié, and J. T. Williams, 2017. ***The Conservation Status of Marine Bony Shorefishes of the Greater Caribbean***. Gland, Switzerland: IUCN. viii + 75 pp.

TECHNICAL REPORTS

1. Banjoo, D. 2016 Interim report on Ammonia Pollution at Point Lisas, Report submitted to the Environmental Management Authority, 9pp.
2. Institute of Marine Affairs, 2016. National Sargassum Response Plan, 2016. Draft Report, Institute of Marine Affairs. 89p.
3. Persad, R. 2016 Density Measurement Report for Port of Spain, Port Authority, Port of Spain.- 36p.
4. Institute of Marine Affairs. 2016. Wet Season Monitoring of wetlands west of Point Lisas Nitrogen Limited, Point Lisas, Trinidad- Document prepared for Point Lisas Nitrogen Limited, 54 p.
5. Institute of Marine Affairs. 2017. Dry Season Monitoring of wetlands west of Point Lisas Nitrogen Limited, Point Lisas, Trinidad- Document prepared for Point Lisas Nitrogen Limited, 48p.

RESEARCH REPORTS

1. Institute of Marine Affairs, 2016. State of the Marine Environment Report for Trinidad and Tobago 2016. Final Report, Institute of Marine Affairs
2. Bullock, C. 2016. A Survey of Bacteriological Water Quality at the Coastline from Bonasse to Fullerton at Cedros Bay, Trinidad, W.I.
3. Nelson, W. (2016). Heavy metal distribution in coastal sediments from Trinidad and Tobago.
4. Darsan, J., Ramnath, S. and Alexis, C. 2016. Coastal Conservation Project: Status of Beaches and Bay in Trinidad 2004-2008. Institute of Marine Affairs
5. Darsan, J., Ramnath, S. and Alexis, C. 2016. Coastal Conservation Project: Status of Beaches and Bay in Tobago 2004-2008. Final Report 2016. Institute of Marine Affairs
6. Kanhai, Attish. 2016. An Assessment of the Benthic Communities of the Caroni Swamp. Final Report, Institute of Marine Affairs.

7. Amoroso, R. 2017. Coral Reef Monitoring Project - Status of the Coral Reefs of Tobago 2016 and Summary Report 2010-2016, Final Report Institute of Marine Affairs,
8. Nelson, W. 2017. Assessment of the potential mobility/bioavailability of heavy metals in Sediment from Trinidad and Tobago. Final Report, Institute of Marine Affairs
9. Kishore, R. 2017. Age and growth studies of the wahoo, Acanthocybium solandri from the southern Caribbean. IMA Report. 34 pp.
10. Hassanali, Kahlil. 2016 - Attaining Climate Change Mitigation and Adaptation in Coastal Sectors in Trinidad and Tobago. Final Report, Institute of Marine Affairs

JOURNAL PUBLICATIONS

- Darsan, J., Jehu. A., Asmath, H., Singh. A., Wilson, M., 2016. ***'The influence of fluvial dynamics and North Atlantic swells on the beach habitat of leatherback turtles at Grande Riviere Trinidad'***. Journal of Environmental Management, vol 180, pp. 111-122
- Hassanali, K. 2017. ***'Challenges in mainstreaming climate change into productive coastal sectors in a Small Island State- The case of Trinidad and Tobago'***. Ocean and Coastal Management vol.142.
- Phillips, A., Coutou, J., Rajh, S., Stewart, N., Watson, A., Jehu, A., Asmath, H., Dziva, F., Unakal, C., Holder, R., Carthy, R.R., 2017. ***'Temporospatial dynamics and public health significance of bacterial flora identified on a major leatherback turtle (Dermochelys coriacea) nesting beach in the Southern Caribbean'.*** Marine Ecology, vol. 38, no. 2

ENVIRONMENTAL INCIDENTS' REPORTS

- Preliminary Report on the Oil Fingerprinting Analysis of an Oil Spill at Trinidad and Venezuela May- 2017. 51pp.
- Fishkill – Williams Bay – 24 January 2017.
- Fishkill - Crews Inn and Power Boats, Chaguaramas – 10 May 2017.
- Fishkill – Power Boats – 19 May 2017.
- Fishkill - Alcan Bay, Chaguaramas – 3 July 2017.

COMMITTEES

- Inter-Agency Initiative for International Testing of Fish from Trinidad and Tobago- Public Health Risk Assessment on Consumption of Fish from the Gulf of Paria
- Upstream Effluent Management (UEM) Committee.
- UNEP LBS SOCAR (State of the Area Report) Data Sub-Group
- Blue Flag National Jury.
- Interim National Coordinating Committee for the Development and Implementation of a Sustainable Management Mechanism for POPs in the Caribbean.
- Global Environment Facility Small Grants Programme (GEF SGP) - National Steering Committee (NSC) 2016-2018 and Technical Working Group
- FAO Improving Forest and Protected Area Pilot Project Sub-committees- Tobago North East Marine Protected Area, Matura, Nariva and Caroni
- Caribbean Fisheries Training Institute Management and Advisory Committee
- Marine Scientific Research Sub- Committee of the National Law of the Sea Committee under the Ministry of Foreign and CARICOM Affairs. (Chair)
- Sustainable Management of Bycatch in Latin America and the Caribbean Trawl Fisheries (REBYC-II LAC).
- Fish and Fisheries Products Sub-Committee.
- Land Reclamation Committee.
- San Fernando Waterfront Development Committee.
- National Steering Committee for FAO Improving Forest and Protected Area Management in Trinidad and Tobago.
- EU Environmental Programme Steering Committee.
- EU climate resilience project – Technical Working Group (Water, Biodiversity, Coastal Resources).
- National Focal Point for ACS Sandy Shores Project.
- National Focal Point – IOCARIBE, Biodiversity Convention- Coastal and Marine Areas.

A natural arch at Chacachacare Island, Trinidad, formed by the erosion of metamorphic rock, overlooks the Boca Grande and neighbouring Venezuela.
- Jonathan Gomez

2.0 INFORMATION CENTRE

Glendon Glasgow, Information Officer, speaks to Roxborough Secondary students about the invasive Lionfish, in February 2017

The Information Centre is responsible for the development and implementation of public education and awareness, community education, public relations, and the promotion of the research of the Institute of Marine Affairs. For the period under review, the department engaged primary, secondary and tertiary level students, community-based organisations, non-governmental organisations, government agencies, the private sector and other stakeholders. The department participated in public exhibitions, delivered school presentations and conducted a range of other outreach activities. The Lionfish Public Awareness Campaign was a major initiative of the department for the period. The activities of that campaign were geared towards raising awareness on the invasive species threat in the waters of Tobago. The Information Centre also serves as the gateway to disseminate IMA's research information to inform policy and keep stakeholders abreast of ongoing and completed research projects. The IMA's Library also serves as the documentation centre providing local marine environmental information on Trinidad and Tobago. It is the only one of its kind on the island.

The Centre is responsible for the following:

2.1 Public Education and Awareness
2.2 Information dissemination
2.3 Public relations
2.4 Social media
2.5 Library services

The following strategic developments were spearheaded under different categories for the period October 2016 to September 2017.

2.1 PUBLIC AWARENESS AND EDUCATION

The public education and outreach programme raised awareness on several marine environmental topics, engaging more than one thousand five hundred (1500) primary and secondary school students, fifty (50) tertiary level students, various private and public organisations and other members of the public. This took the form of educational talks, exhibits and tours delivered internally and externally by Information Centre and Research staff.

Approximately one hundred and forty-five (145) primary, secondary and tertiary students toured the aquaculture facilities of the Fisheries and Aquaculture Research Programme. Students from as far as Colorado State University visited and toured the research facility for a project assignment. Additionally, pupils from St. Peter's Private Primary School, the Point Fortin and La Brea Police Youth Camps and the Caribbean Youth Science Forum were introduced to fish farming techniques and models employed at the Institute.

The department facilitated a number of exhibitions where the Information Officers engaged over one

thousand (1000) persons on the significance of coastal and marine conservation. The Information Centre partnered with Nature Seekers to stage displays to raise awareness on marine litter and pollution' coral reefs and endangered leatherback turtles. Officers delivered presentations on the topics of coral reefs, climate change, lionfish invasion, eutrophication, and marine litter/pollution to more than four hundred students (400) at several primary and secondary schools in Trinidad and Tobago. They also facilitated a number of career days for several secondary schools; disseminating information and guidance on the science subjects required for careers in marine sciences. The Officers also provided delivered presentations on Invasive Species: Lionfish to over two hundred (200) secondary students in Tobago.

The Department delivered the Sea & Me Project to post-Secondary Entrance Assessment (SEA) students at four primary schools in Carenage and Point Cumana. Topics covered were water education, marine mammals, coral reefs and water safety. This community outreach activity provided an opportunity for pupils to be exposed to the basic understanding of biodiversity and our marine and coastal resources. The outreach activities are beneficial to the sustainable development of Trinidad and Tobago as it supports Theme 1 (Nurturing our Greatest Asset) - Goal 7 (Modern Relevant Education and Training System) of the Vision 2030 National Development Strategy –. Please see Appendix 1 for more details on the outreach activities conducted for the period under review.

2.2 INFORMATION DISSEMINATION

The Information Centre (IC) launched the State of the Marine Environment Report Trinidad and Tobago 2016 which was prepared by the research staff. The Honourable Camille Robinson-Regis, Minister of Planning and Development attended and toured the Institute's research facilities.
Towards the latter half of the fiscal period, the Information Centre (IC) partnered with Sustain T&T, a non-governmental organisation, to produce and air two short narrative videos (films) on marine litter entitled, **'Future Work'** and **'The Bottle'**. These videos were created during the period April – August 2017 and launched and aired at the Green Screen Environmental Film Festival 2017. They helped raise awareness about the high levels of marine pollution that exists in Trinidad and to communicate the message concerning the adverse impacts of pollution on our marine ecosystems.

The IMA's triannual externally distributed newsletter, IMA News, was produced and disseminated in December 2016, April and August 2017. Stakeholders were kept abreast of the progress in research projects, new monitoring techniques such as the water quality monitoring buoy and alerted to pressing marine environmental matters through articles written by research staff. For the period under review, forty articles submitted by researchers from the four research programmes were published in the Trinidad Express and Tobago Today. The use of traditional media such as the newspaper is a viable medium to raise awareness on marine environmental issues.

The IMA Tidal Calendar 2018 was produced to not only inform the intended users of tidal projections but to showcase the splendid beauty of the scenic sea and landscapes. Users of the Tidal Calendar, comprise though not limited to, members of the maritime sector and the fishing and yachting industries.

The Information Centre (IC) assisted the Research Programmes in convening two community symposia, which were hosted at the Chatham Community Centre, Southwest Trinidad, and at the BPTT/Mayaro Resource Centre on the 29th March and 30th September 2017 respectively. Both themes, ***"Towards a Healthier Southwest Peninsula Trinidad'*** in Chatham and ***"Promoting Stakeholders' Participation in Marine Resource Management"*** demonstrated the Institute's commitment to sensitise the communities to coastal and marine issues, such as coastal erosion and beach water quality, that are commonplace in those areas. The symposia not only disseminated the research work of the Institute but also fostered communication among scientists, the business community and other members of the public. The Department also facilitated a workshop from 6-17 February 2017entitled, 'The use of Freshwater Fish in Vector Control", which was conducted by the Fisheries and Aquaculture Research Programme for regional participants who were mainly from Barbados. The training material used in the workshop was derived from data and research reports generated by the Institute.

The IMA Logo Policy was created and approved by the Board of Governors for the period under review.

Public Relations

The Information Centre spearheads collaborations with civil society, organisations and agencies that demonstrate the conservation of our natural resources. On Saturday 16th September, the Institute of Marine Affairs joined in the Ocean Conservancy's annual International Coastal Cleanup at Marianne River, Blanchisseuse. The IMA partnered with WASA and B-mobile and assisted in removing and collecting over seven hundred and forty-five pounds of garbage from the beach.

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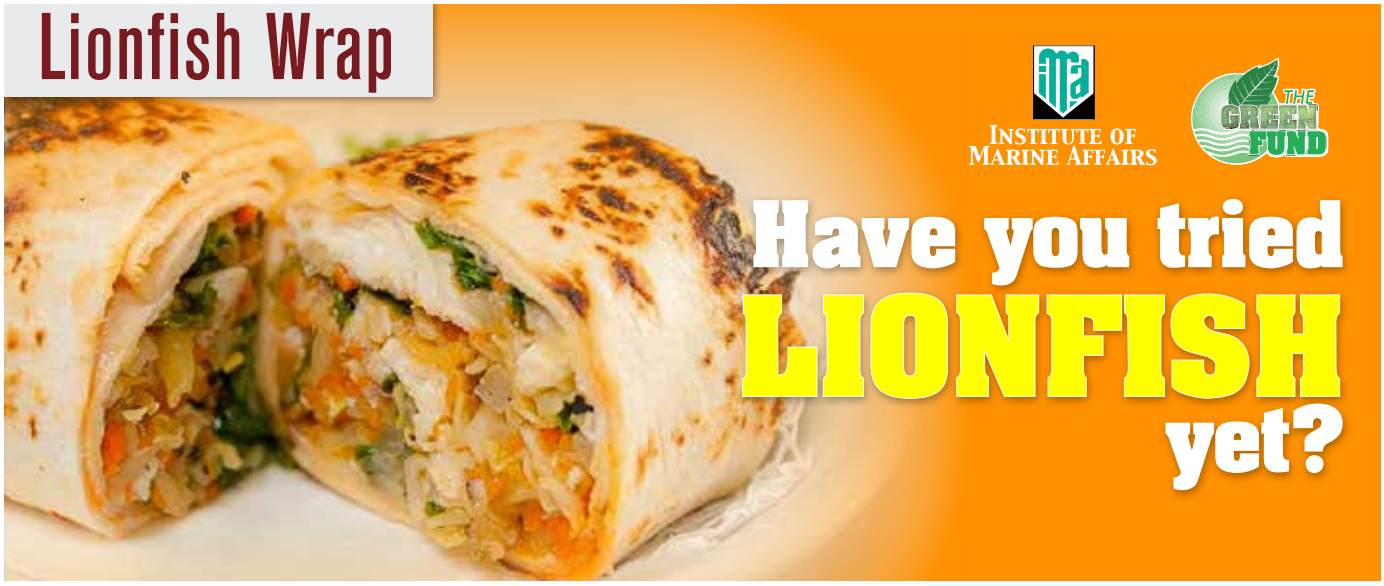
2.3 LIONFISH AWARENESS CAMPAIGN

The objective of the Lionfish Awareness Project was to raise awareness of this marine invasive species to the local public. It officially started on April 9th 2014 with a deadline completion of December 31st 2016. However, an additional year was requested and the project was completed in December 31st 2017. This section provides a list of achievements for the period under review.



Electronic billboard from the "Have you tried Lionfish yet?" November/December 2016 promotion.

Events and Activities

- **Lionfish Culling Event** - The Institute held a Lionfish Culling Event at the Buccoo Reef Marine Park on the 30th November 2016 to raise awareness of this marine invasive species, which has the potential to adversely affect the sensitive ecology of the Buccoo Reef. The THA supplied special permits that allowed teams of hunters assembled by the Institute to hunt lionfish in the protected area. Three hundred and sixty-one Lionfish were caught during the culling event. The opportunity was also taken to conduct fish surveys to develop baseline data for the health of the reef. The Institute also set up an education booth in the Pigeon Point Heritage Park.
- **Baseline Information - Vagus MRI**, a marketing research and intelligence company, was contracted to conduct a baseline study that would determine the level of awareness of lionfish in Trinidad and Tobago, as well as gather general information on the public's view of the marine environment. The final report from Vagus MRI showed that over 70% of persons could not correctly identify the Lionfish and over 80% would not eat this fish. The baseline data were used by the Information Centre to guide the development of a public awareness and education campaign the implementation of which was as follows:
- **Electronic Billboard Advertising** - The Institute ran a billboard campaign, "Have you tried Lionfish yet?" in November/December 2016 to promote the eating of lionfish in Trinidad and Tobago.
- **Production of Animation Video** - A 90 second lionfish animation video entitled, "I am Lionfish", was developed and produced by Creative Concepts Ltd.
- **Television Programming** - The "Lionfish Derby 2015", was produced by Bad Granny Company Ltd. and released via the "Bad Granny gets Wet" Television Series and aired on CNC3 on the following dates– March 7th, 9th, 12th, 14th, 16th,19th, 21st, 23rd, 26th, 28th, 30th, 2017 and April 2nd, 4th, 6th, and 9th, 2018. The animation video entitled "I am Lionfish" was shown as

an advertisement during the airing of the IMA Lionfish Derby 2015. The Institute promoted the eating of Lionfish in an advertisement aired during the last three episodes of the Series by using artwork that was developed for the billboard campaign. The The "IMA's Lionfish Derby 2015"was also uploaded to YouTube as part of the "Bad Granny Gets Wet" Series as well as an independent video. The version of the video grouped with the Bad Granny series had 1,513 views and the independent version had 497 views. Numerous viewers indicated that were very impressed with the way the information was delivered.

- **Education outreach** – the IMA in collaboration with the the Department of Marine Resources and Fisheries in Tobago conducted outreach in schools to raise awareness of the Lionfish. Approximately 1,075 school pupils were educated about the threats posed by the lionfish. Lionfish outreach was also conducted in schools across Trinidad and Tobago upon request.
- **Public Outreach** – The IMA in collaboration with the Lifeguard Division of the Ministry of National Security during the period May –July 2017, trained as many as 95 lifeguard personnel to identify lionfish, and the correct method for treating lionfish stings caused by their venomous spines.

Community Education Officer, Lori Lee Lum educating Lifeguards of the Ministry of National Security about the threat of the invasive Lionfish to marine ecosystems and associated livelihoods.

2.4 INTERNAL COMMUNICATIONS

- Monthly Internal Newsletters were sent to all users electronically highlighting staff achievements and involvement in external projects, attendance at seminars, training sessions and workshops. In keeping with the IMA's Going Green initiative, efforts were made to reduce the use of paper by limiting the number of internal newsletters that were mounted on notice boards on the compound.
- IMA's first Divali function was hosted in the Auditorium on 28th October 2016. A presentation was delivered by the Auditor, Mrs. Reena Ramdass, on the significance of the festival of Divali. A specially invited guest, Ms. Ena Maraj, provided additional an insightful presentation on the significance of the deya during Divali.
- A Fund-Raising Barbeque was held to aid meeting part of the medical expenses for the Boat Captain, Mr. Ruskin Cummings. The fund-raising event was held on 4th November 2016.
- Staff celebrated World Wetlands Day by visiting the Buccoo Reef and Bon Accord Lagoon on Friday 3rd February 2017.
- The Mobile Unit of the National Blood Transfusion Service (Blood Bank) of Trinidad and Tobago visited the IMA on 26th April 2017 when some staff members donated blood
- A surprise Mother's Day Celebration, organised by male staff, was held on 12th May 2017.
- A surprise Father's Day event, which was organized by the female staff, was celebrated on 14th June 2017.
- IMA staff participated in the Ministry of Planning Sports and Cultural Club's Inter Departmental 5-A-Side Football competition on 1st July 2017 at Macoya, where the IMA Stingrays won the competition.
- Emancipation Day was observed on 28th July in the Auditorium. External guests were invited to present on the significance of this public holiday and to demonstrate various styles of African Head Dress.
- A surprise retirement function was held on 30th August 2017 on the IMA compound to recognize the yeoman service and stellar contribution of Mr. Gerard Mahabir, former Manager of Administrative Services.

Other Activities

- IMA staff participated in a Coastal Cleanup at Chacachacare on Sunday 12th March 2017. The Cleanup was hosted by the Ministry of Agriculture, Land and Fisheries, CDA and EMA.

VISITING SCIENTIST

- Ms. Erin Fedewa, a M.Sc. Student from the Oregan State University, through a U.S. Fullbight Grant, was given approval to conduct independent research (10th February to 30th November 2016) at the IMA. During her visit, Ms. Fedawa was aligned to the Fish Age and Growth Laboratory in the Fisheries and Aquaculture Research Programme. The IMA provided Ms. Fedewa with laboratory and field resources in the conduct of her research. Her research involved the evaluation of a selected mangrove system at Scotland Bay as a nursery habitat by examining and relating early life history characteristics to habitat quality, using juvenile growth rates as a proxy for nursery site productivity.
- An inhouse training session on the use of the R Statistical Software package was facilitated by Ms. Fedewa and Hanne Bregje-Koster (volunteer) from the 26th to 27th October in the IMA's Auditorium.
- Ms. Fedewa also presented her research entitled "Early life history characteristics of juvenile French grunt, ***Haemulon flavolineatum***, in relation to habitat quality in Trinidad nurseries" on 25th November 2016 at IMA.

IMA Representation

- Lester Doodnath represented IMA at the Green Screen Film and Panel discussions at St. Mary's College Centenary Hall on 2nd November 2016 and at NALIS Audio-visual room on 8th November 2016.
- Krystal Ganaselal and Lester Doodnath attended and visited a Recycling Exhibition hosted by the EMA at UTT, O'Meara Campus on 26th an 27th April 2017.

2.5 SOCIAL MEDIA

During the fiscal period under review, the Information Centre continued to develop the Institute's social media presence to increase the organisation's visibility and opportunities for feedback with stakeholders. One of the more popular social media platforms Facebook, was utilised to boost the Institute's public presence. This resulted in an increased number of organic reaches for information shared and content generated by the IMA from October 2016 to July 2017. The table below provides an overview of Facebook posts, information shared and organic reach for content uploaded for the period under review.

Line graphs below show that the section to yield the most views on IMA's Facebook page was the homepage, where Figure 1 shows a combination of registered Facebook users (those logged-in) and visitors not logged into Facebook. Figure 2 specifically shows the most popular section viewed by Facebook users that were logged-in.

The post with the highest organic (unpaid) reach for the period was "Lenten fish menu idea; Lionfish population reduction". 2196 Facebook users engaged the post up to the time of the review (see Figure 3).

MONTH	VIDEO	SHARED VIDEO	LINKS	PHOTO	TOTAL
October 2016	-	-	5	-	5
November 2016	-	4	5	6	15
December 2016	-	4	1	1	6
January 2017	-	-	4	-	4
February 2017	-	2	1	-	3
March 2017	-	-	1	1	2
April 2017	-	2	-	1	3
May 2017	-	4	-	-	4
June 2017	-	2	-	1	3
July 2017	-	3	-	-	3
August 2017	5	6	5	22	38
September 2017	-	4	2	6	12
					98

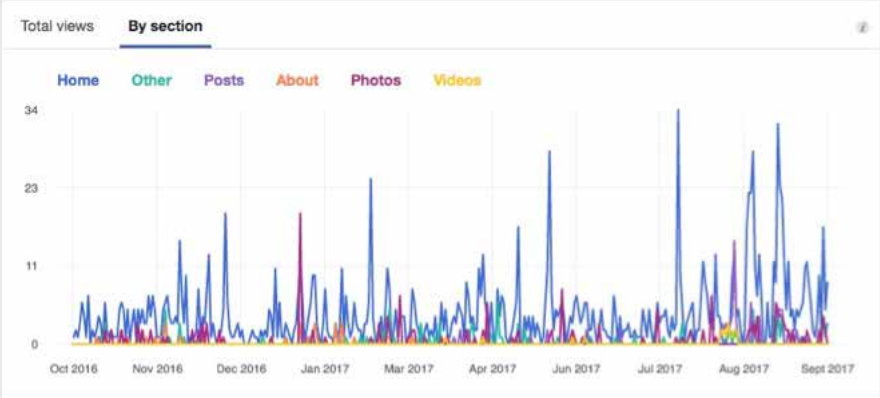


Figure 1 - Total views of IMA's Facebook page for the period 1 Oct 2016 - 30 Sept 2017. (Includes Facebook users and non-users)

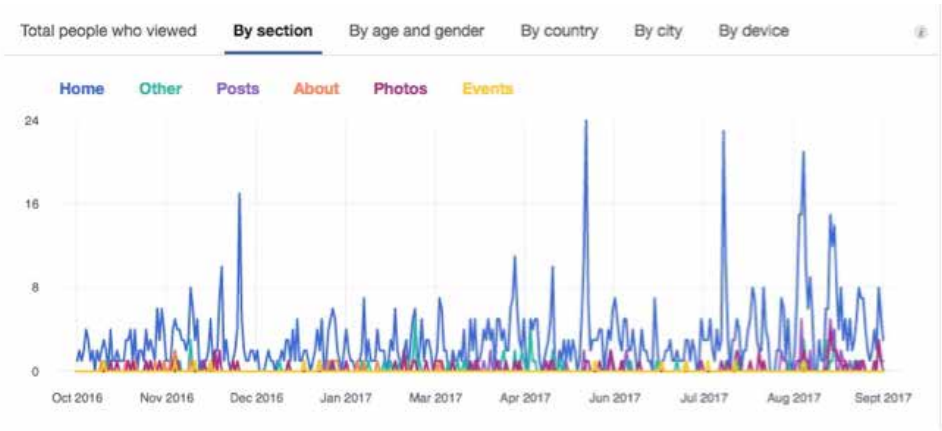
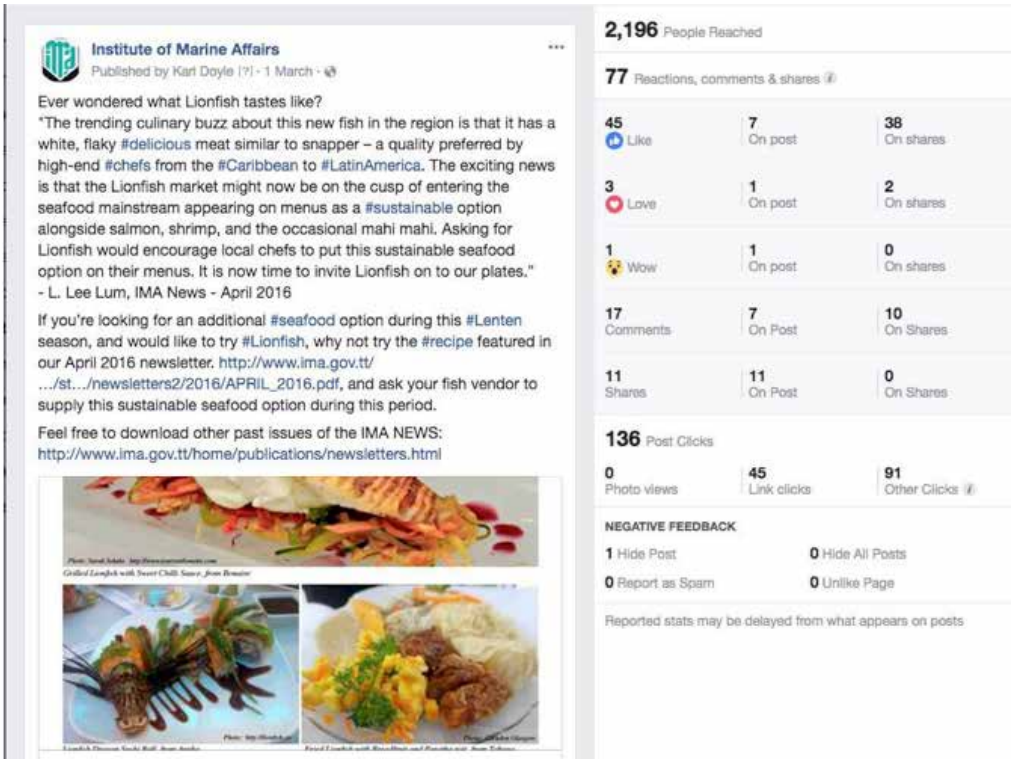


Figure 2 - Sections of IMA's Facebook page viewed by logged-in Facebook users for the period 1 Oct 2016 – 30 Sept 2017



2.6 LIBRARY SERVICES

Introduction

The IMA Library is the only national documentation centre that gathers and houses publications specific to local marine environmental content on research conducted in Trinidad and Tobago. The collection contains a comprehensive cache of information that demonstrates the Institute of Marine Affairs' support of Theme V (Placing the Environment at the Centre of Social and Economic Development) of Vision 2030 of the Government of the Republic of Trinidad and Tobago's National Development Strategy. The Library continued to support the IMA's research and public education and awareness thrust through access to current materials, resources and an up-to-date information service. This section highlights the Library's accomplishments under the following two categories:

1. Library Operations
2. Library Services

2.6.1 LIBRARY OPERATIONS

Library Operations refer to structured activities that involve the collection, preparation and management of all sources of information to be catalogued and classified for inclusion in an information service.

i. Collections Management – A draft Collections Management Policy was submitted for review, which provided international standards and criteria regarding the development, classification and preservation of the collection.

ii. Collection Development – Sixty-four (64) publications, generated by all the Research Programmes, were deposited, adding value to the Library's collection. The sixty-four publications comprised five technical reports, ten research reports, five environmental incident reports, three journal articles, one book chapter and forty newspaper articles. Other relevant information published by external stakeholders and current information resources, relevant by topic and available in electronic format, were also added to the library's collection. Despite budgetary limitations, the library was able to purchase a few print titles based on departmental requests. This resulted in a selective acquisitions approach that includes streamlining the collection with a focus on acquiring electronic books. A total of twenty-eight reports were catalogued for ease of retrieval. A rare collection focusing on sponges of Trinidad and Tobago was donated by Dr. Avril Siung-Chang, a former IMA Researcher.

iii. Digitization - The Library continued its Digitization Project to:
- ensure increased ready access to the IMA research reports;
- reduce the amount of paper utilised in the Unit;
- preserve the collection for the Institute's corporate memory.

A total of thirty-nine (39) reports were scanned in archival format in the period October 2016 – September 2017.

iv. Weeding of Collection – After careful review, a weeding exercise to remove outdated books based on subject relevance and book overlaps was completed. Old monograph volumes such as the "Ocean World of Jacques Cousteau volume series" and the old volume series entitled, "Index Flora of Trinidad and Tobago Series 1- 9', were withdrawn. Although the Library continued to receive book donations, fewer book donations were added to the collection owing to a selective approach based on the guidelines outlined in the Draft Collections Management Policy.

2.6.2 LIBRARY SERVICES

The Library received numerous internal and external queries, categorised as follows:

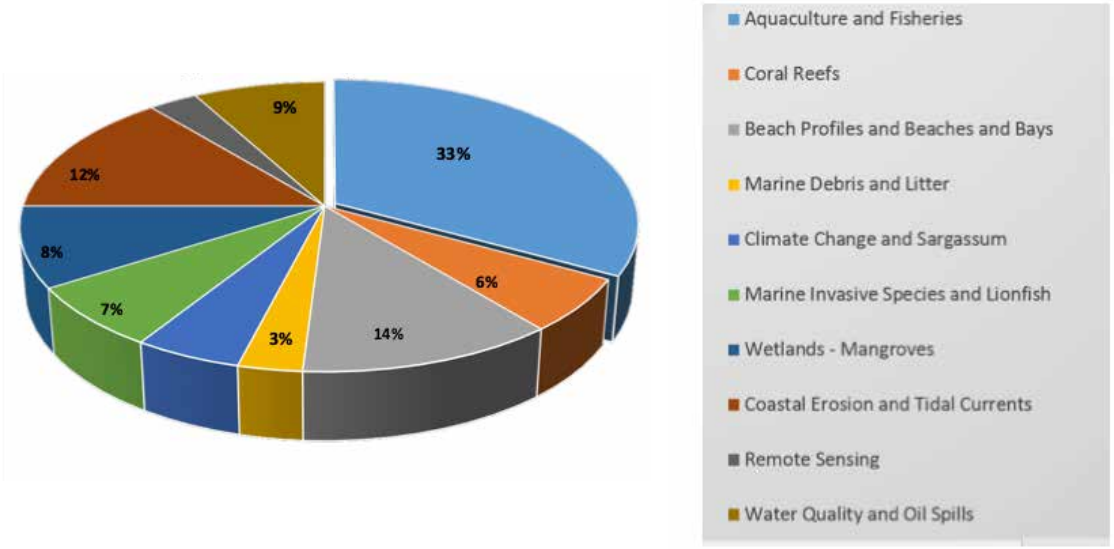
i. Information queries and subject-related enquiries
ii. Interlibrary loans
iii. Exhibitions
iv. Data requests
v. Freedom of Information Requests

i. Information Queries - Over the last fiscal year, the IMA Library received a total of one hundred and fifty-two information requests, which comprised internal and external

enquiries that were made in either in person or via electronic mail. Of the one hundred and fifty-two information requests, 149 requests were satisfactorily filled by the Library while three requests had to be referred to the libraries of the Fisheries Division of the Ministry of Agriculture, Land and Marine Resources and the Environmental Authority, Thirty-seven internal requests for specific information made by staff – thirty-five from research staff and two from support staff. Out of the total information requests, one hundred and three persons visited the Library in person requesting information, while forty-five information requests were received and satisfactorily addressed via electronic mail. The average turnaround time for addressing each information request was four hours.

ii. Subject-related enquiries comprised the following topics: aquaculture and fisheries; beach profiles / beaches and bays; coral reefs; marine debris and litter; climate change and sargassum; marine invasive species and (Lionfish); wetlands; coastal erosion and tidal currents; remote sensing and water quality and oil spills. As indicated in the following pie chart, the topic of aquaculture and fisheries was most requested by library patrons.

Figure 4. Subject-related Information Requests and Enquiries 2016 - 2017



Interlibrary Loan Service - the Library sought to borrow reports for IMA Research staff in order to ensure uninterrupted access to research materials and to comply with copyright procedures. Two interlibrary loan requests were made to the Library of the Fisheries Division of the Ministry of Agriculture, Land and Marine Division and 1 interlibrary loan was made to the University of the West Indies (UWI) Alma Jordan Library. The Library facilitated one interlibrary loan of an IMA report to the Environmental Management Authority (EMA) Library. Each year interlibrary loan usage fluctuates based on the needs of research staff.

iii. Displays – The library continued to stage exhibitions based on the United Nations (UN) Commemorative Days and national holidays of the Republic of Trinidad and Tobago;

- 17th – 30th May 2017 - World Biodiversity Day 22nd May;
- 1st-15th June 2017 – World Oceans Day 8th June;
- 20th August-30th September 2017 – 55th Independence Day and Republic Day; and,
- 15th-30th September 2017 – International Coastal Cleanup.

iv. Data Requests - For the period under review, eighteen data requests were addressed with a turn-around time of one month on average. For some of our responses, if the IMA did not have the relevant information, the requestor was referred to other entities such as the EMA. In one instance, a patron who requested the hard copy of the ProEcoServ Project was only provided with a soft copy of same, as the print copy was damaged in the fire that occurred on 15th September 2015. The Data Policy stipulates that use of IMA's data requires compliance with the IMA Data Licence by the requesting parties, and submission of a copy of the written report that contains the IMA data The IMA received the reports from Cropper Foundation and Environment Tobago as well as two UTT student reports that utilised IMA data from 2016.

v. Freedom of Information Queries – There were a total of four information requests made under the Freedom of Information (FOI) Act for the period under review, compared to a total of 1 FOI request from the previous fiscal period. The largest identifiable group of requestors was the Non Governmental Organisation, Fisherman and Friends of the Sea (FFOS) and the information included the following:

- Water and Sediment Quality data where dead fish was found within the Chaguaramas Basin;
- Levels of polycyclic aromatic hydrocarbons (PAHs) in the Gulf of Paria
- Whether IMA building codes adhere to the international protocols that facilitate the physically disabled/challenged,

3.0 INFORMATION TECHNOLOGY DEPARTMENT

The Information Technology (IT) Department is responsible for the appropriate deployment of technology to support the needs of the Institute and its stakeholders, thereby contributing to Theme III (Improving Productivity through Quality Infrastructure and Transportation) of Vision 2030 National Development Strategy – Goal 4 by providing a well-maintained Information Communication Technology (ICT) System.

The IT Department provides organisational support in the following areas:

- IT Governance and Policy Development
- Management of Data and Information Systems
- Management of Network, Communication and Computer Systems
- IT Service Helpdesk Support

During the period October 2016 to September 2017 the Information Technology (IT) Department undertook various upgrades and transformation projects in these functional areas.

3.1 IT GOVERNANCE AND POLICY

Remote Access and Cellular Usage Policies were revised and obtained Board of Governors approval. There was an increased emphasis placed on IT policy adherence and necessary amendments to existing policies, to be more applicable to a contemporary organisation.

A Standard Operating Procedure was revised for Server Maintenance and developed for Network Switch Configuration, the Wireless and Local Area Network (WLAN & LAN) infrastructure, Firewall and Data Backup. A Digitisation Project was initiated to digitally capture and catalogue documents via a Directory Index (DI). Eighty percent of IT documents were digitised and stored in portable document format (pdf) on a folder directory and physical documents were filed according to the DI.

Business Continuity efforts were advanced with the advent of Off-Site Data Storage through Tape Archival. Data is backed up weekly on LTO – 5 Tapes and stored with a reputable vendor which adheres to ISO 18933:2012 (en) standards for care and handling of tapes.

Asset Tracking and Inventory Management efforts were initiated to organise IMA's equipment and software according to best practice. A contract was issued for an Asset Tracking and Inventory Management Solution. However, the vendor failed to fulfil the contracted requirements and subsequently the next best candidate was awarded. This development has delayed the progress, but the IMA SharePoint Services Inventory Management Software has been utilised to address some IT needs.

3.2 MANAGEMENT OF DATA AND INFORMATION SYSTEMS

Enterprise wide software licences and related services is managed via the SharePoint Services Portal. Financial challenges arose due to the economic climate and resulted in a reduction in services to fit the available budget.

Renewed emphasis was placed on Data Management, as data is seen as the currency of research given the inherent reusability of data. Database repositories were developed for Geology, Trace Metals, Nutrient and Microbiology. The Geology Database has been populated with over eleven thousand records.
Access to the Microsoft Azure Cloud Platform was obtained through a Water Monitoring Proof of Concept Project with Microsoft. Environmental Data is stored via SQL Server Database and data is displayed via a PowerBi Portal and Mobile Application.

3.3 MANAGEMENT OF NETWORK, COMMUNICATION AND COMPUTER SYSTEMS

The IT infrastructure was improved with the acquisition of two Cisco WS-C3850-48P-S switches and associated warranty, which were deployed as a core stacked switch. A Network Attached Storage (NAS) Device, HPE 1650 EasyStore, was obtained for Disk based Data Backup. The Bandwidth speed was doubled to 30 Mbps to facilitate research demands in January 2017.

Two consecutive Service Level Agreements were signed with ICONS for a combined total of one year, to bolster Networking capacity and improve skillsets. Areas of focus included IT Infrastructure and Data backup.
IT Service Helpdesk

Five hundred and thirty-five (535) IT Helpdesk Tickets were completed over the period. A Service Catalogue of available IT functions and associated fulfillment timeframes were developed to set service expectations.

Challenges
The major challenges of the IT Department over the period were:

- An aging IT infrastructure
- Financial Constraints

4.0 FACILITIES AND TECHNICAL SUPPORT SERVICES

4.1 THE FACILITIES DEPARTMENT EXECUTED MANY PROJECTS OVER THE PERIOD, NAMELY:

- Flood alleviation works was conducted by Triple E Building, Williams Sale Partnership (WSP, and Contractor, Lester James, thereby resolving the drainage issues that have been plaguing the IMA for some time.
- The chiller system for the Research Building continues to be a challenge as this system is not only outdated, but also plagued by voltage fluctuation in the Chaguaramas area. There have been numerous breakdowns and downtime reported for this recurring problem. The option of putting the system on the generator is being considered; quotations from Peake Technologies were received for split systems in the building.
- There were several electrical problems in the Accounts and IC Buildings. Rewiring of the Accounts Building approval was granted and tenders were received.
- The auditorium upgrade was completed.
- The well pump was replaced.
- The glass doors used to enter Building Block 5 known as B5 were repaired.
- Quotation from Rentokil received for fumigation of the B5 building was received.
- Deputy Director's office was refurbished.
- The shed required for the oyster project was completed.
- Repairs to security/perimeter lighting on the eastern side of the compound were completed.
- CCTV cameras were installed and monitored in order to combat thefts that were taking place on the compound.
- Ceiling works were completed in the HR offices.
- Disposal of old items are on track and Piranha International Ltd. was chosen for disposal.
- The Fire Alarm system installation by Safety Plus Ltd. has commenced and will continue in 2018
- Insect Vector Control continued spraying of the IMA compound to keep the mosquito population in check

Ongoing works

- The Water and Sewage Authority (WASA) to regularize the IMA's sewerage connection.
- A licensed plumber is to be contacted to register our sewerage connection; follow up to continue with the Chaguaramas Development Authority, IMA's landlord, as drawings already have WASA stamps.
- Design Engineering is still working on the electrical audit. The contractor for the rewiring of the Accounts Building conducted a site visit.

Staff Participation:

- The boat crew played an instrumental role in the successful water quality buoy deployment. Two other employees from the department, C. Superville and M. Andrews provided manpower.
- Facilities staff, D. Carter and M. Andrews worked with staff of the Fisheries and Aquaculture Research Programme on several activites of the Land Based Integrated Multitrophic Assessment Project. Activities included: boxing for chlorinator, building and installation of an access gate for the water treatment system, A storeroom door, door lock and plate were installed in the Aquaculture facilities.
- Mr. Z. Khan participated in a four-day workshop on public speaking.

Service Contracts

The Facilities Department also maintains the following contracts for essential repairs and service:

- A/C maintenance (Research Building)-Peake Technologies Ltd.
- A/C (all other areas) Temperature Solution Ltd.
- Grounds maintenance-Alan Alexander General Maintenance Services

- Passenger elevator maintenance-Caribbean Lifts Ltd.
- Grounds & R.V. Kanawa Generators-SAVCO Power Ltd.
- Pest control services - General Pest Control-Pest Off Ltd. The IMA is in the process of comparing other pest service costs.
- General cleaning/Janitorial services - Interior Cleaning Services Ltd.
- Security Services- PPL Security
- Potable water/sanitization of coolers- Blue Waters Products Ltd.
- Well Servicing - Water & Oil Well Services-

Facilities & TSS Helpdesk.

A total of 132 requests from IMA staff were recorded and completed on the Facilities & TSS Helpdesk.

4.2 TECHNICAL SUPPORT SERVICES

The Technical Support Services (TSS) Department staff consists of:

- Two Launch Captains: Mr. Ronald Robinson; and Mr. Andre Warren, who replaced the late Mr. Ruskin Cummings was given a one-year contract.
- One Launch Engineer, Mr. Mark Pierre.
- The Institute operated without a permanent Seaman II (Deckhand) as Mr. Derry Juman's temporary tenure ends in November 2017. He was however, on call when trips are scheduled.
- One Auto Mechanic, Mr. Christopher Superville. The IMA operated with one Mechanic. Mr. Superville has received his Diploma in Supervisory Management.
- TSS department was managed by the Operations Manager (Ag).

Fleet of Vehicles

The TSS department provided IMA's researchers with proper working vehicles and vessels for their respective projects.

The TSS department currently maintains the fleet of vehicles comprising of:

	Manufacturer	Model	Registration No.
1.	Mazda	B2500 Pick Up	TBZ 4737
2.	Mazda	BT-50 Pick Up	TCF 1840
3.	Mazda	BT-50 Pick Up	TDH 7658
4.	Mazda	BT-50 Pick Up	TDH 7659
5.	Nissan	X-Trail	PBZ 4582
6.	Nissan	Wingroad	PBX 8909
7.	Nissan	Panel Van	TCF 516
8.	Nissan	Civilian Passenger Bus	TBJ 1599
9.	Toyota	Hilux	TCX 5579
10.	Toyota	Hilux	TCX 5580
11.	Nissan	Frontier	TDM 1928

The following vehicles will be up for auction in early 2018:

- TBR 4966-Mazda B2500 Pick Up
- TBR 4967-Mazda B2500 Pick Up
- TBZ 5770-Mazda B2500 Pick Up
- The Massey Ferguson Tractor -TAP 7261

The department prepared for annual vehicle inspections which usually takes place in the months of March/ April.

Fleet of Vessels:

1. R.V. PELAGICA
2. R.V. KANAWA
3. MAKO 25
4. YAMAHA SX-210. This vessel was acquired from the Forestry Division in exchange for IMA's Boston Whaler. We have yet to add this vessel officially to our fleet as we are awaiting funds to purchase engines to equip this vessel.
5. MUDSKIPPER + Trailer

Annual licences for vessels and trailers were renewed in April .

5.0 HUMAN RESOURCES DEPARTMENT

Introduction

The Human Resources Department directly coordinates all activities related to Manpower Planning, Compensation and Benefits Administration, Employee Assistance Programme Administration, Industrial Relations, Performance Management, Recognition and Reward Administration, Training and Development, Health and Safety Supervision, and Employee Services. The following strategic developments were spearheaded in the period under review.

Staffing

For the financial year 2016 to 2017, the Institute functioned with staffing vacancies in crucial job positions. Hiring to fill vacant positions continued to be suspended pending the appointment of the Board of Governors. A Board of Governors was installed during the financial year. Immediately upon the installation of the Board, efforts were undertaken to recruit the two top positions of Director and Deputy Director of Research.

The Institute conducted its annual Summer Internship Programme, providing university students the opportunity for involvement in research activities, with the aim of encouraging them to consider careers in marine research. To this end, four undergraduates were accepted as interns for the period June to August 2017. As has become customary, the Institute participated in the St. Francois Girls' College World of Work Programme, and this year hosted six fourth form students for two weeks in July. The students were exposed to various aspects of research and support activities conducted at the IMA.

Training and Development

Training and development of employees' skills and expertise were supported. A Senior Fisheries Research Officer was awarded a four month fellowship to the University of Florida, under the Caribbean Fisheries Professional Development Programme, for advanced training in Fish Age and Growth Techniques; Data Analysis, Growth Modelling and Otolith Processing and Imaging. Another Research Officer was awarded a Hubert H. Humphrey Fellowship to pursue a non-degree, ten month academic study and related professional experiences in the Field of Natural Resources, Environmental Policy and Climate Change.

Seven research scientists were introduced to "R Statistical Software" and twenty-one (21) officers were schooled in Mastering Public Speaking and Presentations using Power Point.

Officers continued to represent the Institute and give of their expertise at various regional and international conferences and workshops.

Employee Services

The Institute was advised by the Group Health Plan providers that the Plan was operating at a loss and revised coverage was negotiated. The revised coverage was effected in April 2017.

The responsibility for administration of the Employee Group Life and Overseas Travel Insurances were transferred to the Human Resources Department in the later part of the financial year. The Institute provides a confidential Employee Assistance Programme (EAP) for employees and their dependents. As the official liaison with the EAP Service Provider, the Department coordinated workshops for employees in Personal Vision Planning, and training sessions for employees and supervisors in the utilisation of the programme.

The following pages provide a listing of staff employed at the Institute, and a listing of the training workshops attended by staff for the period October 2016 to September 2017.

PERMANENT & CONTRACT STAFF – 1ST OCTOBER 2016 – 30TH SEPTEMBER 2017

Accounts

Cameron, Jackie	Accounts Manager
Christopher, Nekeisha	Accounts Clerk II
De Freitas, Anika	Clerk Typist II
Joseph, Rhonda	Supervisor/OIC
Karim-Dowlat, Jameela	Accounts Clerk I
Lewis, Rachael	Accounts Clerk III Terminated 17/10/16
Peters, Andrea	Secretary II

Administrative Services

Mahabir, Gerard	Administrative Officer
Inniss, Evol	Stores Assistant
Jones, Ashton	Driver/Messenger
McIntosh-Caesar, Dawn	Secretary II
Singh, Amrit	Ag. Procurement Supervisor/Procurement Clerk
Williams, Ronald	Driver/Messenger

Directorate

Arneaud, Toylan	Ag. Director
Andrews, Selman	Field Assistant/Driver
Asmath, Hamish	Geographic Information Systems Officer
Chadee, Lisa	Secretary II
Doodnath, Lester	Project Implementation Officer
Johnson, Arlene	Executive Assistant
Juman, Rahanna	Ag. Deputy Director (Research)/Senior Research Officer
Khan, Zaheer	Ag. Operations Manager/Health, Safety & Environment Officer
O'Brien, Ramona	Ag. Supervisor (Research Secretariat)/ Secretary I
Powell, Marcia	Internal Audit Assistant
Ramdass, Reena	Internal Auditor
Samuel-Turner, Sabrina	Secretary I
Seemungal, Ryan	Geospatial Technician

Human Resources

Wyke, Maria	Ag. Human Resource Manager/ Personnel & Industrial Relations Officer
Joseph-Browne, Nisa	Human Resource Assistant
Lewis-Patterson, Deborah	Telephone Operator/Receptionist
Noel, Roslyn	Maid/Internal Courier
Guevara, Tracey	Secretary III
Williams, Amelia	Secretary III

Information Centre

Barrow, Lorraine	Ag. Chief Information Officer/ Librarian
Doyle, Karl	Graphic Artist
Ganaselal, Krystal	Information/Public Relations Officer
Glasgow, Glendon	Information Officer
Lee Lum, Lori	Community Education Officer
Medina, Tracey	Secretary II
Thomas-Dookie, Christine	Library Technician
Yates, Brent	Printer II

Information Technology

Nelson, Paul	Ag. Information Technology Manager/Data Officer
Antoine, Rahsaan	Computer Technician Resigned 16/12/16
Ramoutar, Oscar	Network Administrator
Ramsamaroo, Sudesh	Computer Technician

Facilities

Andrews, Maurice	Groundsman
Carter, Dennis	General Craftsman
Gomez, Derick	Electrical Technician I
Ramkhelawan, Kamini	Clerk Typist II
Seegobin, Garvin	Groundsman

Technical & Support Services

Cummings, Russkin	Launch Captain Deceased 20/06/17
Pierre, Mark Roger	Launch Engineer
Robinson, Ronald	Launch Captain
Superville, Christopher	Auto Mechanic I
Warren, Andre	Launch Captain

Biodiversity & Ecology

Gomez, Jonathan	Marine Technician I
Hassanali, Kahlil	Research Officer (Policy)
Jute, Alana	Research Officer (Reference Collection)
Kanhai, Attish	Research Officer (Benthic Ecology)

Environmental Quality

Banjoo, Darryl	Senior Research Officer (Chemistry)
Bullock, Christine	Senior Research Officer (Microbiology)
Dennie, Aleisha	Laboratory Technician II
James, Salinas	Laboratory Technician I
Lai Fang, Keagan	Laboratory Technician II
Nelson, Wendy	Research Officer (Chemistry)
Ramoutar, Sheldon	Research Officer (Microbiology)
Ramsammy, Shane	Laboratory Technician I
Williams, Kyle	Ag. Laboratory Supervisor/Laboratory Technician I

Fisheries & Aquaculture

Carrington, Sean	Technician III
Gomez, Joseph	Labourer
Henry, Tyann	Marine Technician II
King-Julien, Rhea	Research Officer (Aquaculture) Resigned 07/09/17
Kishore, Rosemarie	Senior Research Officer (Fisheries)
Maharaj, Ben	Research Officer (Socio-Economist)
Robinson, Daniel	Research Officer (Aquaculture)
Solomon, Farahnaz	Research Officer (Fisheries)
Titus, Addison	Senior Supervisor - Aquaculture
Walters, Tyronne	Technician II

Oceanography & Coastal Processes

Alexis, Christopher	Research Officer (Coastal Engineering)
Bhagwandeen, Christopher	Marine Technician II (Resigned 11/07/17)
Mohammed, Aaron	Marine Technician I
Persad, Rameez	Marine Technician I
Peters, Rennie	Senior Electronic Technician

WORKSHOPS/CONFERENCES/MEETINGS – 1ST OCTOBER 2016 TO 30TH SEPTEMBER 2017
LOCAL

Workshop: **"Caribbean Climate Smart"**
Venue: *Chief Secretary's Conference Room, Calder Hall, Tobago*
Date: 4th October 2016
Attendee(s): Kahlil Hassanali

Workshop: **"ACCA Members Business Breakfast - FATCA"**
Venue: *Arthur Lok Jack, North Campus*
Date: 4th November 2016
Attendee(s): Rishmala Reena Ramdass

Conference: **"Microsoft M4 Conference Trinidad and Tobago Empowered – Digital Information Seminar"**
Venue: *Hilton Hotel, Port of Spain*
Date: 15th November 2016
Attendee(s): Karl Doyle

Workshop: **"Applying GIS in your Job"**
Venue: *The University of the West Indies, St Augustine*
Date: 4th October 2016
Attendee(s): Daniel Robinson; Rachael Amoroso; Sheldon Ramoutar; Christopher Bhagwandeen

Training: **"R Statistical Software"**
Date: 26th and 27th October 2016
Attendee(s): Lester W Doodnath; Farahnaz Solomon; Attish Kanhai; Paul Nelson; Tyann Henry; Rosemarie Kishore; Rachael Amoroso

Workshop: **"The Impact of Industrial Court Judgements on your Business"**
Venue: *The Trinidad and Tobago Chamber of Commerce, Westmoorings*
Date: 30th November 2016
Attendee(s): Maria Wyke

Training: **"Virtualization"**
Venue: *IMA*
Date: 8th December 2016
Attendee(s): Oscar Ramoutar

Conference: **"Breakfast Meeting – Sexual Harassment and Your HR Response"**
Venue: *ECA Training and Conference Facility, Aranguez*
Date: 21st February 2017
Attendee(s): Nisa Joseph-Browne

Conference: **"Landmark Court Judgements: Compensation for Emotional Distress Seminar"**
Venue: *Trinidad Hotel and Conference Centre, Port of Spain*
Date: 29th March 2017
Attendee(s): Maria Wyke

Workshop: **"NGC Bocas Festival 2017 Workshop: Preservation and Conservation"**
Venue: *National Library and Information System Authority (NALIS), Port of Spain*
Date: 26th April 2017
Attendee(s): Christine Thomas-Dookie

Workshop: **"Microsoft Workshop on SQL Server: Features and Administration"**
Venue: *Microsoft Trinidad and Tobago, St. James*
Date: 23rd to 25th May 2017
Attendee(s): Paul Nelson

Training: **"Calculating Final Pay"**
Venue: *ECA Training and Conference Facility, Aranguez*
Date: 13th and 27th June 2017
Attendee(s): Nekeisha Christopher

Conference: **"Enhancing Ocean Governance Symposium"**
Venue: *University of Trinidad and Tobago, Chaguaramas Campus*
Date: 29th and 30th June 2017
Attendee(s): Christopher Alexis; Wendy Nelson; Toylan Arneaud; Dr Rahanna Juman; Kahlil Hassanali; Farahnaz Solomon

Training: **"Mastering Public Speaking and Presentation using PowerPoint**"
Venue: *IMA*
Date: 6th, 7th, 13th and 14th July 2017
Attendee(s): Addison Titus; Kahlil Hassanali; Darryl Banjoo; Attish Kanhai; Rachael Amoroso; Kyle Williams; Danielle Sookram; Christine Bullock; Sheldon Ramoutar; Wendy Nelson; Christopher Alexis; Mathew Rahamut; Glendon Glasgow; Krystal Ganaselal; Tracey Medina; Karl Doyle; Hamish Asmath; Lester W Doodnath; Zaheer Khan; Paul Nelson; Farahnaz Solomon

Workshop: **"NALIS' Save Our Stuff (SOS) Preservation and Conservation Laboratory"**
Venue: *National Library and Information System Authority (NALIS), Port of Spain*
Date: 11th, 13th and 14th July 2017
Attendee(s): Christine Thomas-Dookie

Workshop: **"NALIS' Save Our Stuff (SOS) Preservation and Conservation Laboratory"**
Venue: *National Library and Information System Authority (NALIS), Port of Spain*
Date: 13th and 14th July 2017
Attendee(s): Brent Yates

Workshop: **"Introduction to Disaster Risk Management for the Caribbean"**
Venue: *University of Trinidad and Tobago, Chaguanas Campus*
Date: 20th and 21st July 2017
Attendee(s): Zaheer Khan

Conference: **"KPMG Annual Tax Seminar"**
Venue: *Hilton, Port of Spain*
Date: 9th August 2017
Attendee(s): Nekeisha Christopher; Jameela Karim-Dowlat

Workshop: **"Workshop on Risk Mapping"**
Venue: *Engineering Division of the Ministry of Agriculture, Land and Fisheries, Centeno*
Date: 21st to 25th August 2017
Attendee(s): Ryan Seemungal

Workshop: **"Cyber Security Workshop**"
Venue: *Global Service Internationalization Hub, Chaguanas*
Date: 29th August 2017
Attendee(s): Sudesh Ramsamaroo

Workshop: **"Auditing Stores and Inventory Management Workshop"**
Venue: *Arthur Lok Jack, San Juan*
Date: 22nd September 2017
Attendee(s): Rishmala Reena Ramdass

INTERNATIONAL

Workshop: **"Third Meeting of the Scientific and Technical Advisory Committee (STAC3) to the Protocol concerning Pollution from Land-Based Sources and Activities (LBS)"**
Venue: *UNEP-CEP, Miami, Florida*
Date: 31st October 2017 to 2nd November 2017
Attendee/s: Darryl Banjoo

Workshop: **"Sustainable Water Management under Climate Change in Small Island States in the Caribbean Project – CSIS"**
Venue: *Grenada*
Date: 14th to 16th November 2016
Attendee(s): Kahlil Hassanali

Workshop: **"Second Session of the IODE Steering Group for Caribbean Marine Atlas Phase 2 Project"**
Venue: *UNESCO, Cartagena, Colombi*a
Date: 15th to 17th February 2017
Attendee(s): Hamish Asmath

Workshop: **"CARICOM Regional Workshop on the Conservation and Sustainable Use of Marine Biological Diversity in Areas Beyond National Jurisdiction through a New Implementing Agreement under UNCLOS"**
Venue: *Belize*
Date: 20th to 22nd February 2017
Attendee(s): Kahlil Hassanali

Workshop: **"Sustainable Ocean Initiative (SOI) Capacity Building Workshop for the Wider Caribbean and Central America"**
Venue: *UNDEP, Costa Rica*
Date: 20th to 24th February 2017
Attendee(s): Rahanna Juman

Workshops: **"UNDP/GEF Caribbean Large Marine Ecosystem (CLME+) Project Ecosystem-Based Management Workshop", "UNEP's State of Convention Area Report Meeting"," UNEP's 3rd Meeting of the Contracting Parties to the Protocol concerning Pollution from Land-based Sources and Activities in the Wider Caribbean Region (LBS)" and "UNEP's 17th Intergovernmental Meeting on the Action Plan for the Caribbean Environment Programme and 14th Meeting of the Contracting Parties to the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region"**
Venue: *Cayenne, French Guiana*
Date: 10th to 17th March 2017
Attendee(s): Toylan Arneaud; Darryl Banjoo

Workshop: **"Global Nutrient Cycle Workshop – Training of Trainers and Technology Validation of the Global Nutrient Management Toolbox"**
Venue: *Manila, Philippines*
Date: 20th to 24th March 2017
Attendee(s): Hamish Asmath

Workshop: **"Workshop on Climate Change Induced Loss and Damages in Artisanal Fisheries"**
Venue: *St Lucia*
Date: 19th April 2017
Attendee(s): Farahnaz Solomon

Conferences: **"IOCARIBE Marine Science Conference" and the "14th Session of the IOC Sub-commission for the Caribbean and Adjacent Regions"**
Venue: *Cartagena, Columbia*
Date: 24th to 28th April 2017
Attendee(s): Rahanna Juman

Workshop: **"Conduct of Marine Scientific Research under the United Nations Convention on the Law of the Sea"**
Venue: *UNESCO, St Lucia*
Date: 5th May 2017
Attendee(s): Rosemarie Kishore

Workshop: **"Amazon and Caribbean Regional Workshop for Global Environment Fund Groundwater (GEFIW) Projects"**
Venue: *Belem, Brazil*
Date: 9th to 12th May 2017
Attendee(s): Rahanna Juman Darryl Banjoo

Meeting: " **Partnership Dialogue 3: Minimizing and Addressing Ocean Acidification"**
Venue: *New York, USA*
Date: 6th June 2017
Attendee(s): Rahanna Juman

Workshop: **"UN Environment Global Dialogue on Oceans"**
Venue: *Puntarenas, Costa Rica*
Date: 8th and 9th June 2017
Attendee(s): Lester W Doodnath

Conference: **"15th Session of the Group of Experts for the Global Sea Level Observing System (GLOSS) and WCRP/IOC Regional Changes and Coastal Impacts Conference"**
Venue: *New York, USA*
Date: 8th to 14th July 2017
Attendee(s): Rameez Persad

Workshop: **"4th Session of the Preparatory Committee on the Development of the International Legally Binding Instrument under UNCLOS on the Conservation and Sustainable Use of Marine Biological Diversity beyond areas of National Jurisdiction"**
Venue: *New York, USA*
Date: 17th to 21st July 2017
Attendee(s): Kahlil Hassanali

Workshop: **"Technical Professional Conference on Protection of Coastal Ecosystems along the Guiana Shield"**
Venue: *Paramaribo, Suriname*
Date: 2nd to 4th August 2017
Attendee(s): Rahanna Juman

Fellowship: **"Hubert H. Humphrey Fellowship – Non-Degree Academic Study and Related Professional Experiences in the field of Natural Resources, Environmental Policy and Climate Change"**
Venue: *California, USA*
Date: 15th August 2017 to 8th June 2018
Attendee(s): Kahlil Hassanali

Fellowship:	**"University of Florida Fellowship under the Caribbean Fisheries Professional Development Programme – Advanced Training in Fish Age and Growth Techniques; Data Analysis, Growth Modelling and Otolith Processing and Imaging"**
Venue:	*Florida, USA*
Date:	15th August 2017 to 16th December 2017
Attendee(s):	Rosemarie Kishore

Workshop:	**"Sustainable Ocean Initiative Training of Trainees Workshop"**
Venue:	*Seocheon, Republic of Korea*
Date:	25th to 29th September 2017
Attendee(s):	Farahnaz Solomon

Conference:	**"Caribbean Coastal Resilience Forum"**
Venue:	*New Providence, Bahamas*
Date:	26th and 27th September 2017
Attendee(s):	Rahanna Juman

6.0
Accounts Department

INSTITUTE OF MARINE AFFAIRS FINANCIAL STATEMENTS
FOR THE YEAR ENDED SEPTEMBER 30, 2017

INSTITUTE OF MARINE AFFAIRS
Balance Sheet as at September 30, 2017

	Notes	2017 TT$	2016 TT$
ASSETS			
Non- Current Assets			
Fixed Assets	4	44,419,514	47,657,497
Total Non-Current Assets		44,419,514	47,657,497
CURRENT ASSETS			
Cash and Bank		14,990,798	15,480,960
Investments		28,165,247	27,247,522
Accounts Receivable		89,352	231,683
Goods in Transit		347,669	0
Prepayments and Other Assets		3,826,913	4,132,588
Total Current Assets		47,419,979	47,092,753
TOTAL ASSETS		**91,839,493**	**94,750,250**
EQUITY AND LIABILITIES			
Retained Earnings		29,918,147	33,190,214
Non-Current Liabilities			
Deferred Revenue		58,195,894	59,395,894
Pension Plan Liability	5	341,873	(488,445)
Retentions		1,163,688	1,163,688
TOTAL Non-Current Liabilities		59,701,455	60,071,137
Current Liabilities			
Accounts Payable		664,797	160,885
Accruals		1,555,094	1,328,014
Total Current Liabilities		2,219,891	1,488,899
TOTAL EQUITY & LIABILITIES		91,839,493	94,750,250

The accompanying notes form an integral part of these financial statements.

Chairman Board of Governors: _____ Director: _____

UNAUDITED

INSTITUTE OF MARINE AFFAIRS
Income and Expenditure Statement
For the year ended September 30, 2017

	Note	2017 TT$	2016 TT$
INCOME			
Government Grants		23,935,757	27,399,460
Interest		408,878	297,207
Gain (Loss) on Foreign Exchange		329,852	18,683
Gain (Loss) on Asset Disposals		0	620,093
Unrealized Gain (Loss) on Invest		195,439	0
Non-Government Income		153,273	221,544
Total Income		**24,827,760**	**28,556,987**
EXPENDITURE			
Sales & Related Cost		15,664,351	15,778,420
Administrative Expenses	6	4,322,317	4,292,864
Maintenance & Repairs		1,837,986	1,856,533
Research Expenses		1,621,850	1,227,050
Audit Fees		100,913	212,387
Board Remuneration		101,572	104,922
Depreciation Expense		3,815,963	4,201,550
Bad Debt Expenses		0	2,230
Total Expenses		**27,464,952**	**27,675,956**
Net (Loss)/Income		**(2,637,192)**	**1,299,430**
OTHER COMPREHENSIVE INCOME			
Reavulation Reserve		0	348,399
Pension - Actuarial gains/ (losses)		(830,318)	697,165
Unrealized Gain/Loss on INvest		195,429	0
Total Comprehensive Income		**3,272,071**	**1,926,595**

The accompanying notes form an integral part of these financial statements.

UNAUDITED

INSTITUTE OF MARINE AFFAIRS
Statement of Accumulated Surplus
as at September 30, 2017

	2017 TT$	2016 TT$
Accumulated surplus brought forward	33,190,214	31,263,619
(Deficit)/ Surplus for the period	(3,272,071)	1,926,595
Accumulated surplus carried forward	29,918,143	33,190,214

The accompanying notes form an integral part of these financial statements.

UNAUDITED

INSTITUTE OF MARINE AFFAIRS
CASH FLOW STATEMENT
For the year ended September 30, 2017

	2017	2016
	TT$	TT$
OPERATING ACTIVITIES		
Loss /Surplus	(3,272,071)	1,926,596
Adjustments:		
Depreciation	3,815,963	4,201,551
Revaluation Reserve	0	(348,399)
(Gain)/Loss on Asset Disposals	0	(620,093)
Deferred Income	(1,710,757)	(2,273,360)
(Increase)/Decrease in Pension Plan Assets	830,318	(689,277)
Unrealized Foreign Currency (Gain)/Loss	(329,852)	(18,683)
Net Cash provided by Operating Activities	(666,399)	2,178,335
Dec./(Inc) in Trade and Other Receivables	100,337	793,165
Increase/(Decrease) in Creditors/Accruals	730,992	(524,008)
Changes in Operating Assets & Liabilities	831,329	
Net Cash provided by Operations	164,930	2,447,492
INVESTING ACTIVITIES		
Capital Grants Received	510,757	1,223,146
Purchase of Fixed Assets	(577,976)	(1,562,754)
Proceeds from Disposal of Assets	0	631,076
Net cash flow from investing activities	(67,219)	(291,468)
Unrealized Foreign Currency Gain/Loss	329,852	18,683
Net Increase <Decrease> in cash & cash equivalents	427,563	2,757,643
Cash Balance at Beg of period	42,728,482	39,970,839
Cash Balance at End of Period	43,156,045	42,728,482
Represented by:		
Cash and Bank	14,990,798	15,480,960
Investments	28,165,247	27,247,522
	43,156,045	42,728,482

The accompanying notes form an integral part of these financial statements.

UNAUDITED

INSTITUTE OF MARINE AFFAIRS
Notes to the Financial Statements for the year ended September 30, 2017

1. INCORPORATION ACTIVITIES

The Institute was established by an Act of Parliament of Trinidad and Tobago on 10th May 1976, Chapter 37:01 of the Laws of the Republic of Trinidad and Tobago refers. This Act was amended by Act #13 of 1990. The principal activities are:

a) to develop and implement programmes and projects that translate the marine and related policies of the Government into activities that contribute to national development;
b) to develop and execute programmes and projects that foster and encourage regional and international collaboration in the exploitation of the marine and other related areas of the environment;
c) to promote a public understanding of and appreciation for all aspects of the marine and related environment;
d) to stimulate and advance the conduct of marine scientific research in Trinidad and Tobago;
e) to promote the utilisation and conservation of the marine resources for the economic and social benefit of Trinidad and Tobago and to enhance the national capabilities;
f) to do all such things as are incidental or conducive to the attainment of the above objectives.

2. REPORTING CURRENCY

The financial statements are expressed in Trinidad and Tobago dollars.

3. SIGNIFICANT ACCOUNTING POLICIES

a) Accounting Convention
The financial statements are prepared under the historical cost convention and in accordance with approved accounting standards. No account is taken of the effects of inflation.

b) Accounts Receivable
Accounts receivable are stated net of provision for bad and doubtful debts. The Institute has made a provision for doubtful debts of approximately 23% of debtors in the year ended 2017.

c) Fixed Assets
Fixed assets are depreciated at rates estimated to write off the depreciable amounts to the fixed assets over their useful lives.

The annual depreciation rates used are: -

Category	Method	Rate
Buildings and improvement works	Straight line	2%
Plant and machinery	Reducing balance	10-25%
Computer Equipment	Reducing balance	33%
Furniture and fittings	Reducing balance	10%
Marine vessels	Reducing balance	25%
Motor vehicles	Reducing balance	25%
Reference and resource materials	Reducing balance	10%

d) Income
The Government of Trinidad and Tobago funds most of the operations of the Institute by means of monthly subventions. These are recognized on a cash basis and credited to income.

e) Deferred Income
Grants from Government, related to the purchase of fixed assets, are deferred and credited to revenue over the useful life of the assets concerned.

UNAUDITED

INSTITUTE OF MARINE AFFAIRS
Notes to the Financial Statements for the year ended September 30, 2017

3 SIGNIFICANT ACCOUNTING POLICIES (continued)

f) Taxation
The Institute may be exempted from the payment of, or the Government shall bear the cost of any taxes, customs duties, fees or levies which may be imposed on the Institute in respect of any equipment, materials and supplies imported into Trinidad and Tobago by the Institute which are essential for its operations.

g) Foreign currency
Transactions involving foreign currencies are converted at the rates prevailing on the dates of such transactions. Monetary assets and liabilities are translated at the rate prevailing at the Balance Sheet date. Exchange gains and losses are taken directly to the Income and Expenditure Account.

INSTITUTE OF MARINE AFFAIRS

Notes to the Financial Statements for the year ended September 30, 2017

4. FIXED ASSETS

Property, plant and equipment	LAND & BUILDINGS	CAPITAL WORK IN PROGRESS	MOTOR VEHICLE	PLANT & MACHINERY & EQUIPMENT	REFERENCE & RESOURCE	FURNITURE & FIXTURES	TOTAL
Year ended 30 September 2017							
Opening book value	32,485173	1,190,871	635,626	10,471,362	237,171	2,637,292	47,657,496
Prior period adjustments							
Additions				248,666		329,314	577,980
Disposals of Assets				(3,590,651)		(4,668)	(3,595,319)
Revaluations							
Disposal of Depreciation				3,590,651		4,668	3,595,319
Depreciation charge	(788,888)	-	(158,906)	(2,556,045)	(24,999)	(287,125)	(3,815,963)
Closing net book value	**31,696,285**	**1,190,871**	**476,720**	**8,1663,983**	**212,172**	**2,679,481**	**44,419,513**
At 30 September 2017							
Accumulated Cost	39,584,831	1,190,871	2,389,946	44,503,468	1,259,545	5,993,835	94,922,496
Revaluation							-
Accumulated depreciation	(7,888,546)	-	(1,913,226)	(36,339,485)	(1,047,372)	(3,314,354)	(50,502,983)
Net book value	**31,696,285**	**1,190,871**	**476,720**	**8,163,983**	**212,172**	**2,679,481**	**44,419,513**
Year ended 30 September 2016							
Opening book value	33,274,069	1,190,871	594,817	11,890,994	199,722	2,808,397	49,958,870
Prior period adjustments							-
Additions	-	-	195,854	1,559,603	65,000	136,846	1,957,303
Disposals			(149,977)	(112,990)		(19,017)	(281,984)
Revaluations							-
Depreciation charge	(788,888)	-	(5,068)	(2,866,245)	(27,551)	(288,934)	(3,976,694)
Closing net book value	**32,485,173**	**1,190,871**	**635,626**	**10,471,362**	**237,171**	**2,637,292**	**47,657,496**
At 30 September 2016							
Accumulated Cost	39,584,831	1,190,871	2,389,946	47,845,453	1,259,545	5,669,189	97,939,835
Revaluation							-
Accumulated depreciation	(7,099,658)	-	(1,754,320)	(37,374,091)	(1,022,374)	(3,031,897)	(50,282,340)
Net book value	**32,485,173**	**1,190,871**	**635,626**	**10,471,362**	**237,171**	**2,637,292**	**47,657,496**

5. PENSION PLAN LIABILITY

The Institute's pension plan is a defined benefit plan. The plan is operated by virtue of a Trust Deed made on 8th June 1990 between the Institute of Marine Affairs and the Trustees of the Plan. The assets supporting the Plan are invested through a Deposit Administration Policy with an insurance company.

Effective October 1st, 1999, the Institute adopted the provisions of International Accounting Standard 19 Employee Benefits (IAS 19) (Revised). It treated with the transitional asset as an adjustment to the opening retained earnings of that period because it was impracticable to restate the comparative information of prior periods.

Retirement Benefit Asset/Liabilities

a) Net liability in statement of financial position	**2017**	**2016**
Present value of defined benefit obligation	(49,919,148)	(46,798,054)
Fair value of plan assets	49,577,275	47,286,499
Value of surplus/(deficit)	(341,873)	88,445
Unrecognized actuarial losses/(gains)	**14,990,798**	**15,480,960**
Investments	-	-
	(341,873)	**488,445**

INSTITUTE OF MARINE AFFAIRS
Notes to the Financial Statements for the year ended September 30, 2017

5. PENSION PLAN LIABILITY (continued)

b) Movement in present value of defined benefit obligation

	2017	2016
Defined benefit obligations at start	46,798,054	45,291,978
Current service cost	1,616,667	1,677,690
Interest cost	2,398,498	2,318,380
Members contributions	399,339	416,816
Past service cost/(credit)	-	-
Re-measurements:		
Experience Adjustments	394,796	(869,040)
Actuarial (gain)/loss from change in financial assumptions	-	-
Benefits paid	(1,688,205)	(2,037,770)
Defined benefit obligation at end of year	**49,919,149**	**46,798,054**

c) Movement in fair value of plan assets

	2017	2016
Plan assets at start of year	47,286,499	45,091,146
Interest income	-	-
Expected return on plan assets	2,370,813	2,254,455
Company's contributions	1,587,773	1,655,589
Members contributions	399,339	416,816
Benefits paid	(1,688,205)	(2,037,770)
Experience adjustments	(339,544)	(55,022)
Administration & other non-plan investment management expenses	(39,400)	(38,715)
Fair value of plan assets at end of year	**49,577,275**	**47,286,499**
Actual return on plan assets	**2,031,270**	**2,199,432**

INSTITUTE OF MARINE AFFAIRS
Notes to the Financial Statements for the year ended September 30, 2017

5. PENSION PLAN LIABILITY (continued)

Expenses recognised in profit or loss

	2017	2016
Current service cost	1,616,667	1,677,690
Interest cost income	2,398,498	2,318,380
Expected return on plan assets	(2,370,813)	(2,254,455)
Administration & other non-plan investment management expenses	39,400	38,715
Net pension cost	**1,683,752**	**1,780,329**

Re-measurements recognised in other comprehensive income

	2017	2016
Actuarial (gain)/loss from changes in financial assumptions	-	-
Experience adjustments	394,796	(869,040)
Expected return on plan assets	2,370,813	2,254,455
Actual return on plan assets	(2,031,270)	(2,199,432)
Total amount recognised in other comprehensive income	**734,339**	**(814,017)**

Reconciliation of opening & closing statement of financial position entries

	2017	2016
Opening defined benefit asset/(liability)	488,445	(200,832)
Net pension cost	(1,683,752)	(1,780,329)
Re-measurements recognised in other comprehensive income	(734,339)	814,017
Company contributions paid	1,587,773	1,655,589
Closing defined benefit asset/(liability)	**(341,873)**	**488,445**

INSTITUTE OF MARINE AFFAIRS
Notes to the Financial Statements for the year ended September 30, 2017

5. PENSION PLAN LIABILITY (continued)

Summary of principal assumptions as at 30th September

	2017	2016
Discount rate	5.00% per annum	5.00% per annum
Expected return on assets at the end of the year	5.00% per annum	5.00% per annum
Future promotional salary increases	3.25% per annum	3.25% per annum
Future inflationary salary increases	0.75% per annum	0.75% per annum
Future increases in the NIS ceiling for earnings	Nil	Nil
Future increases to pensions	0.25% per annum	0.25% per annum
Mortality	UP94 Generational at 2017	UP94 Generational at 2016
Termination of active members	Nil	Nil
Early retirement	Nil	Nil
Future expenses	Nil	Nil

Sensitivity analysis

	2017	2016
Base IAS 19 Results	49,919,148	46,798,054
Reduce Discount Rate by 1.0% pa	59,144,451	55,538,502
Increase Discount Rate by 1.0% pa	42,757,272	40,024,904
Reduce Discount Rate by 0.5% pa	48,588,927	45,537,430
Increase Discount Rate by 0.5% pa	51,356,571	48,161,475
Increase average life expectancy by 1 year	50,263,089	47,036,153

INSTITUTE OF MARINE AFFAIRS
NOTES TO THE FINANCIAL STATEMENTS - September 30, 2017

6. ADMINISTRATION

Included in Administration expenditure is the cost attributable to a 30 year lease agreement between Chaguaramas Development Authority (CDA) and the IMA. This lease is an operating lease and provides for an annual rent of $14,850 over the total period of the lease.

INSTITUTE OF MARINE AFFAIRS
Notes to the Financial Statements for the year ended September 30, 2017

7. SEVERANCE BENEFITS

Under the provisions of the Retrenchment and Severance Benefits Act 1985, the Institute is required to pay severance benefits to workers who are retrenched. The Institute has adopted a 'pay-as-you-go' approach in dealing with these payments. With this approach, provision is not made for obligations until employees are actually retrenched.

	2017	**2017**
	$	**$**
Minimum Lease Payment		
An expense in the year	254,850	245,627

As at the balance sheet date the IMA has outstanding commitments under the operating lease as follows

	2017	**2016**
	$	**$**
Within one year	12,000	12,000
In the second to the fifth year inclusive	48,000	48,000
After five years	192,000	204,000
	252,000	264,000

UNAUDITED

APPENDICES

APPENDIX ONE

INFORMATION CENTRE
PUBLIC OUTREACH
DETAILS OF OUTREACH ACTIVITIES
OCTOBER 2016 – SEPTEMBER 2017

SCHOOL TOURS OF AQUACULTURE FACILITY AND LABORATORIES:

- 35 students from Colorado State University's 'Semester at Sea' Oceanography Programme (M.V. World Odyssey) received a tour of IMA's Aquaculture Facility.
- 14th November 2016.
- 45 students from St. Peter's Private Primary School received a tour of the Aquaculture Facility. 9th March 2017.
- 50 children from Point Fortin and La Brea Police Youth Camps viewed a presentation on "Coral Reefs" as well as a tour of the Aquaculture Facility.
- 15 students from the Caribbean Youth Science Forum (CYSF), NIHERST, visited the IMA and viewed a presentation and tour of the Aquaculture Facility and Marine Chemistry Laboratory. IC was assisted by a researcher.

EXHIBITIONS

- **Trinidad and Tobago Bioblitz 2017**
  4th and 6th November 2016
  Royal Botanic Gardens, Port of Spain
  IMA hosted a booth to raise awareness about marine conservation.
- **Nature Seekers' Exhibition**
  11th November 2016 Matura Savannah, Matura
  IMA hosted an interactive booth at this environmental exhibition.
- **Nature Seekers' Exhibition – Annual Pre-Season Beach Clean-up**
  5th March 2017
  Orosco Bay (Matura Beach)
  IMA hosted an exhibit to educate the general public on issues relating to environmental conservation and sustainability. An IMA representative also participated as a judge in the turtle building competition.
- **Emperor Valley Zoo Exhibition**
  12th and 20th April 2017
  450 persons visited the IMA's booth during the Lionfish Awareness and Outreach at the Zoo. A live Lionfish was on display, and tokens and special prizes were distributed.
- **World Environment Day 2017**
  5th June 2017
  IMA hosted a booth to share information on marine conservation at EMA's World Environment Day Exhibition at St. Clair. Approximately 220 primary and secondary school students visited the IMA's booth.
- **UTT Exhibition**
  2nd – 4th August 2017. IMA participated in UTT's Annual Marine Sciences Showcase at Trincity Mall. Approximately 250 persons visited the IMA's booth.
- **Sangre Grande Regional Corporation**
  IMA hosted a booth at the Sangre Grande Regional Corporation's Volunteer Session for the community on 15th August 2017. Approximately 120 persons visited the IMA's booth.

SCHOOL OUTREACH

- **St. Benedict's Career Day**
  28th October 2016
  IMA hosted a booth at a Career Fair for students.

- **San Juan North Secondary's Career Day**
  23rd November 2016
  IMA hosted a booth to raise awareness about careers in Marine Science. Approximately 50 students and teachers visited.

- **Trinidad Outreach**
  20th - 30th January 2017.
  Nine Schools. Hillview College, El Dorado West Secondary, Tunapuna Secondary, Tunapuna Presbyterian Primary, Curepe Fatima R.C. Primary, Holy Saviour Anglican, Grant Memorial Presbyterian Primary, Naparima Boys' College and Naparima Girls' High School. Presentations were delivered by researchers on the following topics "Benthic Ecology", 'Marine Pollution" and 'GIS Monitoring".

- **Tobago Outreach**
  6th – 9th February 2017
  Schools: Speyside Anglican, Speyside High School, Charlotteville Methodist, Delaford Anglican (St. Paul's), Delaford RC, Ebenezer Methodist, Roxborough Secondary and Roxborough Anglican (St. Barnabas). A total of 223 primary students and 63 secondary students received presentations on 'Invasive Species: Threat of the Lionfish' and 'Coral reefs and the Threat of the Lionfish".

- **St. Benedict's Career Day**
  10th February 2017
  IMA hosted a booth at a Career Fair. Approximately 140 students visited the booth.

- **Arima Central Secondary School – Career Day**
  10th March 2017
  Presentations on "Careers in Marine Sciences'' were delivered to approximately 140 students

- **St. Bernadette's Primary**
  14th March 2017
  A presentation on 'Coral Reefs' was delivered to 33 students.

- **St. Anthony's College – Earth Day**
  23rd March 2017
  IMA hosted a booth at an "Earth Day" awareness event. Approximately 70 students visited the booth.

- **St. Charles High School – Career Day**
  5th April 2017
  Approximately 75 students received presentations on "Careers in Marine Sciences".

- **St. Mary's College – Geography Camp**
  11th April 2017
  Approximately 42 students received presentations on "Coral Reefs" and "Climate Change". The camp was held at Blanchisseuse High School.

- **Woodbrook Secondary School**
  27th April 2017
  Approximately20students received a presentation entitled, "Coral Reefs– Threats/Current Status". The presentation was delivered by a Junior Researcher, Rachael Amoroso.

- **Guaico Presbyterian Primary**
  7th June 2017
  A presentation on "Coral reefs – threat of the Lionfish" was shared with 45 students.

SEA & ME PROJECT 2017

- The fourteenth year of the "Sea and Me Project" began on 11th May 2016 and ended on 8th June 2016. The project involved 69 Standard Five Post SEA students of the four primary schools in Carenage and Point Cumana. Topics covered were Water Education, Marine Mammals, Coral Reefs and Water Safety.

COMMUNITY OUTREACH AND INFORMATION DISSEMINATION

- A joint project with the St. James Public Library commenced in February 2017 to encourage students to use the library. The IMA was invited to deliver presentations to schools visiting the library.
    - Ascension Anglican Primary School – 20 students. Presentation on "Coral Reefs and the Threat of the Lionfish" on 14th February 2017
    - Ascension Anglican Primary School – 28 students. Presentation on "Climate Change and Global Warming" on 14th March 2017
    - Gaines Normal AME – 19 students. Presentation on "Water Education" on 22nd May 2017
    - NALIS Young Adults Camp – 6 students. Presentations on "Understanding Mangrove Ecosystems and Bioluminescence in the Ortoire River" on 12th July 2017.

- A Water Education Workshop began in February 2017 with 24 Standard Three pupils of St. Peter's R.C. Primary School, Point Cumana. Through activities, games and song, the students were taught the connection of all water on earth.
- During May and June 2017, IMA engaged and shared information with 93 personnel of the Lifeguard Services, Ministry of National Security on the threat of the 'Invasive Lionfish'. Public awareness sessions were conducted at 9 lifeguard stations (Maracas, Las Cuevas, Toco, Salybia, Los Iros, Quinam, Vessigny and Manzanilla and Mayaro) in Trinidad.
- Information on marine conservation and the threat of the Lionfish was shared with students from Trimont College on 29th May 2017 at UTT Chaguaramas Campus. Lionfish Activity books were distributed.
- IMA participated in EMA's Enviro Camp Outreach at Plum Mitan Presbyterian Primary School, Manzanilla and Nariva Swamp Field Station, Kernahan Village and Biche. Approximately 100 children received a presentation about "Coral Reefs/Threat of the Lionfish" on 19th July, 26th July and 9th August 2017.
- A presentation on "Marine Pollution" was delivered to 45 students from the Sangre Grande Seventh Day Adventist School and Coal Mine Vacation Open Bible School on 20th July 2017.
- A presentation on "Wetlands" was delivered to 40 children at the Couva NALIS Vacation Camp on 25th July 2017.
- Presentations on "The Importance of the Marine Environment" were delivered at Rainbow Rescue, Maraval and the Margaret Kistow Home in Malabar, Arima on 14th and 21st August 2017 respectively.
- IMA was invited by Sustain TT to participate in their outreach activities.

APPENDIX TWO

NEWSPAPER ARTICLES/MEDIA RELEASES

1. **Jute, Alana** (2016, October 6). *"Ballast water – the Travelling Sea"*. The Trinidad Express.

2. **Hassanali, Kahlil** (2016, October 20). *"New Priorities in the Face of Global Climate Change"*. The Trinidad Express.

3. **Alexis, Christopher** (2016, November 10). *"Coastal Erosion - a Problem at Cocos and Guayaguayare"*. The Trinidad Express.

4. **Solomon, Farahnaz** (2016, November 17). *"What is a Fish Kill?"* The Trinidad Express.

5. **Banjoo, Darryl** (2016, November 24). *"Oil spills Harmful Impact on Health and Environment"*. The Trinidad Express.

6. **Barrow, Lorraine** (2016, December 1). *"Saving Coral Reefs from Lionfish Menace"*. The Trinidad Express.

7. **Juman, Rahanna** (2016, December 15). *"Disappearance of our Seagrass"*. The Trinidad Express.

8. **Kanhai, Attish** (2016, December 21). *"Secret Lives of Polychaete Worms*". The Trinidad Express.

9. **Ramoutar, Sheldon** (2016, December 29). *"Bacteria's Critical Role in Tropical Marine Ecosystems".* The Trinidad Express.

10. **Solomon, Farahnaz** (2017, January 5). *"Saving Sharks"*. The Trinidad Express.

11. **Kanhai, Attish** (2017, January 12). *"Fishing for Plastics".* The Trinidad Express.

12. **Asmath, Hamish** (2017, January 18) *"What I do in my Backyard affects our Seas."* The Trinidad Express.

13. **Nelson, Wendy** (2017, February 1). *"Pollution and our Marine Environment"*. Tobago Today.

14. **Juman, Rahanna** (2017, February 2). *"Celebrating Wetlands for Disaster Risk Reduction Today "*. The Trinidad Express.

15. **Sookram, Danielle** (2017, February 16). *"The Caroni Swamp – Benefits to People."* The Trinidad Express.

16. **Amoroso, Rachel** (2017, January 26). *"Faded brilliance – the Loss of Corals to Disease"*. The Trinidad Express.

17. **Amoroso, Rachel** (2017, March 22). *"Faded brilliance – the Loss of Corals to Diseases."* Tobago Today.

18. **Barrow, Lorraine** (2017, March 23). *"IMA Hosts Forum in Chatham on Healthy Coasts."* The Trinidad Express.

19. **Juman, Rahanna** (2017, March 30). *"Drafting a Policy for T&T Coastal Resources."* The Trinidad Express.

20. **Hassanali, Kahlil** (2017, April 6). *"Protecting Biodiversity in the Deep Blue sea."* The Trinidad Express.

21. **Doodnath, Lester** (2017, March 16). *"Seabirds of Trinidad and Tobago – Importance and Impacts."* The Trinidad Express.

22. **Doodnath, Lester** (2017, April 12). *"Seabirds of Trinidad and Tobago – Importance and Impacts."* Tobago Today.

23. **Rahamut, Matthew** (2017, April 13). *"Ocean Acidification: Causes and Impacts."* The Trinidad Express.

24. **Prevatt, Amara** (2017, May 18). "*Marine Litter and What we can do about it."* The Trinidad Express.

25. **Seemungal, Ryan** (2017, May 25). *"Leaving just our Footprints…the Problem of Coastal Debris."* The Trinidad Express.

26. **Jute, Alana** (2017, May 31). "*Ballast water: the Travelling Sea."* Tobago Today.

27. **Mohon, Jeunisse** (2017, June 1). *"Our Natural Connection."* The Trinidad Express.

28. **Banjoo, Darryl** (2017, June 7). *"Oil Spills: Impacts on the Marine Environment and Human Health."* The Trinidad Express.

29. **Ganaselal, Krystal** (2017, June 22). *"Our Oceans, our Future…playing a Critical Role in our Daily Lives."* The Trinidad Express.

30. **Solomon, Farahnaz** (2017, July 6).*"Bait Dump vs. Fish Kill in Chaguaramas."* The Trinidad Express.

31. **Kanhai, Attish** (2017, July 13). *"Ocean Acidification and the Preservation of Childhood Wonder."* The Trinidad Express.

32. **Solomon, Farahnaz** (2017, July 27). *"Raising Awareness on the State of our Marine Resources."* The Trinidad Express.

33. **Ganaselal, Krystal** (2017, Aug/Sep.). *"Our oceans, our Future…Playing a Critical Role in our Daily Lives."* Everywhere Tobago, No. 16, 2017

34. **Bullock, Christine** (2017, August 10). "*It's vacation time! Visit our Beaches for these Benefits but Beware of Potential Risks."* The Trinidad Express.

35. **Hassanali, Kahlil** (2017, August, 24). *"Climate Change, Sargassum and the Lionfish invasion."* The Trinidad Express.

36. **Bullock, Christine** (2017, August 25). *"It's vacation time! Visit our beaches for these Bnefits but Beware of Potential Risks."* Tobago Today.

37. **Henry, Tyanne** (2017, September 7). *"The Queen Conch-Royalty of the Sea."* The Trinidad Express.

38. **Glasgow, Glendon** (2017, September 14). "*That Floating Island."* The Trinidad Express.

39. **Barrow, Lorraine** (2017, September 20). *"Third Community Research Symposium in Mayaro today – Promoting Stakeholders Participation in Marine Resource Management."* The Trinidad Express.

40. **IMA** (2017, September 28). *"Managing Marine Resources Symposium."* The Trinidad Express.