IMA NEWS

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INSTITUTE OF MARINE AFFAIRS

BpTT and IMA partner in support of Marine Resilence in Tobago

Centre: Honourable Pennelope Beckles, Minister of Planning and Development
(l-r): Regional President of bpTT Ms. Claire Fitzpatrick; Tobago House of Assembly Secretary for Tourism, Culture, Antiquities and Transportation, Councillor Tashia Burris; Mr. Adison Titus, Dive Technician IMA; Dr Rahana Juman Ag. Director of IMA.

On April 26th 2022 the Institute of Marine Affairs with bpTT launched the Marine Resilience Initiative (MARIN) Tobago at the Pigeon Point Heritage Park Tobago. An 18-month pilot project; the Institute with support from the bp Trinidad and Tobago (bpTT) seeks to determine the feasibility of certain coral and seagrass restoration and rehabilitation strategies for the island of Tobago. This comes as many areas of Tobago's marine ecosystems have been degraded as a result of pollution from human sources, climate change impacts, and the annual sargassum influx. Restoration and rehabilitation initiatives will also aim to maintain and conserve biodiversity and support livelihoods opportunities made possible by these ecosystems. The second objective is to sensitise surrounding communities and stakeholders on the importance of coral reef and seagrass ecoystems and the role they play in preserving their quality of life in a bid to actively engage said community in management efforts.

Delivering the feature address was the Honourable Pennelope Beckles, Minister of Planning and Development. She noted that the project is a noteworthy milestone in the nation's quest to place the environment and its welfare at the centre of the sustainable development goals. The Minister added that "nature is giving its all to maintain and preserve the quality of life and our livelihoods, and ecosystems provide too many services to allow the degradation to go unaddressed."

Also addressing the gathering at the launch was Tobago House of Assembly Secretary for Tourism, Culture, Antiquities and Transportation, Councillor Tashia Burris who spoke on behalf of the Honourable Farley Chavez Augustine, Chief Secretary of the Tobago House of Assembly and Secretary for Finance, Trade and the Economy. She commended both bpTT and the IMA for strategically partnering on what she described as a "worthy cause" and said "for those of us entrusted with the responsibility of governance, this study by the IMA and BPTT is paramount. "As policy makers and decision makers, it is imperative that we are able to utilise reliable research in order to make wise development choices on behalf of the people that we serve," the Councillor added.

The Regional President of bpTT Ms. Claire Fitzpatrick deliberated on the crucial role that Tobago's natural resources play not only for leisure but also as a source of income and development. "Like other small island developing nations, Trinidad and Tobago's future depends on [its] ability to harness and preserve its natural resources even as the environment is coming under increasing threat."

IMA project leads Dr Anjani Ganase and Dr Rahanna Juman shared details of the pilot study. According to Dr Anjani Ganase, Coral Reef Ecologist, the pilot will focus on five coral reef sites: Buccoo Reef in the Marine Protected Area,

Setting seagrass for transplanting

Mt Irvine Reef, and Flying Reef in southwest Tobago, Booby Island Reef, Charlotteville and Angel Reef, Speyside in northeast Tobago. Building on existing data acquired through more than eighteen years of monitoring of the reef systems, the pilot will look at the current state of ecological resilience. It will also look at the viability of larval-based coral restoration strategies for Tobago by identifying the spawning patterns of local coral species. Coral spawning is a natural step in the reproductive cycle of corals which is fundamental to maintaining both coral populations and its diversity. Coral spawning, however, has never been officially documented in Tobago. The restoration methodology hopes to capitalise on this natural spawning event by increasing the survivability and changes of propagation for the species. The IMA team will work in collaboration with local dive tour operators and members of the dive community showing them how to conduct dives for coral spawning and equipping them with the information needed to aid the scientists in developing annual coral spawning predictions so that the propagation work could be conducted.

For seagrasses three locations in southwest Tobago where *Thalassia testudinum* dominated seagrass beds occur or were once present has been identified: Bon Accord Lagoon in the Marine Protected Area; Petit Trou; and Kilgwyn Bay. Seagrasses will be assessed for current ecological health and seagrass replanting methodologies (wire frame attachment or directly pinned to the seabed) will be tested with assistance of community groups. IMA will also conduct a preliminary assessment of the total vegetative carbon stock of seagrasses of Bon Accord Lagoon as a potential source of "blue carbon" in our MPA, which may incentivise seagrass conservation

Engaging communities at seagrass workshop held by IMA

and restoration as a blue carbon pool for climate mitigation.

The feasibility assessment for rehabilitation and restoration is an essential first step to guide the implementation phases of future restoration activities in Tobago. The immediate outputs of the study would be to coordinate rehabilitation efforts at a national scale and avoid pockets of mismanaged restoration activities by well-intentioned, but isolated activities that may be potentially detrimental. This is necessary for initiating coral reef and seagrass restoration in Tobago that will be extended to more sites in Trinidad and Tobago in the next phase. It will also help determine the most practical step forward, so that efforts and funds can be focused on the needs of the marine habitats that are suitable for rehabilitation. Part of this includes building social resilience in tandem with ecological resilience via community inclusion.

Among the tangible outputs of this pilot project is the production of a restoration guide for coral reef and seagrass rehabilitation and the building of a Tobago marine resilience network among stakeholders.

Team MARIN

For more, you may view the launch at:

https://www.facebook.com/IMAgovTT/videos/276962107981151

Funding from Japanese Government for Sargassum project

Mr. Sato Katsuya from the Japanese Embassy & Mr. Daniel Robinson Aquaculture research Officer at IMA

Mr. Sato Katsuya from the Japanese Embassy visited the IMA in early 2021 to discuss how the Japanese government can provide assistant on environmental issues. One of the challenges highlighted was the threat of Sargassum seaweed in our coastal areas. While it is still unclear why so much Sargassum is coming to our shores, one issue that remains true is that the impact of Sargassum continues to be a problem. In recent times large Sargassum deposits on beaches have negatively impacted the socioeconomic aspects of local livelihoods (tourism, fishery industries- ports) of coastal communities. The United Nations Environment Programme (UNEP) 2018 White Paper indicates that some areas of the Caribbean have witnessed significant decline in tourism, for example a thirty-five percent (35%) drop in tourist arrivals in 2018 in Mexico, as a result of the sargassum influx. Sargassum blooms also resulted in reduced access to fishing grounds and disrupted fishing operations. In Tobago mats of up to 0.6m thick engulfed the beaches with the most notable incident occurring in July 2015. Labelled a natural disaster by the Tobago House of Assembly, over TTD 3 million was spent on clean-up efforts.

On February 18th 2022, the Japanese Government signed an agreement with United Nations Development Programme (UNDP), Barbados to provide US12,339,473.00 million to five countries in the region including Trinidad and Tobago for technical assistance. Each country will receive $US 2 million in assistance through the provision of equipment such as floating boom barriers, aquatic conveyors, work boats, machine surface beach rakes, tractors, and dump trucks. The Project also includes the transfer of expertise and technical knowledge on the collection, removal, transport and disposal of Sargassum. Dr. Rahanna Juman represented the Ministry of Planning and Development at the virtual signing ceremony. The project will also include training and capacity development for scientific monitoring using different technologies- such as UAS drones, GIS and other spatial mapping tools to evaluate the amount of Sargassum influx. In addition, site-specific Sargassum collection and management plans to minimise beach erosion and sea turtle nesting sites will be developed in each of the countries of focus under this initiative. IMA will be a partner on this project.

Mr. Teruhiko Shinada, Ambassador Extraordinary and Plenipotentiary of Japan to Barbados, and Ms. Valerie Cliff, Resident Representative, United Nations Development Programme (UNDP) Barbados and the Eastern Caribbean

Strengthening Ocean Governance through Meaningful Capacity Building in Ocean Affairs

The Government of the Republic of Trinidad and Tobago (GORTT) through the Institute of Marine Affairs (IMA) is participating in a four year capacity development and technical assistance programme for developing states to reinforce their competencies for implementing the United Nations Convention on the Law of the Sea (UNCLOS) and related agreements. The project also aims to better harness the benefits of a sustainable ocean economy or blue economy, including a more effective implementation of the UN 2030 Agenda for Sustainable Development and it's Sustainable Development Goals (SDGs).

The project is funded by the Government of Norway and is implemented by the United Nations Division of Ocean Affairs and Law of the Sea (UN DOALOS). The programme is designed to ensure that beneficiary states are fully involved in the identification and development of their ocean-related capacity needs and priorities. It will also identify and address capacity gaps at the regional and national levels in a bid to overcome critical capacity barriers which will enable beneficiary states to better address strategically important and time-sensitive law of the sea and ocean governance issues they are faced with. Ultimately, the project also aims to promote strengthened, sustainable and inclusive ocean economies. There are three main activities under the project:

- Regional Consultations - The identification of priority capacity-building needs and corresponding assistance through consultations with ocean-related regional intergovernmental organisations to reinforce national and regional ocean governance programmes of work.
- National Ocean Governance Studies - A high-level overview of the beneficiary states' legal and institutional frameworks to support the implementation of UNCLOS and reinforce the overall efficiency of national ocean governance frameworks.
- Customised Training Courses - Needs-based foundation and specialised courses on ocean affairs and the law of the sea will be delivered to assist in reinforcing the capacity of government officials and relevant stakeholders at regional level.

Trinidad and Tobago has commenced its National Ocean Governance Study, which is expected to be completed by September 2022. The goals of the study are to:

1. provide a high-level overview of the state's legal and institutional framework for oceans;
2. promote integrated ocean management by enhance the awareness within the beneficiary state regarding its overall legal and institutional framework for oceans, including potential linkages, overlaps and gaps;
3. facilitate the analysis of the compatibility of the national legal and institutional framework with the core requirements under the UNCLOS and related applicable international instruments;
4. assist beneficiary states in the identification and prioritisation of capacity gaps in the development and implementation of frameworks for oceans; and
5. provide a knowledge base of the national legal and institutional frameworks for oceans.

For more information, the project's website can be accessed here: **https://www.un.org/Depts/los/doalos-norway.htm**

Let us Empower ourselves with sound Information for 2022! - A Transparent and Accessible Ocean with Open Access to Data, Information and Technologies

Paul Nelson and Lorraine Barrow

There is something about the start of a new year that can bring a whiff of green optimism and a breath of fresh ocean air. It affords us the opportunity to pause and revisit occurrences and experiences of the past year and make new resolutions. One thing that stood out in 2021, against a backdrop of the unrelenting COVID-19 pandemic, were the extreme weather events signaling that climate change is REAL! As the year 2022 gets into its stride with new year resolutions, let us include self-empowerment with sound information and data to go **GREEN** as we make every effort to conserve our **BLUE** ocean resources/spaces.

The deadly floods in Belgium and Germany that claimed the lives of more than two hundred (200) people, the severe flooding that triggered fatal landslides in Uganda, Canada and Indonesia to the unprecedented flooded subways in China and New York City – all within the span of just a few months during the summer of 2021, serves as a wake-up call that climate change is **HERE!** Around the same time, as if that was not enough of climate-fueled severe weather events, some countries in the Pacific Northwest region suffered severe heat waves while the Mediterranean region experienced intense droughts. According to recently published scientific reports, these catastrophic weather events are a result of a warming earth as increasing amounts of greenhouse gases (GHGs) trapping heat near the earth and warming our oceans are producing changes in climatic patterns. Our oceans are in decline!

In an effort to reverse the decline in ocean health, the years 2021- 2030 have been declared, 'the Decade of Ocean Science for Sustainable Development' by the United Nations (UN). The Decade seeks **to deliver 'the science we need' in order to transform 'the ocean we have'** to **'the ocean we want'**. The UN has identified the importance of information and data enhanced by enabling technologies and platforms as key to restoring ocean health and transforming **'the ocean we have'** to **'the ocean we want'** – a healthy ocean. This is evident in its sixth societal outcome which states, **"a transparent and accessible ocean made possible by applied knowledge derived from trustworthy data**

and information through the utilisation of enabling technologies and innovation." Scientists around the world depend on the data and information unearthed by their colleagues and the various intelligences of cultural and recreational users of ocean resources to build robust management systems that will support ocean health.

Importance of Oceans

Humans depend on oceans for our psychological and physical wellbeing, nutrition, economic prosperity and the sustainable development of nations, more so coastal communities. This point is well established in a 2020 UNESCO Report, which states that at least three billion persons depend on oceans. Further, a 2016 report of the Organization for Economic Co-operation and Development (OECD) stated that the ocean economy is estimated to generate US 3 trillion dollars in 2030 and USD 15.5 trillion in 2050. Oceans also produce more than half the oxygen we breathe and regulate the weather. However, this vast resource continues to be subjected to many forms of pollution from human activities. According to several scientific reports, marine pollution also contributes to warmer seas, which give rise to extreme and severe weather events.

But what does data, information and technologies have to do with healthy oceans?

To achieve a better understanding of warming oceans, research scientists study, monitor, track and collect data on ocean systems – increasing sea surface temperatures, sea level rise, change in weather patterns over a period of time – to understand and analyse the adverse impacts on coastal communities and marine ecosystems such as coral reefs, mangroves, fisheries and marine mammals. Once this data is stored in global databases to facilitate access and data sharing, scientists from other jurisdictions are able to see and understand patterns, trends and other linkages that aid in understanding the whole. A more complete picture leads to better management strategies to address issues that negatively impact ocean health. This data adds evidence and value when it is analysed and generated into knowledge and information reports such as the local State of Marine Environment Report 2016 or the International Panel on Climate Change (IPCC) Assessment Report Series, produced and published by the IMA and IPCC, respectively. This knowledge makes the ocean understandable, empowers legislators to develop science-based policy, provides value-added information for social science planners (coastal planning) and allows the scientific community and other stakeholders to remedy problems.

Transparency

Sharing data and information across jurisdictions stimulates knowledge and promotes research collaboration. This in turn builds capacity and transfers technology for developing countries, who traditionally have had limited access to information products. One such example was the discovery/identification of new deep-sea marine species found at the depths of Trinidad and Tobago's our ocean floor by The University of West Indies' Professor Judith Gobin. The discovery was made possible from a research collaboration aboard the E.V. Nautilus, which hosted local and international scientists to explore the ocean floor using the vessel's deep-sea advanced technology and to share their findings in real-time with university students through live online sessions in 2013. This data collected and shared by Professor Gobin promoted research collaboration across jurisdictions and informed us of the **'ocean we have'** in the deep-sea, which can help us protect and conserve our biodiversity in order to attain the **'ocean we want'.**

Enabling Technologies to Bridge Gap between Science and Society

Emerging technologies enhance access to data and information stored in remote databases, which help boost business outcomes and empower individuals to make informed decisions. For example, data generated from satellite imagery technology, when converted into knowledge products, can provide early warning forecasts on sargassum landfall that enables hotel managers to respond in a timely manner. Another example of emerging technologies is the use of water quality buoys fitted with a range of state-of-the-art sensors that facilitate the collection and dissemination of data in real time enabling the early detection of water quality-related environmental incidents such as fish kills, oil spills and harmful algal blooms evoking a quicker response. The Institute of Marine Affairs, for example, maintains two moored data buoys (NEXSENS CB950) at Angel Reef Speyside and Buccoo Reef in Tobago, made possible through the Caribbean Community Climate Change Centre (5Cs) / NOAA Coral Health and Monitoring Programme Coral Reef Early Warning System (CREWS) and the Inter-

American Development Bank. The data buoys provide atmospheric data as wind temperature and speed, atmospheric temperature, rainfall and humidity. Physiochemical parameters include sea temperature, conductivity, salinity, turbidity, pH and chlorophyll. The data is publicly available online at **https://www.coral.noaa.gov/noaa/champ/**

Access to data and information provides the necessary knowledge needed to address the many issues impacting the health of oceans. Perhaps you can be part of the solution. Seek out information on what you can do to contribute to the health of our coastal and marine spaces. In 2022, empower yourself! Learn something new about the ocean and get to know your own impact on our marine and coastal environments. Access the Institute's website (**www.ima.gov.tt**) to read and learn how man's actions exacerbate marine environmental issues. Download the IMA Mobile Application – SeaiTT to learn about the Lionfish, report environmental incidents and how to conserve our BLUE natural resources! As we usher in 2022, the Institute of Marine Affairs extends warm wishes to all our readers and remains committed to the dissemination of information on the conservation of our marine environment. Now is the time to transform ocean knowledge into sustainable action!

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One of the Nursery Tanks at the I.M.A

IMA's Mangrove Planting Exercise

Is the IMA equipped to establish a mangrove nursery? Can we nurture and grow seedlings at work? On November 18th 2020, individuals at the Institute of Marine Affairs (IMA) set out to answer these questions. Those involved collected approximately 100 red mangrove seedlings from Caroni Swamp to test and determine whether favourable conditions could be created at the IMA for growth. In this pilot project, the seedlings were planted in a single tank inside the shade-house and left to grow. The seedlings were prospering but soon began to out compete one another as they grew larger and eventually died out, during the work from home arrangements in response to the COVID-19 pandemic.

The Second Time's the Charm

Though the pilot nursery was not successful in the end, we did learn that the environment could be created and maintained to ensure the necessary conditions for growth. Thus started the second attempt at growing the seedlings, with over 300 propagules being collected and planted in three tanks, located outside the shade-house, on February 10th 2021. These tanks were checked on weekly for leaf growth, vigor and watering.

The propagules' resilience to harsh conditions were truly tested this time around as the increasing numbers of COVID -19 cases forced the country into another work from home period. As such, some staffers involved in the project were around to care for the

nursery. Addison Titus played a pivotal role in the success of the nurseries during the lockdown as he cared for the nursery throughout that timeframe.

Finding a Forever Home

With a success rate of about 98% growth from propagules to seedlings, it was time to find a new home that could accommodate their growth. Finding an area for a replanting exercise requires ensuring that the land to be used has ever-present levels of moisture for the mangroves. In this regard, Hart's Cut was determined to be a prime area for replanting due to its close proximity to the Institute as well as having the right conditions needed for the propagules to thrive. In this regard, the Chaguaramas Development Authority (CDA) played a pivotal role. CDA provided approval for the exercise to take place and provided support by opening the area of interest, clearing the land and even aided in the replanting exercises on the day itself.

On December 7th 2021, over 300 seedlings were taken from the nursery at the IMA and replanted at Hart's Cut, Chaguaramas in a combined effort from a team at the IMA and members from the CDA. The IMA will continue to monitor the growth of these mangrove seedlings in the upcoming months to determine their success.

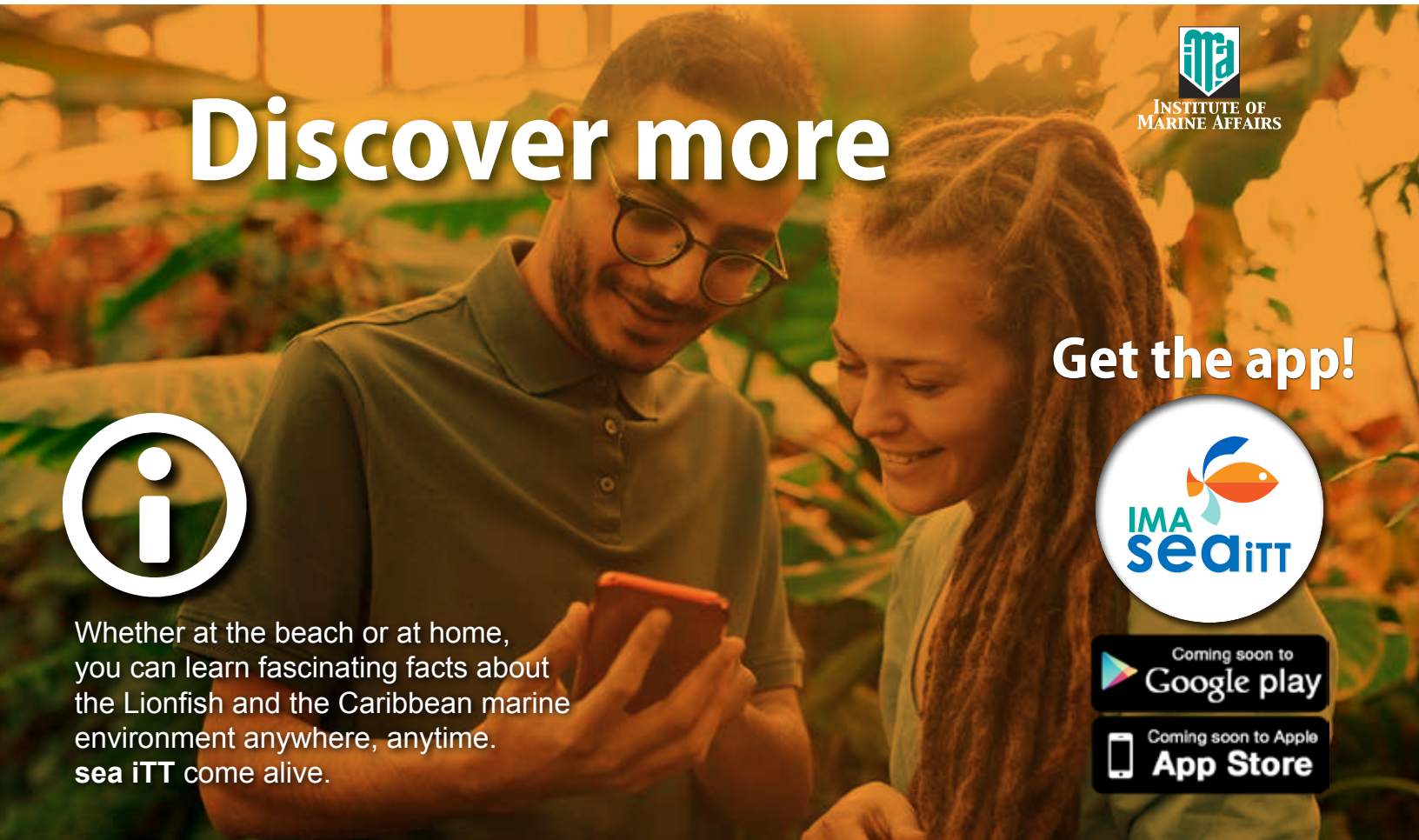
IMA Team that executed the Replanting Exercise on December 7th, 2021 with two CDA representatives.

IMA assists school with water quality testing project

On February 11th 2022 the IMA assisted the Eldorado Secondary School with a Water Quality Testing exercise. Before the COVID 19 pandemic students would visit the IMA to get a hands-on appreciation for the steps involved in water quality testing. As a result the limitations presented by the pandemic, this year the IMA was able to carry two teachers on site to conduct water quality testing. The data from this activity would feed into each student's School Based Assessment (SBA), a component of their CSEC examinations. The water testing operation was led by Shane Ramsammy of the IMA who gave a briefing on the importance of testing various water parameters. During the briefing Mr. Ramsammy spoke about the connection between urban development and spikes in nitrate and nitrite levels in the water. The teachers sampled Macqueripe Bay, Williams Bay and the Diego Martin River for the following parameters:

- Nitrate
- Nitrites
- Phosphates
- Turbidity
- Dissolved Oxygen

The values of these parameters are able to paint a picture of the health of a marine environment and also guild policy on usage of coastal areas.



THE BLUE CORNER

Wolf that lives in the Atlantic Ocean

Even a quick glance at an Atlantic wolffish *Anarhichas lupus*, and an observer knows how it earned its common name. It has very large teeth that stick out of its mouth, even when closed, giving it a ferocious appearance. Atlantic wolffish inhabit both the west and east coasts of the Atlantic. Despite this look, Atlantic wolffish are not known to be aggressive towards people and do not bite unless provoked. They have long, eel-like bodies and are sometimes known as “wolf eels” but are not eels. Instead, they are advanced fish that are closely related to sculpins.

https://oceana.org/marine-life/atlantic-wolffish/

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