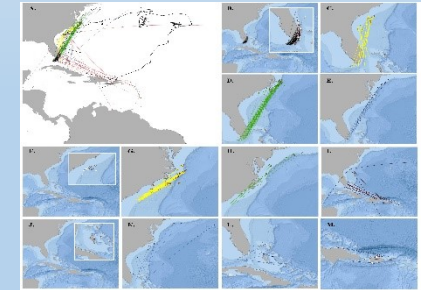
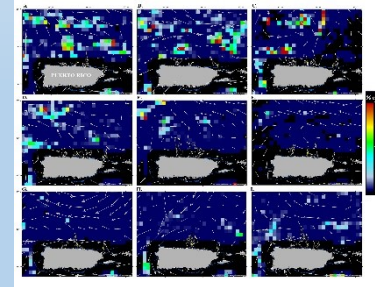
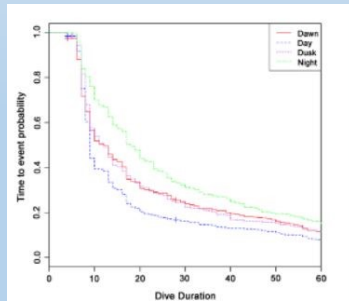
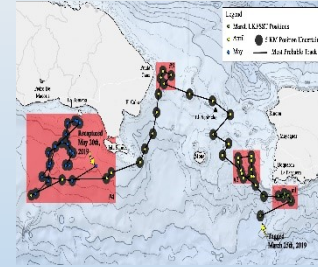
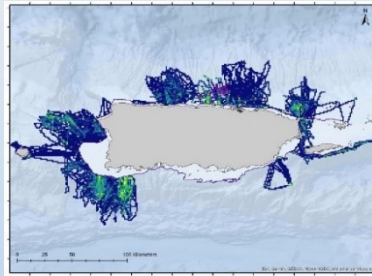
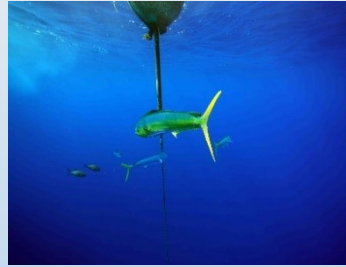


Dolphinfish Research Program



Dr. Wessley Merten

CFMC 12.5.2023

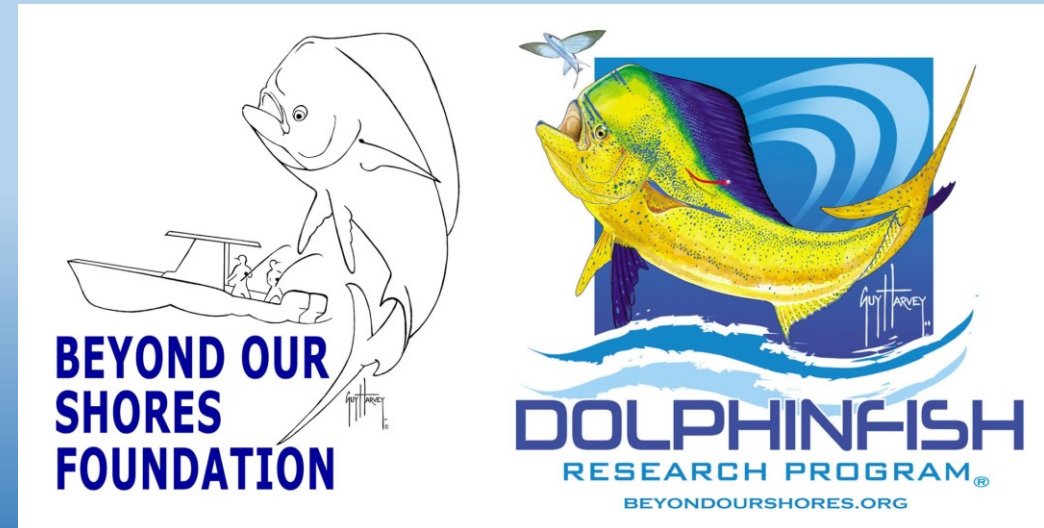
Beyond Our Shores Foundation

Dolphinfish Research Program

Newport, Rhode Island

BEYONDOURSHORES.ORG

DOLPHINTAGGING.COM



DOLPHINFISH RESEARCH PROGRAM



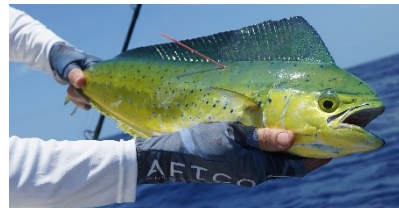
- International citizen science mark and recapture program for dolphinfish
- Designed to collect data on movements, life history patterns, and population dynamics
- Started in 2002 – Finishing 22nd year

35,247
Tagged

97 — 91 DOL, 6 WAH
Satellite tags deployed

808
Recaptured

14
Publications



41

Total de FAD Desplegados

20

FADs Activo

2996

Informes

1171

Fish Tagged en FADs en el Carib

24 Surface / 17 Subsurface

2,996 trips up to Nov 30th, 2023

As of 12.5.2023

2 Published 1 in prep



35 Satellite Tag Deployments 28 DOL, 6 WAH, 1 FAL



26 Acoustic Tag Deployments 16 DOL, 5 YFT, 3 WAH, 1 BLK, 1 FAL

51 Vessels Involved

FAD Research Program

Use of video monitoring to quantify spatial and temporal patterns in fishing activity across sectors at moored fish aggregating devices off Puerto Rico

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Abstract: Documenting how storms and environmental variability affect the population dynamics, trends, and abundance of dolphins (Coryphæna hippurys) on short temporal scales is important for improving dolphin fishery resource monitoring, conservation, and management. Here, a multifaceted technique was used to document an abrupt increase in fishing success among small-scale fishing vessels off the north coast of Puerto Rico during the 2018 Hurricane Leslie event. Seven datasets were used to document this event, and each provided substantial information, but the combination of vessel catch and effort and seven-day averages of floating-algae density (FD), derived from the satellite-based alternative floating-algae index (AFI) imagery, proved the most effective to monitor dolphin fishery success on short and near real-time scales. Results revealed vessel effort and FD co-occurrence, with vessel tracks within 100 coverage of 81% to 84%. Catch records from multiple confirmed landings of dolphins from Argemone and during the episode, 87% of total dolphin catch occurred at Argemone habitat, with the remaining associated with nearby fish aggregating devices (FADs). No fishery vessel or fish tracking provided additional evidence of dolphin abundance and movements associated with Argemone and nearby FADs. The combination of these methods provided a new technique to support insight into decreasing change in fishing success for dolphins, a key pelagic fishery. Expanding the spatiotemporal coverage of these methods could lead to the understanding of short dolphin fishery and other pelagic fish, e.g., tuna and billfish) resource monitoring, improving data collection, and enhancing regulatory and data reporting compliance among small-scale fisheries.

Keywords: fish aggregating devices; effort; Caribbean Sea.

Resumen: Un estudio en las costas del norte de Puerto Rico documentó un aumento abrupto en el éxito de la pesca de delfines (Coryphæna hippurys) durante el evento del huracán Leslie en 2018. Se utilizaron siete conjuntos de datos para documentar este evento, y cada uno proporcionó información sustancial, pero la combinación de los registros de capturas y esfuerzo de los buques y los promedios de densidad de algas flotantes (DF) derivados de imágenes satelitales de la densidad de algas flotantes (AFI) demostró ser el más efectivo para monitorear el éxito de la pesca de delfines a corto y casi en tiempo real. Los resultados revelaron la co-ocurrencia del esfuerzo de los buques y la DF, con un seguimiento de los buques dentro de un 81% a 84% de cobertura. Los registros de capturas de múltiples desembarques confirmados de delfines en Argemone y durante el episodio, el 87% de la captura total de delfines ocurrió en el hábitat de Argemone, con el resto asociado con dispositivos cercanos de agregación de peces (DAP). Ningún seguimiento de buques o seguimiento de peces proporcionó evidencia adicional de abundancia y movimientos de delfines asociados con Argemone y dispositivos cercanos de agregación de peces (DAP). La combinación de estos métodos proporcionó una nueva técnica para apoyar el conocimiento sobre el cambio en el éxito de la pesca de delfines, una importante pesquería pelágica. Ampliar la cobertura espacial y temporal de estos métodos podría conducir al entendimiento de cambios en el éxito de la pesca de delfines y otras especies de peces pelágicos, como el atún y el pez vela, mejorando el monitoreo de recursos, la recolección de datos y el cumplimiento de los reportes de datos entre las pesquerías de pequeña escala.

Palabras clave: dispositivos de agregación de peces; esfuerzo; mar Caribe.

Citation: Meinen W, Rivera R, Amelkoo R, Serrano K, Collazo O (2023) Use of video monitoring to quantify spatial and temporal patterns in fishing activity across sectors at moored fish aggregating devices off Puerto Rico. Sci. Mar. 87(2):117-126. doi:10.3989/scimar.04730.09A



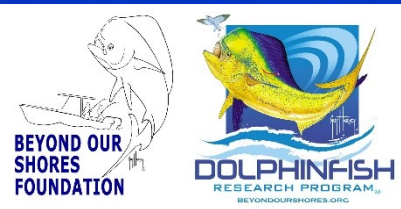
Presentation Outline

Presentation Objective:

Provide an update of specific data collected through the DRP in the Caribbean Sea and WCA

Outline:

1. Case Study 1a: Commercial Catch DR (8 min)
2. Case Study 2: Dolphinfish Movements WCA Recap (7 min)





Case Study 1a:

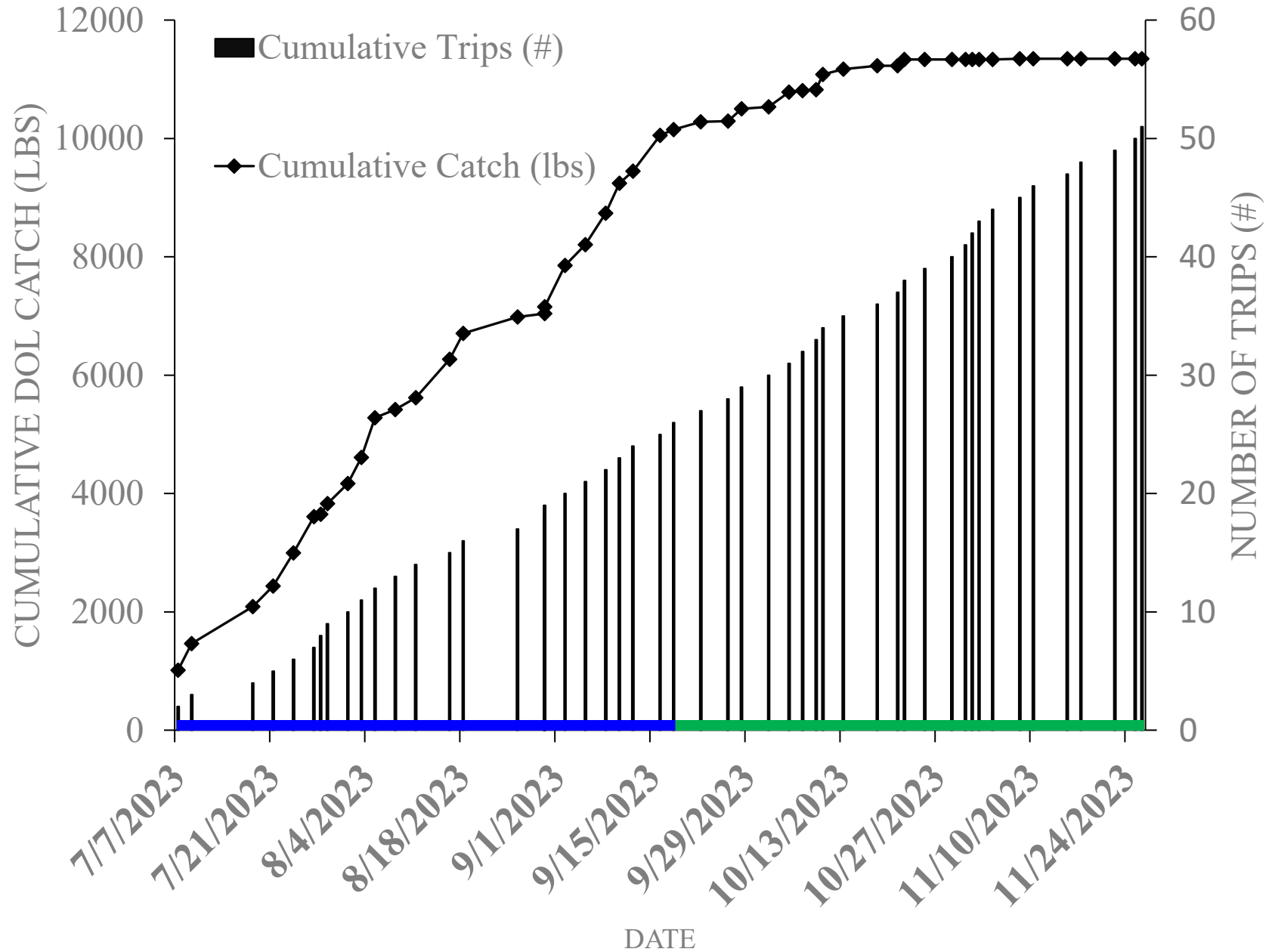
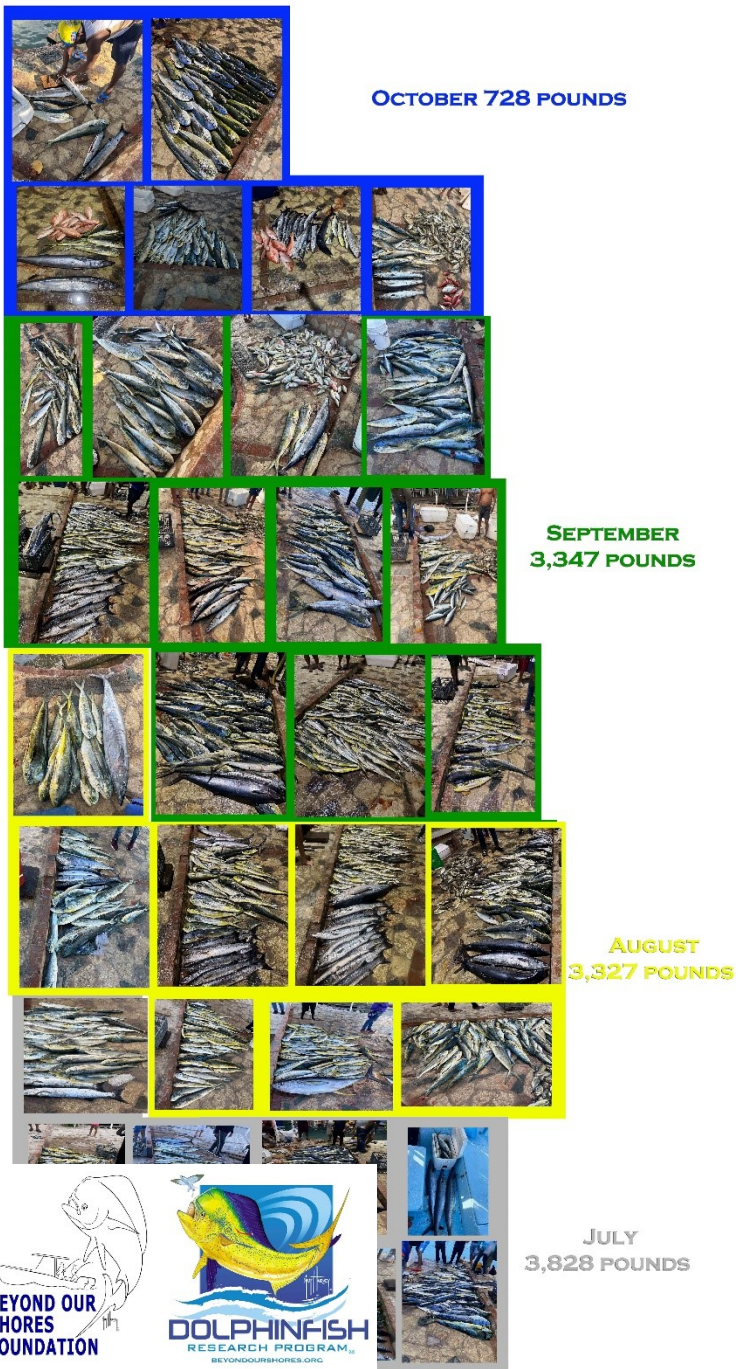
Commercial Catch:
Southern DR

July 23' to Nov 23'





Average of 416 pounds per outing for last 16 (Max: 670; Min: 40)
5,430 pounds in 16 outings – 1 boat – southern DR



Average of 298 pounds per outing over 38 (Max: 700; Min: 12)

11,348 pounds in 38 outings – 1 boat – southern DR

10/10/2023 – 260 lbs DOL offshore

11/2/2023 – 132 lbs BUM, 120 lbs barracuda
50 lbs WAH, 30 lbs BLK coastal

11/26/2023 – 620 lbs BUM, 57 lbs WAH
6 lbs barracuda coastal



Dominican Republic

FISH4ACP aims to make the mahi-mahi fishery in the Dominican Republic stronger to improve the livelihoods and working conditions for artisanal fisher folk, ensuring that growth goes hand in hand with environmental sustainability to preserve mahi-mahi for future generations of local fishers.

VALUE CHAIN AT A GLANCE

Mahi-mahi

(*Coryphaena hippurus*)



PRODUCTION METHOD

VOLUMES*

VALUE*

Wild caught,
artisanal

610
tonnes

USD
6.6 million

* estimated primary production

WHAT WE focus on

- Value chain analysis and upgrading strategy to make the mahi-mahi value chain more productive and sustainable.
- Improving mahi-mahi production, handling and marketing to increase benefits and reduce dependence on imports.
- Helping fisher associations to improve business environment and social security benefits for artisanal fishers.
- Strengthen governance and management to make mahi-mahi fishing more efficient, safer and environmentally sustainable.



Facts & figures

Mahi-mahi is fished along the southern coast of the Dominican Republic. Captures **increased** from **255 tonnes** in **2000** to an estimated **612 tonnes** in **2023**.

Mahi-mahi is a fish that grows and matures rapidly. It can be **harvested more frequently** than other species.

Fish consumption of around **8 kg per person per year** in the Dominican Republic is low compared to other Caribbean countries.

Mahi-mahi exports are low and go mainly to the United States, around **10.5 tonnes per year on average** between **2016 - 2021**.

FISH4ACP is an initiative of the Organisation of African, Caribbean and Pacific States (OACPS) aimed at making fisheries more sustainable.

Also known as dolphinfish, mahi-mahi is a highly appreciated food fish common to most of the world's warm and temperate seas. It is one of the principal catches of artisanal fishers in the Dominican Republic.

The fishery provides local fishermen with an income and is an important source of food that sells well on local markets and in the capital of Santo Domingo. Improvements to the cold chain and post-harvest handling could increase economic returns, but they require investments in human capital and the processing facilities.

FISH4ACP is supporting the Dominican Republic in making the mahi-mahi value chain, an important artisanal fishery, more productive and sustainable, making sure that benefits are shared equitably and growth does not increase the burden on the environment.

FISH4ACP is fostering social integration by working with local fisher associations and organized groups of women fish vendors. Activities seek to promote participation of artisanal fisherfolk in the value chain by improving access to loans, social security and education, and through capacity building.

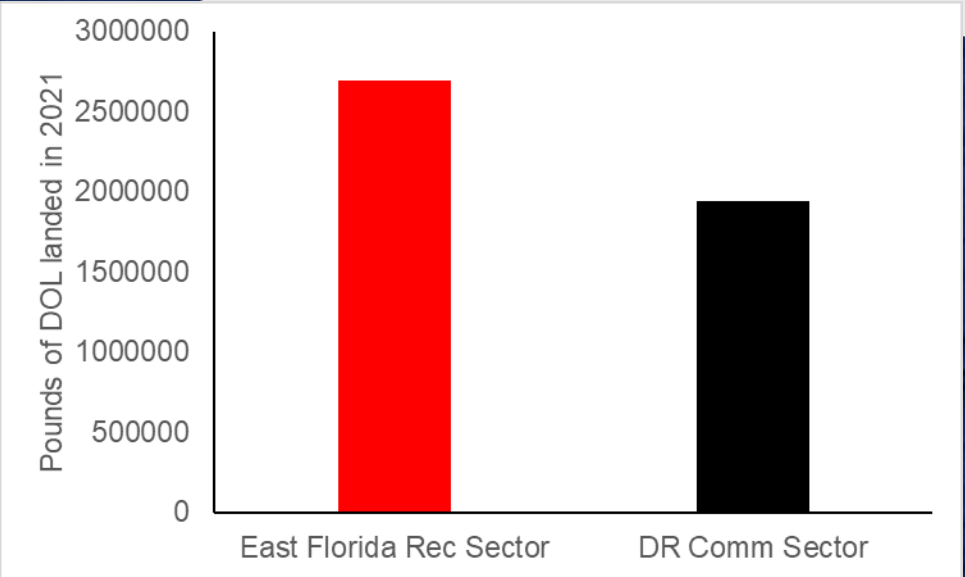
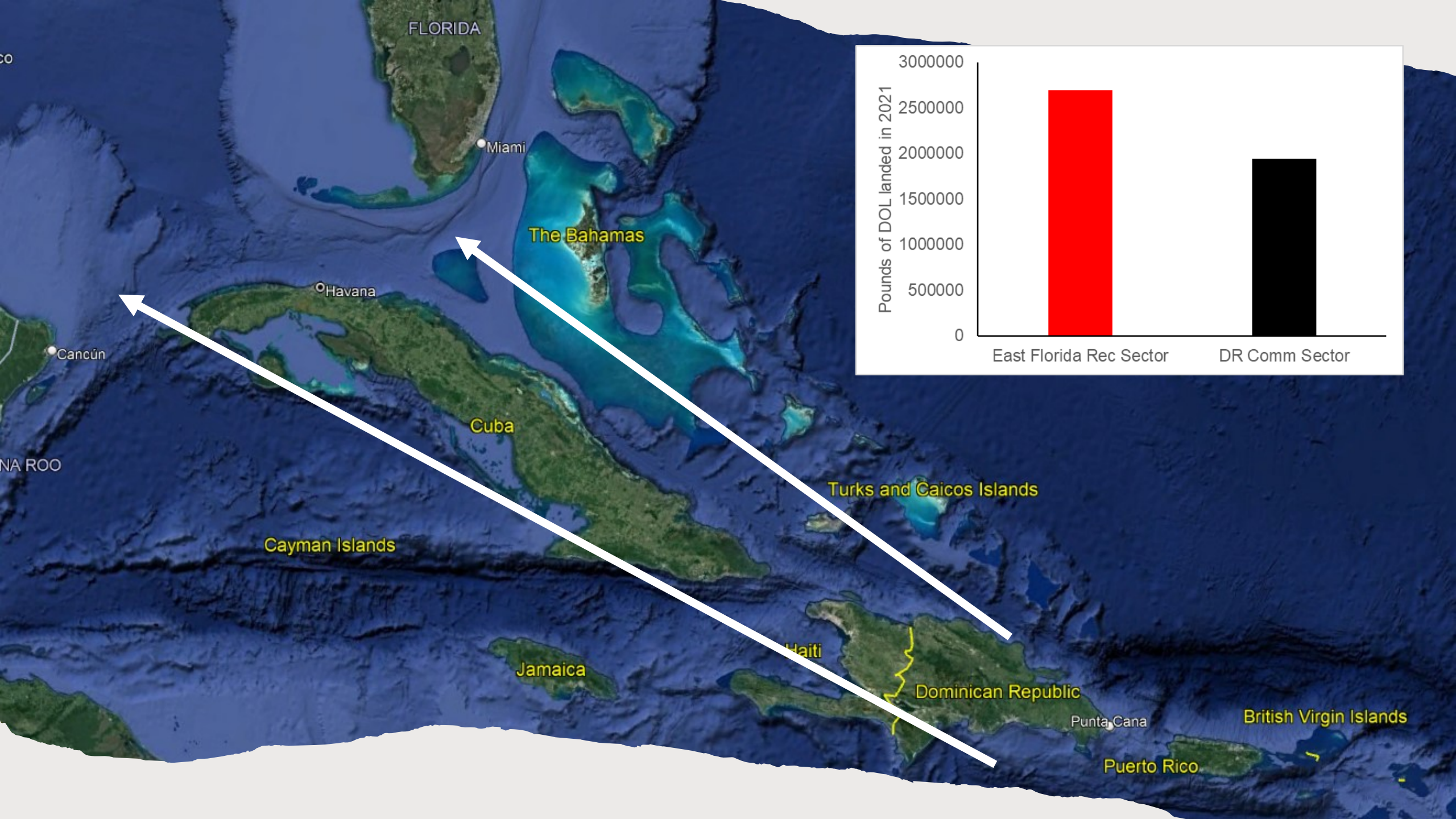


This document was produced with the financial assistance of the European Union (EU) and the German Ministry for Economic Cooperation and Development (BMZ). The views expressed herein can in no way reflect the official opinion of the EU, the Organisation of African, Caribbean and Pacific States and other partners.

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Pescadores de dorado N= 2369 (860 asociados y 1509 independientes)

FISH4ACP@fao.org
Food and Agriculture Organization of the United Nations



Status and trends of moored fish aggregating device (MFAD) fisheries in the Caribbean and Bermuda

Margaret W. Wilson^{*}, Julia M. Lawson, Maria Ignacia Rivera-Hechem, Juan Carlos Villaseñor-Derbez, Steven D. Gaines

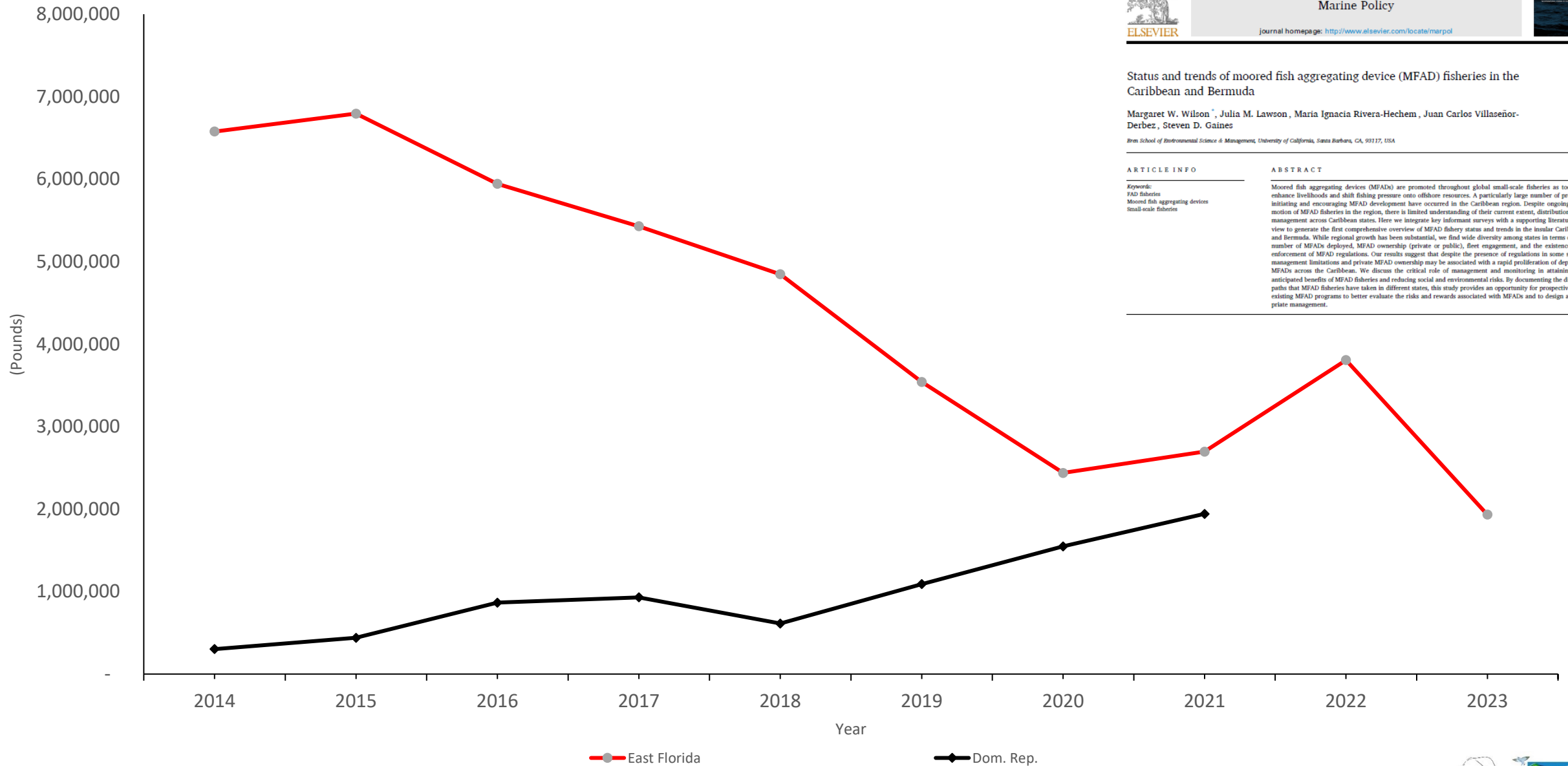
Bren School of Environmental Science & Management, University of California, Santa Barbara, CA, 93117, USA

ARTICLE INFO

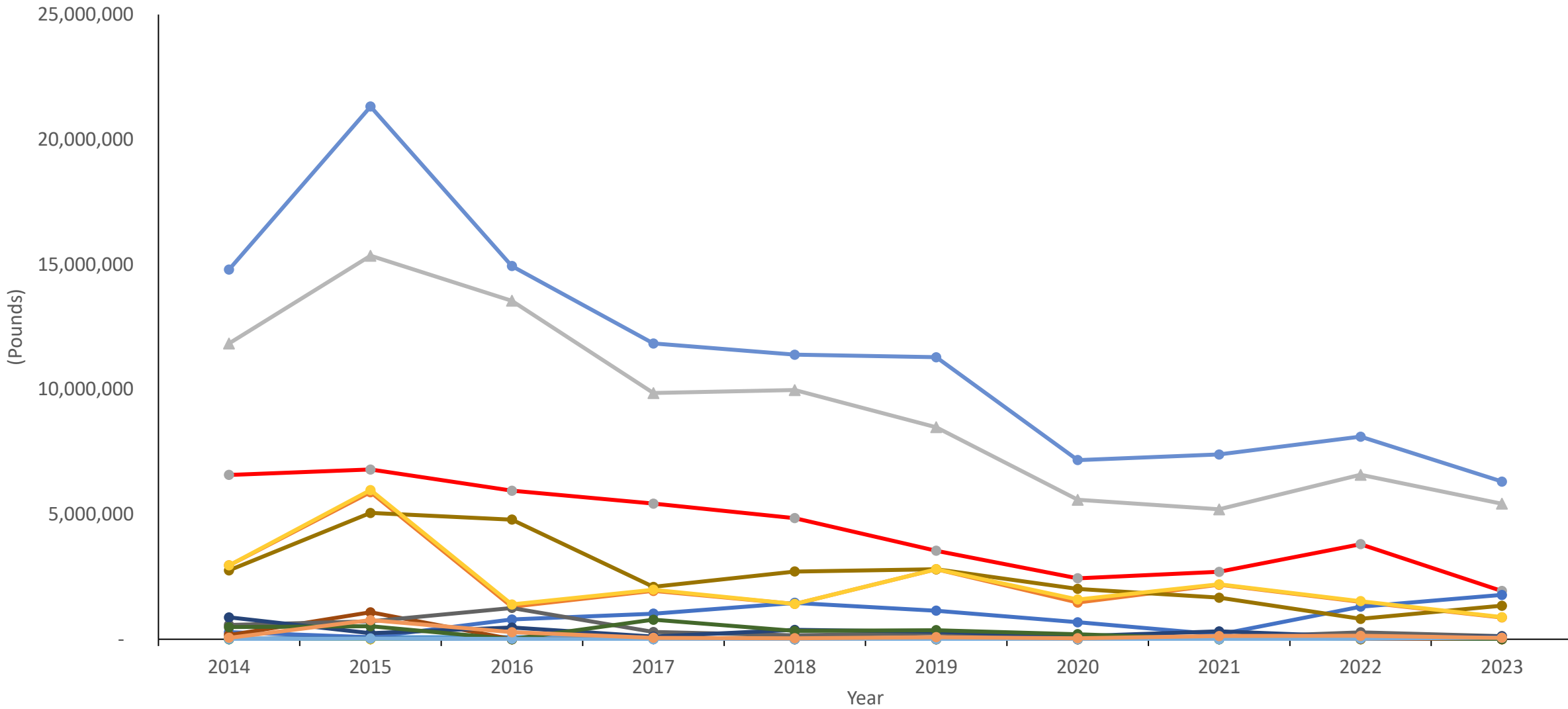
Keywords:
 FAD fisheries
 Moored fish aggregating devices
 Small-scale fisheries

ABSTRACT

Moored fish aggregating devices (MFADs) are promoted throughout global small-scale fisheries as tools to enhance livelihoods and shift fishing pressure onto offshore resources. A particularly large number of projects initiating and encouraging MFAD development have occurred in the Caribbean region. Despite ongoing promotion of MFAD fisheries in the region, there is limited understanding of their current extent, distribution, and management across Caribbean states. Here we integrate key informant surveys with a supporting literature review to generate the first comprehensive overview of MFAD fishery status and trends in the insular Caribbean and Bermuda. While regional growth has been substantial, we find wide diversity among states in terms of the number of MFADs deployed, MFAD ownership (private or public), fleet engagement, and the existence and enforcement of MFAD regulations. Our results suggest that despite the presence of regulations in some states, management limitations and private MFAD ownership may be associated with a rapid proliferation of deployed MFADs across the Caribbean. We discuss the critical role of management and monitoring in attaining the anticipated benefits of MFAD fisheries and reducing social and environmental risks. By documenting the diverse paths that MFAD fisheries have taken in different states, this study provides an opportunity for prospective and existing MFAD programs to better evaluate the risks and rewards associated with MFADs and to design appropriate management.



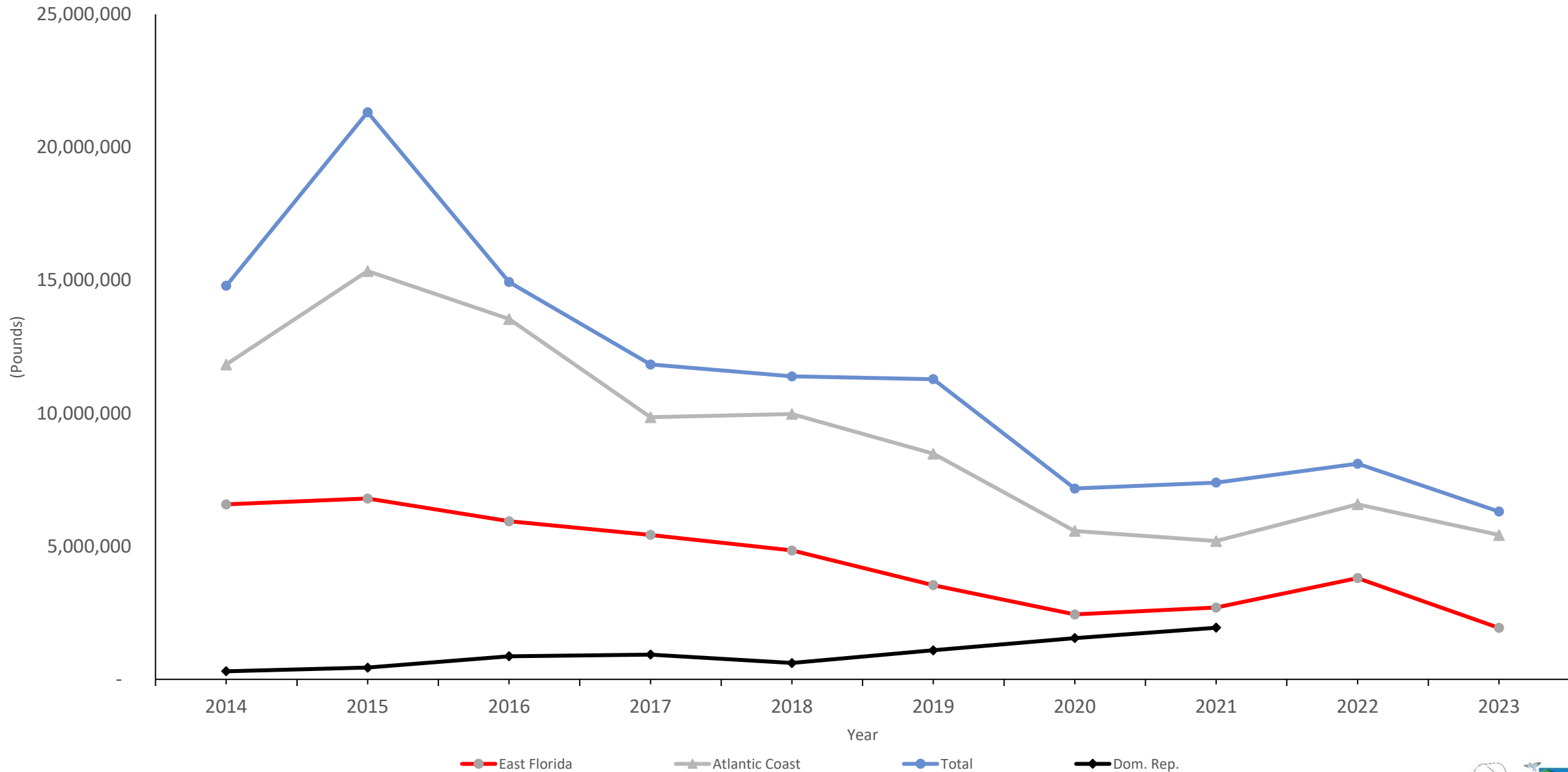
U.S. MRIP Data for East Florida Rec through Wave 3 2023 + FAO DR Commercial Landings to 2021



- Alabama
- East Florida
- West Florida
- Georgia
- South Carolina
- Conneticut
- Delaware
- Massachusetts
- Maryland
- North Carolina
- New Jersey
- New York
- Rhode Island
- Virginia
- ▲ Atlantic Coast
- GOM
- Total

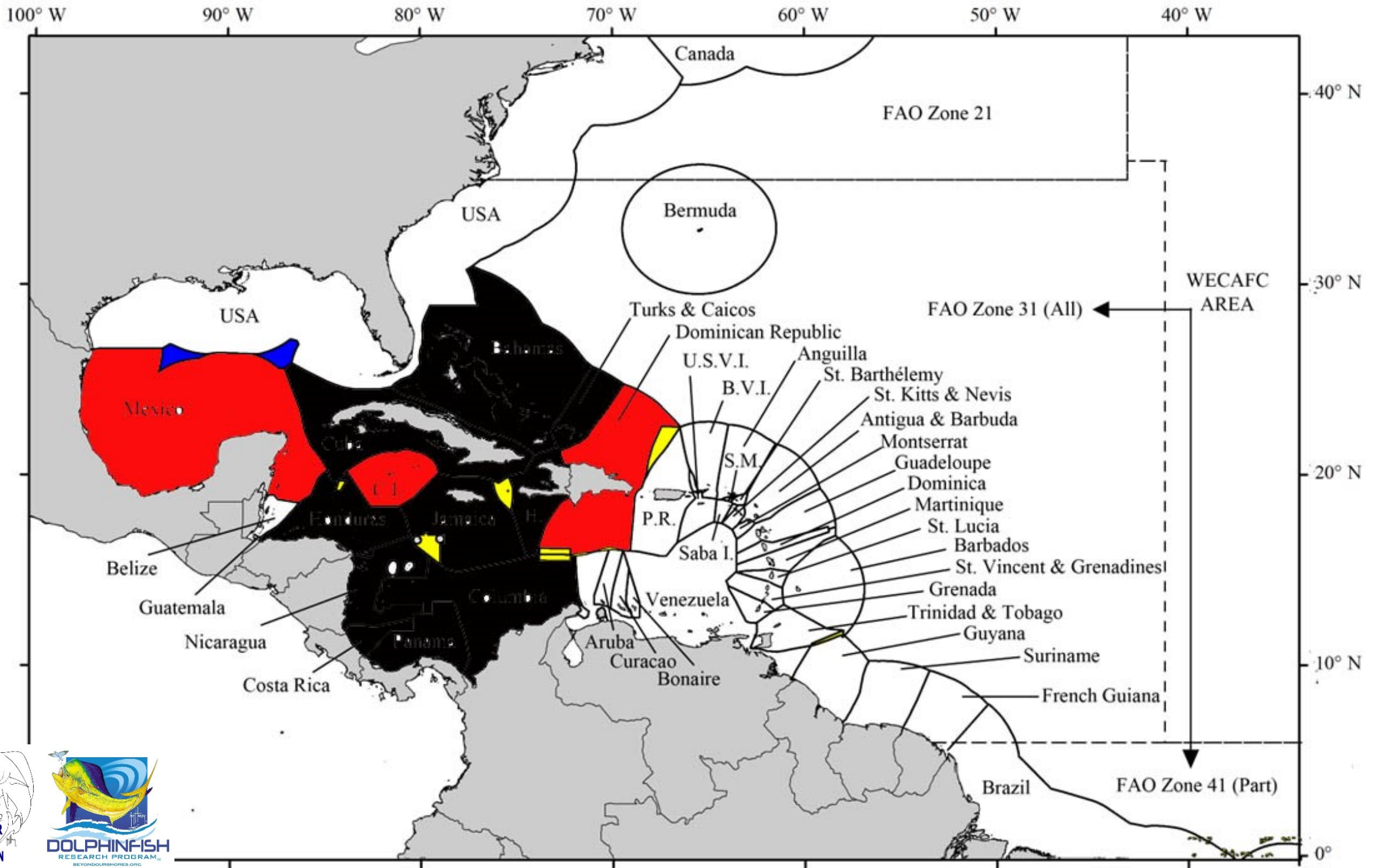



U.S. MRIP Data for GOM and Atlantic Coast by State/Group through Wave 3 of 2023



U.S. MRIP Data for through Wave 3 of 2023 + FAO DR Commercial Landings to 2021

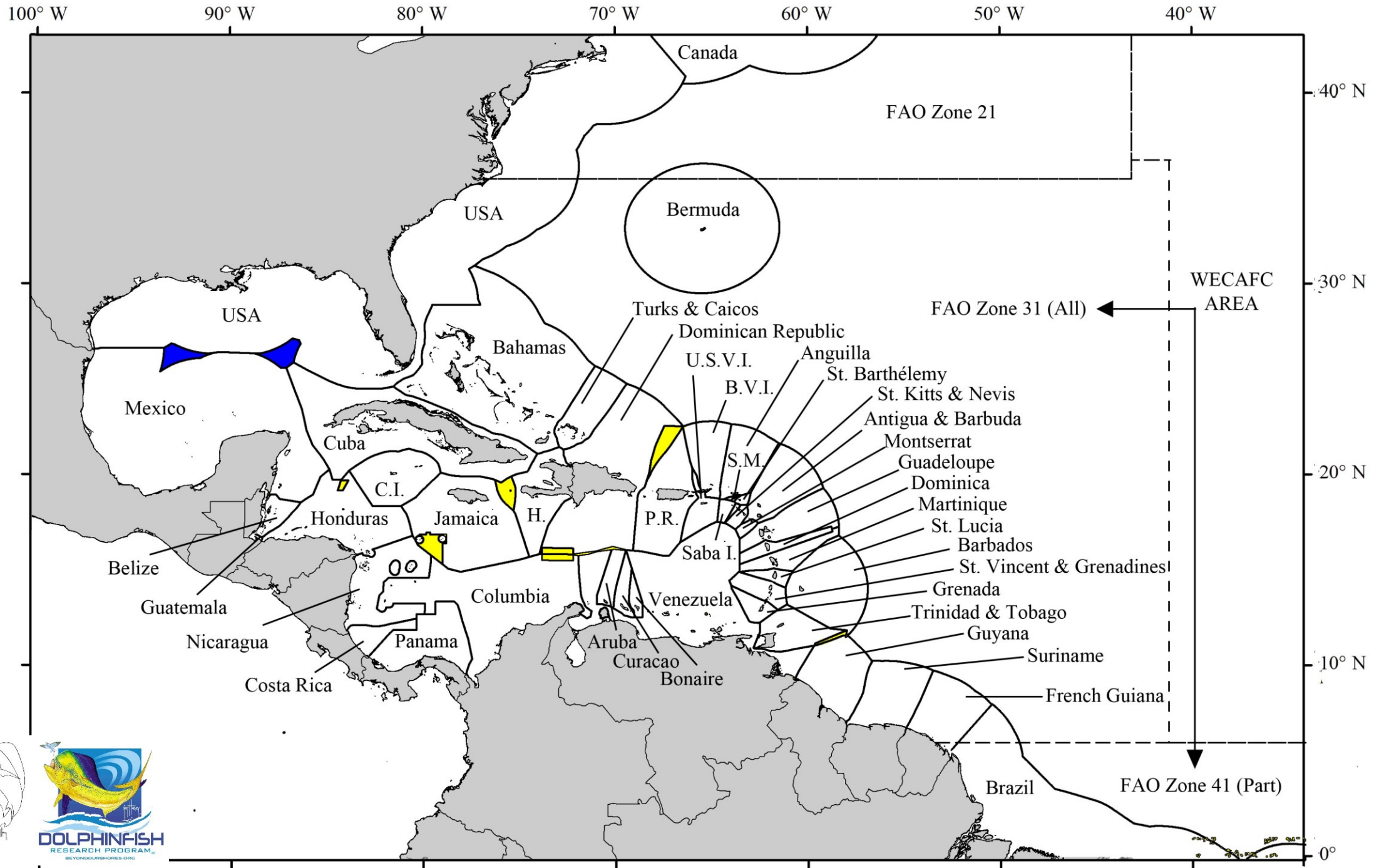


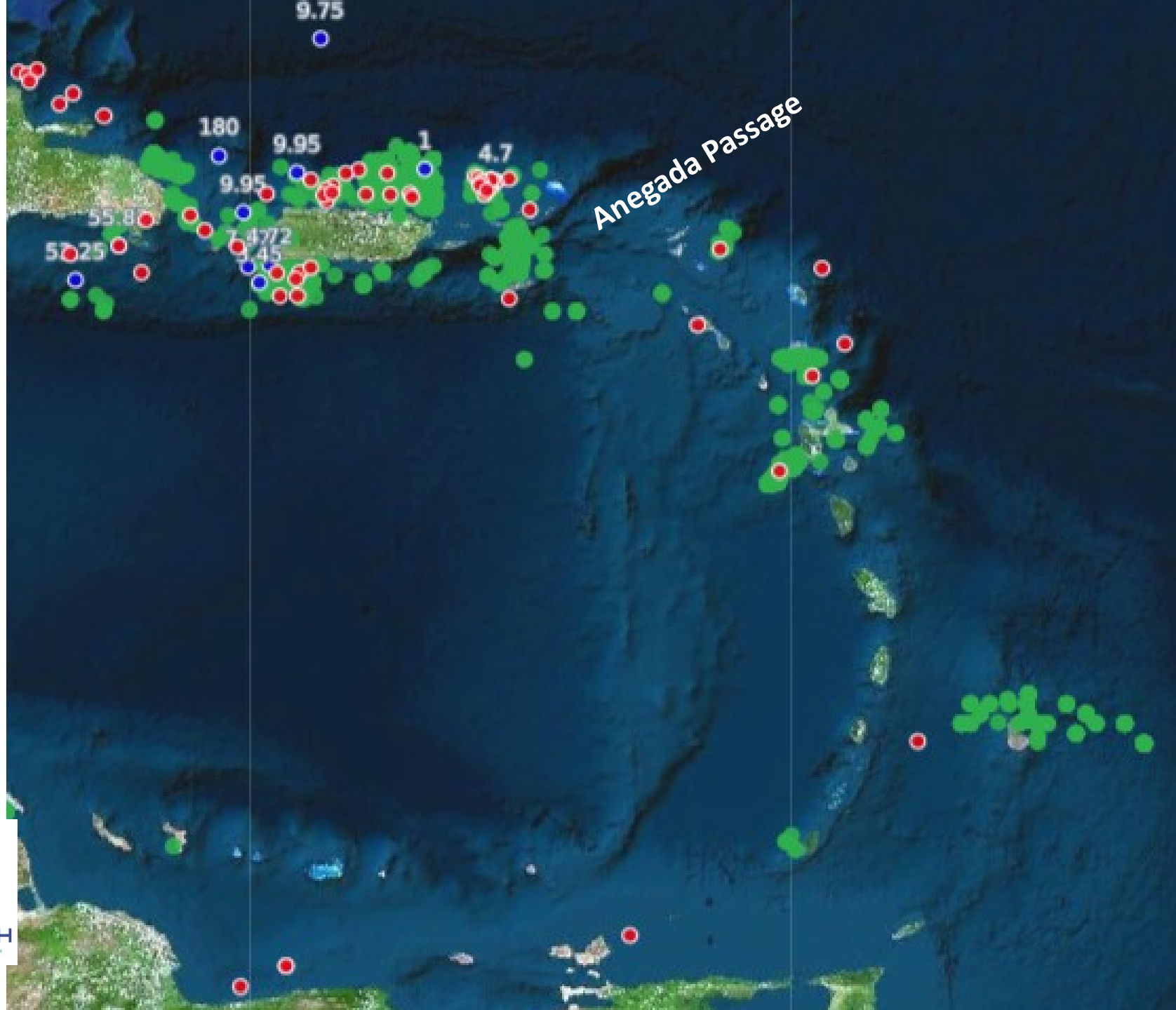


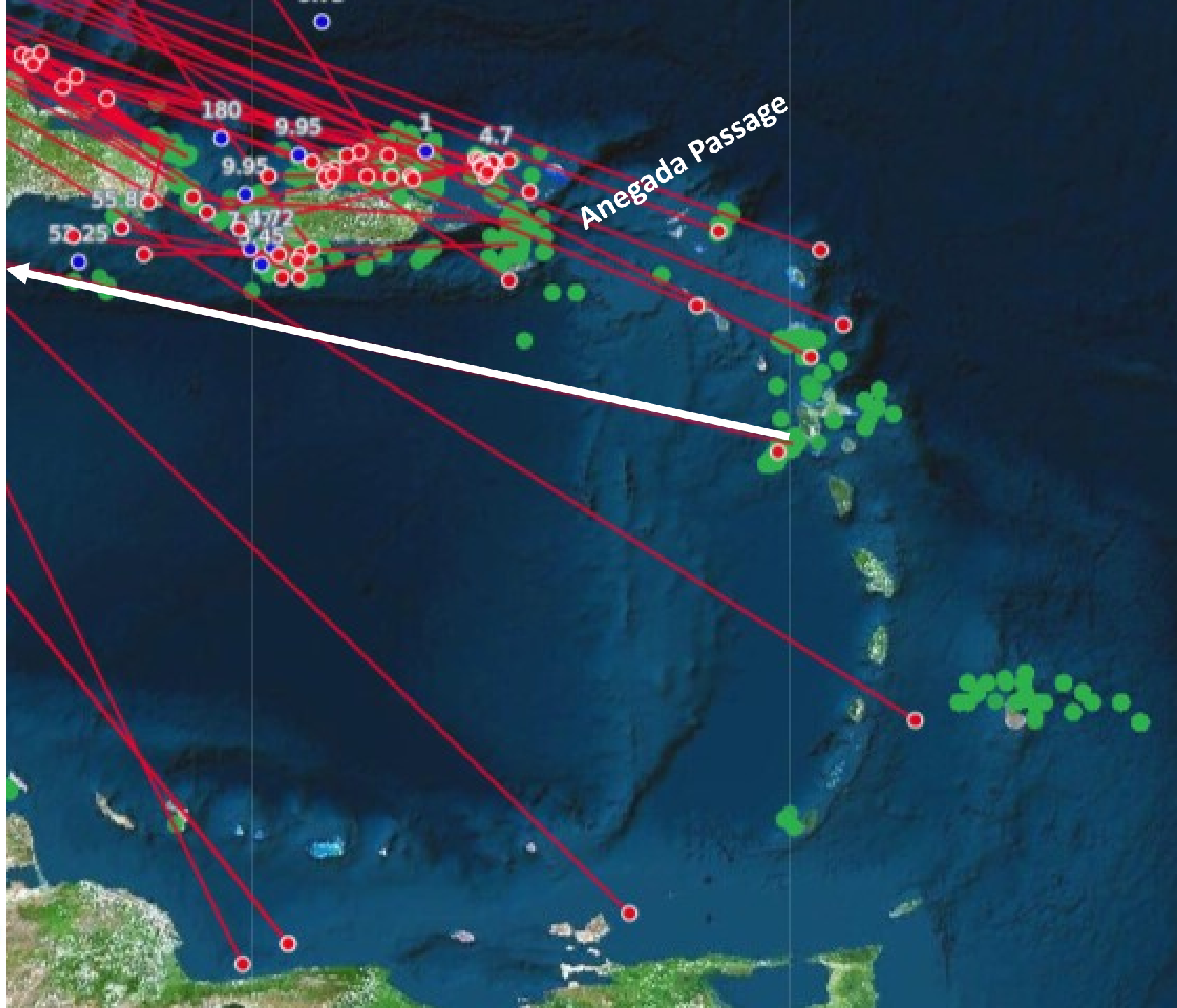
A large fish, likely a dolphinfish, is captured in mid-leap from the water. The fish's mouth is wide open, and it is surrounded by a large splash of water. The fish has a yellowish-green body with dark spots and a dark dorsal fin. The background is a blurred view of the ocean surface.

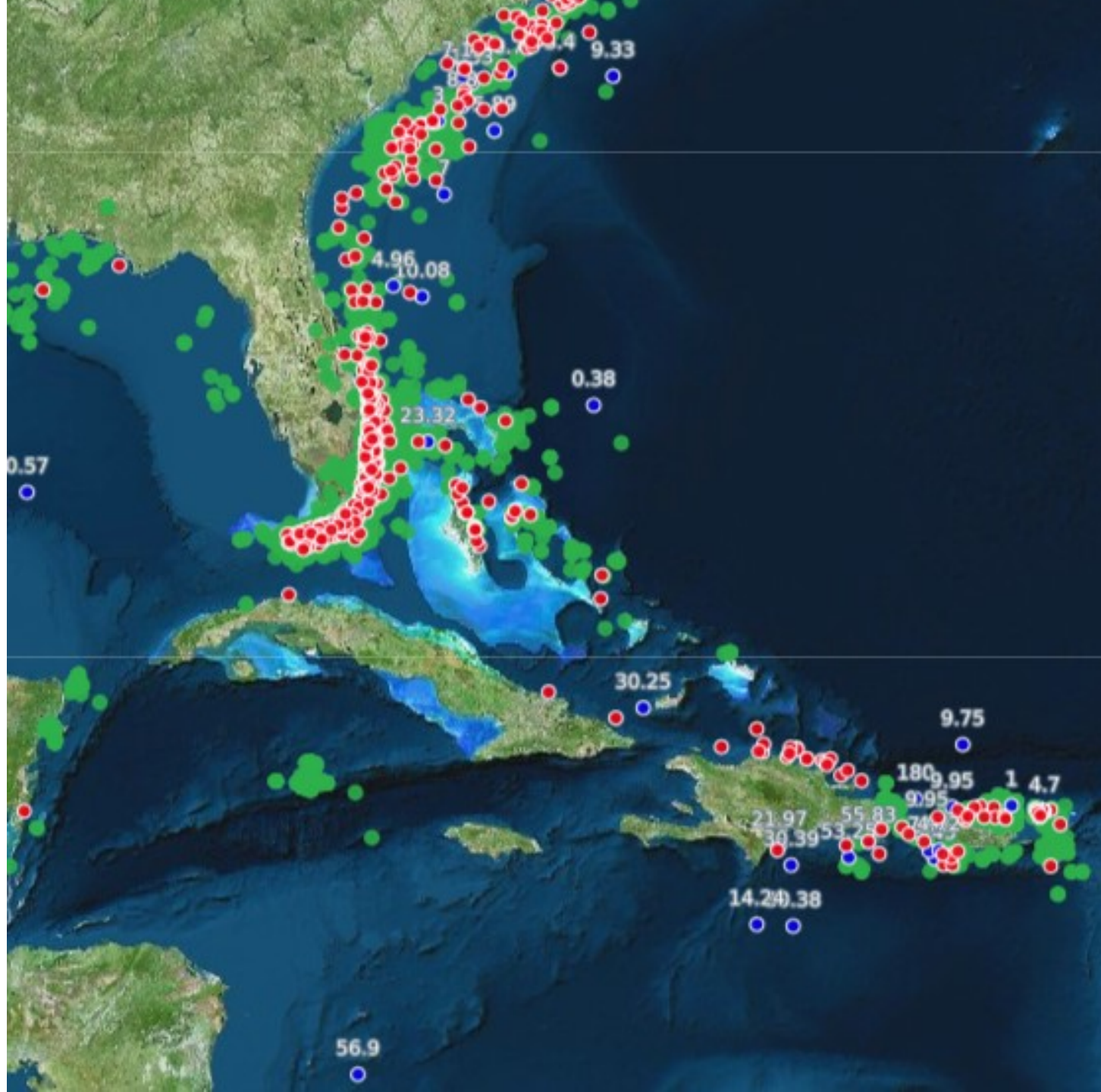
Case Study 2:
Dolphinfish WCA
Movements Recap

Picture: W. Merten

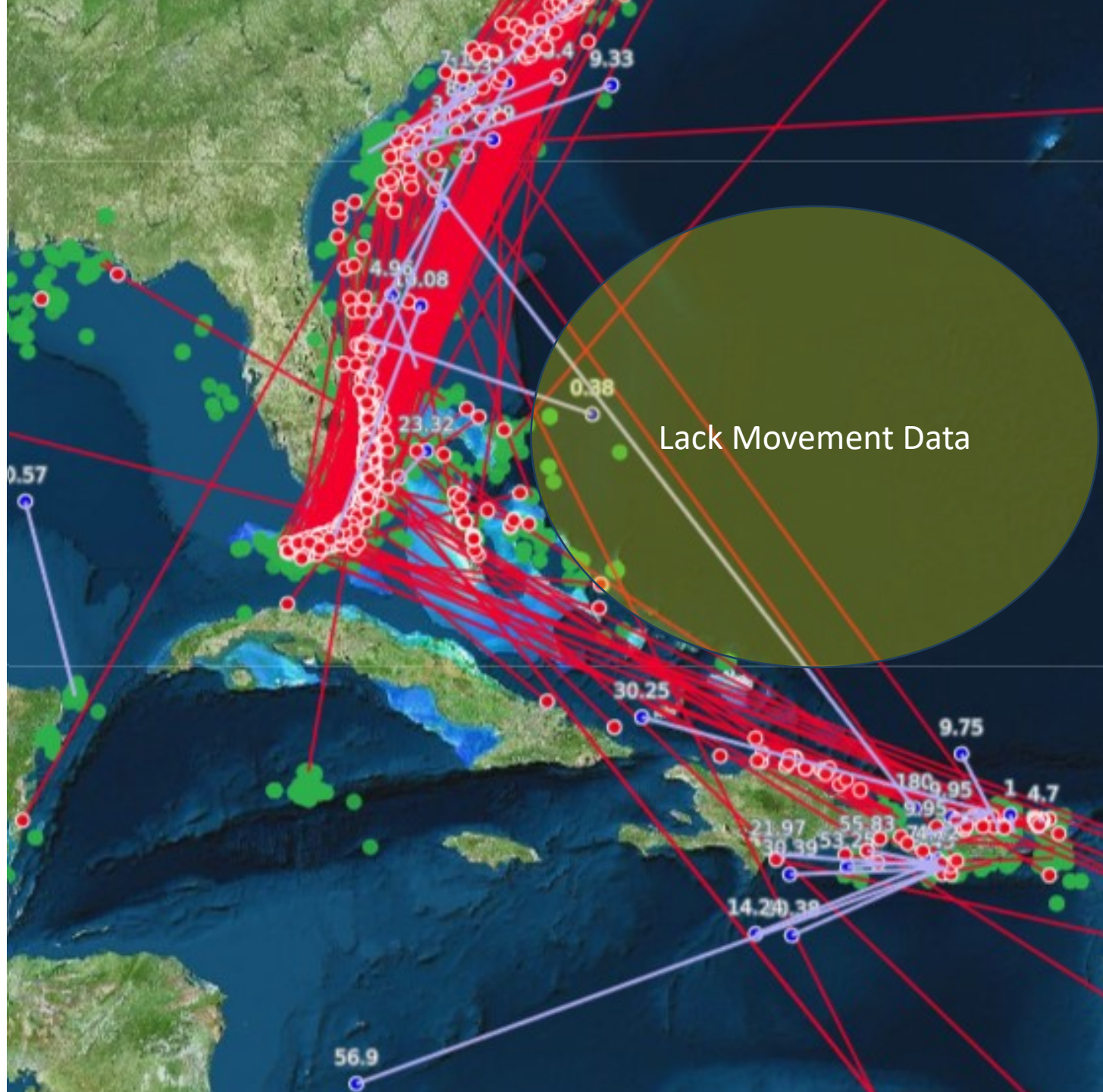


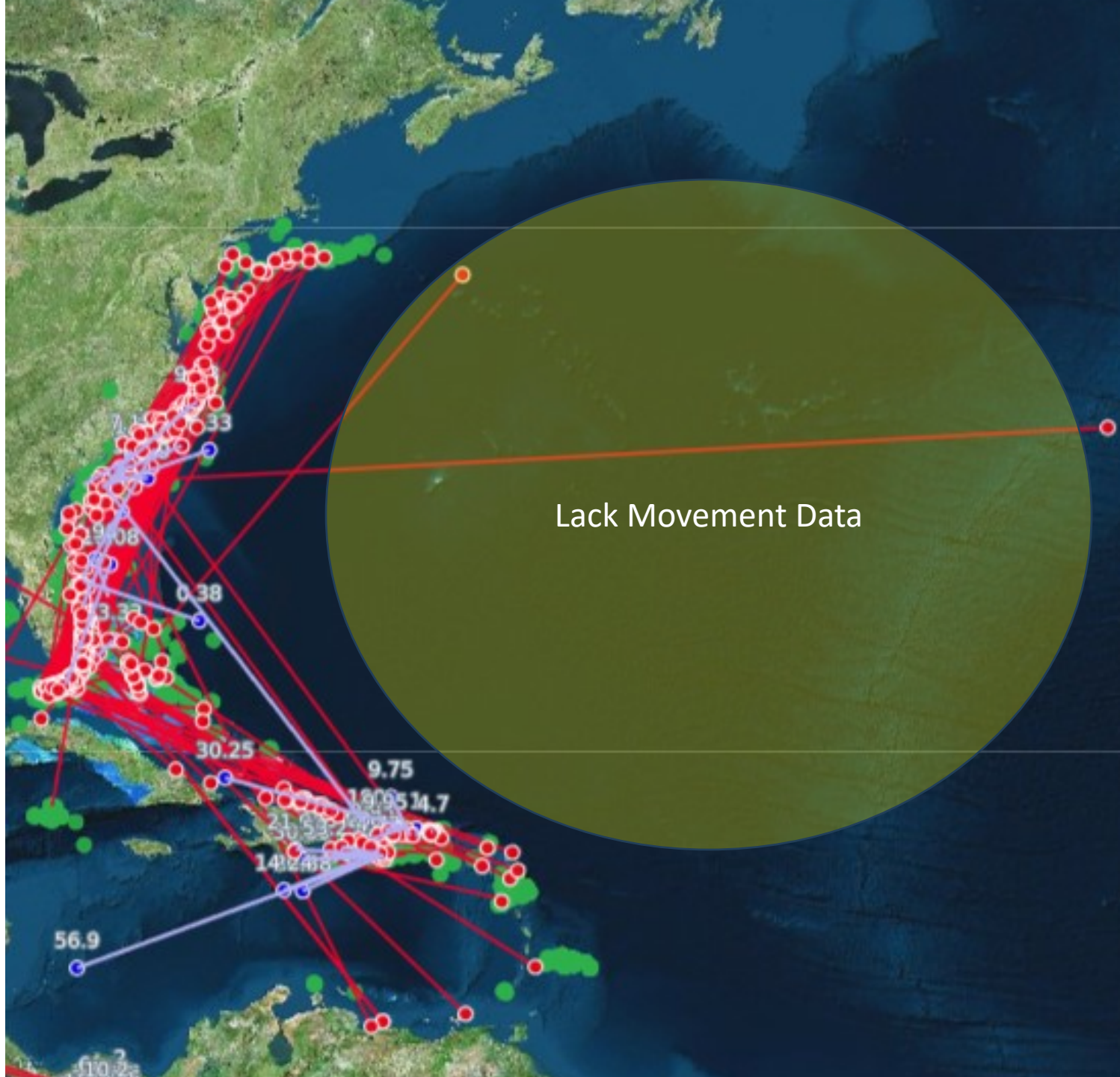










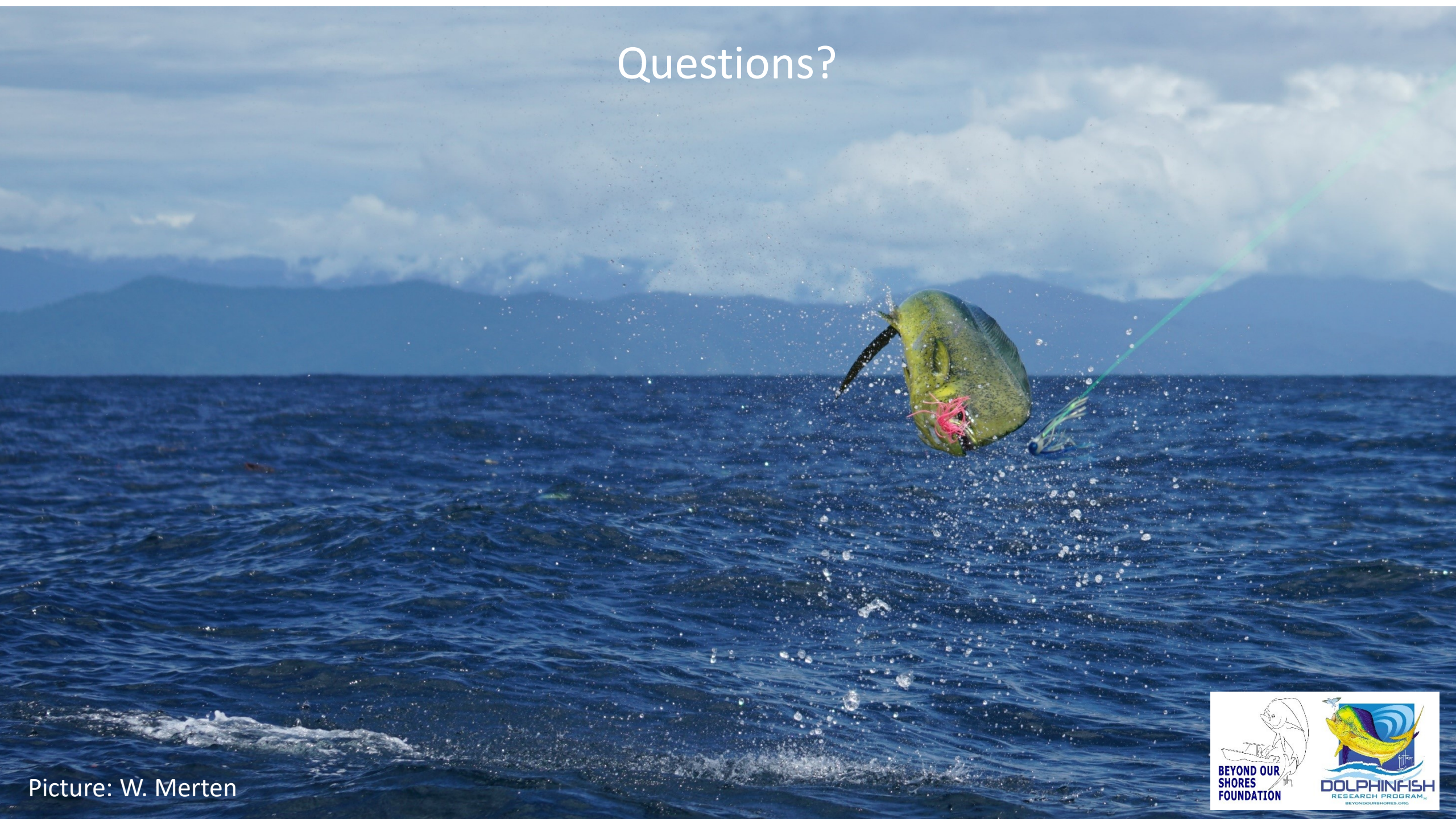


Conclusion: Issues Facing WCA Dolphin Stock

- Lack of data on/at FADs in Caribbean Sea and Sargassum events
- Inconsistent regulations on same stock despite transitory evidence
- Generally, small subadult fish (<24" FL) are being caught at FADs but frequency varies seasonally
- Lack of quality data on the recreational fishery yet increase in the fishery (Freire et al. 2020)
- Unknown Indirect harvest in longline fisheries (Lynch 2018; Merten et al. 2022b)
- Lack of landings data from 23 nations in WCA
- Under reporting of landings is likely in some major FAO dolphin reporting nations in the WCA
- Increasing demand in major seafood markets (MSA 2016)
- High discard mortality (Rudershausen et al. 2019) – Need to promote use of nonoffset circle hooks
- Perception of resistance to overfishing
- Underappreciate of multinational distribution which fragments data collection and management
- Size truncation and diminished stock productivity?



Questions?



Picture: W. Merten

