

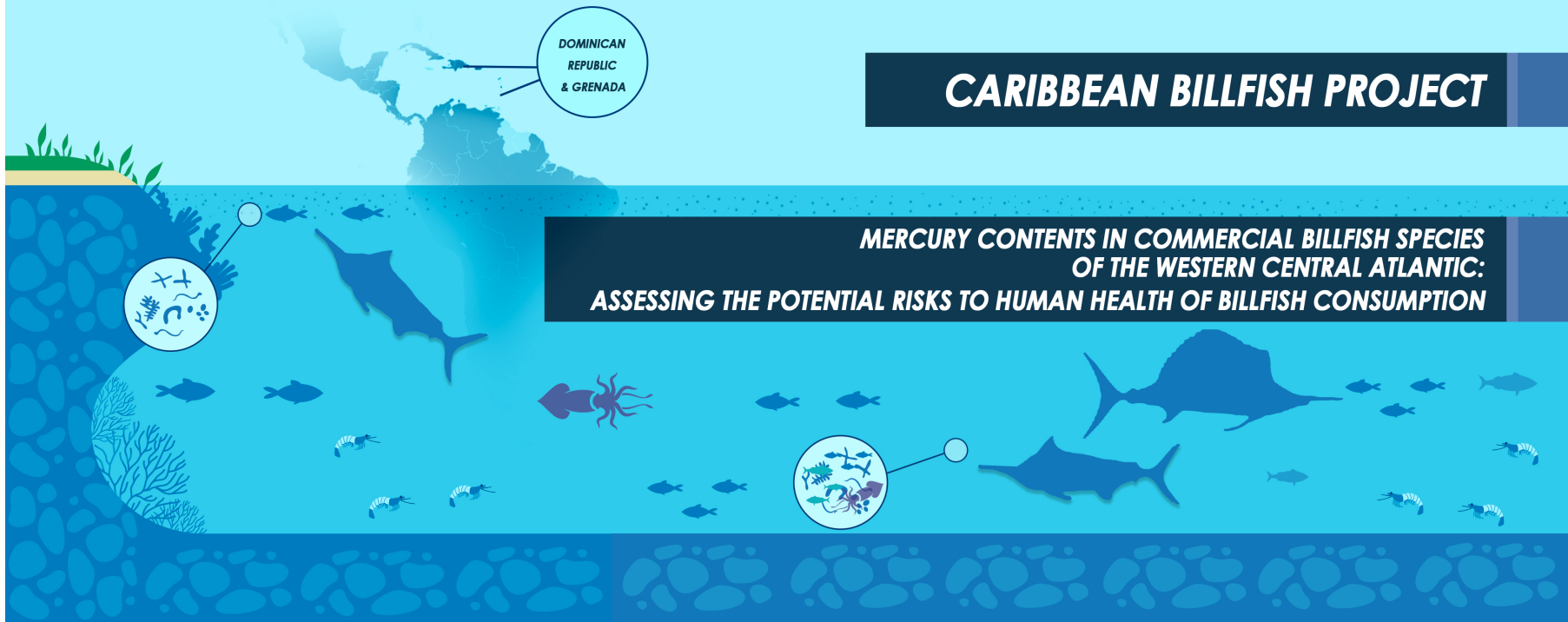
# OCEAN PARTNERSHIPS



DOMINICAN  
REPUBLIC  
& GRENADA

## CARIBBEAN BILLFISH PROJECT

**MERCURY CONTENTS IN COMMERCIAL BILLFISH SPECIES  
OF THE WESTERN CENTRAL ATLANTIC:  
ASSESSING THE POTENTIAL RISKS TO HUMAN HEALTH OF BILLFISH CONSUMPTION**



## BACKGROUND:

Mercury (Hg) is a globally distributed pollutant that can be released into the environment from both natural, such as volcanic activity, weathering of rocks, geologic deposit, etc., and human sources, such as coal burning, mining, and other industrial activities.

Once entered into the ocean, mercury can be transformed into methylmercury (MeHg), which is an even more toxic pollutant.

Fish can then naturally bioaccumulate methylmercury in their muscle tissues, primarily through consumption of other organisms that also contain methylmercury. This process is known as biomagnification, and can cause significant increases in MeHg concentration at each level in the food chain. Billfish, as top predators, are naturally susceptible to the bio-accumulation of MeHg within their body tissues.

Consumption of large amounts of these fish species by humans can in-turn result in human exposure to this toxicant, and in significant associated health issues. Methylmercury toxicants target the central nervous system, particularly during foetal development, making pregnant women a particularly vulnerable consumer group.

MeHg concentrations in meat of billfish species in the Caribbean have not been measured before. In other regions, such as north and eastern Pacific, Gulf of Mexico and others, unhealthy levels of MeHg have been measured and nutritional advice regarding the consumption of billfish was provided to the consumers. This was not the case in the Caribbean as yet. It is therefore critical to fill this gap in information and accurately assess the MeHg concentration in Caribbean billfish meat, in order to set healthy thresholds for local human consumption of these species. The Caribbean Billfish Project carried out a regional study into the mercury concentrations in billfish meat, with a focus on the situation in Grenada and the Dominican Republic.

## THE AIMS OF THE GRENADA STUDY WERE:

1. To assess the extent of current billfish consumption in Grenada.
2. To assess the concentration of mercury (Hg) in Blue and White marlin, as well as in Atlantic sailfish landed in Grenada.
3. On the basis of 1 and 2 above, provide recommendations about healthy levels of Billfish consumption in Grenada.

## METHODOLOGY:

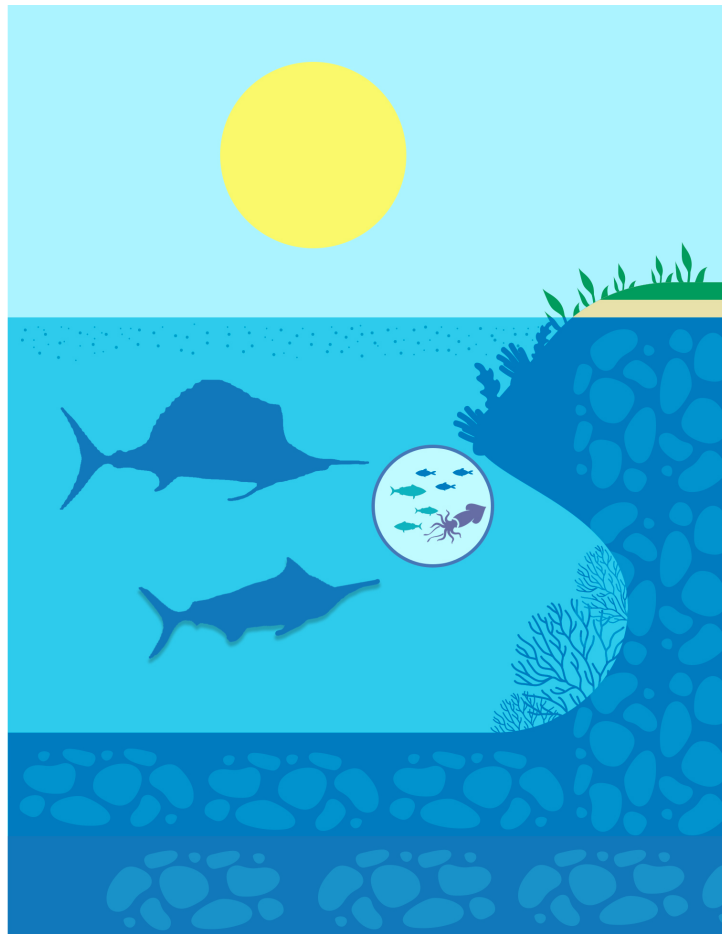
145 billfish samples were collected at the most strategic fish landing sites in Grenada and in the Dominican Republic for these regional fish stocks, including Atlantic Sailfish (n=38), Blue Marlin (n=62) and White Marlin (n=45). The tissue samples were then analysed for mercury content in IZSVE (Italy) laboratories using internationally certified laboratory equipment. A fish consumption survey was held in Grenada to investigate the importance of billfish within the diet of the Grenadian people. Based on the local rate of billfish consumption, and on the billfish tissue mercury concentration analyses, the study then estimated the potential risk to human health of billfish consumption in Grenada.

## SUMMARY RESULTS:

Overall, only a small part of the human population in Grenada may be at risk of mercury toxicity from eating large amounts of billfish. According to this study, there are no human health risks associated with consuming Atlantic Sailfish in Grenada, and only a low risk from consuming White Marlin. Consumption of Blue Marlin however may present higher risks in Grenada and probably throughout the Caribbean, since more than 25% of the Blue Marlin samples contained mercury concentrations that were over the recommended limit.

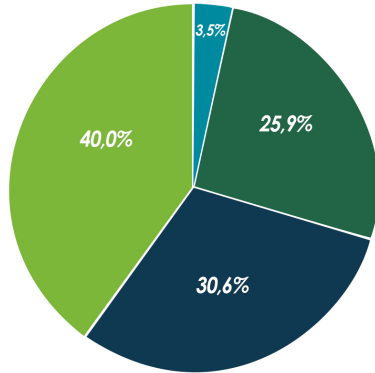
During the study, many consumers stated that they were not able to identify what species they buy and eat, highlighting the need for clear labelling of billfish products.

Considering the wide range of Hg concentrations detected in Blue Marlin, and given the possibility that the consumption of only one portion of highly contaminated meat could exceed the total Tolerable mercury dose for a few months, women during pregnancy, or intending to get pregnant should be reasonably recommended to avoid consumption of any Blue Marlin. It is further recommended that all the consumers in Grenada and probably elsewhere in the Caribbean should be cautious with eating Blue Marlin and should avoid high consumption rates of this species in general (e.g. not more than 220 grs/week).



## BILLFISH CONSUMPTION IN GRENADA:

Frequency of Billfish Consumption:



4 or more times per week	3,5%
1 or 2 times per week	25,9%
1 or 2 times per month	30,6%
from 1 to 4 times per year	40,0%

Portion Of Billfish Usually Consumed:



Small portion  
(4oz/113gr raw weight)  
41,2%



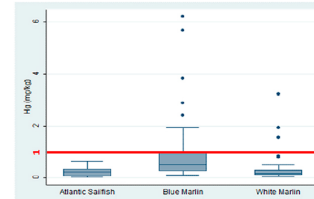
Medium portion  
(6oz/170 gr raw weight)  
41,2%



Large portion  
(8oz/220 gr raw weight)  
17,6%

## BILLFISH MERCURY CONCENTRATION IN THE COLLECTED SAMPLES:

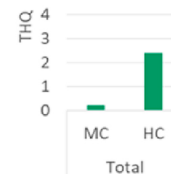
OVERALL, RELATIVELY FEW BILLFISH SAMPLES (12%) CONTAINED HIGH LEVELS OF MERCURY, WITH BLUE MARLIN BEING THE MOST PROBLEMATIC SPECIES, AS ILLUSTRATED BELOW:



ATLANTIC SAILFISH: IN 38 SAMPLES, NONE PRESENTED MERCURY CONCENTRATIONS OVER THE RECOMMENDED LIMIT (1MG/KG)\* = 0%  
 BLUE MARLIN: IN 62 SAMPLES, 15 PRESENTED MERCURY CONCENTRATION OVER THE RECOMMENDED LIMIT (1MG/KG)\* = 24,2%  
 WHITE MARLIN: IN 45 SAMPLES, 3 PRESENTED MERCURY CONCENTRATION OVER THE RECOMMENDED LIMIT (1MG/KG)\* = 6,7%

\* LIMIT SET FOR THESE SPECIES BOTH BY FAO AND EUROPEAN COMMISSION

## ACCEPTABLE LEVELS OF BILLFISH CONSUMPTION IN GRENADA:



Median Consumers (MC) of Billfish in Grenada are not at high risk of mercury toxicity, whereas High Consumers (HC) are at risk of exceeding the recommended limit, especially for Blue Marlin (THQ = 1).

GIVEN THE DETECTED HG LEVELS IN THE COLLECTED SAMPLES, WEEKLY CONSUMPTION OF MEDIUM PORTIONS OF WHITE MARLIN OR ATLANTIC SAILFISH COULD BE CONSIDERED SAFE, AND ALLOW FOR ADDITIONAL CONSUMPTION OF OTHER FISH SPECIES DURING THE WEEK. THE WIDE RANGE OF HG CONCENTRATIONS FOR BLUE MARLIN COMPLICATES DIETARY RECOMMENDATIONS FOR THIS SPECIES, AND WARRANTS CAUTION, PARTICULARLY FOR PREGNANT WOMEN, CHILDREN AND TODDLERS.

(FOR MORE INFORMATION ON THIS SUBJECT, PLEASE CONSULT YOUR PHYSICIAN, NUTRITIONIST OR DIETARY ADVISOR)

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Food and Agriculture  
Organization of the  
United Nations



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**Caribbean Billfish Project**