



MINAMATA INITIAL ASSESSMENT- BELIZE

RESULTS VALIDATION WEBINAR SERIES SUMMARY REPORT



JUNE 2021

BACKGROUND

Mercury is an indestructible, highly toxic heavy metal that harms the health of humans and the environment. As such, to protect human health and the environment from the adverse effects of mercury and mercury compounds, the Minamata Convention on Mercury was developed.



The Minamata Convention on Mercury is a global treaty that aims to protect human health and the environment from the adverse effects of mercury and mercury compounds.

It entered into effect on August 16, 2017 and as of June 2021, 131 countries have become Party to the Convention.

To enable the ratification and/or implementation of the Minamata Convention, many countries around the world have embarked on Minamata Initial Assessment (MIA) projects.

Belize is yet to become a Party to the Minamata Convention but the Government of Belize supports the overall objective of the Convention and is actively considering becoming a Party to the Convention. To inform this decision, Belize participated in the project GEF 9991 'Development of Minamata Initial Assessment in the Caribbean- Belize (MIA Belize)', which commenced in August 2018.

THE MIA-BELIZE PROJECT AGENCIES ARE AS FOLLOWS:

FUNDED BY:



IMPLEMENTED BY:



EXECUTED BY:



**NATIONAL
EXECUTING PARTNER:**



As a part of the MIA Belize Project, a Results Validation Webinar Series was developed to ensure a national review and validation of the outputs of the project by the National Working Group (NWG).

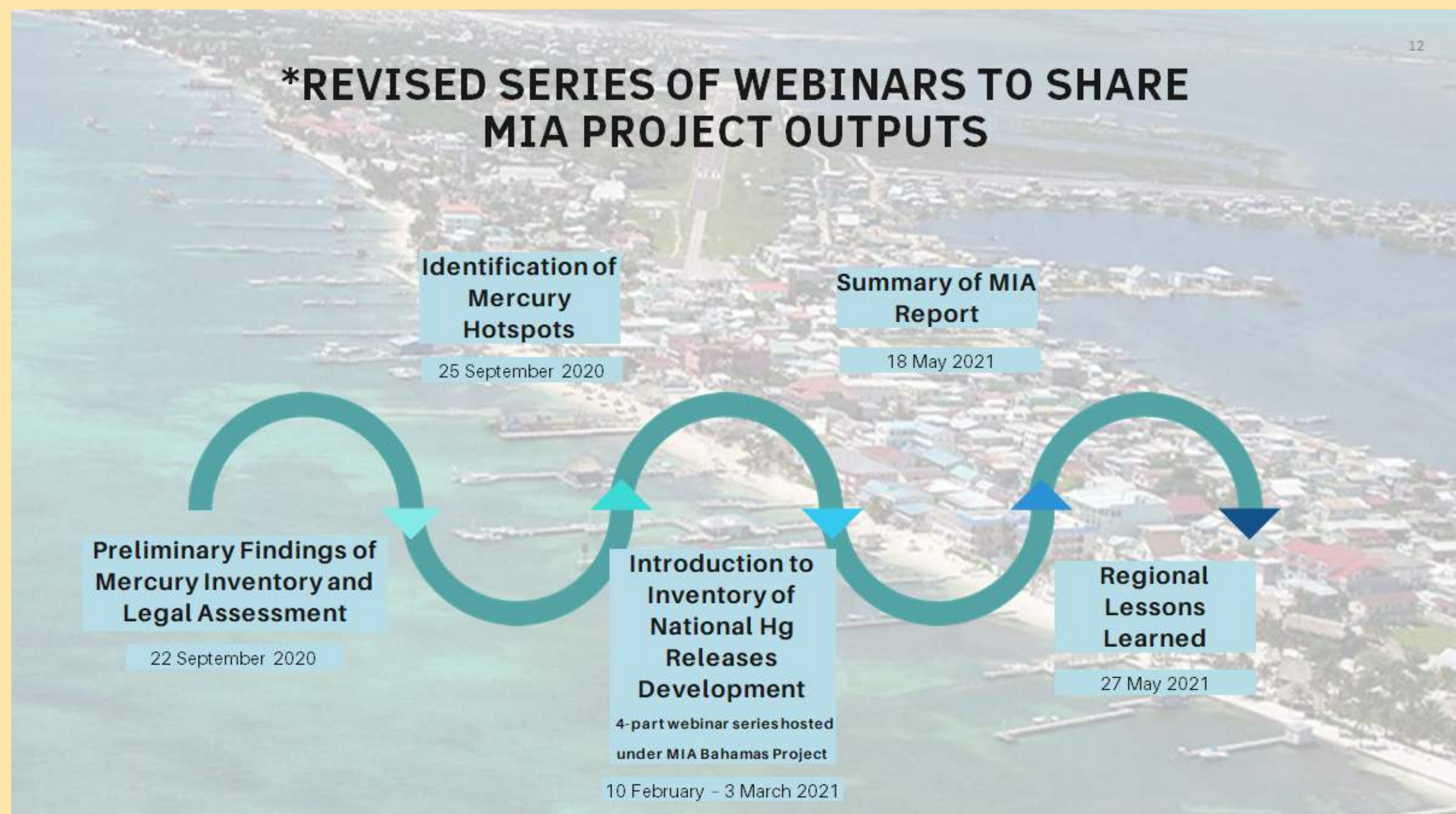
The Series commenced in September 2020 and concluded with the Regional Lessons Learned Webinar in May 2021.

MIA-BELIZE RESULTS VALIDATION WEBINAR SERIES

The objective of the webinar series was to provide the NWG, a voluntary technical group that oversees the national roll-out of the project, with an overview of the outputs of the MIA Project to ensure that the aims of the MIA are achieved for the sound management of the environment in Belize. Due to the restrictions of the COVID-19 Pandemic, reviews and engagements were conducted via e-mail and virtual meetings.

The webinar was initially proposed as a five (5) part webinar series to discuss the outputs of the project. The first two (2) sessions took place in September 2020 and addressed the "*Preliminary Findings of Mercury Inventory and Legal Assessment*" and "*Identification of Mercury Hotspots*". Due to certain events such as the November 2020 national elections in Belize, as well as, subsequent feedback provided on the outputs of the MIA Report, the structure of the webinar series was adjusted to address reviews and ensure the availability of the NWG for the webinars.

Thus, the revised plan for the Results Validation Webinar Series was as follows :



The revised plan incorporated other regional activities such as the MIA-Bahamas Project (GEF 10585) four-part Webinar Series entitled "*Introduction to Inventory of National Hg Releases Development*" in an effort to promote regional messaging and avoid duplication of efforts.

PRELIMINARY FINDINGS OF MERCURY INVENTORY AND LEGAL ASSESSMENT WEBINAR- 22 SEPTEMBER 2020

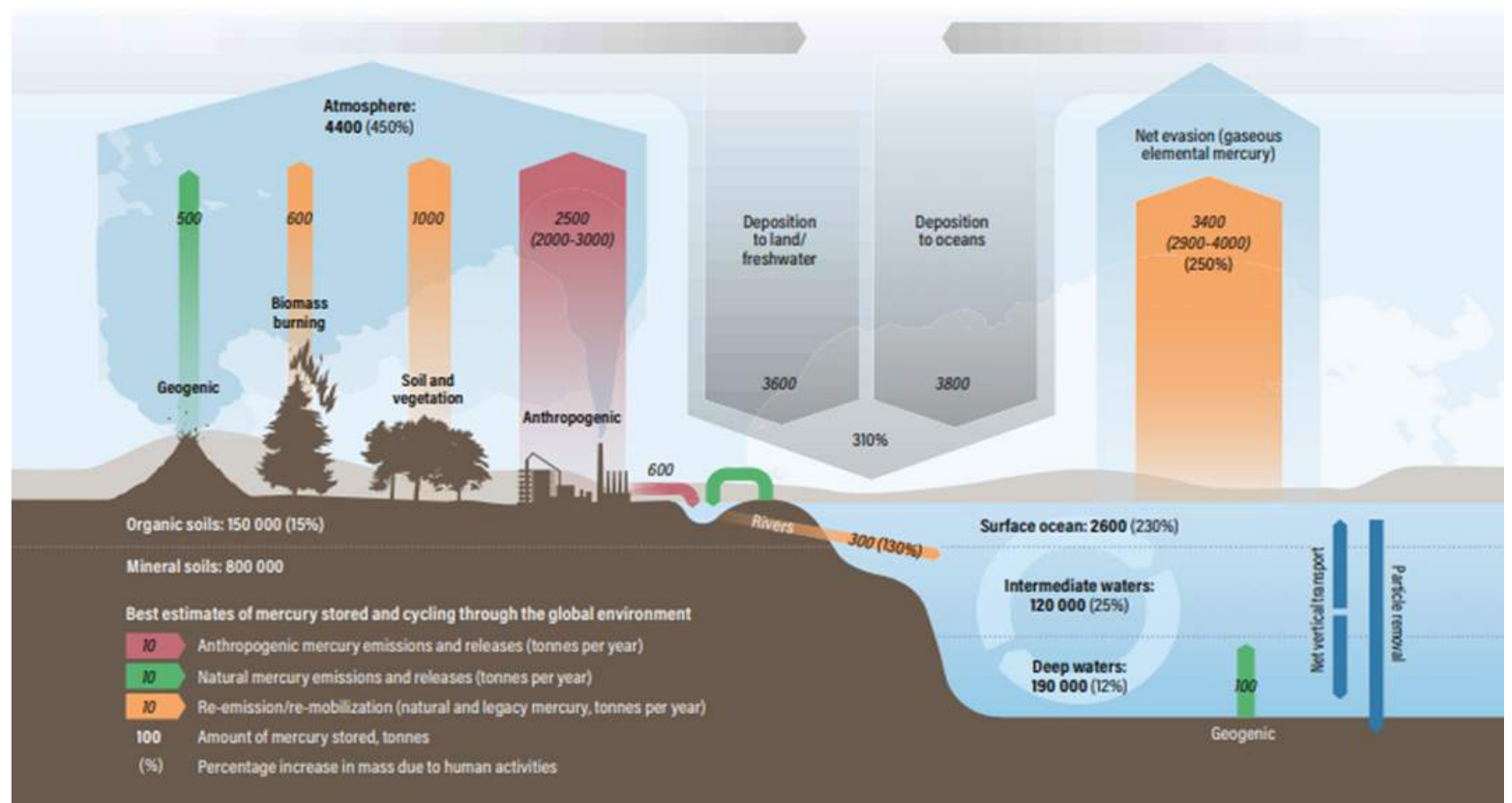
Webinar #1 aimed to present the:

- Preliminary Findings of the Inventory of Mercury Releases;
- Findings of Legislative and Institutional Capacity Assessment;
- Considerations of Findings for Belize in the Global Context.



Before addressing the aims above, the webinar provided participants with a recap of the necessary background information relevant to the development of the Inventory of Mercury Releases:

1. Mercury in the Environment
2. Mercury Releases Output Pathways
3. Quantifying Mercury Releases
4. Method of Current Inventory Development
5. Mercury Sources Sector categories



KEY POINTS:

Preliminary Findings of the Inventory of Mercury Releases

- Based on assessment of mercury releases in Belize for the average year 2018, it was determined that 95.7 kilograms per year of mercury was input to society from the mercury sources identified (note: this figure was updated to reflect final reviews).
- The top three (3) sector categories for mercury releases in Belize were:
 - *Mercury-Added Products (MAPs);*
 - *Other Intentional Product/Process Use and;*
 - *Waste Deposition and Wastewater Treatment.*

This was found to be similar to the top sources identified for other Caribbean countries.

- *General Waste* was the main output pathway for mercury releases as compared to the other output pathways (*Sector-Specific Treatment and Disposal, By-Products and Impurities, Land, Water and Air*).
- It was noted that while the releases estimated indicated the priority areas for mercury management, various assumptions were made in calculating these values as a result of the availability of information. Further assessments and regular updates of the inventory are recommended.

KEY POINTS:

- It was noted that while the gold mining sector in Belize is currently negligible, prospecting is currently taking place. Due to Belize's close borders with other gold mining countries, the potential for mercury to be brought into the country for use in the Artisanal and Small-Scale Gold Mining (ASGM) sector is a potential issue that should be monitored. If the gold mining sector does become more than insignificant in the future, careful monitoring of the process is recommended.



Assessment of Legislative and Institutional Capacity

The Minamata Convention on Mercury consists of various articles that relate to the obligations that a Party to the Convention must meet. Based on the sources of mercury present in Belize, some articles are of greater relevance for consideration as the Government considers becoming a Party to the Convention.

- Article 4 - aims to phase out or phase down the import of certain MAPs by 2020 such as batteries, switches and relays, compact fluorescent bulbs (CFLs), soaps, cosmetics.
- Article 7 (noted as potentially relevant in future) - applies to artisanal and small-scale gold mining (ASGM), in which mercury is used to extract gold.
- Article 8 - aims to reduce mercury emissions to air from five of the most significant source categories including Coal-fired power plants; Coal-fired industrial boilers; Smelting and roasting processes used in the production of lead, zinc, copper, and industrial gold; Waste incineration facilities; and Cement production facilities.
- Article 9 - aims to reduce mercury releases to land and water from sources not addressed by other provisions of the Convention.
- Article 12 - presents recommendations for reducing risks posed by contaminated sites through the creation and adoption of guidance in approaching contaminated sites.
- Article 16- referring to health aspects related to mercury management.

In Belize, National Policies, Legislation and Institutions exist that would benefit Belize's accession to the Minamata Convention. Through this assessment, such instruments were identified as they pertained to chemicals and waste in Belize and through this assessment, strengths, weakness and gaps of this legislation as it relates to mercury management. The relevant Legislative and Institutional frameworks are outlined in the MIA Report document.

KEY POINTS:

- From the assessment of the legislative and institutional capacity in Belize to implement the Minamata Convention, a summary of the recommendations for ratification/accession to the Convention were developed to assist Belize in understanding the obligations and benefits of becoming a Party to the Convention.

Some recommendations include:

- Collection and Analysis of Documentation,
- Consultation with the Ministry of Foreign Affairs on Ratification Instruments,
- Deposition of the Instruments of Ratification/Accession to the Convention's Secretariat.

Considerations of Findings for Belize in the Global Context

As part of the technical component of the Project, technical experts, the Biodiversity Research Institute (BRI) conducted research and subsequently assisted in the development of the Inventory of Mercury Releases. Comparisons were highlighted between the findings of the inventory in Belize and those MIA Inventories developed in fifty-two (52) other countries both regionally and globally. For each of the mercury source categories, the quantity of mercury releases in Belize was ranked against the other countries on a per capita basis.

- With an estimated *Total Mercury Input* of 94 Kg (prior to finalisation), Belize ranked low in terms of mercury releases when compared to other countries.. Similar findings were noted under:
 - *Extraction and Use of Fuels/Energy Sources*
 - *Batteries with Mercury*
 - *Waste Incineration and Burning*
 - *Waste Deposition/Landfilling and Wastewater Treatment*
 - *Crematoria and Cemeteries*
- Furthermore, the following categories ranked in the middle of the findings for mercury releases estimated for other countries.
 - *Consumer Products with Intentional Use of Mercury*
 - *Other Intentional Product/Process*
 - *Dental Mercury-Amalgam Fillings*
- Biomass Fired Power and Heat Production ranked high when compared to other countries on a per capita basis as a result of the burning of bagasse in Belize. It was noted that this may be due to the lack of comparable data for other countries as their records of biomass burning may be low.

WEBINAR #1 QUESTION AND ANSWER

Question: How are the results for the releases from Dental Amalgam Fillings higher than expected despite its use being mostly phased out in Belize?

Answer: While amalgam has been mostly phased out in practice in Belize, the method employed for estimating mercury releases from this sector, provided in the Toolkit for Identification and Quantification of Mercury Releases Level 2, uses default calculations to estimate the amount of mercury that may have been released during preparation, use and disposal over the past twenty years in Belize. Therefore, even though amalgam is mostly phased out in recent years, releases from previously implanted amalgam are considered under the inventory.

Question: Did the inventory take into consideration mercury in skin-lightening products and cosmetics?

Answer: Mercury in skin-lightening creams was considered under the inventory and at the January 2019 in-country workshop, various stores were visited by the Project Coordinator and Biodiversity Research Institute (BRI) to assess the presence of these products in Belize. No such products were found.

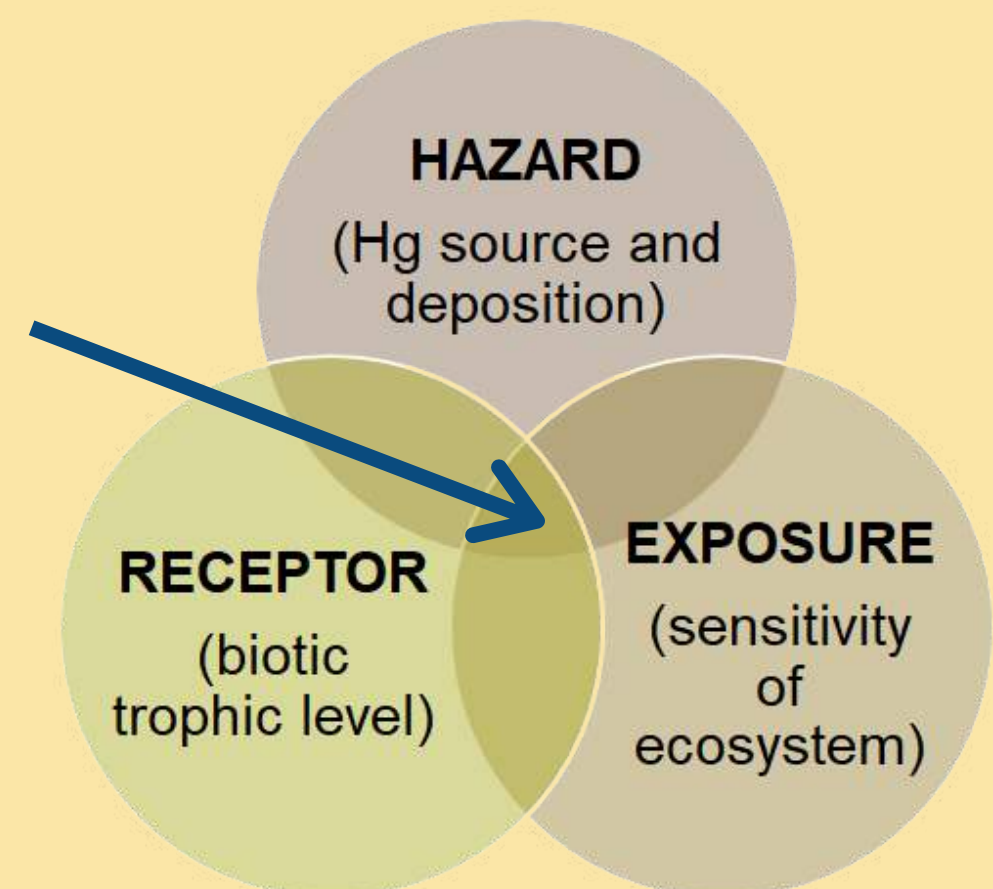
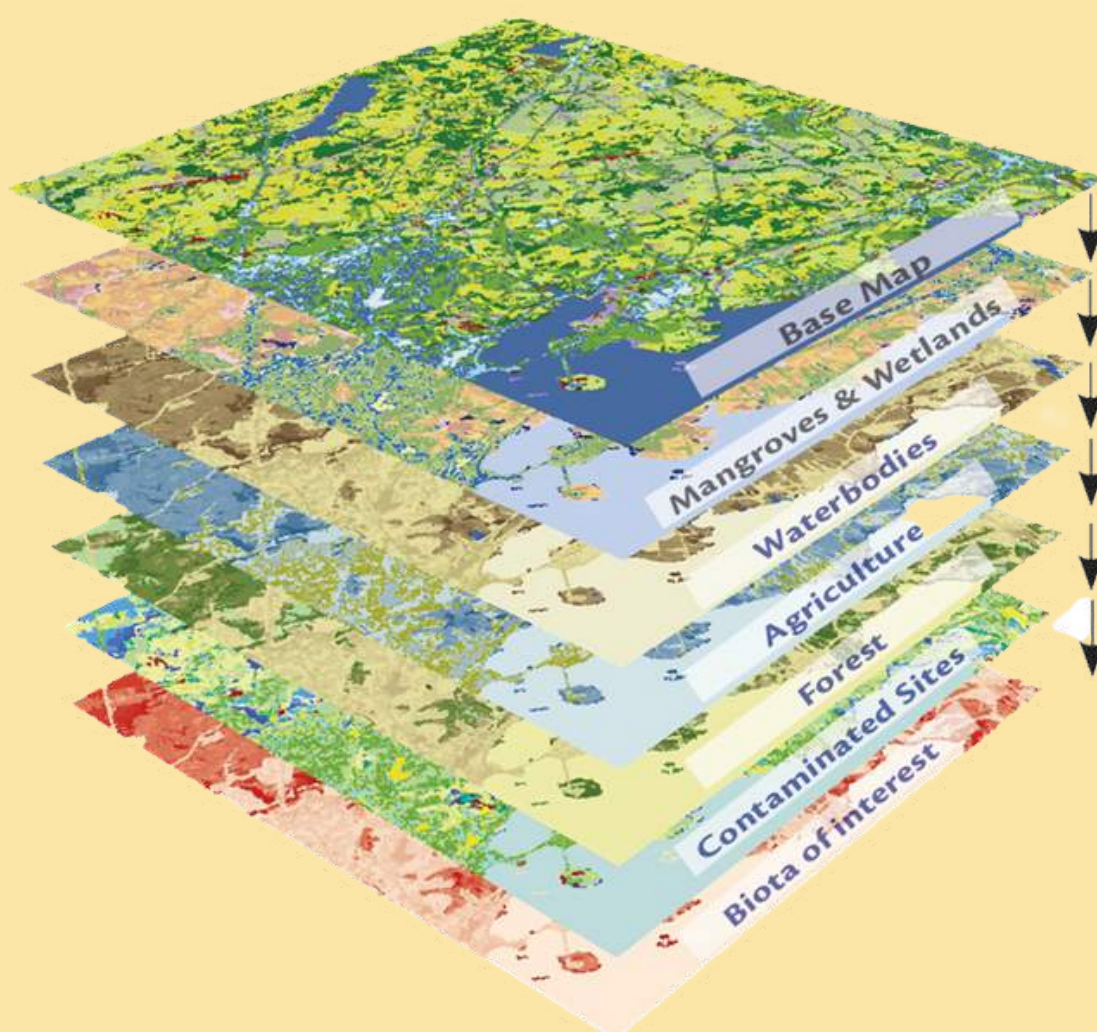
STRATEGY FOR IDENTIFICATION OF POTENTIALLY CONTAMINATED SITES IN BELIZE WEBINAR- 25 SEPTEMBER 2020

The second webinar entry in the series aimed to provide participants with more insight into the activities done for the development of strategies for the identification of potential mercury hotspots in Belize as part of the MIA Project provided by technical experts hired under the project, The Biodiversity Research Institute (BRI). The contents of the session included discussions on:

- Identification of Mercury Hotspots of Concern (mapping)
- Monitoring Mercury in Biota (an additional add-on activity provided by BRI)
- Monitoring Mercury Emissions to Air (an additional add-on activity provided by BRI)

KEY POINTS:

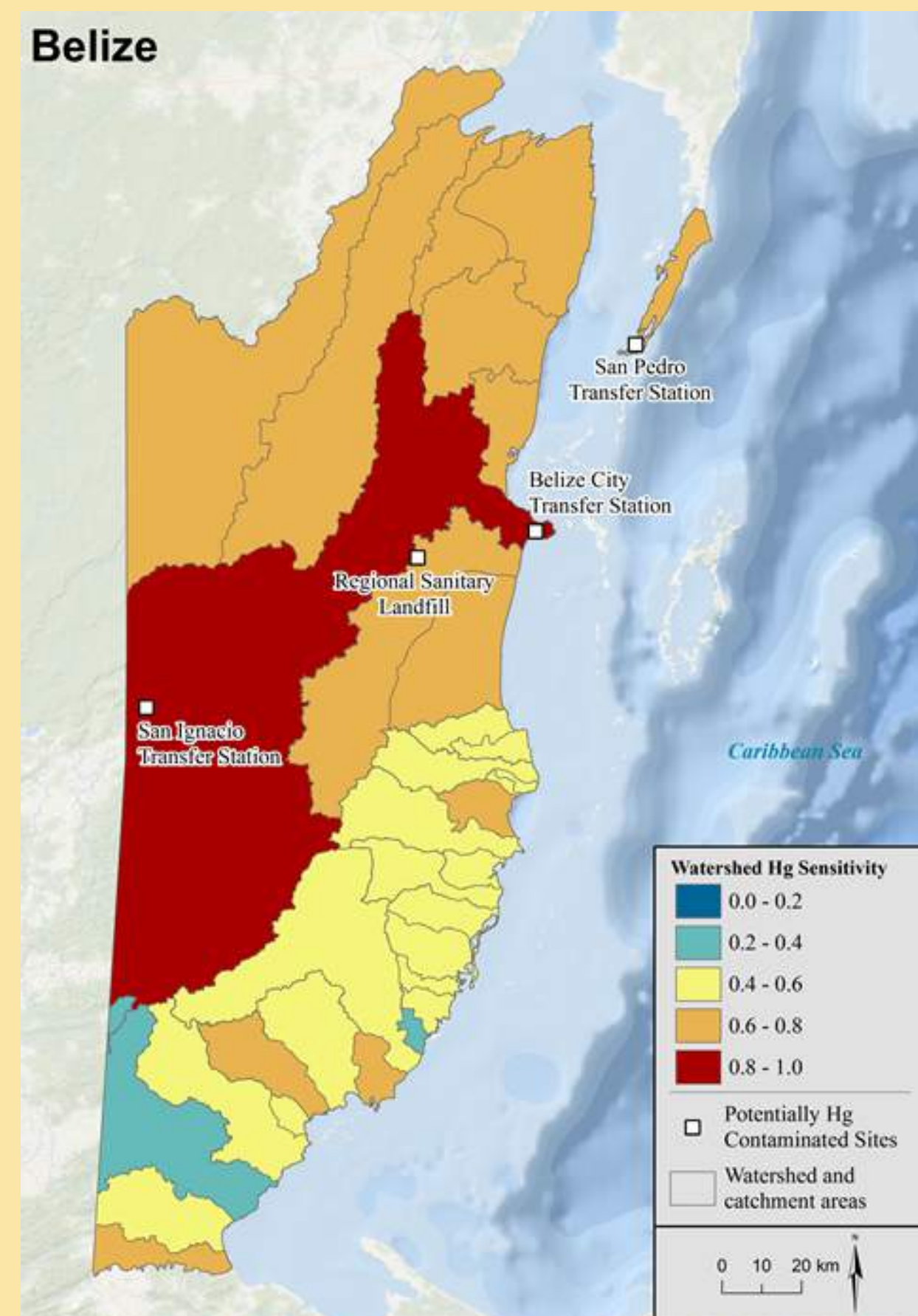
- Under the MIA Project, BRI developed maps to assist in the identification of mercury hotspots. As an add-on activity provided by BRI, sampling of fishes, birds and air was conducted to further assist in providing a baseline for monitoring mercury in Belize.
- An Ecosystem Sensitivity Spot, also known as a Biological Mercury Hotspot is defined as, "a geographic area where the environmental mercury concentrations are sufficient to be methylated at levels of biological concern (e.g., reproductive harm) for biota that are at upper trophic levels."
- Although the mercury content in a system may be high, this does not indicate a systems ability to convert mercury into methylated mercury which is the harmful form of mercury that bioaccumulates.



- Using GIS layers, BRI developed an Ecosystem Sensitivity Map using seven (7) predictor variables including mangrove and wetlands, water bodies, agriculture areas, forests, and contaminated sites to analyse mercury sensitivity by watershed.
- For each of the predictor variables, key variables were used in the development of a model.

KEY POINTS:

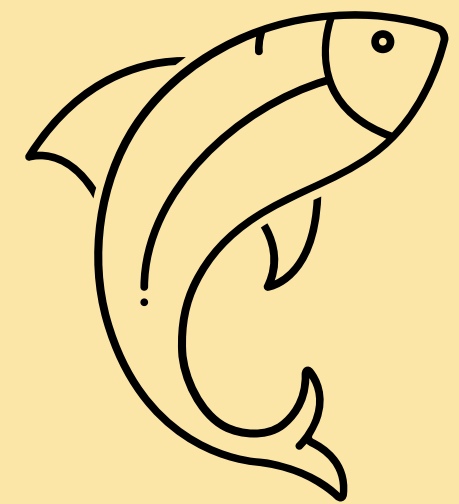
- The key variables assessed by BRI in the development of each model are as follows:
 - Contaminated sites
 - Watershed Sensitivity to Mercury Input and Subsequent Methylation
 - Landfills
 - Wastewater Treatment Plants
 - Wetlands, which have the greatest capacity to convert mercury to methylated mercury
 - Mangroves,
 - Emergent Wetlands
 - Lagoons
 - Forests
 - Riparian
 - Montane Forest
 - Lowland
 - Savannah
 - Agriculture
 - Croplands
 - Orchards
 - Sugarcane Fields
- Based on this data, the Ecosystem Sensitivity Map show areas with high watershed mercury sensitivity in red and less sensitive areas in blue.
- The Belize River has the highest sensitivity to mercury; therefore, the model indicated that this system has the greatest ability to methylate mercury.
- It is important to highlight that an area with a high ability to methylate mercury does not mean that it is a contaminated site but rather that it is an area where testing for mercury contamination can be focused.
- Further to that, activities that may cause mercury to be released should be avoided in areas of high watershed mercury sensitivity.



KEY POINTS:

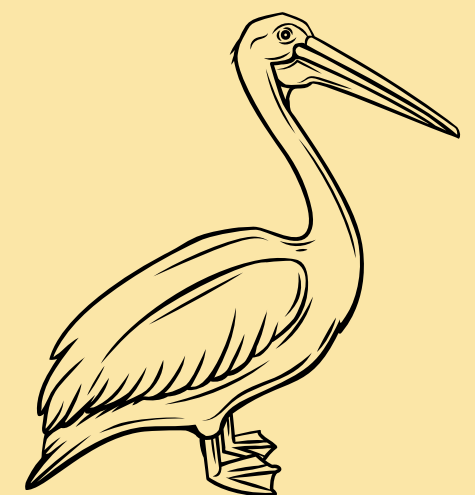
Fish Sampling (add-on activity provided by BRI)

- Seafood fish markets in Belize City were visited to collect samples from fish that would be locally consumed.
- Sampling data that was collected over past years by the Belize Electricity Company Limited (BECOL) at five (5) sites - Chalillo Reservoir, Guacamallo Bridge, Cristo Rey and upstream and downstream of the Vaca Dam were also considered for the assessment.
- Considerations for future fish sampling as well as lab analysis were also provided. Some of these recommendations included:
 - Sample and compare fish of similar length;
 - Sample fish from the locations up and downstream from potential point sources;
 - Analyze fish soon after collection;
 - Analyze at least three composites (of three fish in each composite) from each species per site.



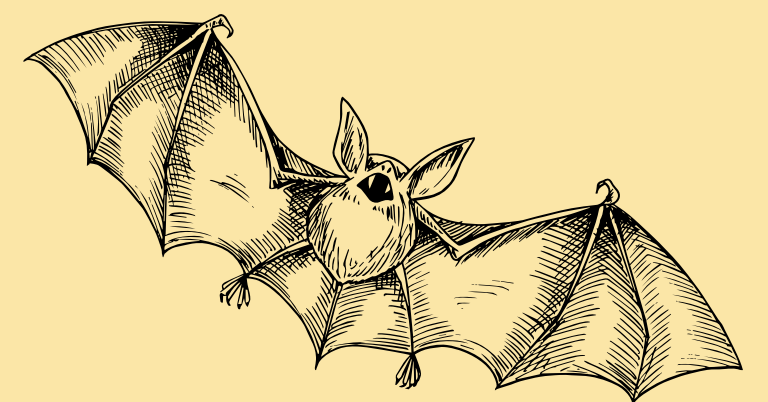
Bird Sampling (add-on activity provided by BRI)

- Bird Sampling was focused on land birds in Belize to estimate the levels of mercury concentrations in target species. Samples were taken from Runaway Creek Nature Reserve, Tropical Education Centre and Belize Foundation for Research & Environmental Education (BFREE).
- Five (5) groups were targeted for sampling including Neotropical migrants, woodcreepers, wrens, Kingfishers and Species associated with army ant swarms.



Bat Sampling (add-on activity provided by BRI)

- Sampling was done at the same locations as bird sampling and targeted insectivores and fruit-eating bats.



Air Sampling (add-on activity provided by BRI)

- Mercury Passive Air Samplers were set up in Belize at two locations - Mile 24 Transfer Station/Landfill and the Tropical Education Centre to assess mercury emissions over an extended period of time. At each location, four (4) samplers were set up to ensure accurate results.
- The data obtained from each of the sampling activities would be used to further justify the participation of Belize in regional monitoring activities being developed.

KEY POINTS:

Caribbean Regional Mercury Monitoring Network (CRMMN)

- The CRMMN is co-led by Antigua and Barbuda and assisted by Saint Kitts and Nevis with BRI providing technical support. The Caribbean mercury monitoring plans to estimate the levels of mercury in:
 - a. Air deposition
 - b. Fish
 - c. Birds
 - d. Human dietary and
 - e. Cosmetic skin-lightening creams.

The Government of Belize is invited to continue expanding on mercury monitoring efforts through participation in the CRMMN.

WEBINAR #2 QUESTION AND ANSWER SESSION

Question: Has any consideration been taken to test for mercury in lobster and conch?

Answer: In general, shellfish has been identified at lower trophic level and have therefore not been considered too often to contain high mercury levels. However, there have been instances of high mercury levels being found. There is a challenge in comparing mercury levels in shellfish as not all shellfish tissue methylate mercury. If there is strong interest in testing mercury levels in shellfish, this can be further explored by the CRMMN.

Question: Were hair samples collected in Belize to test for mercury?

Answer: Belize hair samples could not be collected because of the project timeline; however, through the Minamata Convention, there are opportunities for further funding of mercury assessments. In order for Belize to gain access to funds, they must become a party to the Minamata Convention

MIA BAHAMAS PROJECT WEBINAR SERIES- INTRODUCTION TO INVENTORY OF NATIONAL MERCURY RELEASES DEVELOPMENT WEBINAR SERIES


Held from February to March of 2021, this webinar series was part of the MIA Bahamas Project consisting of a four (4) part introductory training session held to promote the understanding of the issues posed by mercury and the needs for implementation of the Minamata Convention in The Bahamas as well as across the Caribbean. Participation from across the region was encouraged.

The webinar series aimed to:

- Discuss mercury issues as it relates to the Caribbean
- Provide an overview of the obligations of the Minamata Convention on Mercury
- Provide initial training to national stakeholders across the region on conducting an inventory of mercury releases using the UNEP 'Toolkit for the Identification and Quantification of Mercury Releases'
- Share and discuss mercury awareness-raising strategies with Caribbean messaging

A complete report of this webinar series is also available on the BCRC-Caribbean website at the following link: [Webinar Training Series Brief](#).

WEBINAR TRAINING SERIES
10 February - 3 March 2021
Every Wednesday @ 9:00 am
(GMT-5)



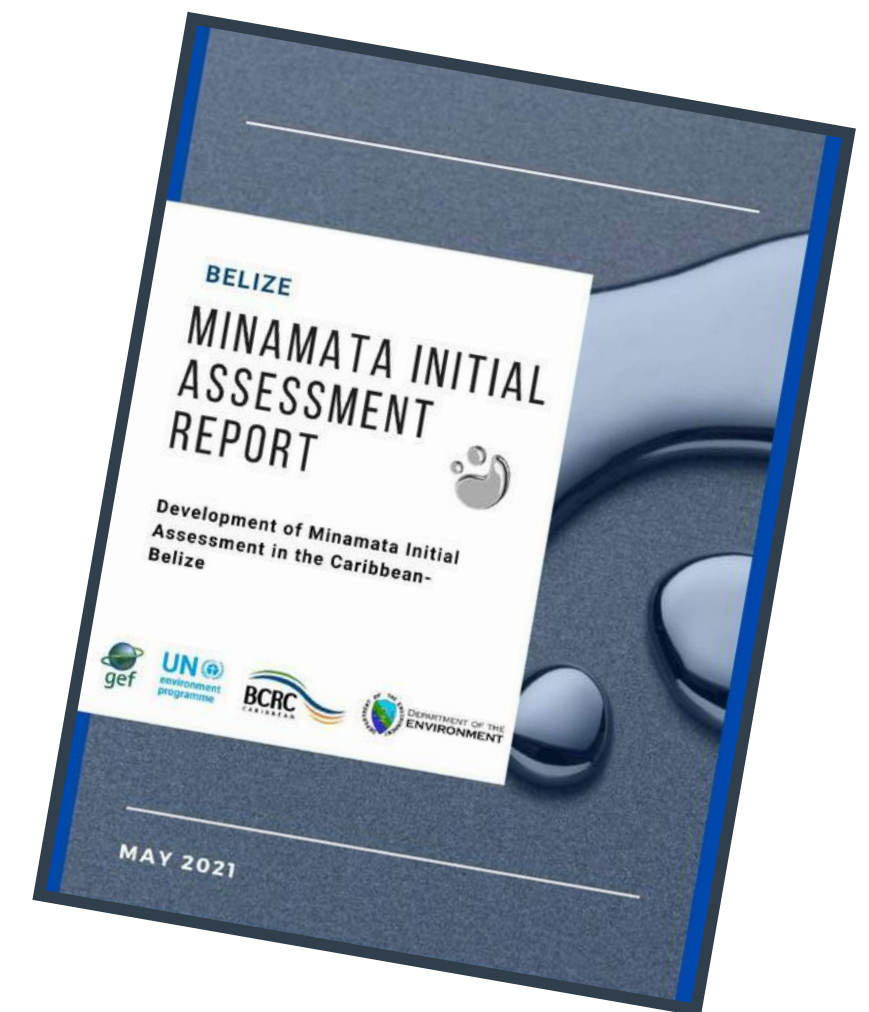
**INTRODUCTION TO
INVENTORY OF NATIONAL
MERCURY RELEASES
DEVELOPMENT**

**A four-part webinar series on the
Issues posed by the toxic chemical
mercury in the Caribbean.**

• Introduction to the Minamata Convention on Mercury	10 February 2021 @ 9:00-10:00 am (GMT-5)
• Mercury Sources and Introduction to the Development of an Inventory of Mercury Releases	17 February 2021 @ 9:00- 10:00 am (GMT-5)
• Development of an Inventory of Mercury Releases	24 February 2021 @ 9:00 - 10:00 am (GMT-5)
• Mercury Issues and Awareness Raising in the Caribbean	3 March 2021 @ 9:00 - 10:00 am (GMT-5)

SUMMARY OF THE NATIONAL MINAMATA INITIAL ASSESSMENT REPORT WEBINAR- 18 MAY 2021

Following the incorporation of feedback obtained from key stakeholder, technical consultants and the United Nations Environment Programme (UNEP), the Belize Minamata Initial Assessment (MIA) Report was finalised. This webinar aimed to provide: an overview recap of the project activities conducted; an outline of the main findings of the MIA Report and; discuss the priorities for implementation of the Minamata Convention on Mercury in Belize.

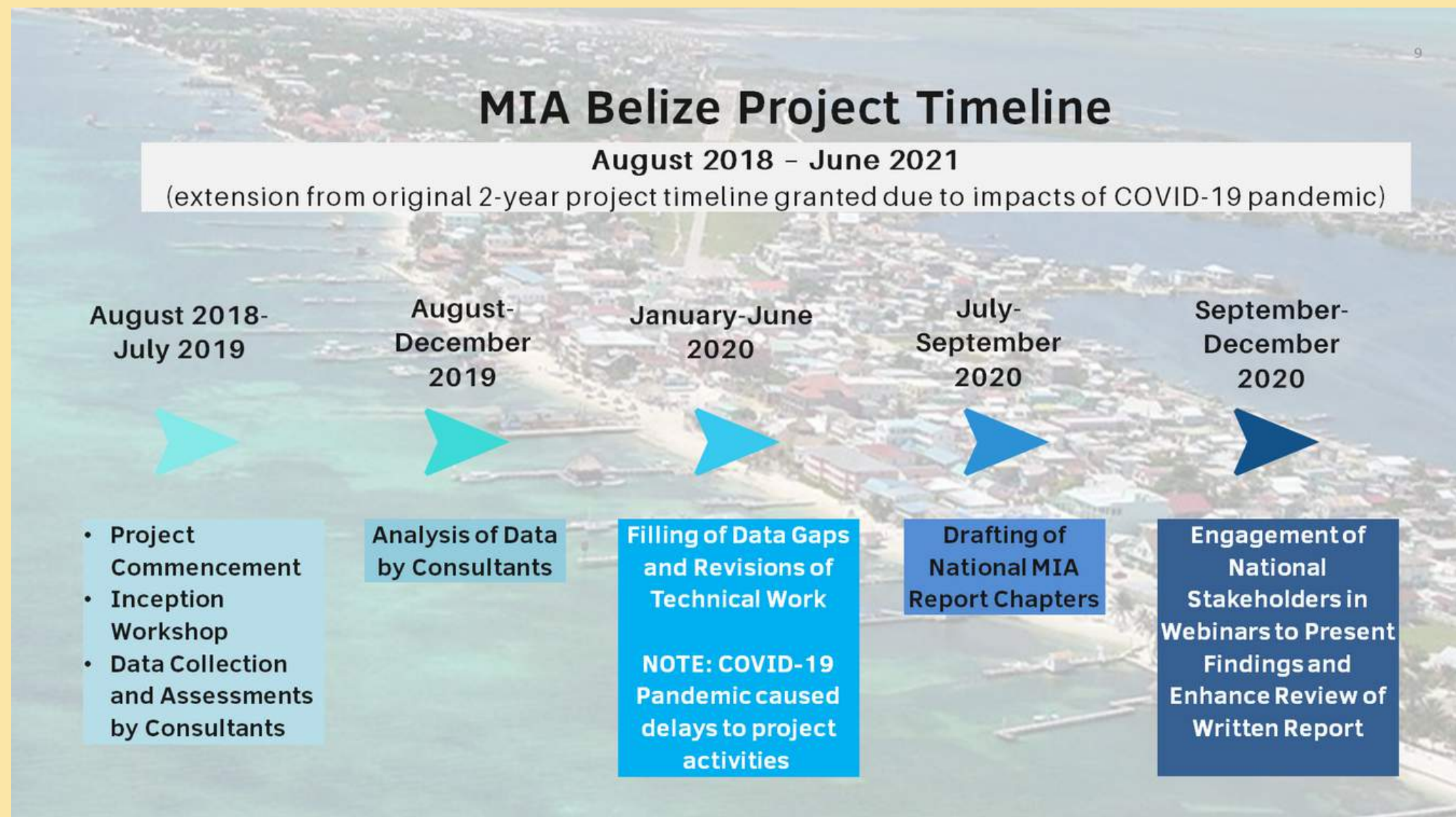


KEY POINTS:

Project Recap

- An overview of the MIA Belize Project was presented, which highlighted:
 - The Project Aim
 - The Project Components:
 - 1. Global technical support and capacity building for MIA development
 - 2. Development and Validation of the Minamata Initial Assessment
 - 3. Monitoring and Evaluation
 - MIA Belize Project Timeline and Key Activities
- It was noted that Belize was not yet a Party to the Minamata Convention but through the outputs of the project, the Government would be enabled to make an informed decision to accede to the Convention.
- Component 1 of the Project referred to the support provided by UNEP through the Global Mercury Partnership resources and through technical reviews of the project's outputs.
- Component 2 referred to the main project activities that resulted in the development of the MIA Report.
- Component 3 of the project ensured transparency and accountability of the BCRC-Caribbean as the project executing agency since regular expenditure and progress updates were verified by UNEP. The final outputs of this component involved an independent financial audit and terminal evaluation which would be completed by June 2021.

KEY POINTS:



Presentation of the Final MIA Report Outcomes

- The MIA Report consists of six (6) chapters as follows:
 1. National Background Information
 2. Mercury Inventory and Identification of Emissions and Releases
 3. Policy, Regulatory and Institutional Framework Assessment
 4. Identification of Populations at Risk and Gender Dimensions
 5. Awareness/Understanding of the Workers and Public; and Existing Training and Educating Opportunities of Target Groups and Professionals
 6. Implementation Plan and Priorities for Action

KEY POINTS:

- Chapter 1 provided a brief overview of the national geography, population, socio-economic and environmental background.
- The UNEP Toolkit for the Identification and Quantification of Mercury Releases (UNEP Toolkit) Level 2 (Version 2019) was used to estimate mercury releases in Belize for one year based on identified mercury sources.
- For data collection, 2018 was used as the base year, although it was noted that in cases where 2018 data was unavailable, previous years or assumptions were used to make inferences for mercury releases.
- For each mercury source sector category, the subcategories responsible for the highest mercury output remained unchanged between the preliminary and final inventory. However, there were some changes to estimated mercury releases based on feedback received and validated.
- Based on the inventory it was estimated the mercury input to society was 95.72 kilograms of mercury per year (kg Hg/y), and the total mercury releases was estimated to be 93.95 kg Hg/y. The main source categories for mercury releases were determined to be:
 - Use and disposal of mercury-added products such as thermometers, compact fluorescent lamps, batteries, and dental amalgam fillings (74%)
 - Mercury waste into landfills and wastewater (15%)
 - Biomass fired power and heat production (11%)
- General Waste was found to be the main output pathway for mercury releases.
- For the development of strategies to identify potential mercury hotspots, spatial analysis was done in order to produce a Belize Watershed Mercury Sensitivity Map which highlighted areas that have a high tendency for mercury to accumulate within the landscape. This map can be used as a tool to guide and direct priority locations for future monitoring and mitigation efforts.
- The assessment of the legislative and institutional capacity for mercury management involved a comparison of the obligations of the Minamata Convention against the existing and proposed policies, legislation and institutional framework of Belize. Recommendations for the accession (ratification) and implementation of the Minamata Convention were then provided. Some of the recommendations included:
 - Carrying out the administrative steps for the deposition of the instrument of ratification/accession to the Minamata Secretariat;
 - Consider adoption of the Draft National Integrated Chemicals Management Bill (2017) for implementation in Belize;
 - Enact national implementing legislation either through National Assembly or by Minister by Order.
- The chapter of the MIA Report which involved the *Identification of Populations at Risk and Gender Dimensions*, highlighted the health issues caused by mercury and noted that certain persons may have a higher likelihood of exposure due to their occupational circumstances or pre-dispositions outlined.

KEY POINTS:

- Another key aspect of mercury management included in the MIA Report was the need for awareness and understanding of mercury issues by various stakeholders. Under the MIA Project, a Communication Strategy was developed to target key stakeholders in the government, private sector and the general public. A communications package and associated communications guidance document were developed. The package contains materials to share with various stakeholders through different channels.



Priorities for the Implementation of the Minamata Convention on Mercury

- Beyond the accession of the Minamata Convention on Mercury, the main priorities for Belize include:
 - The promotion of mercury-free consumer products
 - Development of proper separation methods for disposal of mercury-added products at the household and landfill levels
 - Mercury testing and monitoring in persons and biota through hair and fish sampling, respectively
 - Integration of gender into mercury/chemicals abatement projects
- Under the GEF Programme, Implementing Sustainable Low and Non-Chemical Development in SIDS (ISLANDS) planned for 2021-2025, several activities for mercury management are included. Belize is a participating country in the GEF ISLANDS Programme, however it will only be able to benefit from the mercury management activities if it becomes a Party to the Minamata Convention.



WEBINAR #3 QUESTION AND ANSWER SESSION

Question: Would Belize be able to participate in the GEF ISLANDS Programme without receiving funds for mercury management until Belize becomes a Party to the Minamata Convention?

Answer: Yes. Although funds may not be received, Belize can still learn from knowledge provided to other countries that implement mercury activities under the Programme but in order to fully benefit from GEF ISLANDS, Belize would need to become a Party.

A COPY OF THE WEBINAR PRESENTATIONS AND RECORDINGS CAN BE ACCESSED AT THE FOLLOWING LINK:

WEBINAR SERIES RECORDINGS AND PRESENTATIONS

**SHOULD YOU HAVE ANY ISSUES ACCESSING THE LINK, PLEASE EMAIL:
INFO@BCRC-CARIBBEAN.ORG.**

THANK YOU!



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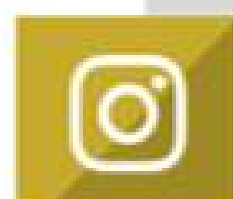
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