

SESSION 6 - DISASTERS

Geospatial Information supporting Disaster Risk Management Decision Making in the Americas

Tuesday September 8, 2020

9:15 – 10:30 am (US EST)

Bridging the Divide : Connecting Earth Observations, Statistical
and Geographic Information for Better Decision Making

#2020AmericasSymposium

UN-GGIM Working Group Disasters/ **Simone Michelle Lloyd, GISP**

Ms. Lloyd is a certified geospatial professional, educator, trainer & project manager with a wealth of over 13 years experience contributing to the development of Jamaica's geospatial landscape. She is the Senior GIS Manager/Trainer within the National Spatial Data Management Branch of the Ministry of Economic Growth & Job Creation. Her main responsibilities include coordinating the development & delivery of GIS training and education initiatives, Jamaica's National Emergency Response GIS Team (NERGIST) and geospatial public education and awareness initiatives, managing various geospatial projects, programmes & events. She currently serves as Jamaica's primary geospatial delegate to the United Nations Global Geospatial Information Management (UN-GGIM) Group of Experts, with co-chairmanship support to the Working Group on Geospatial Information and Services for Disasters and very active membership within UN-GGIM: Americas, serving on the CARIGEO project.



Jamaica Co-Chair support – UN-GGIM WG Disasters,
Senior GIS Manager/Trainer, National Spatial Data Management Branch (NSDMB),
Ministry of Economic Growth & Job Creation (Jamaica)

UN-GGIM WG Disasters & NSDMB (Jamaica)/ Presentation Agenda

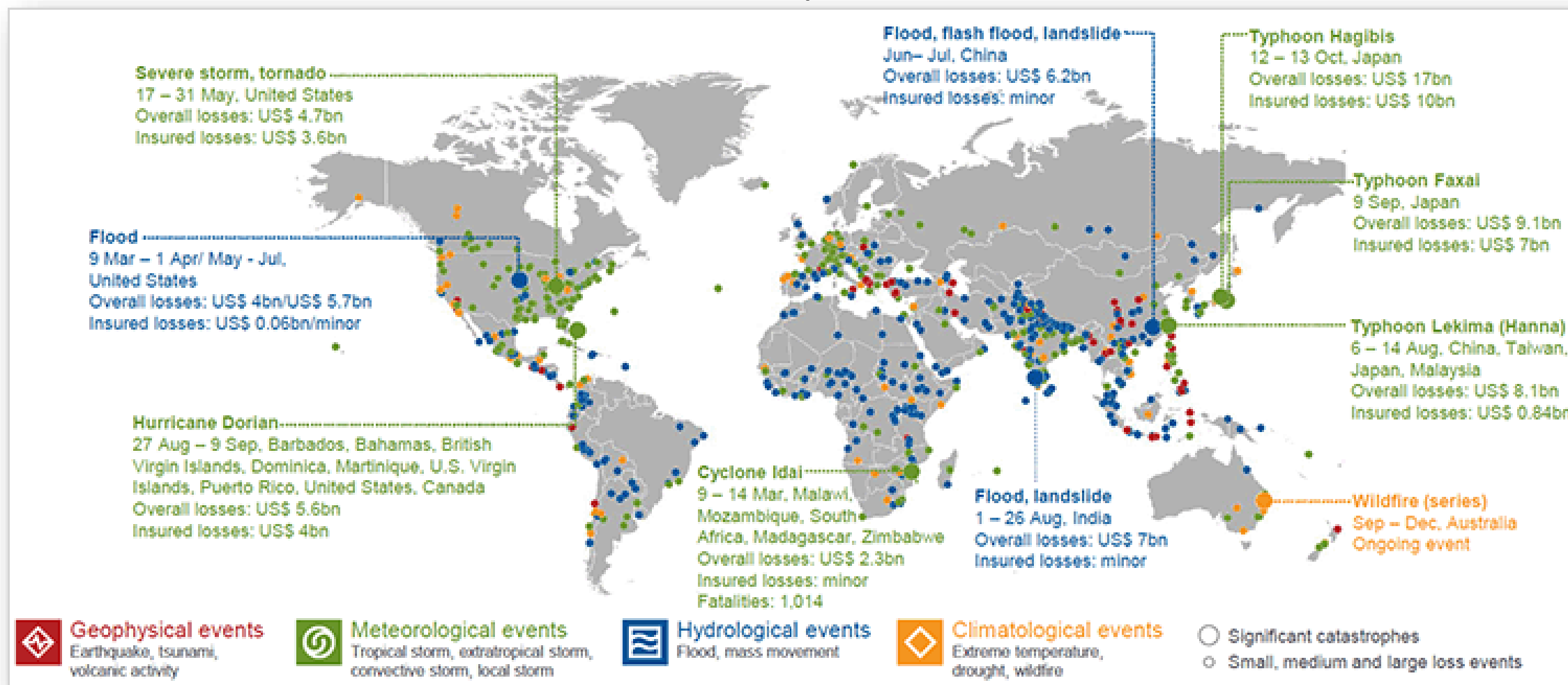
- Global Impact of Disasters
- Caribbean Disaster Vulnerability
- UN-GGIM WG Disasters & the Strategic Framework
- Jamaica's Geospatial Response to Disasters

Global Impact of Disasters



World Natural Catastrophes, 2019

Overall losses from world-wide natural catastrophes in 2019 totaled **\$150 billion** dollars





Caribbean Disaster Vulnerability

UN-GGIM WG Disasters & NSDMB (Jamaica)/ Caribbean Disaster Vulnerability

Caribbean countries, especially Small Island Developing States (SIDS) are primarily impacted by **earthquakes** and **hurricanes** as natural hazards.

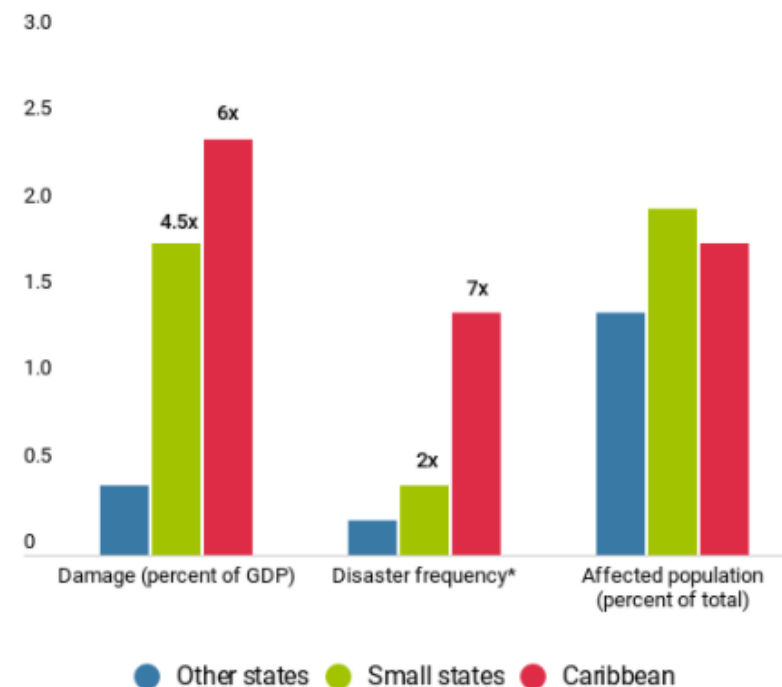
“Natural disasters in the Caribbean are becoming more ferocious and frequent even relative to small states. The recent devastations of Category 5 hurricanes Maria and Irma (both in September 2017) demonstrate how powerful storms can lead to widespread destruction, loss of life, and weaker economic growth prospects.”
(Muñoz and Ötöker, 2018)

Muñoz, Sònia and İnci Ötöker. 2018. “Building Resilience to Natural Disasters in the Caribbean Requires Greater Preparedness”. December 10, 2018
<https://www.imf.org/en/News/Articles/2018/12/07/NA120718-Building-Resilience-to-Natural-Disasters-in-Caribbean-Requires-Greater-Preparedness>

Highly vulnerable

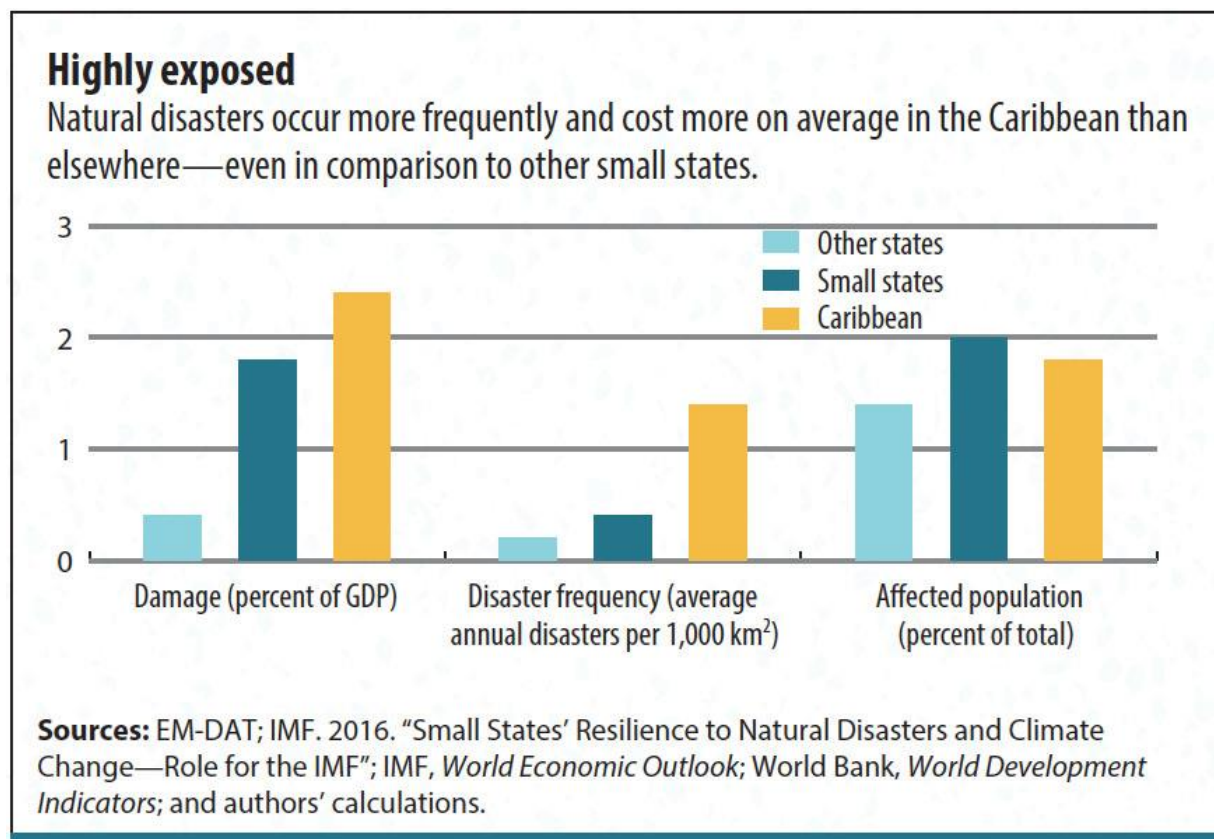
Caribbean countries experience frequent natural disasters with high human and economic costs.

(frequency and effects of natural disasters, 1990-2014)



Source: IMF staff calculations.

UN-GGIM WG Disasters & NSDMB (Jamaica)/ Caribbean Disaster Vulnerability



- Caribbean countries have a very high vulnerability to frequent and costly natural disasters.
- Given, ratings of **disasters per capita or land area**, many Caribbean countries are among the 25 most vulnerable nations.
- Over 325 of 511 occurring disasters impacting small states (<1.5 million pop.) occurred in the Caribbean.
- Impact: killing >250,000 people and affecting > 24 million (injury, loss of homes and livelihoods).

<https://www.imf.org/external/pubs/ft/fandd/2018/03/otker.htm>

UN-GGIM WG Disasters & NSDMB (Jamaica)/ UN-GGIM WG Disasters Overview

- United Nations Committee of Experts on Global Geospatial Information Management (UN-GGIM) in August 2015, under decision 5/110 supported the proposal to establish a working group to further develop and implement a strategic framework that would be:

Focused in a practical manner;

Aligned with the outcome and follow-up to the Sendai Framework for Disaster Risk Reduction 2015-2030 and its implementation;

Able to take into consideration the special needs of developing countries, especially with respect to capacity building and knowledge sharing and;

Broadly representative of different regions of the world and taking into account regional experiences.

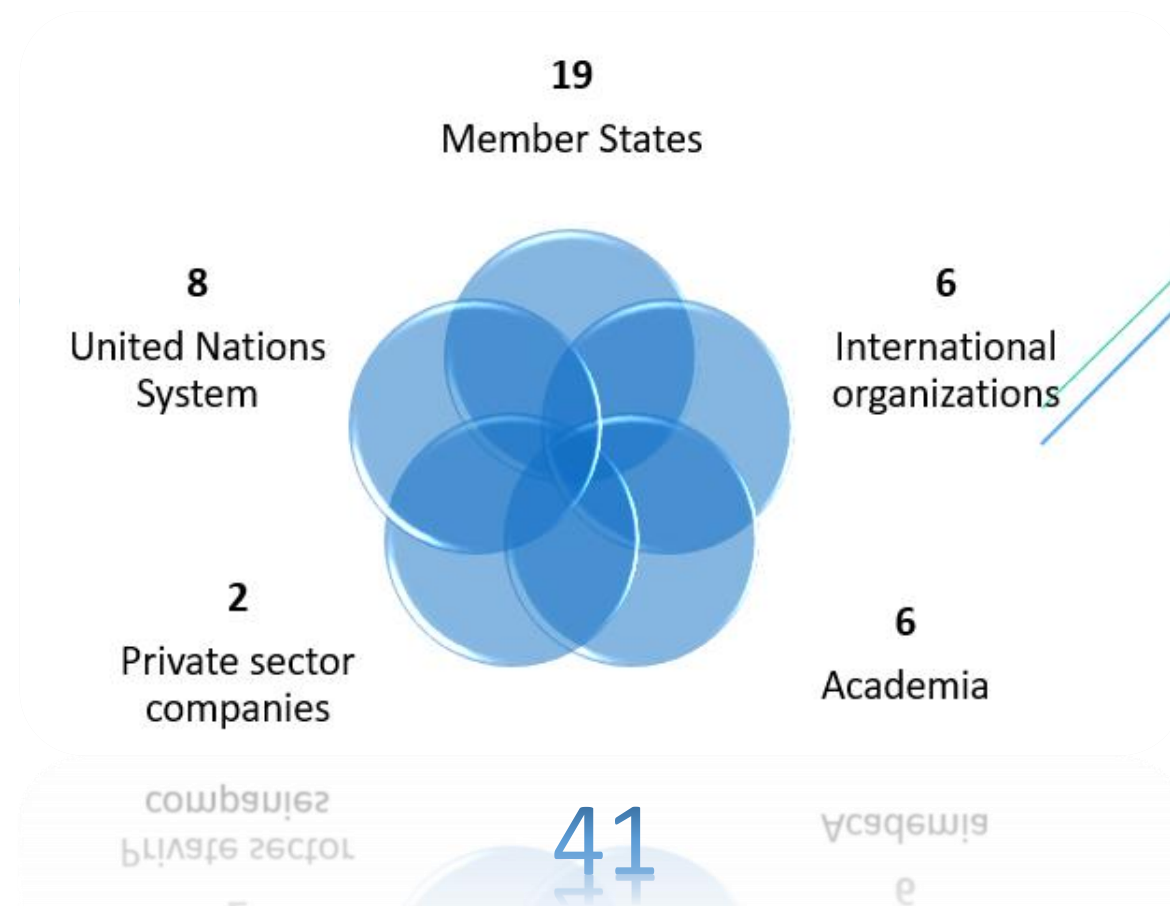
UN-GGIM WG Disasters & NSDMB (Jamaica)/ UN-GGIM WG Disasters Overview



- **Co-chairmanship:** Jamaica and Japan
(August 2019 – Present)



- **Previous Co-Chairmanship:** Jamaica and Philippines
(2016 – 2019)



UN-GGIM WG Disasters & NSDMB (Jamaica)/ UN-GGIM WG Vision & Objective

Vision

- **Accurate, timely and reliable geospatial information and services** are available, in a coordinated way, to decision makers and operational leads prior to, during and post disasters.

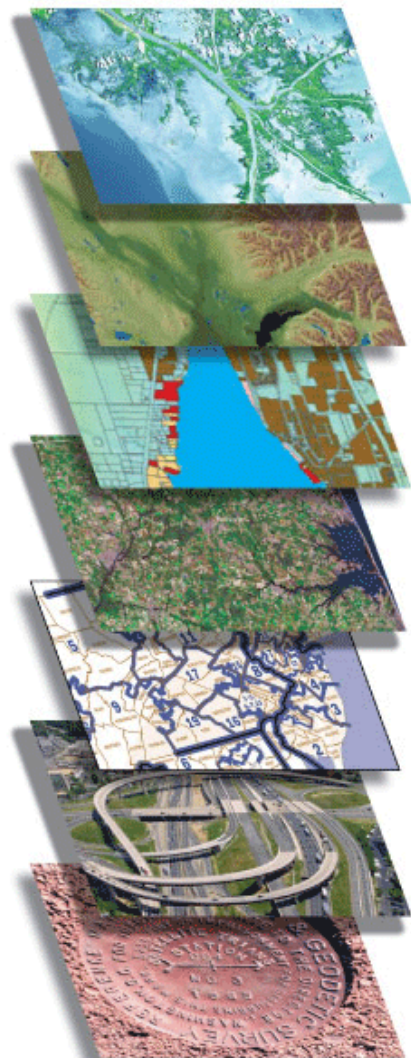
Objective

- Provide a **forum for dialogue and coordination** among Member States, their relevant government bodies, the United Nations system, international disaster risk and emergency response organizations, non-government organizations (NGOs), private sector bodies, academia, other international organizations and experts, and donors with responsibility for disaster risk reduction and management.

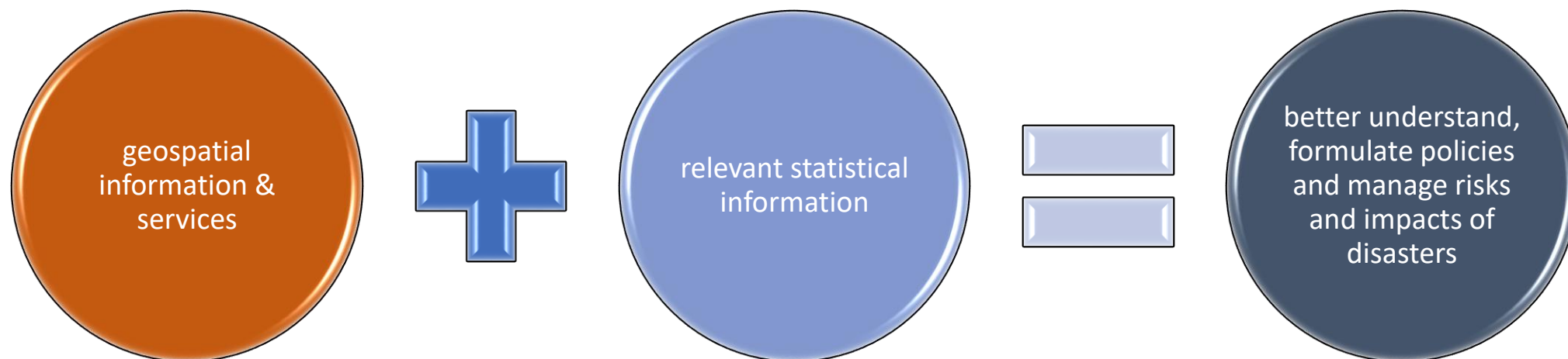
UN-GGIM WG Disasters & NSDMB (Jamaica)/ UN-GGIM WG Objective (cont'd)

Objective

- Improve the availability, accessibility, and timeliness of good quality geospatial information for disaster risk management by **encouraging policies to promote open access to data and reducing data security concerns** at all phases of disaster risk management, at all levels of government and towards the successful achievement of the 2030 Agenda for Sustainable Development.
- Encourage greater **coordination and collaboration on geospatial information activities for disaster risk management** with the regional committees and thematic networks of UN-GGIM, the UN regional commissions, the UN Office for Disaster Risk Reduction (UNDRR), the UN Institute for Training and Research's Operational Satellite Application Programme (UNITAR-UNOSAT), the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER), and the Open Geospatial Consortium (OGC).



Use of:



Member States

UN-GGIM WG Disasters: Strategic Framework on Geospatial Information and Services for Disasters



Access the Strategic Framework here:

http://ggim.un.org/documents/UN-GGIM_Strategic_Framework_Disasters_final.pdf

The Strategic Framework on Geospatial Information and Services for Disasters was adopted by the UN Economic and Social Council in July 2018 under resolution 2018/14 (available in all 6 languages, see below, Documents then 2018)

[Arabic](#) [Chinese](#) [English](#) [French](#) [Russian](#) [Spanish](#)

Complete Strategic Framework Assessment tool:

<https://bit.ly/2TxLF0t>

(Extended deadline of Oct 2, 2020)

UN-GGIM WG Disasters & NSDMB (Jamaica)/ Strategic Framework on Disasters

Five Priorities for Action



Governance
and Policies



Awareness Raising
and Capacity Building



Data
Management



Common Infrastructure
and Services



Resource
Mobilization

Advance the use of
Geographic
information to
support **Disaster
Risk Reduction** in
the Americas.

Jamaica's Geospatial Response to Disasters



UN-GGIM WG Disasters & NSDMB (Jamaica)/ Jamaica's Geospatial Response



- All key Government of Jamaica (GOJ) response entities generate and utilize geospatial information:
 - **Office of Disaster Emergency & Response (ODPEM)** – overall responsibility
 - **Meteorological Services of Jamaica** - monitors meteorological events
 - **Mines and Geology Division (MDG)** - maps geophysical and geomorphological hazards
 - **Water Resources Authority (WRA)** - examines drought and flood events
 - **National Works Agency (NWA)** - develops and maintains roadways and gullies
 - **Jamaica Defence Force (JDF)** - security and restoration efforts
 - **Jamaica Constabulary Force (JCF)** - security services

UN-GGIM WG Disasters & NSDMB (Jamaica)/ Birth of NERGIST

- The vision for **Jamaica's National Emergency Response GIS Team (NERGIST)** was born out of the devastation felt after **Hurricane Ivan** in September 2004. Jamaica suffered direct and indirect damages costing \$J 35.9billion (US\$ 595,000).
- Founder and past Chairperson of the Land Information Council of Jamaica – Mrs. Jacqueline daCosta, envisioned GIS volunteers from the Land Information Council of Jamaica (LICJ) member organizations supporting the Office of Disaster Preparedness & Emergency Management's (ODPEM) efforts.
- Active since 2004 but was approved by **Cabinet on 28th June 2010**.

UN-GGIM WG Disasters & NSDMB (Jamaica)/ NERGIST Response to Disasters

• :



Hydro-meteorological:

Hurricanes, Tropical Storms & Depressions

Floods & Landslides

Drought & Bush Fires

Disease Outbreak:

Chikungunya

COVID-19



Past Local Deployments: Initial Disaster Assessment (within 48 hours)	Past Regional Deployments: CDEMA Rapid Needs Assessment Teams (RNAT) (within 72 hours)
<ul style="list-style-type: none"> • Hurricane Ivan, 2004 • Hurricane Dean, 2005 • Tropical Storm Nicole, 2010 (<i>Plate 2</i>) 	<ul style="list-style-type: none"> • Hurricane Irene, Bahamas (2011) • Hurricane Mathew – Bahamas (2016) • Hurricane Irma - Turks & Caicos (September 2017) (<i>Plate 4</i>)
<ul style="list-style-type: none"> • Hurricane Sandy, 2012 • Drought affected areas in Upper St. Andrew, 2014 • Chikungunya mapping, 2014 • Bush Fires in Upper St. Andrew, 2015 (<i>Plate 3</i>) • May Trough Rain Floods, 2017 • Flash Flood, Montego Bay, 2017 	



Plate 2: NERGIST and ODPEM conducting Initial Damage Assessment in Savanna-La-Mar, Tropical Storm Nicole (2010)



Plate 3: NERGIST mapping bushfire extent in Upper St. Andrew (May 2015)



Plate 4: NERGIST mapping damage extent after Hurricane Irma in Turks & Caicos (September 2017)

UN-GGIM WG Disasters & NSDMB (Jamaica)/ Success Stories

COVID 19 Response = Longest NERGIST deployment
(from March 16, 2020 – June 19, 2020 > 89 days)

National Emergency
Operations Centre
(NEOC) at ODPEM

Provision of onsite and
remote mapping services
for COVID-19 cases

Generation of static
COVID-19 status maps

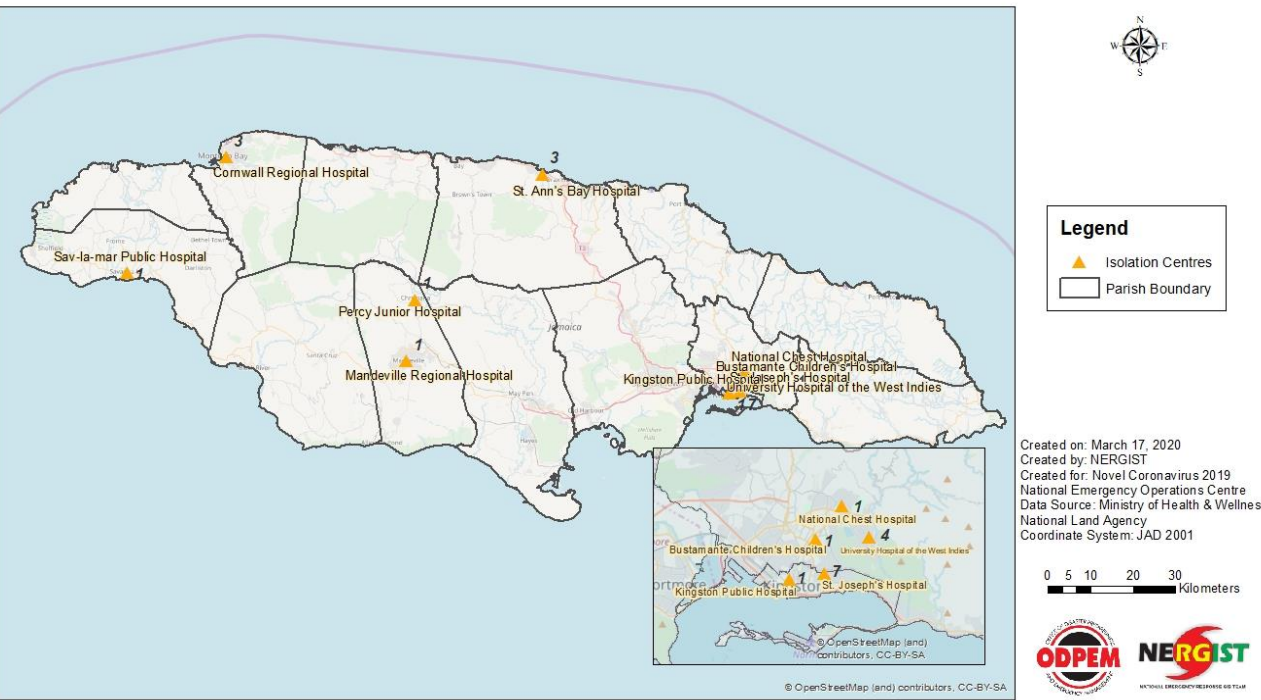
Conduct spatial analysis
and predictive modelling



Development and
maintenance of different
Jamaica COVID-19
Operations Dashboards

Generation of Survey 123
forms for tracking and
monitoring

COVID 19 ISOLATION CENTRES DISTRIBUTED NATIONALLY

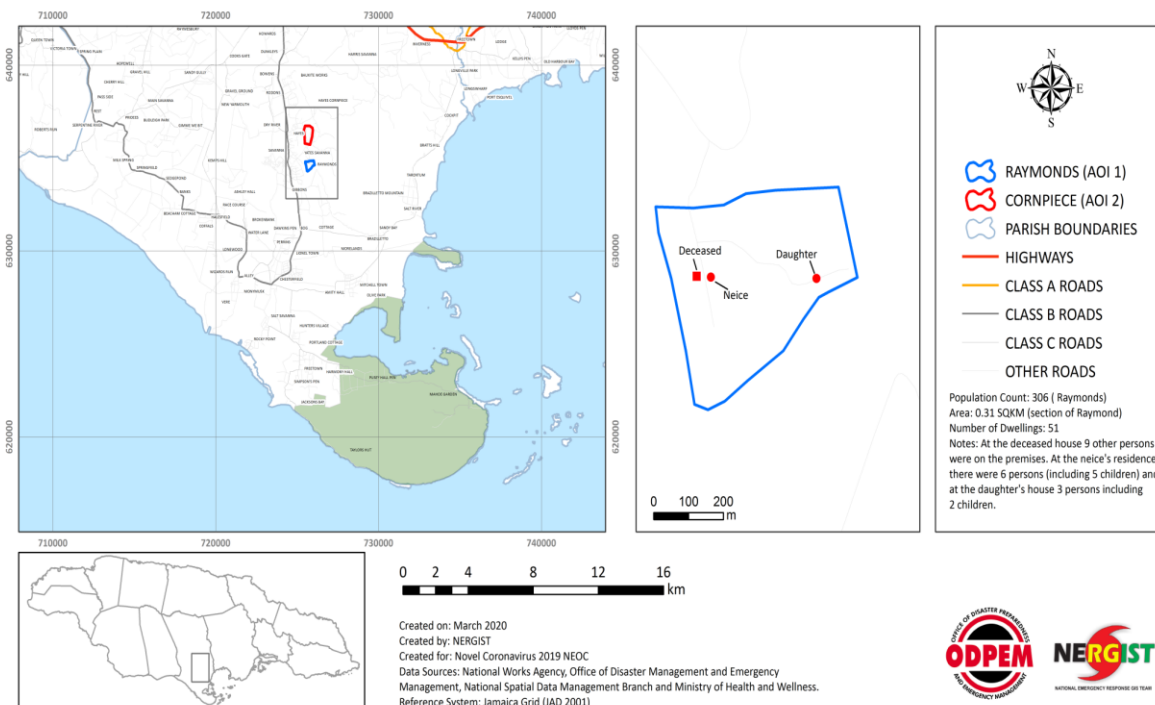


COVID-19 QUARANTINE AREAS SEVEN(7) - NINE (9) MILES BULL BAY - ST ANDREW

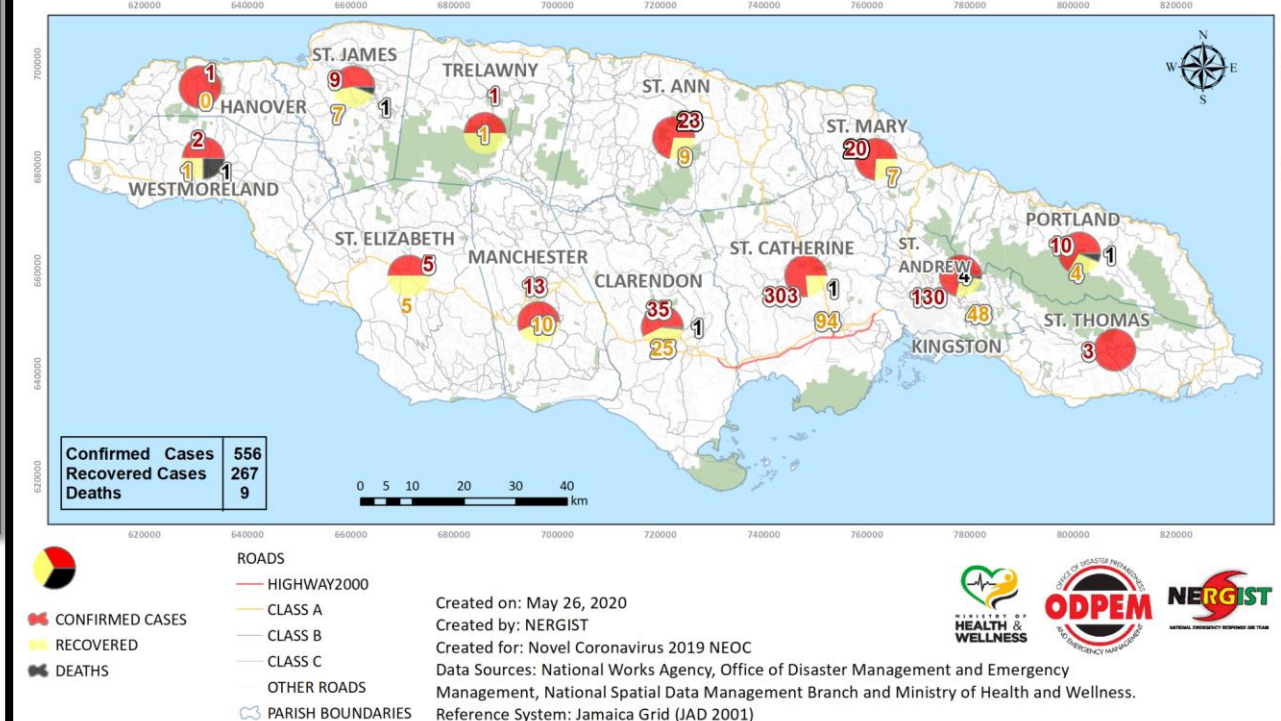


All primarily undertaken using
ArcGIS Desktop 10, ArcGIS
Online, ArcGIS Survey 123,
Dashboards for ArcGIS,
Quantum GIS etc.

RAYMONDS COMMUNITY BOUNDARY, CLARENDON, JAMAICA



CONFIRMED AND RECOVERED CASES OF NOVEL CORONAVIRUS (COVID 19) ACROSS JAMAICA



MINISTRY OF
HEALTH & WELLNESS

**CLASS 1 REPORTING FORM -
INDIVIDUAL
NOTIFICATION(ON
SUSPICION)**

Next

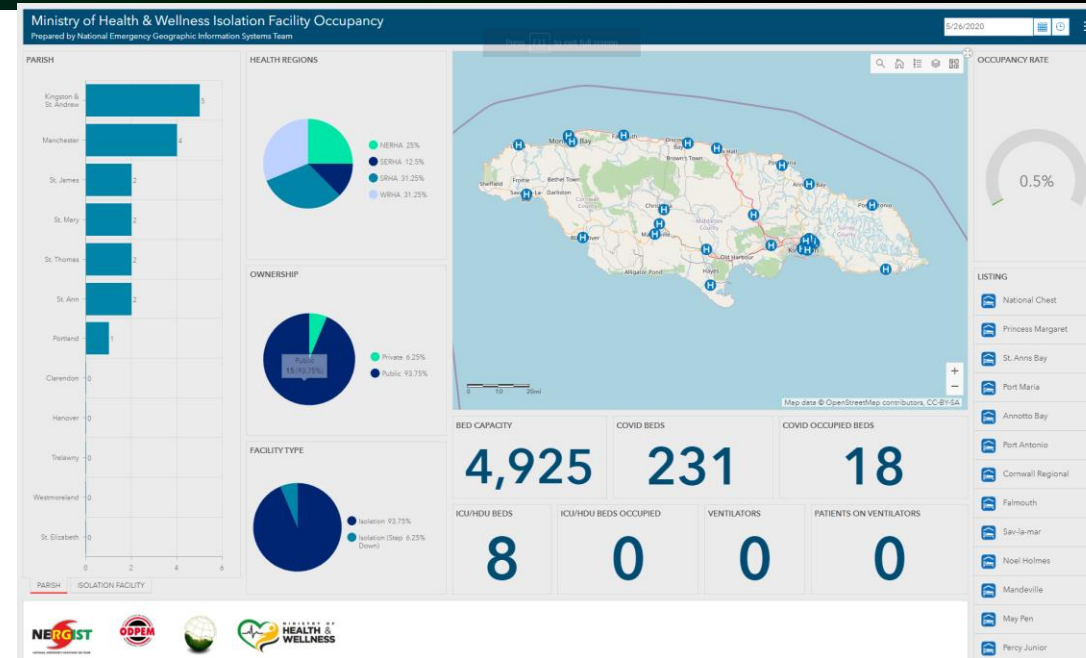
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Powered by Survey123 for ArcGIS

- **Five (5)** different **Survey 123 forms** for the Ministry of Health and Wellness (MOHW) to aid the:
- 1) mapping and monitoring of **BPO public calls for general COVID19** information and indication of symptoms onset for guidance.
- 2) mapping and monitoring of **travel patterns and health status of MOHW staff** and public health workers in the field,
- 3) mapping and monitoring of **suspected, confirmed, recovered and death cases**
- 4) mapping and monitoring of the **households that were quarantined** to track COVID19 health status
- 5) **occupancy monitoring for Isolation facilities** (bed spaces, ventilators available and used etc.)



- Six (6) **ArcGIS Dashboards** developed for COVID-19 response. Each having their own audience:
- 1) National internal dashboard (desktop version),
- 2) National internal dashboard (mobile version),
- 3) Public dashboard (desktop version),
- 4) Public dashboard (mobile version),
- 5) MOHW staff health status monitoring and
- 6) Isolation facilities monitoring dashboard.



UN-GGIM WG Disasters & NSDMB (Jamaica)/ Challenges and Opportunities

- **COVID-19 pandemic** is the largest global disaster challenge recorded. As horrific as it has been, it has created an ideal opportunity to **test and apply the Strategic Framework**.
- COVID-19 pandemic has demonstrated the **critical importance of access to available and trusted geospatial information** to support **decision-making** during all phases of disaster risk management.
- UN-GGIM WG Disasters encourages Member States to consider implementing the Strategic Framework, particularly given that the COVID-19 pandemic provides a unique opportunity for monitoring and tracking each country's progress across the Framework's five priorities for action

UN-GGIM WG Disasters & NSDMB (Jamaica)/ Summary and Key Takeaways

- The generation and maintenance of Geospatial information and services for disasters must take a multi-stakeholder approach for success:
 - NERGIST, ODPEM, Ministry of Health & Wellness and Jamaica Defence Force (JDF) were/are primary in utilizing geospatial resources for COVID-19 response
 - Reliance of geospatial data from other key Ministries, Departments & Agencies
- Reliable, accurate, available and timely Geospatial information are key towards facilitating better decision making
- Awareness of variety of Geospatial information and services

UN-GGIM WG Disasters & NSDMB (Jamaica)/ References

- Munich Re. 2020. **Facts + Statistics: Global catastrophes**. Geo Risks Research, NatCatSERVICE
<https://www.iii.org/fact-statistic/facts-statistics-global-catastrophes>
- Muñoz, Sònia and İnci Ötoker. 2018. “Building Resilience to Natural Disasters in the Caribbean Requires Greater Preparedness”. December 10, 2018. Available at: <https://www.imf.org/en/News/Articles/2018/12/07/NA120718-Building-Resilience-to-Natural-Disasters-in-Caribbean-Requires-Greater-Preparedness>
- Ötoker, İnci and Krishna Srinivasan. 2018. Bracing for the Storm: For the Caribbean, building resilience is a matter of survival. Finance & Development, March 2018, VOL. 55, NO. 1. Available at: <https://www.imf.org/external/pubs/ft/fandd/2018/03/otker.htm>
- UN-GGIM. August 2017. “UN-GGIM Strategic Framework on Geospatial Information and Services for Disasters”
http://ggim.un.org/documents/UN-GGIM_Strategic_Framework_Disasters_final.pdf

UN-GGIM WG Disasters & NSDMB (Jamaica)/ References

- UN-GGIM. May 2017. “Strategic Framework on Geospatial Information and Services for Disasters” - Kunming Forum on United Nations Global Geospatial Information Management Kunming, China 10-12 May 2017

<http://ggim.un.org/meetings/2017-Kunming/documents/Session%207%20-%20UNGGIM%20WG%20on%20Geospatial%20Information%20and%20Services%20for%20Disasters.pdf>

- UN-GGIM. 2019. “UN-GGIM Strategic Framework on Geospatial Information and Services for Disasters Assessment Survey”

<https://bit.ly/2TxLF0t>

http://ggim.un.org/documents/Proposed%20UN-GGIM%20SF%20Monitoring%20Tool_V10.4_for%20Consult.pdf

SESSION 6 – DISASTERS

Geospatial Information & Services
supporting Disaster Risk Management
Decision Making in the Americas

Tuesday September 8, 2020

Thank You

**Questions and answers will
be received after the final
presentation in this session.**