SEMINAR ON BUILDING A SCIENCE and DATA-BASED AGENDA FOR DECISION-MAKING ON RESILIENCE IN THE CARIBBEAN

October 20 – 21, 2022

Cabrits Resort & Spa Kempinski Dominica
Roseau, Commonwealth of Dominica

ANNOTATED AGENDA

The objectives of the Seminar/Workshop are to:

- Identify critical gaps in the availability and use of science-based data to support decision-making on vulnerability reduction and resilience building in the Caribbean
- Assess good practice and lessons learned from national, regional, and global resilience building
- Develop an agenda of collaboration among Caribbean Governments and regional and international agencies to address these critical data gaps in the short, medium, and long-term

THURSDAY OCTOBER 20, 2022

Registration: ***7: 00 a.m. -7:45 a.m.***

8:00 a.m. to 10:00 a.m. **SESSION 1:** **From Climate Vulnerability to Climate Resilience: Essentials for Sound Decision-making**

The IPCC's Special Report released in October 2019, makes clear that the targets set in the Paris Agreement and the steps identified by countries in their Nationally Determined Contributions (NDCs) are not ambitious enough and will not bring about any significant reduction in climate change impacts, especially on the marine environment. Warming of 1.5 degrees Celsius is predicted to destroy between 70 and 90 per cent of reef-building corals while warming of 2 degrees Celsius will likely destroy 99 percent of tropical coral reefs. Other predicted climate change impacts include increased economic and social vulnerability; increased probability of droughts and coastal flooding associated with the strengthening of episodic ocean current events; increasing intensity of tropical cyclones and altered food security through changes in arable land available for agriculture. Scientists forecast that without major mitigation efforts, carbon dioxide concentrations will reach about 560 ppm in another 40 years, that is by 2060 (Gergis, 2019). This means that Caribbean countries must aggressively speed-up the design and implementation of policies and strategies at the individual, business, community, state, and national level to achieve climate-resilient and sustainable development. The adaptive instruments must

include structural resilience strategies to fortify buildings, shorelines, and infrastructure as well as non-structural strategies to better prepare people and governments to withstand and efficiently build back from climate-related trends and disasters.

This overview session will explore the following topics/issues:

- Overview of the status of climate science (limitations of modelling/forecasting tools); sector-centered impact forecast and sector-based indicators of change –fishery and agriculture)
- Key metrics for determining critical climate change impacts (economic, social and environmental)
- Understanding the science of climate risks and their transient nature over time (risk reduction, transfer, acceptance; equitably balancing the costs and the benefits across the parties and communities they affect).

Moderator- ***Francine Baron,*** Chief Executive Officer, Climate Resilience Execution Agency for Dominica (CREAD)

- ***Dr. Michael Taylor*** - Dean of the Faculty of Science and Technology – The University of West Indies (UWI) Mona
- ***Dr. Roger Pulwarty*** - Senior Scientist - National Oceanic and Atmospheric Administration (NOAA) Physical Sciences Laboratory
- ***Dr. Rashmin Gunasekera*** - Senior Disaster Risk Management Specialist - Global Facility for Disaster Reduction and Recovery (GFDRR) World Bank
- ***Dr. Jorge Vanegas*** – Director of the Institute for Sustainable Communities - Texas A&M
- ***Dr. David Farrell*** – Principal – Caribbean Institute for Meteorology and Hydrology (CIMH)
- ***A. Amina Wilkins*** – Biologist – Society for Risk Analysis, Councilor, Justice, Equity and Risk Specialty Group

10:00 a.m. – 10:30 a.m. **COFFEE BREAK**

10:30 a.m. to 12:00 p.m. **SESSION 2:** **Decision-making Essentials for Energy Resilience**

Electricity security is vital to well-functioning modern societies and economies. Digital technologies, communications infrastructure, and industrial operations all depend on a reliable and efficient supply of electricity. As energy systems become more interconnected and smart, and as Caribbean countries shift to less carbon-intensive sources of electricity, the security of these systems becomes paramount. And while renewable sources might provide for redundancy of energy grids and decentralized systems, new

challenges to building the resilience of the source, distribution lines as well as energy storage systems arise. Consequently, energy systems in the Caribbean need to be modern and renewable and be able to withstand wide-ranging indigenous and exogenous shocks, including disasters, climate change, price shocks, disruptions in the energy supply chain, social conflicts, and new and emerging cyber threats.

The panel will explore the challenges for utility companies in investing on building resilience of their systems before the threat of business interruptions caused by more frequent and active hurricane seasons. Public-private partnerships and partnerships with the tourism industry will be examined to find formulas to increase investments in energy resilience. Finally, the panel will address the emerging environmental challenges posed by renewable energy, such as changes in water flows, and in evapotranspiration rates caused by clearing of forest and grasslands.

Issues to be discussed include:

- Managing energy-water linkages
- Life-cycle cost analysis for reliable/resilient energy resilience solutions
- Energy resilience analysis methodologies (including analysis of alternatives)
- Developing the business case for future energy resilience decisions
- Tracking availability/reliability of energy systems and infrastructure (outage data, failure rates, etc.) to assist in trade-off decisions
- Critical Physical Planning considerations
- Assess barriers to accelerating alternative financing of energy resilience projects

Moderator - *Dr. Vince Henderson*, Minister for Planning, Economic Development, Climate Resilience, Sustainable Development and Renewable Energy - Government of the Commonwealth of Dominica

- ***Dr. Gary Jackson*** - Executive Director - Caribbean Centre for Renewable Energy and Energy Efficiency (CCREEE)
- ***Dr. Cletus Bertin*** - Executive Director - Caribbean Electric Utility Services Corporation (CARILEC)
- ***Dr. Al Binge***r - Secretary General - Small Island Developing States
- ***Dr. Ramon Sanchez*** – Principal Investigator and Research Associate - Harvard University TH Chan School of Public Health
- ***Dr. Kalim Shah*** – Associate Professor - University of Delaware Biden School of Public Policy
- ***David Stamp*** - Generation Manager - Dominica Electricity Services (DOMLEC)

12:00 p.m. to 1:00 p.m. **Workgroup Sessions and Reports**

1:00 p.m. to 2:00 p.m. **L U N C H**

Amazon Web Services spotlight presentation-

Meeting Sponsor and Partner- Abby Daniel- Director

2:00 p.m. to 3:30 p.m. **SESSION 3:** **Building Resilience with Geospatial Intelligence**

As the risks, effects and costs of disasters increase, disaster resilience emerges as the primary means for Caribbean Governments to help control their fiscal, social, and environmental exposure to disasters. Geospatial intelligence (GEOINT) is defined as "the exploitation and analysis of imagery and geospatial information to describe, assess, and visually depict physical features and geographically-referenced activities on the Earth." It allows communities to: (1) gain a fuller appreciation of their circumstances through the identification, monitoring, and modeling of the risks they face; (2) develop the requite actions to build a community's overall resilience; understand the economic, social and environmental implications of potential disaster; (3) foster a community's psychological resilience and strengthen its ability to "bounce forward"; (4) and build a culture of resilience in its citizens and development partners (civic organizations, businesses and levels of government[1]. GEOINT enables the use of complex, geographically based models to assess, visualize, and present risk such that data-driven decisions may be made.

The panel will explore the requirements for geospatial data and products for supporting decision-making in disaster prevention and mitigation, as well as in disaster preparedness and response. A look into multilateral agreements for making data and products available in case of emergency –including the International Charter, but also bilateral agreements and collaboration among spatial agencies will seek to take a stake of the development of the sector in the hemisphere and identify opportunities for horizontal and triangular cooperation.

This session will explore the following:

- Emerging trends in geospatial technologies
- The current state of use and barriers to the use of GEOINT in the Caribbean
- Developing strategies to overcome these barriers
- Climate services
- Mainstreaming GEOINT in support of resilience planning across all sectors
- The use of GEOINT in designing critical infrastructure (water, energy, communications, transportation
- Cascading effects of infrastructure failure

[1] Report by the United States Geospatial Intelligence Foundation (

- Coordination with telecommunications and information technology industries
- Restoration and repair of telecommunications infrastructure
- Protection, restoration, and sustainment of national cyber and information technology resources
- Developing partnerships and shared ownership of resiliency agenda
- Geospatial technology for building smart cities
- Data requirements for Environmental Impact Assessment
- Building a Climate Resilient Agriculture
- The science of Resilient Physical Planning

Moderator – *Dr. Franklin Carrero-Martínez*, Senior Director, Global Sustainability and Development at National Academy of Sciences

- ***Dr. Juan Carlos Villagrán de León*** – Head of Office - United Nations Platform for Space-Based Information for Disaster Management and Emergency Response (UN-SPIDER)

- ***Raúl Kulichevsky*** – Executive and Technical Director - Argentina National Space Activities Commission (CONAE)

- ***Ricardo Quiroga*** - Disasters Program Coordinator - National Aeronautics and Space Administration (NASA) Earth Science Applied Sciences

- ***Christy Monaco*** - Vice President of Programs - U.S. Geospatial Intelligence Foundation (USGIF)

- ***Rebecca Hunter*** - Senior Manager - Government Affairs at SpaceX / Starlink

- ***Dr. Jong Sung Lee*** - Deputy Associate Director - National Center for Supercomputing Applications (NCSA) University of Illinois at Urbana Champaign

- ***Pierre Chrzanowski*** – Science, Technology and Open Data for Climate and Disaster Risk - Global Facility for Disaster Reduction and Recovery (GFDRR) World Bank

3:30 p.m. – 4:00 p.m. **COFFEE BREAK**

4:00 p.m. to 5:00 p.m. **Workgroup and Reports**

HIGH LEVEL MEETING ON BUILDING A SCIENCE and DATA-BASED AGENDA FOR DECISION-MAKING ON RESILIENCE IN THE CARIBBEAN

Cabrits Resort & Spa Kempinski Dominica
Commonwealth of Dominica

Opening Ceremony
October 20th, 2022
6pm to 7pm

Prayer	
Welcome Remarks	*Francine Baron, Chief Executive Officer, CREAD*
Remarks	*Kim Osborne, Executive Secretary for Integral Development, Organization of American States*
Remarks	*Hon. Dr. Vince Henderson, Minister for Planning, Economic Development, Climate Resilience, Sustainable Development and Renewable Energy*
Keynote Speaker	*Isaac Solomon, Vice President of Operations, Caribbean Development Bank*
Vote of Thanks	

FRIDAY OCTOBER 21, 2022

8:00 a.m. – 8:30 a.m. **Summary Day 1 - Rapporteur**

8:30 a.m. to 10:00 a.m. **SESSION 4: Science for Building Citizen Resilience**

Ultimately, the social, political, environmental, or economic shocks associated with slow and rapid-onset disasters impact people's well-being, including their health and livelihoods and more generally, their coping and adaptive abilities. The first to respond to emergencies and disasters are those affected by them. The evidence has shown that resilience assessments and strategies that are broad-scale, and top-down in nature are nowhere as effective as participatory, community-based, bottom-up approaches. For this reason, the OAS advocates the adoption of a "whole community approaches" to resilience that involve sub-national and national governments, the private sector, academia, and community-based organizations among others. This shift is encouraged by rapidly developing information and communication technologies that can empower citizens to become more resilient and to participate more effectively in decision-making at the household, community, sub-national and national levels. Citizens now have access to extensive, real-time information for risk management (as well as improving data provision in data-scarce regions)[2]. Professional first responders might be overwhelmed or may not be able to access communities that are remote or that become isolated by the failure of infrastructure. While training and organizing community members in emergency preparedness and response becomes paramount, it is not sufficient for an effective response. Community emergency preparedness and response mechanisms must also be integrated within national systems, and this integration must start with training and disaster preparedness.

This session will examine:

- How citizen science can help to reduce risk against water, climate and seismic-related hazards and respond to global environmental change
- How citizens can be assisted in reconciling their disparate interpretations of risks posed by their various hazards
- How citizens in data-poor areas can support data-gathering and monitoring and in pre-and post-disaster assessments
- Lessons from natural hazards-related citizen science projects
- What constitutes "best practice" in a citizen science context
- Lessons from Community Emergency Response activities in the Americas

[2] Paul, J, Hannah D, and Liu W, "Citizen Science: Reducing Risks and Building Resilience to Natural Disasters

Moderator – *Gloria Joseph*, Permanent Secretary for the Ministry of Economic Affairs, Planning, Resilience and Sustainable Development, Telecommunications and Broadcasting - Government of the Commonwealth of Dominica

- ***Elizabeth Riley*** – Executive Director – Caribbean Disaster Emergency Management Agency (CDEMA)
- ***Dr. Evangeline Springe***r - Director Disaster Risk Reduction Center – The University of West Indies (UWI) Cave-hill
- ***Dr. Marcos Regis da Silva*** – Executive Director – Inter-American Institute for Global Change Research (IAI)
- ***Artie Dubrie*** – Coordinator – Sustainable Development and Disaster Unit at Economic Commission for Latin America and the Caribbean (ECLAC)
- ***Íñigo Fernandez Baptista*** – Director of Public Policy for Mexico, Central America, and the Caribbean - Meta
- ***Candice Ramkissoon*** – Technical Officer - Caribbean Natural Resources Institute (CANARI)

10:00 a.m. to 10:30 a.m. **COFFEE BREAK**

10:30 a.m. to 12:00 noon **SESSION 5:** **RESILIENT HEALTH SYSTEMS**

Over the past decade, the Caribbean region has been challenged by compound climate and health hazards, including tropical storms, extreme heat, and droughts, and overlapping epidemics of mosquito-borne diseases, including dengue, chikungunya, and Zika. The COVID-19 pandemic has both drained and diverted public health funding, resulting in declining resources to address the impacts of climate disasters on health. In response to these threats, Caribbean countries are investing in innovative climate change adaptation strategies, including a Health-Climatic Bulletin and the development of early warning systems (EWS) for climate-sensitive diseases. These so-called 'climate services' are tailored to support the needs of end-users – in this case, the public health sector – providing timely and accurate information that can guide decisions about early interventions to reduce morbidity and mortality. The creation and implementation of decision support tools require strong collaborations amongst health, climate, and disaster practitioners with transdisciplinary researchers to assess needs and priorities jointly, assess available data, co-develop the tool, gather feedback via national and regional consultations and conduct training. Challenges to the sustainable implementation of climate services for health include a lack of technological capacity and human resources between the climate and health institutions, a lack of local studies providing evidence of climate-health linkages, and a lack of funding to sustain an operational system. Caribbean countries are also developing National Health Adaptation

Plans (HNAPs) to guide these efforts, and this session will discuss the current status of these efforts. Through a process of co-creation, Caribbean health systems will be better able to mainstream climate information into decision-making processes using tailored tools, such as epidemic forecast reports, risk maps, and climate-health bulletins, ultimately increasing the resilience of the health system.

The session will:

- Assess the status of and barriers to the creation and implementation of:
    - Health National Adaptation Plans (HNAPs)
    - Climate services for the health sector including bulletins and early warning systems for climate-sensitive health issues.
    - National or regional climate and health observatories (integrated surveillance systems)

- Review best practices and lessons learned in creating and sustaining regional and national collaborations amongst the climate, health, disaster, and academic communities to address the impacts of climate disasters on health.
- Determine the scientific information needed by decision-makers to develop policies and interventions to strengthen the resilience of health systems.

Moderator – *Dr. Anna Stewart-Ibarra*, Scientific Director, Inter-American Institute for Global Change Research (IAI)

- ***Dr. Irving McIntyre*** - Minister of Health, Wellness, and New Health Investment – Government of the Commonwealth of Dominica

- ***Dr. Laura Lee Boodram*** – Head of Vector-borne Diseases – Caribbean Public Health Agency (CARPHA)

- ***Dr. Carissa Etienne*** - Pan-American Health Organisation (PAHO)

- ***Dr. Amalia Del Riego*** – Representative for Barbados, Eastern Caribbean, UK Territories, and the French Departments – Pan American Health Organisation (PAHO)

- ***Dr. Diedre Defoe*** – Medical Director and COO - Johns Hopkins Health Equity Group

12:00 p.m. – 1:00 p.m. **Workgroup Sessions and Reports**

1:00 p.m. to 2:00 p.m. **L U N C H**

2:00 p.m. to 3:30 pm **Plenary on Next Steps** **Agreement on an Action Agenda and Allocation of Follow-Up Responsibilities**

Moderator - *Cletus Springer* –

- **CAF- Representative**
- ***Dr. Mark Bynoe* –** Environmental Economist - Caribbean Community Climate Change Center (CCCCC)
- ***Dr. Michael Taylor*** - Dean of the Faculty of Science and Technology – The University of West Indies (UWI) Mona
- ***Dr. Rashmin Gunasekera*** - Senior Disaster Risk Management Specialist - Global Facility for Disaster Reduction and Recovery (GFDRR) World Bank
- ***Dr. Roger Pulwarty*** - Senior Scientist - National Oceanic and Atmospheric Administration (NOAA) Physical Sciences Laboratory
- ***Dr. Amalia Del Riego*** - Representative for Barbados, Eastern Caribbean, UK Territories, and the French Departments – Pan American Health Organisation (PAHO)

3:45 p.m. to 4:00 p.m. **C O F F E E**

Closing Ceremony

4:00 p.m. – 4:30 p.m.

- ***Dr. Marcos Regis da Silva* –** Executive Director – Inter-American Institute for Global Change Research
- ***Kim Osborne* -** Executive Secretary for Integral Development– Organization of American States
- ***Dr. Vince Henderson* –** Minister for Planning, Economic Development, Climate Resilience, Sustainable Development and Renewable Energy - Government of the Commonwealth of Dominica