



Weather and Climate Ready Nations Implementation – IBFWS and CAP

Shawn Boyce

Caribbean Institute for Meteorology and Hydrology

2019 CAP Implementation Workshop

Mexico City, Mexico

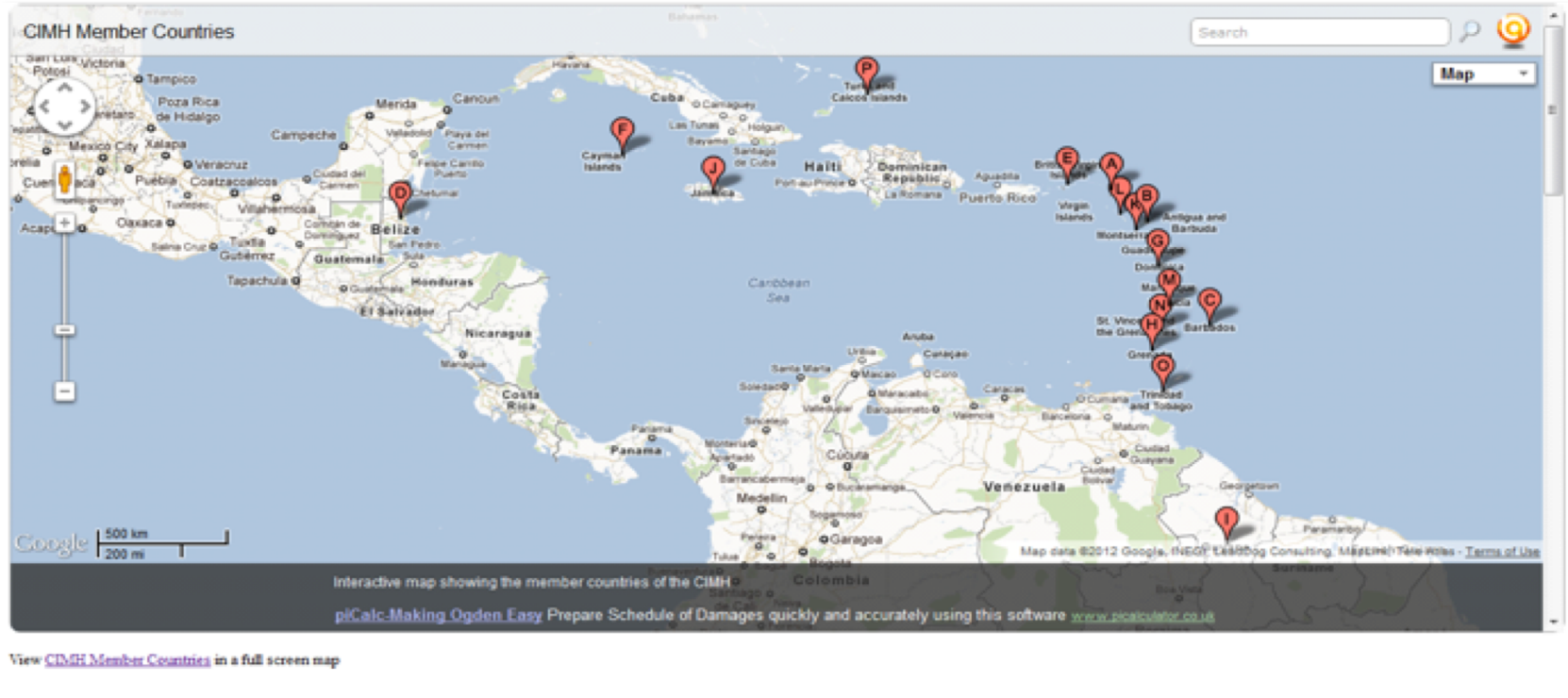
October 17 – 18, 2019

Presentation Overview

- Background
- Impact-based Forecasting
- Communication and Public Dissemination
- Integrating CAP Messaging
- Key Takeaways



Background



“... to assist in improving and developing the Meteorological and Hydrological Services as well as providing the awareness of the benefits of Meteorology and Hydrology for the economic well-being of the CIMH member states. This is achieved through *training, research, investigations and the provision of related specialized services and advice*”.

Background...cont'd

- WMO Regional Training Centre
- Centre for Research and Development in Meteorology, Hydrology and Climatology
- Regional Data Centre
- Regional Instruments Centre
- WMO Regional Centre of Excellence in Satellite Meteorology
- WMO Regional Climate Centre
- Caribbean Centre for Climate and Environmental Simulations
- WMO Pan American Centre for Sand and Dust Storm Warning Advisory and Assessment System (SDS-WAS)
- Advisor to regional governments

Background...cont'd

Weather Briefing

Caribbean Institute for Meteorology and Hydrology
Husbands, St. James, Barbados

Compiled by:
Caribbean Institute for Meteorology and
Hydrology

For
Caribbean Disaster Emergency Management
Agency

Weather Briefing @ CDEMA CU
CDP and other resources



Scenario Planning @ CDEMA CU
Mobilisation, pre-positioning, alerting, etc

Background...cont'd

The Weather and Climate Ready Nations (WCRN) is based on the very successful Weather Ready Nations (WRN) programme and partnership implemented in the US which has transformed the utilization and delivery of early warning information to emergency managers, first responders, government officials, businesses and the public.

Project: Impact-based Forecasting and Warning Services: Barbados

Start date: February, 2017

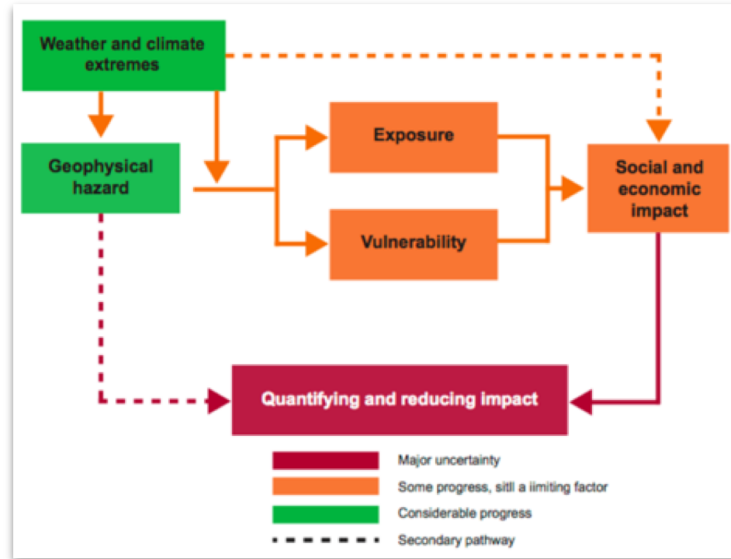
Funding: United States Agency for International Development

Implementation Agencies: US National Weather Service, United Corporation for Atmospheric Research – COMET, CIMH

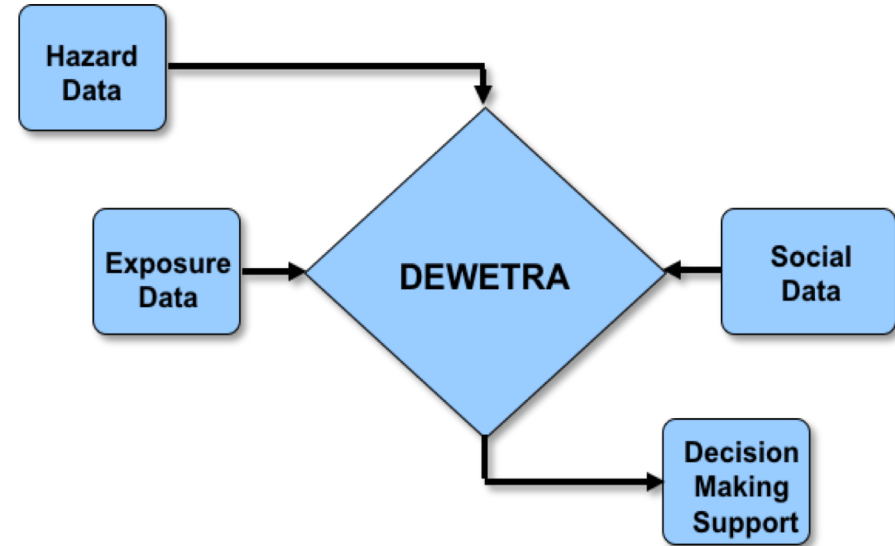
Beneficiary Agencies: Barbados Meteorological Service, Barbados Department of Emergency Management, national agencies

Outcome: Strengthening of the hydro-meteorological and climate early warning systems on the island through the establishment of an operational impact-based forecasting workflow and the strengthening of the relationship between BMS and DEM

Impact-based Forecasting

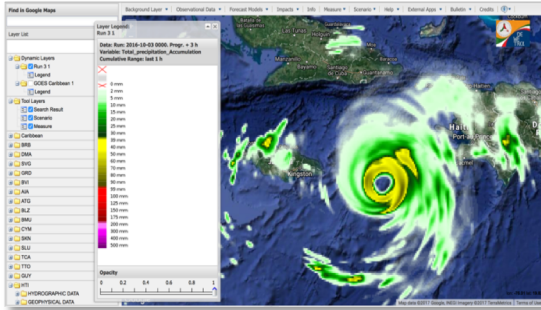


Impact-based Forecasting System
(source: WMO 2105)

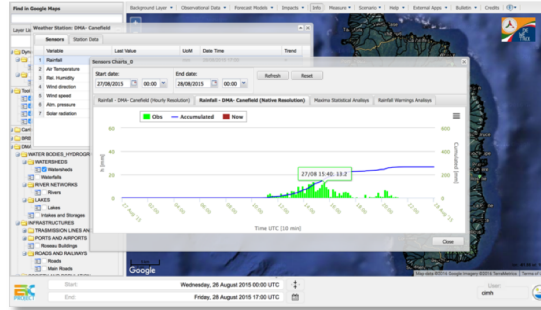


Caribbean Dewetra Application
(established 2013)

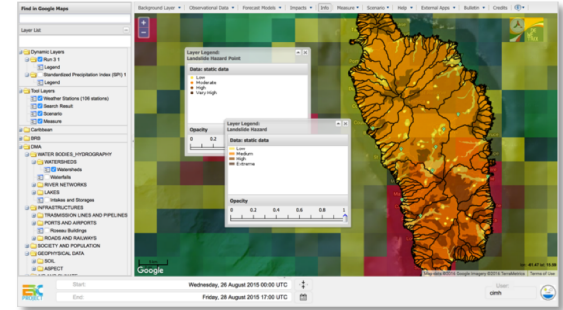
Impact-based Forecasting...cont'd



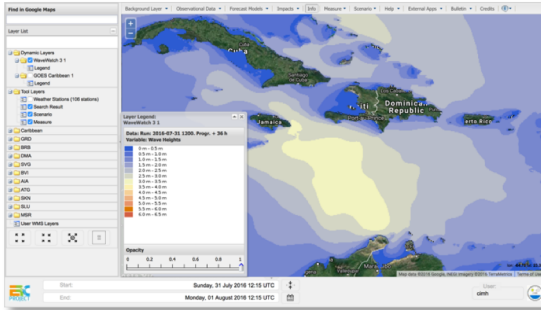
Numerical Weather Prediction



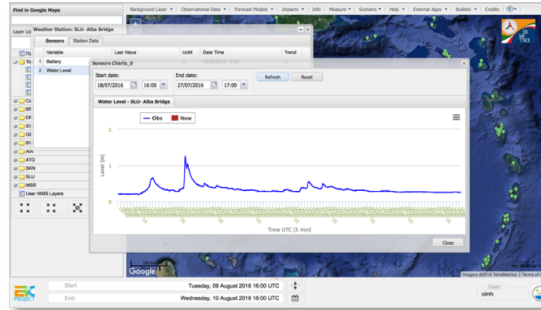
Automatic Weather Station



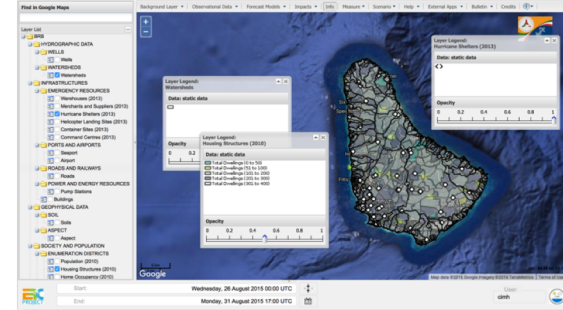
Hazard/Risk Exposure



Wave Height Prediction



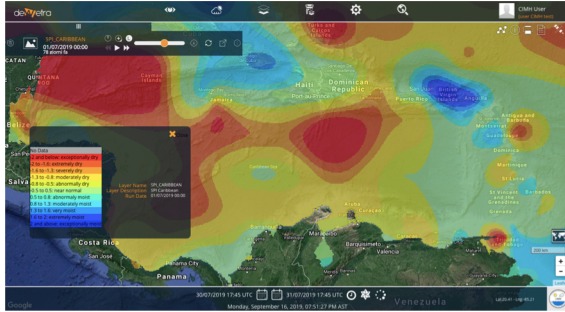
Automatic Water Level Station



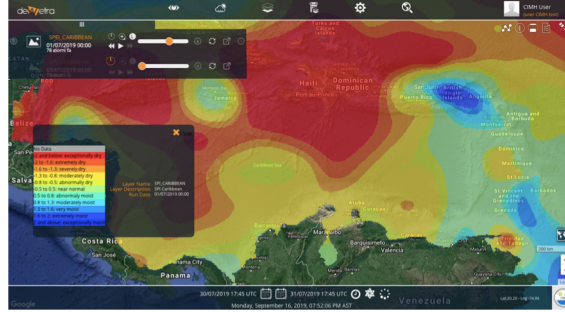
Population Vulnerability

$$\text{Risk} = \text{Exposure} \times \text{Vulnerability} \times \text{Hazard}$$

Impact-based Forecasting...cont'd



SPI



SPEI



SPI Difference



Temperature Anomaly



Monthly Precipitation



SPEI Difference

Climate Monitoring

Impact-based Forecasting...cont'd

Caribbean Dewetra Application

- Online spatio-temporal data fusion decision making platform hosted and maintained by CIMH
- Support impact-based forecasting and near real time hydro-meteorological monitoring
- Multiple hazards can be included
- Auto message generation techniques to support impact forecast were limited
- Improvements were required for communication and dissemination of message
- Facilitated through the Weather (and Climate) Ready Nations Programme



The Caribbean Dewetra Platform

"...a tool for near real-time monitoring and impact-based forecasting"

Shawn Boyce, David Farrell

Caribbean Institute for Meteorology and Hydrology

Introduction

The Caribbean Dewetra Platform (CDP) is a spatio-temporal, data fusion platform capable of seamlessly integrating evolving hazard data, socio-economic and vulnerability information in support of improved decision making within the disaster management community. Ground- and space-based near real-time hydro-meteorological observations in addition to numerical weather prediction outputs are presented in an online geospatial environment accessible by multiple users. Country specific information such as digital elevation models, slope models, watershed extents, hazard maps, population demographics and critical infrastructure can be merged with hazard data to rapidly identify potentially exposed assets and support impact-based forecasting. The ability to crowd-source reported impacts in part through the use of Twitter and other smart device applications provides a useful workflow within the platform for impact verification, managing response actions and damage assessments. This poster showcases some of the various tools and products available within the platform.



Fig. 1: Relationship among key elements of an impact forecasting system. (Source: WMO 1150)

Fig. 2: The Caribbean Dewetra Platform. Data fusion and multi-hazard impact forecasting decision making tool.

Hazard Forecasting and Monitoring

The CDP provides meteorological and disaster officials with an online, disaster management, collaborative tool that supports impact-based forecasting, multi-hazard early warning and improved decision making.



Fig. 3: CIMH 6km WRF rainfall accumulation prediction output. (Hurricane Maria)



Fig. 4: CIMH WRF 6h wave height prediction output. (Hurricane Maria)

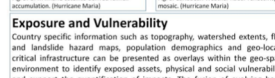


Fig. 5: GPM IMERG satellite-derived rainfall accumulation. (Hurricane Maria)



Fig. 6: Caribbean Weather Radar reflectivity. (Hurricane Maria)



Fig. 7: Landslide hazard map. (Domestic with rainfall accumulation prediction as an overlay.



Fig. 8: Major watersheds with population demographic map and shelters as an overlay.

Exposure and Vulnerability

Country specific information such as topography, watershed extents, flood and landslide hazard maps, population demographics and geo-located critical infrastructure can be presented as overlays within the geo-spatial environment to identify exposed assets, physical and social vulnerabilities and support the quantification of impacts. The fusion of evolving hazard data supports the rapid identification of exposed assets and provides a useful forecasting chain for social and environmental hazards.

Early Warning and Alerting Systems

The CIMH has been steadily expanding hydro-meteorological monitoring networks across the Caribbean. Stations within these networks are capable of issuing threshold based alerts via SMS with the data streamed in near real-time to the CDP for visualization and interpretation. In addition, the platform is equipped with a Common Alert Protocol (CAP) broker and document producer for integration with regional CAP compliant systems. The CIMH network comprises of both commercial and open source stations. Comparatively cheap open source stations significantly reduce losses during extreme events and the cost of network rehabilitation.



Fig. 9: (a) Rainfall monitoring in freshwater and landslide prone areas. (b) Flood monitoring upstream of vulnerable areas. (c) Tide monitoring along coast. (d) CAP document production and dissemination.

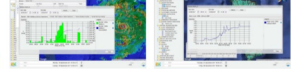


Fig. 10: Near real-time rainfall during the onset of event. (Hurricane Maria)

Fig. 11: Near real-time water levels during onset of event. (Hurricane Maria)

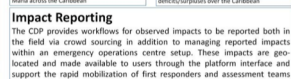
Climate Variability

Climate data provide another layer of valuable information when trying to characterize probable impacts of hydro-meteorological events. Products such as sea surface temperatures and standardized precipitation indices are made available to support the decision making process.



Fig. 12: 14 SST prior to the passage of hurricane Maria across the Caribbean.

Fig. 13: 6-month SPI illustrating precipitation deficits/excesses over the Caribbean.



Impact Reporting

The CDP provides workflows for observed impacts to be reported both in the field via crowd sourcing in addition to managing reported impacts within an emergency operations centre setup. These impacts are geo-located and made available to users through the platform interface and support the rapid mobilization of first responders and assessment teams post event. All data are archived within the platform. The collation of impact data also supports (i) the verification of impact forecasts; (ii) post impact analyses and (iii) research and development activities.



Fig. 15: Geo-located snapshots from the RSS (reproducibility). (Hurricane Maria)

Fig. 16: Illustration of impact report collated from Twitter and RSS. (Hurricane Maria)

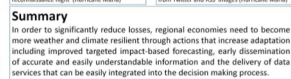


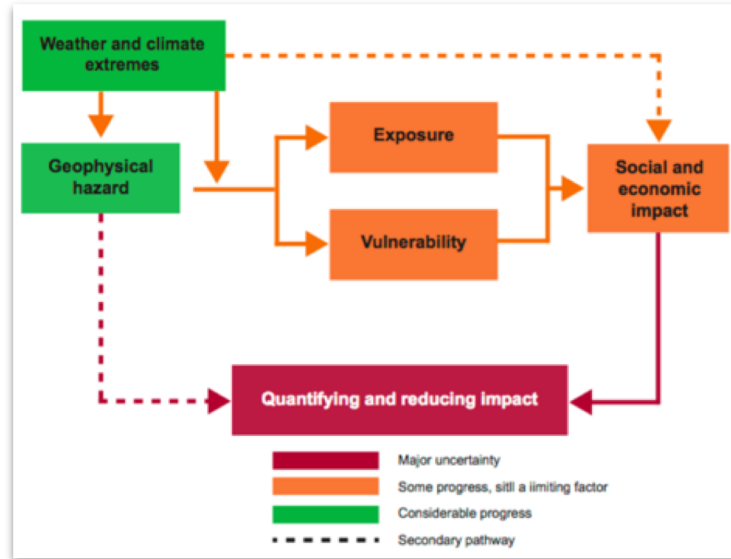
Fig. 17: Illustration of impact report collated from Twitter and RSS. (Hurricane Maria)

Summary

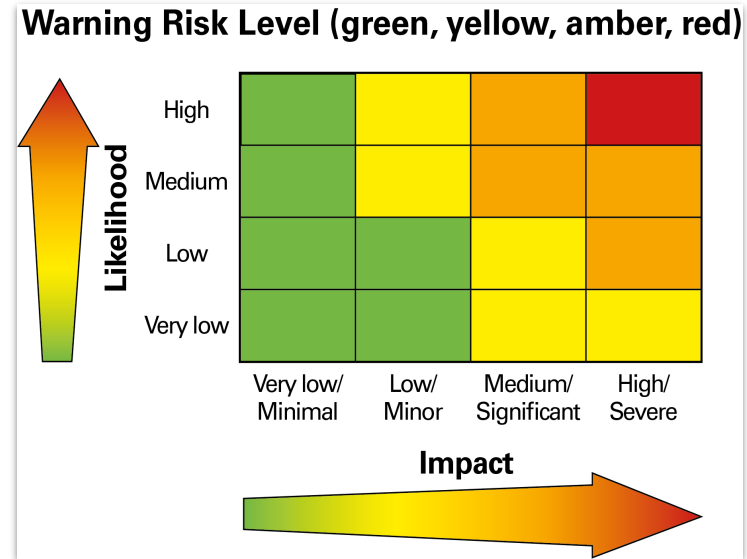
In order to significantly reduce losses, regional economies need to become more weather and climate resilient through actions that increase adaptation including improved targeted impact based forecasting, early dissemination of accurate and easily understandable information and the delivery of data services that can be easily integrated into the decision making process.

Email: shawn@cimh.edu.bb
Web: www.cimh.edu.bb
Facebook: www.facebook.com/CIMH
Twitter: @CIMH
YouTube: www.youtube.com/user/CIMH

Impact-based Forecasting...cont'd



Impact-based Forecasting System
(source: WMO 2105)



Warning Matrix
(source: Weather Ready Nations)

Impact-based Forecasting...cont'd

Risk Matrix							Risk Level		Response
Likelihood	High						High		Take Action
	Medium						Medium		Be Prepared
	Low						Low		Be Aware
	Very Low						Very Low		No Action
		Minimal	Minor	Significant	Severe				
		Potential Impacts							

Warning and Response Matrices

Communication and Public Dissemination...cont'd

Conducted a Stakeholders Communication Modes and Methods workshop in March 2018 (Barbados demonstration)

Meeting Objectives:

- Review and refine the ideal impact, risk, and response matrices with local stakeholders
- Review and refine Standard Operating Procedures
- Review resource needs and action items for WCRNs Demonstration
- Introduce Common Alerting Protocol
- Development of Ambassador Program for Barbados



THE DEPARTMENT OF EMERGENCY MANAGEMENT

MEETING AND ACTIVITIES REPORT

A. DESCRIPTION OF ACTIVITY:
WRNs Barbados: Planning and Preparation Meeting and Stakeholders' Consultation for the Implementation of WRN in Barbados.

The workshop was executed in 3 – phases:
Phase 1 (1st – 2nd March): Planning and Preparation Meeting
Phase 2 (5th – 6th March): Stakeholders' Consultation
Phase 3 (7th March): Workshop Review and Development of Next Steps.

B. LOCATION:
Caribbean Institute for Meteorology and Hydrology, Husbands, St. James

C. DATE AND TIME:
March 1st – 2nd, and 5th – 7th, 2018

D. SPONSOR/COORDINATOR OF ACTIVITY:
USAID/OFDA, CIMH, CZMU, BMS, CDEMA, DEM

E. AGENCIES/UNITS/DEPARTMENTS/ORGANISATIONS ATTENDING:

- a. Phase 1:**
 1. Department of Emergency Management
 2. Barbados Meteorological Services
 3. Caribbean Institute of Meteorology and Hydrology
 4. University Corporation of Atmospheric Research (UCAR) COMET
 5. Telecommunications Unit
- b. Phase 2:**
 1. Department of Emergency Management
 2. Barbados Meteorological Services
 3. Caribbean Institute of Meteorology and Hydrology
 4. University Corporation of Atmospheric Research (UCAR) COMET
 5. Government Information Service
 6. Barbados Civil Aviation Department, Air Traffic Control
 7. Environmental Protection Department
 8. Barbados Fire Service
 9. Royal Barbados Police Force
 10. Ministry of Transport & Works

Communication and Public Dissemination...cont'd

Impact Matrices Developed for Several Hazards

- Rainfall
- Wind
- Severe Convection
- Flood

Impact Matrix for emergency management: Rainfall			
Minimal Impact	Minor Impacts	Significant Impacts	Severe Impacts
<u>Transportation</u> Wet roads and higher likelihood of accidents Localized disruption to traffic	Localized pooling and flooding of roads Occasional accidents and associated disruptions and increased travel times Minor public transportation disruptions	Localized flooding and damage of roads with significant delays and disruption to traffic Accidents and associated disruptions and increased travel times Significant disruptions to public transportations	Widespread flooding and damage of roads with dangerous driving conditions Multiple accidents and associated disruptions and increased travel times Most public transportation significantly delayed
<u>Land slippage/landslides</u> Isolated land slippage	Localized land slippage – limited debris flow on roads	Localized land slippage resulting in road closures and property damage – significant debris flow (rocks and trees)	Land slippage resulting in road closures and property damage and communities cut off
<u>Stream/water course flooding</u> Minor ponding on low lying areas	Localized flooding and/or ponding in low-lying flood prone areas	Possible life threatening flash flooding of vulnerable areas	Life threatening, extensive flash flooding of vulnerable areas

Communication and Public Dissemination...cont'd

Risk and Response Matrices Developed for Several Hazards

- Rainfall
- Wind
- Severe Convection
- Flood

Risk and Response Matrix: Rainfall

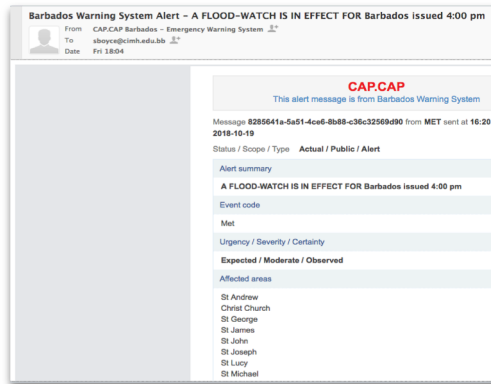
Risk Matrix						Risk Level	Response
Likelihood	High						
	Medium						
	Low						
	Very Low						
		Minimal	Minor	Significant	Severe		
		Potential Impacts					

Response Matrix: Rainfall			
Very Low - Business as usual	Low - Be Aware	Medium - Be Prepared	High - Take Action
Monitor for changing weather conditions.	Be aware and stay out of flood waters. Evaluate inventory of emergency supplies (food, water, medical supplies), restock supplies as needed. Monitor roads and properties for localized flooding and possible traffic and public transportation disruptions.	Stay out of flood waters and check emergency supplies, purchase additional supplies if needed, fill gas tanks, etc. Be prepared for localized flooding of roads and properties in [...locations...], and land slippages that could block roads. Prepare for possible delays or cancellation of public transportation routes	Stay out of flood waters and prepare to use emergency supplies. Avoid walking or driving through moving water and seek safer/higher ground if in [...locations...]. Don't drive and stay off roads in flood prone areas or areas with frequent land slippage/land slides. Plan to shelter in place in non-flood areas.

Communication and Public Dissemination...cont'd

Upgrading the Caribbean MyDewetra platform to generate WCRNs advisory and warning graphics.

- Impact-based forecast and response information bulletin produced
- Authorized messages can be passed via the CAP protocol to local stakeholders, Barbados CAP Server or otherwise
- DEM can review impact/response information
- Workflows to support both BMS and DEM responsibilities and integration with the Barbados CAP Server

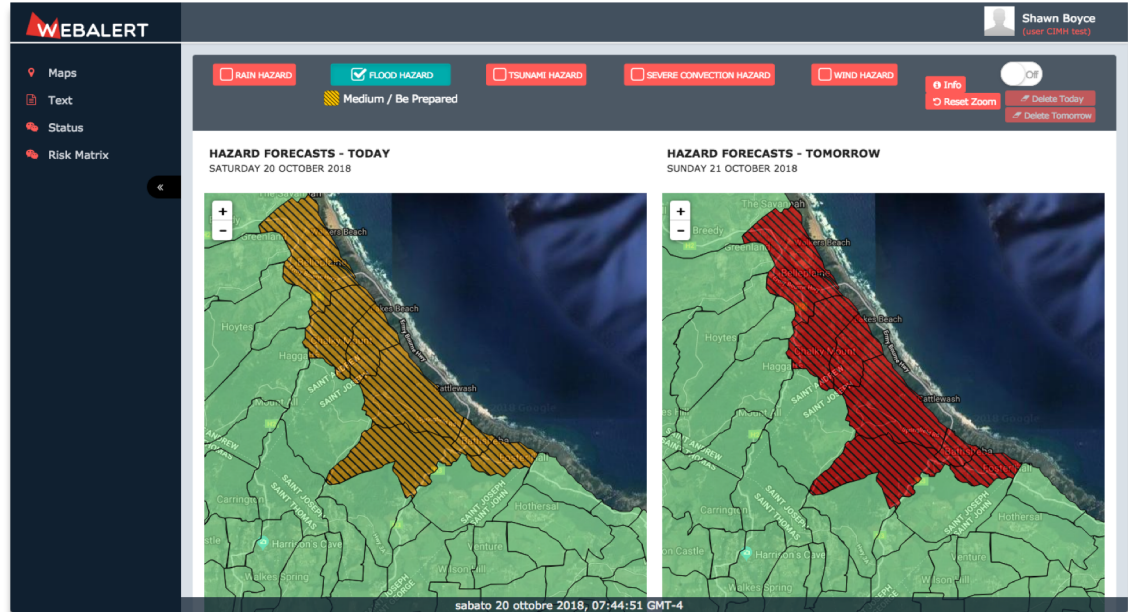


Barbados CAP Server

Integrating CAP Messaging

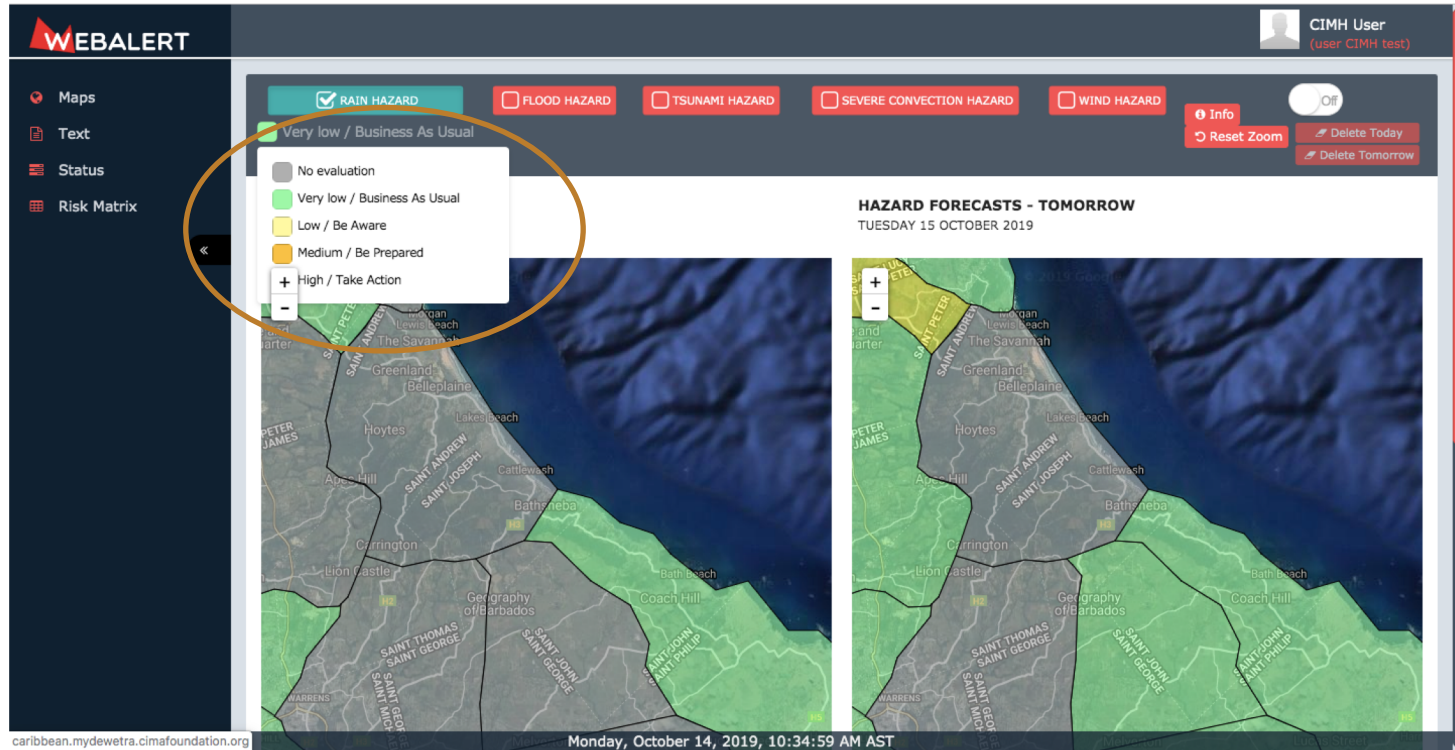
Implementing the WebAlert application to generate alert and warning graphics.

- Utilizing GIS polygons to delineate expected impact zones
- Auto message generation techniques to produce impact forecast for stakeholders
- Multiple hazards can be included
- CAP compliant



Caribbean MyDewetra Platform
WebAlert 2.0 Application

Integrating CAP Messaging...cont'd



WebAlert 2.0 Application

Integrating CAP Messaging...cont'd

The screenshot displays the WebAlert 2.0 Application interface. On the left is a dark sidebar with navigation links: Maps, Text, Status, and Risk Matrix. The main content area is titled "Manage Bulletin" and includes buttons for "New", "Update", and "Correction". The bulletin is dated "MULTI-HAZARD BULLETIN 14/10/2019". It contains a "Bulletin status" section with a reference to previous bulletins, a "Forecast for: Monday 14 October 2019" section stating "NO SIGNIFICANT HAZARD EVENTS PREDICTED / NO ALERT", and a "Forecast for: Tuesday 15 October 2019" section with a "LOW RAIN HAZARD / BE AWARE:" warning for Barbados. The "Hazard impacts" section is divided into "DISCHARGE/Shoreline" and "DRAINAGE", each with "Minimal Impacts" and "Minor Impacts" descriptions. The bottom of the interface shows the date and time: "Monday, October 14, 2019, 10:36:35 AM AST".

WEBALERT

CIMH User
(user CIMH test)

Manage Bulletin

☒ New ☐ Update ☐ Correction

MULTI-HAZARD BULLETIN 14/10/2019

Bulletin status:
reference to previous bulletins.

Forecast for: Monday 14 October 2019
NO SIGNIFICANT HAZARD EVENTS PREDICTED / NO ALERT

Forecast for: Tuesday 15 October 2019
LOW RAIN HAZARD / BE AWARE:
Barbados: NorthW

Hazard impacts

DISCHARGE/Shoreline

Minimal Impacts
Minimal impacts to stream discharge are stream mouths

Minor Impacts
Minor impacts to stream outflow with shifting sand - minor impacts to beach erosion and water backup at outflow locations

DRAINAGE

Minimal Impacts
Minimal impacts to sewers

Minor Impacts
Minor clogging of sewers due to garbage blockage drainage

Monday, October 14, 2019, 10:36:35 AM AST

WebAlert 2.0 Application

Integrating CAP Messaging...cont'd

WEBALERT

Maps

Text

Status

Risk Matrix

Minor Impacts
Minor clogging of sewers due to garbage blockage drainage areas

CIMH User
(user CIMH test)

FIRE AND EMERGENCY RESPONDERS

Hazard responses

RAINFALL

ALL TYPES

Business as usual
Monitor for changing weather conditions.

Be Aware
Stay out of flood waters.
Evaluate inventory of emergency supplies (food, water, medical supplies). Prepare to restock supplies at the beginning of season.
Be aware of localized flooding of roads and properties in [...locations...]. Impacts include occasional accidents, associated disruptions, increased travel times, and land slippages.
Proceed with caution while driving.
Be aware for possible delays in public transportation.
Be aware for possible localized flooding water course our flood prone areas.
Be aware for prepare for possible school closure.
Be aware for prepare for minor flight delays, check with airlines.
Be aware for possible disruptions to tourism activities (scuba, boat tours, etc.).

NOTES:

Next update

Officer on duty

Monday 14 October 2019

Hours 10 35

Preview Save Export & Publish

Monday, October 14, 2019, 10:36:59 AM AST

WebAlert 2.0 Application

Integrating CAP Messaging...cont'd

Administration

GOVERNMENT OF BARBADOS Department of Emergency Management
Android app
iPhone app

Language

EN FR ES

Show additional information

Alert summary

A Flash Flood Watch in effect for Northern and central

Effective

13:01:54 2019-09-07

Expires

17:01:54 2019-09-07

Description

Day time heating is likely to produce some moderate to heavy showers and thunderstorms mainly over the northern and central sections of the island over the next few hours. Thus, a Flash-Flood Watch has been issued mainly for northern and central districts and will remain in effect until 5:00p.m this evening, Saturday 7th September, 2019.

Instructions

Residents in flood-prone areas should remain on the alert and take all necessary precautions.

Contact

MET

Category

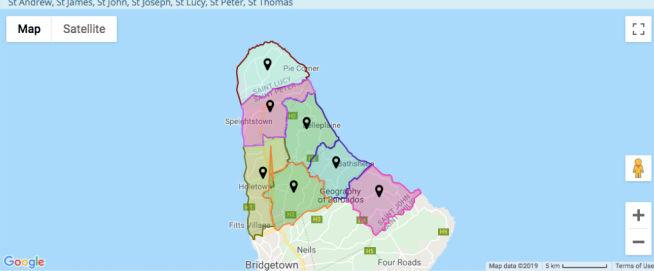
Met

Affected areas

St Andrew, St James, St John, St Joseph, St Lucy, St Peter, St Thomas

Map

Satellite



Attached Media

Screenshot_20190907-125...

CAP Messaging - Current

Administration

GOVERNMENT OF BARBADOS Department of Emergency Management
Android app
iPhone app

Language

EN

Show additional information

Alert summary

LOW RAIN HAZARD / BE AWARE:

Effective

14:41:00 2019-09-05

Starts at

12:00:00 2019-09-05

Expires at

13:00:00 2019-09-05

Description

AGRICULTURE: No impact on agriculture operations AGRICULTURE: Minor impact on agriculture operations - move at risk animals (e.g., chickens) to shelter AIRPORT OPERATIONS: No impacts on airport operations AIRPORT OPERATIONS: Minor impacts on airport operations; a few flights delayed or canceled. Flight operations is depends on airlines COMMUNICATIONS: Minor impacts to cell phone communications COMMUNICATIONS: Intermittent outage to cell- phone communications DISCHARGE/SLOPELINE: Minimal impacts to stream discharge are stream mouths DISCHARGE/SLOPELINE: Minor impacts to stream outflow with shifting sand - minor impacts to beach erosion and water backup at outflow locations DRAINAGE: Minimal impacts to sewers DRAINAGE: Minor clogging of sewers due to garbage blockage drainage areas FIRE AND EMERGENCY RESPONDERS: No impact emergency services FIRE AND EMERGENCY RESPONDERS: Minor impact to emergency services. Some assets (fire trucks, ambulance, etc.) relocate to higher ground in flood prone areas GROUND WATER: Minimal impact to wells GROUND WATER: Limited impact to previous saturated wells HOSPITAL: Hospital operations as usual HOSPITAL: Prepare for patient relocation in most vulnerable areas LAND SLIPPAGE/LANDSLIDES: Isolated land slippage LAND SLIPPAGE/LANDSLIDES: Localized land slippage - limited debris flow on roads OVERLAND FLOODING: Minimal overland flooding OVERLAND FLOODING: Localized flooding of properties (enhanced by high tide due to slower drainings) PORT OPERATIONS: Port operates as usual PORT OPERATIONS: Minor impact on port operations. Small watercraft need to be secured or taken ashore RENEWABLE ENERGY: Solar energy operation not impacted RENEWABLE ENERGY: Minor impact to solar energy output SCHOOL: Minor disruption of school activities SCHOOL: Localized disruption of school activities STREAM/WATER COURSE FLOODING: Minor ponding on low-lying areas STREAM/WATER COURSE FLOODING: Localized flooding and/or ponding in low-lying flood prone areas TOURISM/ECONOMIC IMPACTS: Minimal to no impact to tourism, businesses, etc. TOURISM/ECONOMIC IMPACTS: Minor impact to tourism (canceled tours), business, operations, etc. TRANSPORTATION: Wet roads and higher likelihood of accidents Localized disruption to traffic Limited impact to traffic signals TRANSPORTATION: Localized pooling and flooding of roads Occasional accidents and associated disruptions and increased travel times Occasional traffic signal outage/falshing and traffic congestion Minor public transportation disruptions

Stay out of flood waters. Evaluate inventory of emergency supplies (food, water, medical supplies). Prepare to restock supplies at the beginning of season. Be aware of localized flooding of roads and properties in [..locations..] Impacts include occasional accidents, associated disruptions, increased travel times, and land slippages. Proceed with caution while driving. Be aware for possible delays in public transportation. Be aware for possible localized flooding water course or flood prone areas. Be aware for prepare for possible school closure. Be aware for prepare for minor flight delays, check with airlines. Be aware for possible disruptions to tourism activities (scuba, boat tours, etc.). Ensure drains are cleared. Be aware of possible for possible beach erosion and water backup. Be aware of intermittent cell phone outages. Be aware for the possibility relocation of fire and emergency assets to higher ground. Be aware of possible operations to secure small watercraft. Be aware to secure livestock.

Instructions

Contact


Met

Category

Saint John, Saint George, Christ Church, Saint James, Saint Peter, Saint Michael, Saint Joseph, Saint Andrew, Saint Philip, Saint Lucy, Saint Thomas

Map

Satellite



CAP Messaging – IBFWS. How do we improve the messaging?

Integrating CAP Messaging...cont'd

BULLETIN_2019_09_05_261

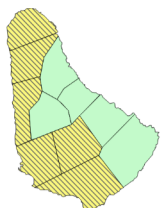
Sender: caribbean.mydewetra
Time Sent: 05 September, 2019 02:03:00
Status: Actual
Message Type: Alert
Note: Bulletin 1 November 28 Officer on duty Estimated rainfall amounts....

Rain

Flood

Flood

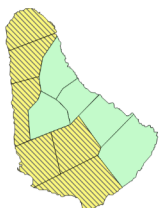
Thursday 05 September 2019



Map Level	Response
High	High Flood
Medium	Medium Flood
Low	Low Flood
Very Low	Very Low Flood

- ☐ Rain Hazard
- ☐ Flood Hazard
- ☐ Tsunami Hazard
- ☐ Severe Conviction
- ☐ Wind Hazard

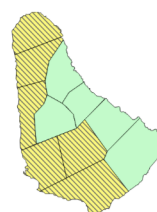
Friday 06 September 2019



Map Level	Response
High	High Flood
Medium	Medium Flood
Low	Low Flood
Very Low	Very Low Flood

- ☐ Rain Hazard
- ☐ Flood Hazard
- ☐ Tsunami Hazard
- ☐ Severe Conviction
- ☐ Wind Hazard

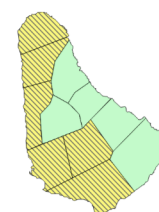
Thursday 05 September 2019



Map Level	Response
High	High Flood
Medium	Medium Flood
Low	Low Flood
Very Low	Very Low Flood

- ☐ Rain Hazard
- ☐ Flood Hazard
- ☐ Tsunami Hazard
- ☐ Severe Conviction
- ☐ Wind Hazard

Friday 06 September 2019



Map Level	Response
High	High Flood
Medium	Medium Flood
Low	Low Flood
Very Low	Very Low Flood

- ☐ Rain Hazard
- ☐ Flood Hazard
- ☐ Tsunami Hazard
- ☐ Severe Conviction
- ☐ Wind Hazard

Event: LOW FLOOD HAZARD / BE AWARE:

Date: 05 September, 2019 12:00:00 to 05 September, 2019 11:59:59

Response Type: Prepare

Urgency: Expected

Area: Saint George Christ Church Saint Peter Saint James Saint Lucy Saint Michael

Description

Instruction

Event: LOW FLOOD HAZARD / BE AWARE:

Date: 06 September, 2019 12:00:00 to 06 September, 2019 11:59:59

Response Type: Prepare

Urgency: Expected

Area: Saint George Christ Church Saint Peter Saint James Saint Lucy Saint Michael

Description

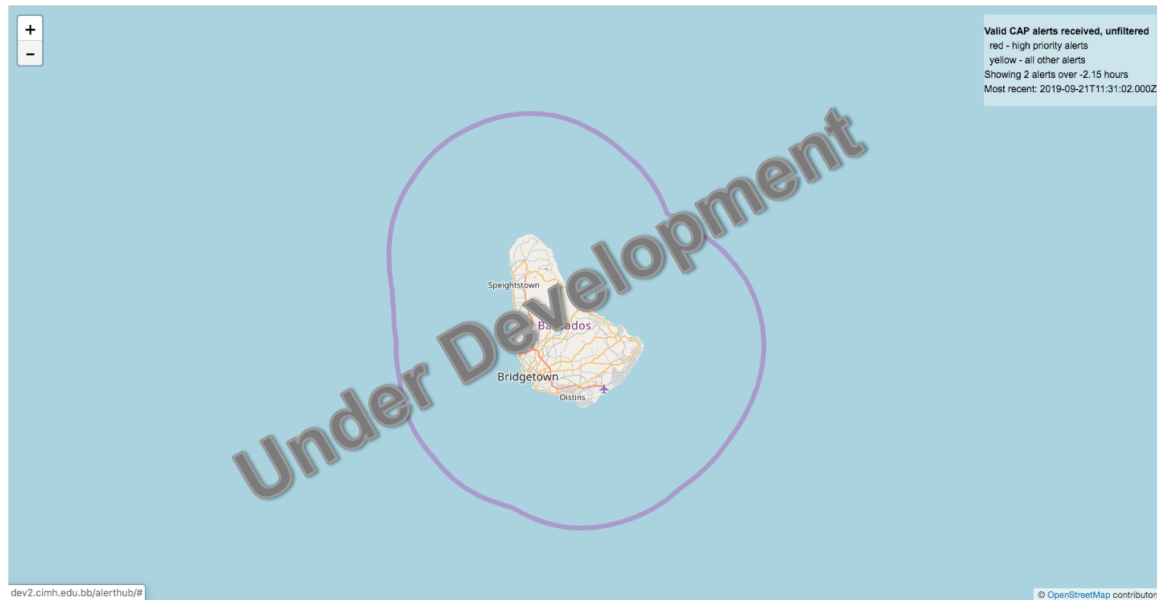
Instruction

CAP Messaging – Website Integration

Integrating CAP Messaging...cont'd

Lessons learned can guide criteria for future implementations

- Strong relationship among NMHSs and NDMA
 - Enhances communication
 - Improve existing SOPs
- Data management and data sharing
 - Access to hazard, exposure and vulnerability data to support IBF
 - Dynamic web page with regional CAP alerts



Dynamic web page

Key Takeaways

- IBFWS being implemented in the Caribbean through WCRN Programme Barbados demonstration
- What the weather will be vs. what the weather will do
- Caribbean MyDewetra Platform provided tools to support IBFWS and CAP
- Tools improved through WCRN Programme
- Integration of IBFWS and CAP messaging has its challenges but doable





Thank you!