

# Transitioning from a Comprehensive Early Warning System to a CAP based system: The Virgin Islands Experience

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# PRESENTATION OUTLINE

## Comprehensive People-centered Early Warning System

- **Background**
  - Risk Knowledge
  - Monitoring and Warning
  - Dissemination and Communication
  - Response Capability
- **Good Practices**
- **Challenges and Lessons Learnt**
- **Priorities for Enhancement**

## Transitioning to a CAP based system

- **Current status**
- **Next steps**

# ELEMENTS OF BVI'S EARLY WARNING SYSTEM

## **Risk Knowledge**

- Organizational Arrangements in place (Planning Authority)
- Hazards Identified and Mapped (HRAP)
- Community Vulnerability Analyzed (Red Cross STM)
- Risks Assessed (QRAP)
- Information Stored & Accessible (NGIS)

## **Monitoring and Warning**

- Protocols & Plans Developed
- Monitoring System in Place
- Forecasting & Warning System Established

## **Dissemination & Communication**

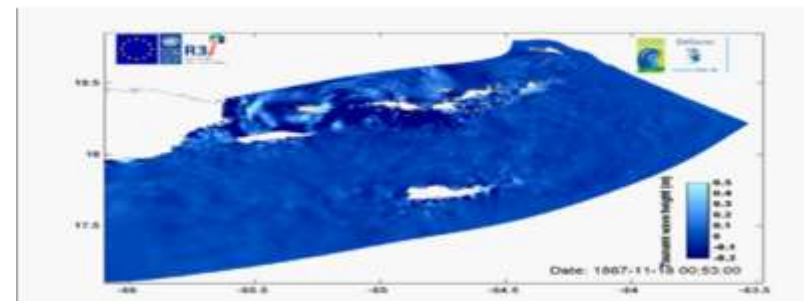
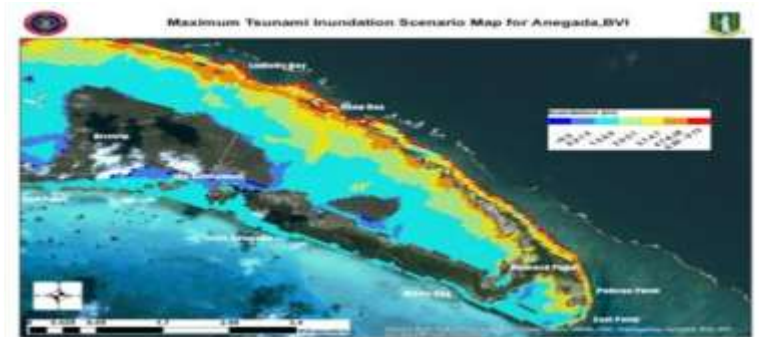
- NEOC and NDMP legislated
- Comms. System & Equipment Installed
- Warning Messages Developed and Understood

## **Response Capability**

- Studies performed to determine public knowledge, aptitude and perception
- Response Plans developed and tested
- Community Capacity Strengthened
- Public Awareness and Education Programme in Place

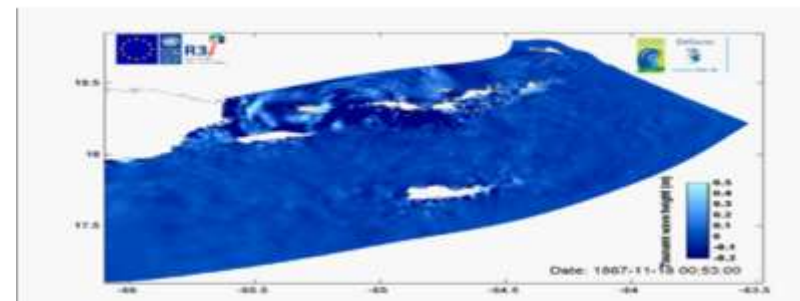
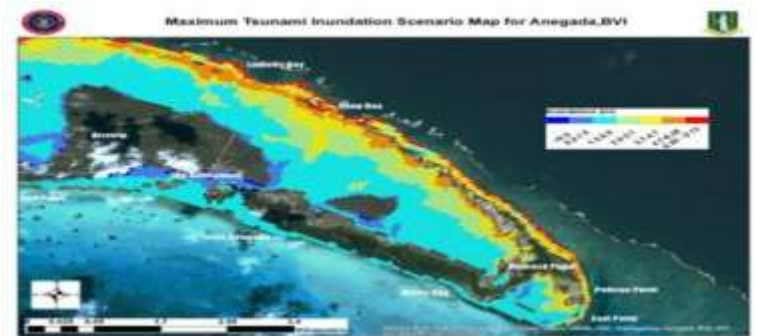
# RISK KNOWLEDGE

- ❑ **1997 - Hazard Risk Assessment Project (HRAP)**
- ❑ **2004-2006 - Quantitative Risk Assessment Project (QRAP)** Included potential economic loss models and hazard maps in GIS
- ❑ **UPRM – Geology, Slope/Cut Maps and an assessment of erosion issues** in Anegada and north coast of Tortola
- ❑ **2008 - USGS Paleoseismic studies** on Anegada
- ❑ **2012 - UNDP R3i project**
  - ❑ **Tsunami Inundation Maps** developed as part of the Modelling focused on six scenarios including two underwater landslides
  - ❑ **Bathymetric mapping** of 4 major islands



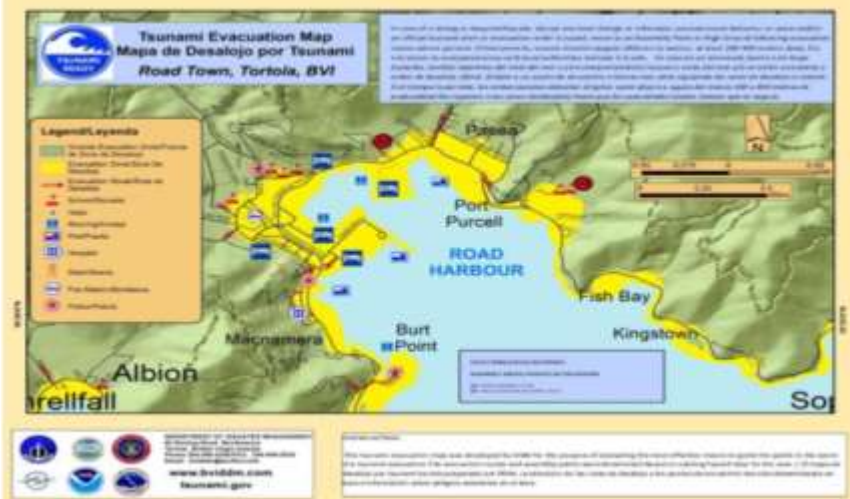
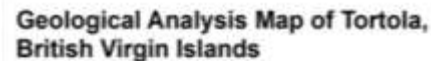
# RISK KNOWLEDGE

- ❑ **2015 - Sea-bed mapping project and hydrographic survey**
  - ❑ Partnership of the National Parks Trust of the Virgin Islands (NPT), the UK Hydrographic Office and the Centre for Environment, Fisheries and Aquaculture Sciences (CEFAS)
  - ❑ Encompassed the underwater mapping of critical areas related to biodiversity conservation
  - ❑ Entailed the acquisition of both the measurement of the depth of the sea (or bathymetry) and marine habitats along the Sir Francis Drake Channel
  - ❑ First seabed survey of its kind in the British Virgin Islands





# Multi-hazard Maps



# Monitoring and Warning

## Hurricanes/Cyclonic Events

- Antigua and Barbuda Meteorological Service
- National Hurricane Center
- StormGeo
- Wilkins Weather Technologies
- UK meteorological resources

## Earthquakes

- MOUs with Puerto Rico Strong Motion Programme and Puerto Rico Seismic Network
- Strong Motion Sensors strategically located throughout the Territory

## Tsunami

- Tsunami inundation maps for Tortola and the 3 major islands
- Arrangements with Puerto Rico Seismic Network
- Coverage under the Pacific Tsunami Warning Center
- The Control Room of the Royal Virgin Islands Police Force serves as the 24-Hour Tsunami Warning Focal Point

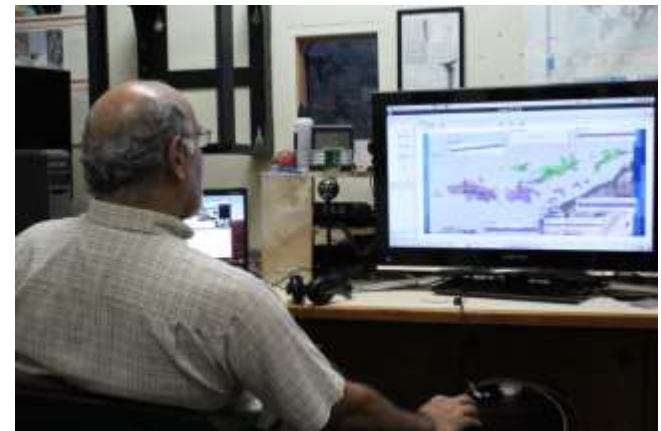
## Flooding

- 18 Weather stations (BVIAA and DDM) strategically located throughout Territory
- DEWETRA platform

# DDM AND PRSN Partnership



- DDM signed an MOU with PRSN in 1999
- Relationship has facilitated linkages with USGS, UNAVCO, PRSMP & expertise from UPRM





# DISSEMINATION & COMMUNICATION

- **National Emergency Broadcast System (NEBS)**
- **Siren Network**
- **Radio Data System**
- **Radio Communication**
  - comprises of more than 70 radios including VHF, HF & UHF
  - can be reached instantly from the NEOC and supported by six qualified amateur operators.
- **Short Message Service (SMS)**
  - test messaging service component of phone, web or mobile communication systems
  - MOUs with all cellular providers



# Response Capability: Caribe Wave/Lantex Exercises

**2015**

4200 persons  
including Premier,  
Deputy Premier and  
Minister of  
Education



**2016**

4700 persons  
including several  
financial institutions  
and schools





# Training



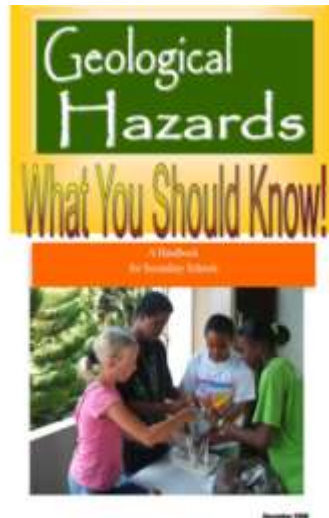
# PUBLIC AWARENESS



DDM TV Programme –  
“Focus”



DDM Facebook Page



DDM YouTube Channel



# Tsunami Ready Designation - May 2014



# Innovation and Good Practices

## Being able to:

- Tie all the elements of the Early Warning System together and to ensure there is redundancy built in
- Build a system from scratch to provide the level of alert and warning to the isolated communities
- Connect all of this elements of the EWS into the SMART Communities model which will be piloted in 3 communities in 2016-2018

## CHALLENGES

- The need for constant upgrading of equipment due to changes in technology
- Remoteness of BVI communities
- Transient nature of the BVI

## LESSONS LEARNED

- The need for redundancy and ensuring that community needs are addressed
- Adapting the EWS to suit the local terrain and environment
- The need to have legislation that governs the use and maintenance of the system
- Importance of constantly educating the population about:
  - the various elements of the EWS
  - how each component work



# Priorities for Enhancement

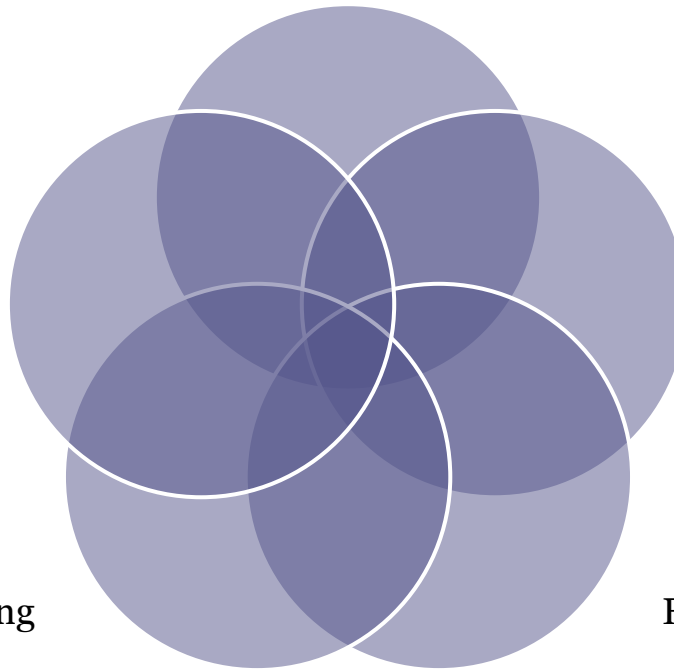
Improve the ability of  
RVIPF (TWFP) to receive  
and disseminate tsunami  
warnings (e.g. EMWIN)

Continue annual  
simulation exercises  
and focus on  
community DRR  
integration  
programmes

Complete hazard data  
sets for smaller islands  
including micro-  
zonation/soil study and  
complete LIDAR  
coverage for all islands

Expand/upgrade strong  
motion sensor  
programme

Full transition to digital  
systems and  
incorporation of CAP





# Transitioning to a CAP based system

Allows for messages to be disseminated simultaneously using a diversity of media

- Radio
- Television
- SMS
- Siren

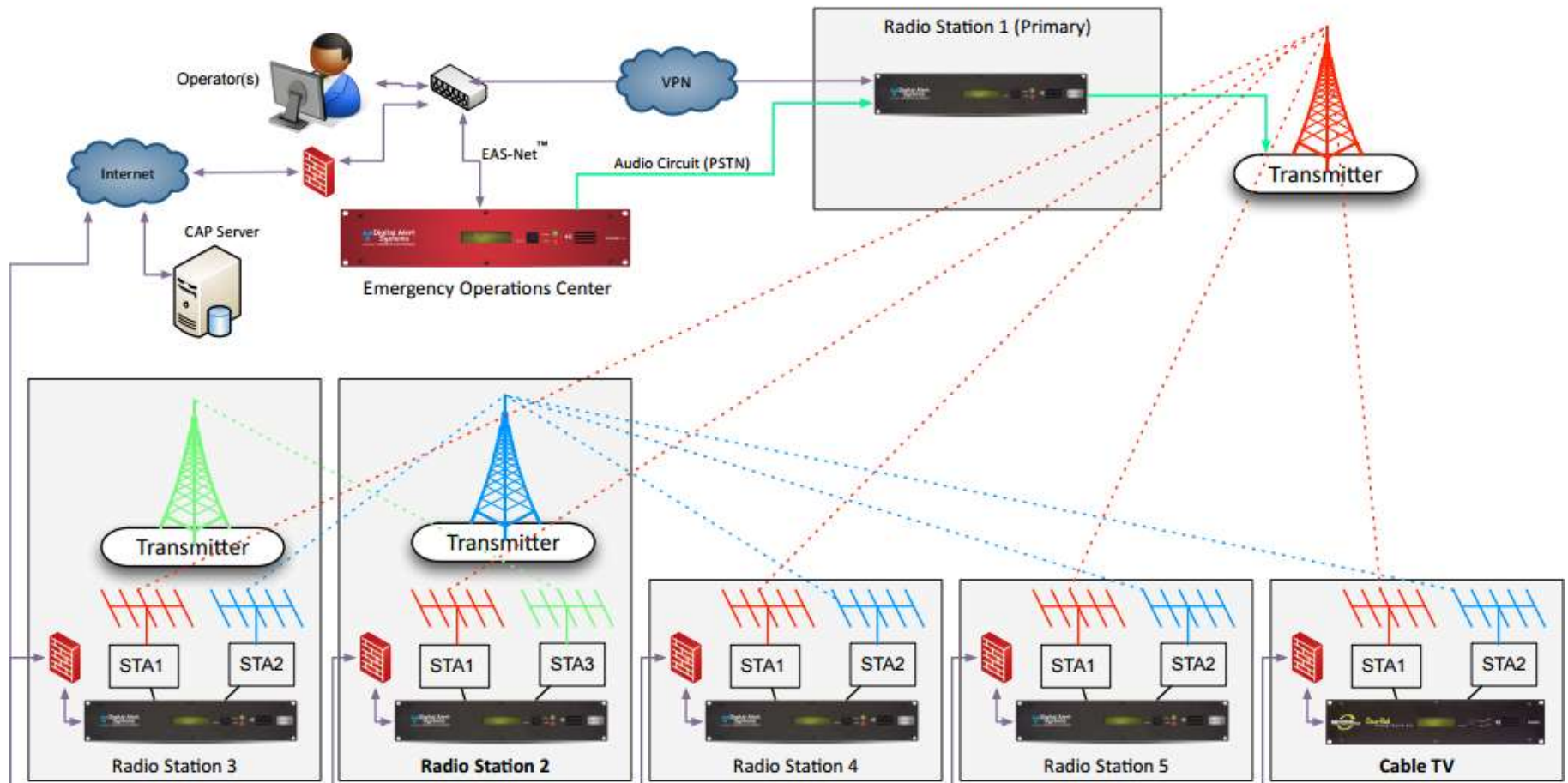
Being able to use the most appropriate medium that best targets the specific community to receive the warning

# Legislation Framework: DM Bill 2011

## Defines an “early warning system”

- Set of capacities needed to generate and disseminate timely and meaningful warning information to enable individuals, communities and organisations threatened by a hazard to prepare and act appropriately and in sufficient time to reduce the possibility of harm or loss
- Makes provisions for the establishment and operation of a National Multi-Hazard Alert System
  - National Emergency Broadcast System
  - Siren
  - Emergency communications
  - Other warning systems as may be prescribed
- Operated under the supervision of the Director, Disaster Management

# CAP based Early Warning System for the BVI



# CAP based Early Warning System for the BVI

## NEOC Encoder Unit with CAP functionality

- Ability to generate and disseminate simple CAP messages to the CAP-ready National Multi-Hazard Alert System

## Primary Entry Point - Radio Station (ZBVI)

- Serves as a redundancy to retransmit CAP messages from NEOC Encoder Unit
- Monitors messages and chooses the higher quality data from the VPN and the PSTN links

## Decoding end points (CAP-based television, radio, siren, bulletin board

- Data validation and dissemination to individuals and communities



# CAP based Early Warning System for the BVI: Next Steps

Convert the existing equipment to CAP-compliant hardware

Transition from dynamic IPs to static IPs

Expand the decoding end-points

- Additional radio/television stations
- Cell providers

Acquire a dedicated CAP-server

Expand the GIS datasets

- Updated topography
- LiDAR for the entire Territory

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