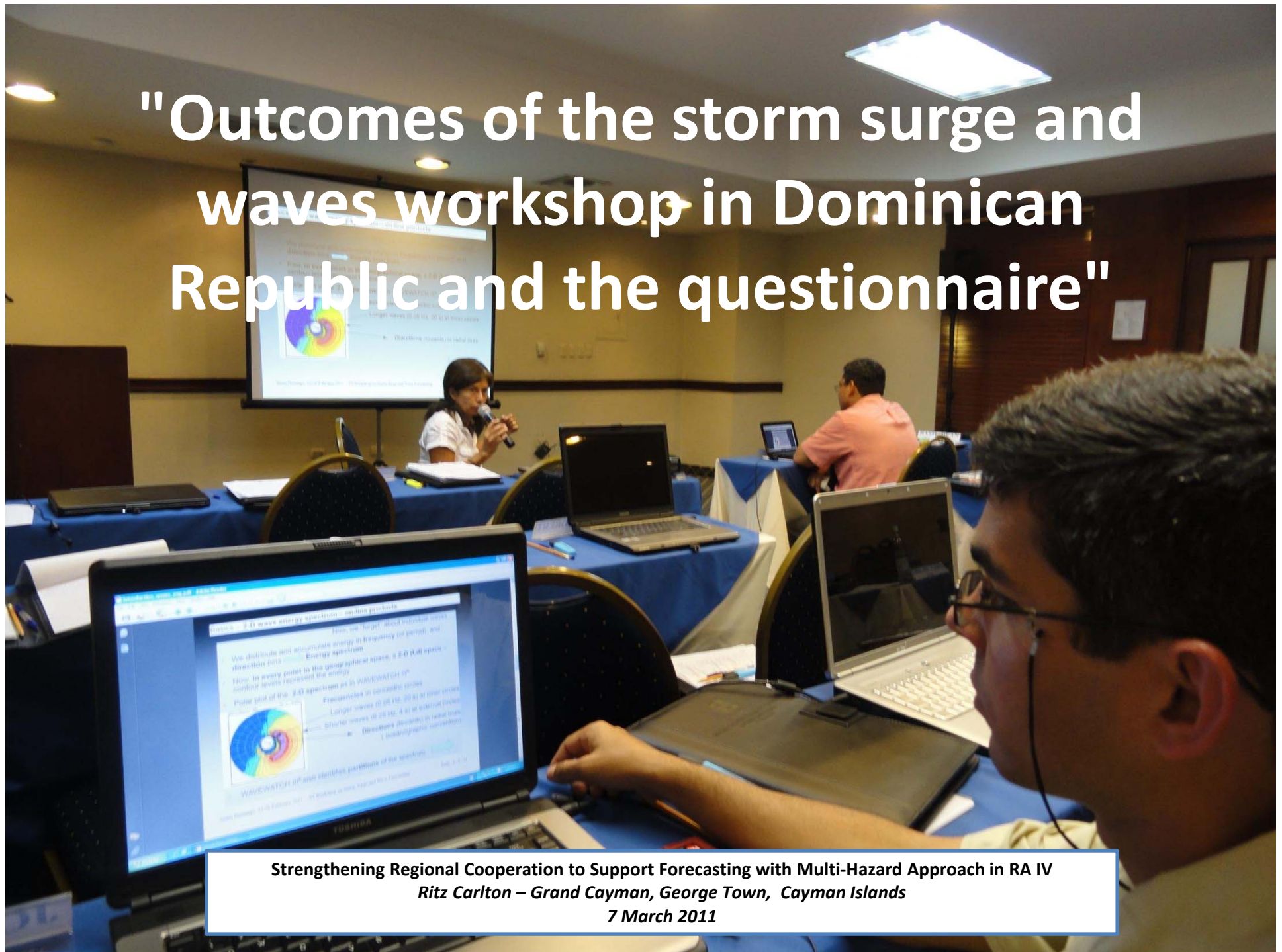


"Outcomes of the storm surge and waves workshop in Dominican Republic and the questionnaire"



Strengthening Regional Cooperation to Support Forecasting with Multi-Hazard Approach in RA IV
Ritz Carlton – Grand Cayman, George Town, Cayman Islands
7 March 2011

TCP/JCOMM Workshop

Storm Surges and Waves Forecasting



GOALS

- To show available operational forecasting products
- To assess national capacities & needs for coastal hazards risk reduction
- Overview & coordination with coastal disaster's risk reduction initiatives in the Caribbean (i.e., [Caribbean MH-EWS Programme](#))
- Introduction to the [Coastal Inundation Forecasting Demonstration Project \(CIFDP\)](#) in the Caribbean

What was discussed in this 10-session Workshop?

- 1. Wind and Wave Forecasting and Model Guidance**.... Use of products for operational forecast; strengths and weaknesses of the model for the region (NHC, ECMWF, MS Canada)
- 2. Discussion of wave products for deterministic and for Ensemble Prediction System (EPS)**... Scientific concept; Examples of products; Operational forecast; Use of deterministic vs. EPS products (ECMWF products; Canadian Wave EPS; SWAN)
- 3. Storm Surge products from the EPS**.... Scientific concept; Examples of products; Operational forecast; Use of deterministic vs. EPS products (SLOSH model for US; Tsunami models for inundation mapping in the Caribbean --- Mercado, Puerto Rico; ADCIRC/unSWAN models coupling in P. Rico)
- 4. Demonstration of e-learning COMET Platforms and use of online products**

What was discussed in this 10-session Workshop?

5. **Operational Forecasting and Warnings Systems** (Meteo-France; MS Canada; Role of Canadian Met Serv in the Canadian ATL Tsunami Warning System; Flood forecasting in the UK)
6. **Requirements for the Operational Warning Systems** (Organisational aspects, Capability / Expert requirements, Infrastructure requirements (computers, network, internet), National User requirements / mandates, Preparation for countries requirement assessment)
7. **Regional coordination of Disaster Risk Reduction strategies for coastal hazards in the Caribbean** (Technical and human communication aspects of end-to-end warning communication platforms, such as communication of uncertainty in forecasts and also ensuring proper actions to be taken by those who receive the forecasts and warnings---- Cuban storm surge MONSAC model and Cuban version of SWAN for coastal inundation; risk maps for main coastal cities; Communication and presentation of these forecasts to users, TV presentations---- Outlook of the MHEWS Programme for the Caribbean.

What was discussed in this 10-session Workshop?

9. **Coastal Inundation forecasting and warning products** ---- Overview; modelling aspects and data requirements; Example of products; Case studies; Regional considerations; Regional approach for the Coastal Inundation Forecasting Demonstration Project (CIFDP)---US Corps of Engineers presented the Storm surge and Wave modelling in Tropical Cyclone, IOC / University of Puerto Rico: existing TSUNAMI models in the area and its application for Puerto Rico ---- Presentation of the Coastal Inundation Forecasting Demonstration Project (CIFDP) and implementation approach in the Caribbean

10. **Coastal Inundation Forecasting Demonstration Project (CIFDP) in the Dominican Republic** ---- Commitment from DR forecast agencies and other stakeholders as a National Agreement; Presentation from the local NMHS; Preparation of a CIFDP Stakeholders workshop in the DR; National Implementation Team (NIT); National Advisory Group (NAG) for the regional/national stakeholders and risk managers involvement and feedback.

CURRENT STATE ASESMENT

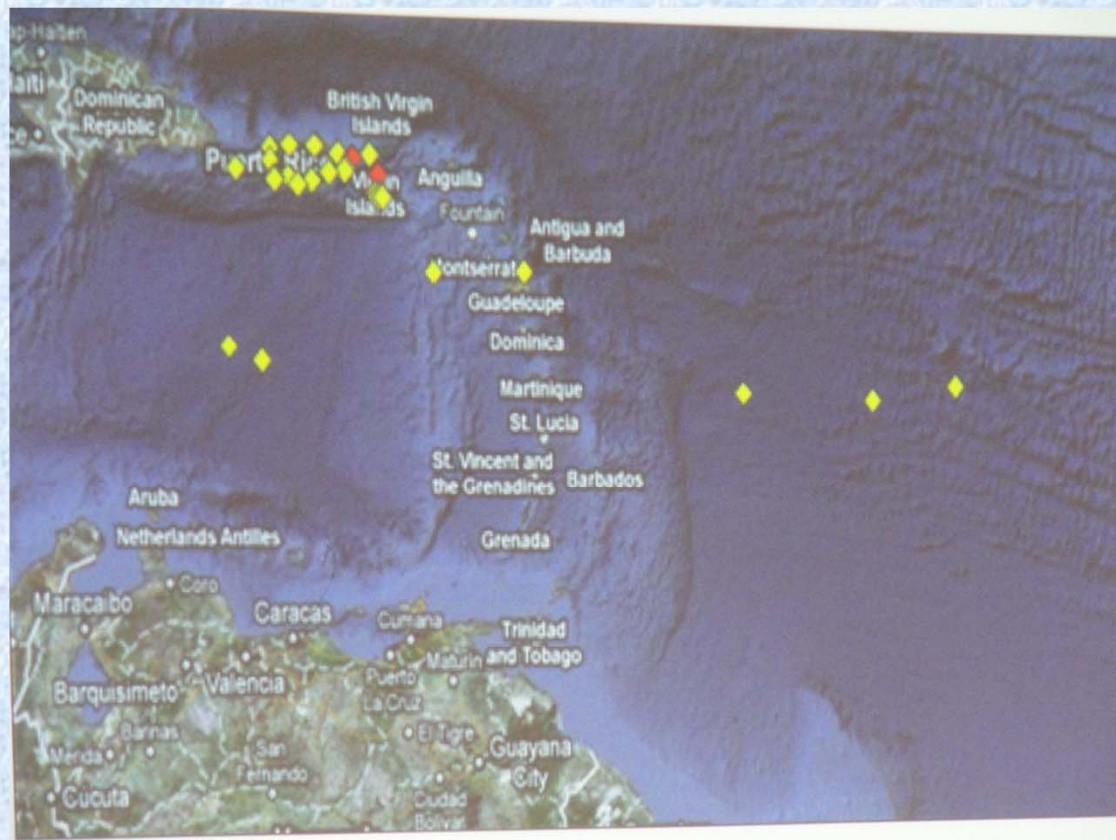
- Meteorologist handle Marine concepts such as warnings and briefings
- But not technically equipped to handle-use products from other agencies such as NHC and ECMWF
- Most of SIDS do not currently possess the know-how to apply the existing technology to produce local marine advisories for coastal development, preparedness and navigation purposes
- Too much fragmentation among agencies

CURRENT STATE ASESMENT

- Lack of human resources and capacity building
- Almost no exchange of technologies within the region
- Lack of recognition to countries that might help in the above mentioned situation
- Almost no working protocols have been developed thus far

USER REQUIREMENTS

- Gaps with regard to Marine Observations
- A network of buoys and tide gauges is required



Observations and Monitoring

Need for Strengthening of the observation and monitoring capacities through:

National

- **Development** of bathymetric survey and databases
- **Establishment** of an appropriate coastal and offshore observation network

Regional

- Complete the network of buoys and tidal gauges for sea-level and sea observations
- Improvement of **regional sharing of observation data**

Marine Forecasting

Need for strengthening of forecasting capacities through:

National

- **Improvement of local forecasting models** for marine related hazards
- **Training & replacement of forecasters** at retirement age
- Coordinating and creating **communication platforms** between the maritime agencies and the NMHS
- **Dissemination** of information through disaster management agencies and user communities on the coastal zone (i.e., port authorities, fisheries, etc..)

Marine Forecasting

Strengthening forecasting & coordination capacities:

Regional

- **Development & improvement** of the storm surges & wind waves warning systems
- **Strengthening the role of regional centers** to develop coordination mechanisms on marine hazards
- **Identify national focal points** for coastal & marine hazards & capacity development through a **Regional Training Center**

CAPACITY BUILDING NEEDS & OPPORTUNITIES

CURRENT STATE OF CAPACITY BUILDING

- There have been two workshops in the region thus far: CIMH & Dominican Republic
- Regional marine training required --- a central focal point or regional training center would be ideal

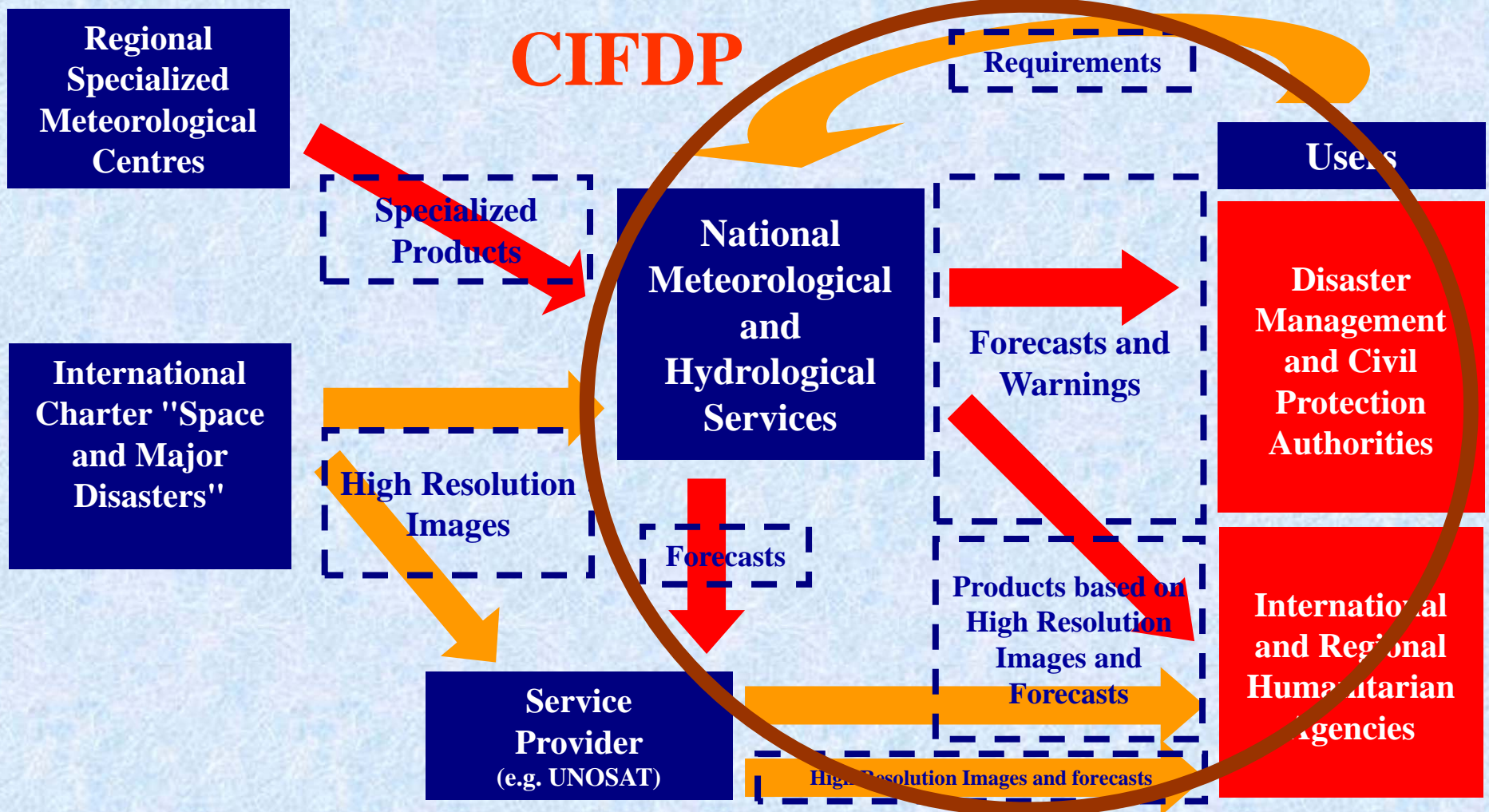
USER REQUIREMENTS

- Need defined marine “authorities” within the NMHS’s (National Meteorological and Hydrological Services)
- Need marine training to build the technical expertise for the Caribbean region
- If possible, the same personnel should attend marine meteorology workshops in the future in order to ensure continuity

COLABORATIVE INITIATIVES AND SYNERGIES

- Establishing of storm surge monitoring program would enable a collaboration between NHC and regional agencies or NHMS's for data contribution to NHC bulletins with regard to storm surge for the region
- A proposal has already been drafted with regard to collaborating with experts to receive training in storm surge modelling

Coastal Inundation Forecasting Demonstration Project (CIFDP)



Integrated Approach to Coastal Inundations Forecasting & Management Systems

How could coastal inundation forecasting products be improved and effectively coordinated, with existing warning services provided by the NMHSs?...

With a integrated team work as a strategy for building improved operational forecasts and warnings capability for coastal inundation through:

Technology development and transfer

- > Use of NMHSs capabilities to produce and provide coastal inundation forecasting and warning services

Communication platform and training

- > Improving interactions between NMHSs and end-users (Government, Disaster Management and Civil protection Agencies, Media, etc...)

CIFDP - *Outline*

- *Expected outcome:*
End-to-end integrated software coupling meteorological, hydrological and met-ocean forecasting components for fulfillment of end-users needs for coastal inundation operational forecasting and warning services
- *Regions/countries for the implementation:*
 1. Bay of Bengal (*Bangladesh*)
 2. Caribbean (*Dominican Republic*)

Partners: WMO Programmes: MMOP, HWR, TCP

Met Services: NMHS, RMSC and Regional DRR Institutions

International: IOC-UNESCO, IHO, UNOSAT

THANK YOU !
¡ GRACIAS !

