World Meteorological Organization
Working together in weather, climate and water

WMO

Coastal Inundation Forecasting Demonstration Project (CIFDP)

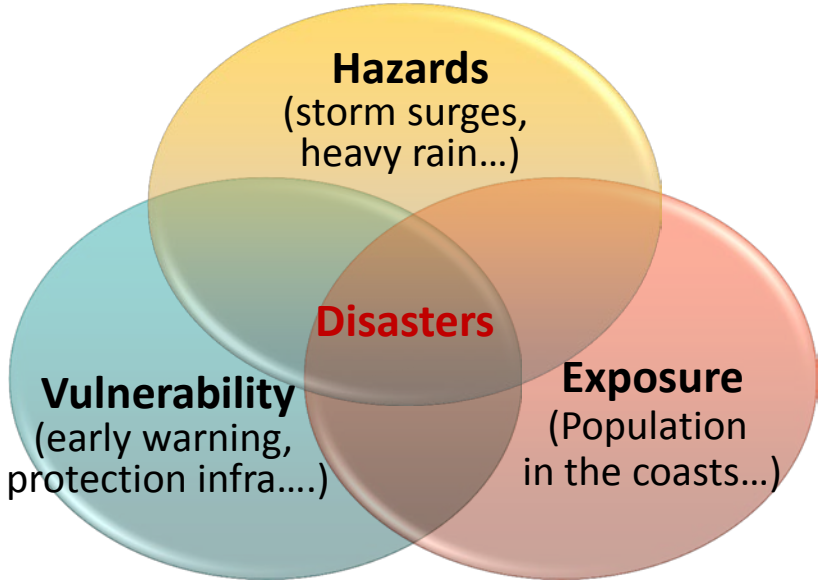
WMO Technical Commission for Oceanography and Marine Meteorology (JCOMM)
WMO Technical Commission for Hydrology (CHy)

Boram Lee, Don Resio and Val Swail

13th International Workshop on Wave Hindcasting and Forecasting and 4th Coastal Hazards Symposium
27 October – 1 November, 2013 Banff, Canada

Exposure to coastal inundation is large and growing

- Population is attracted to coasts by an abundance of local resources
  - Growing coastal population
  - Urbanising coastal zone
  - Tourism, recreation, retirement…
- In many parts of the world, the population is directly exposed to the coastal hazards and this will increase with Climate Change and Sea Level Rise.

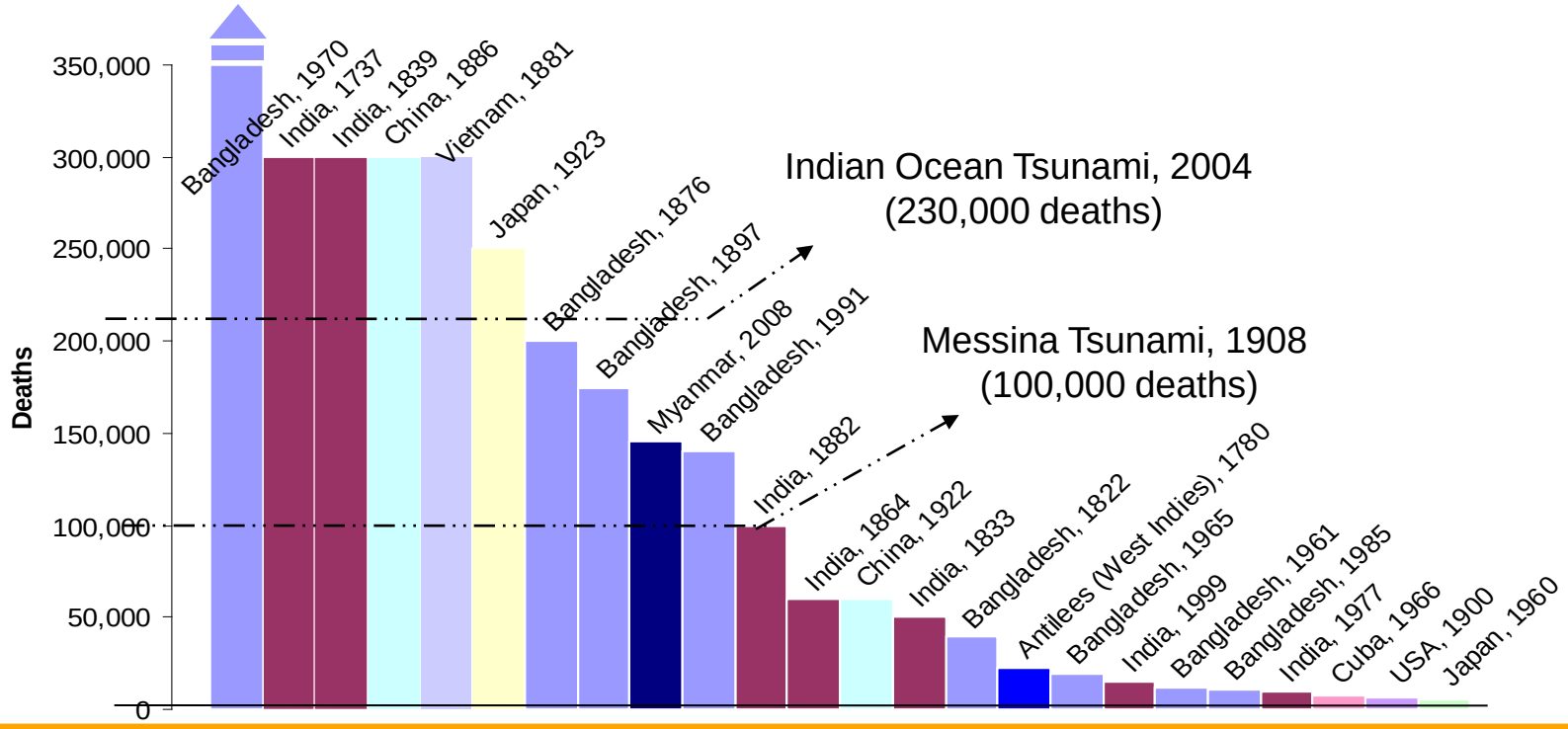


Disasters are more likely when Hazards and exposed population overlap with Vulnerability.

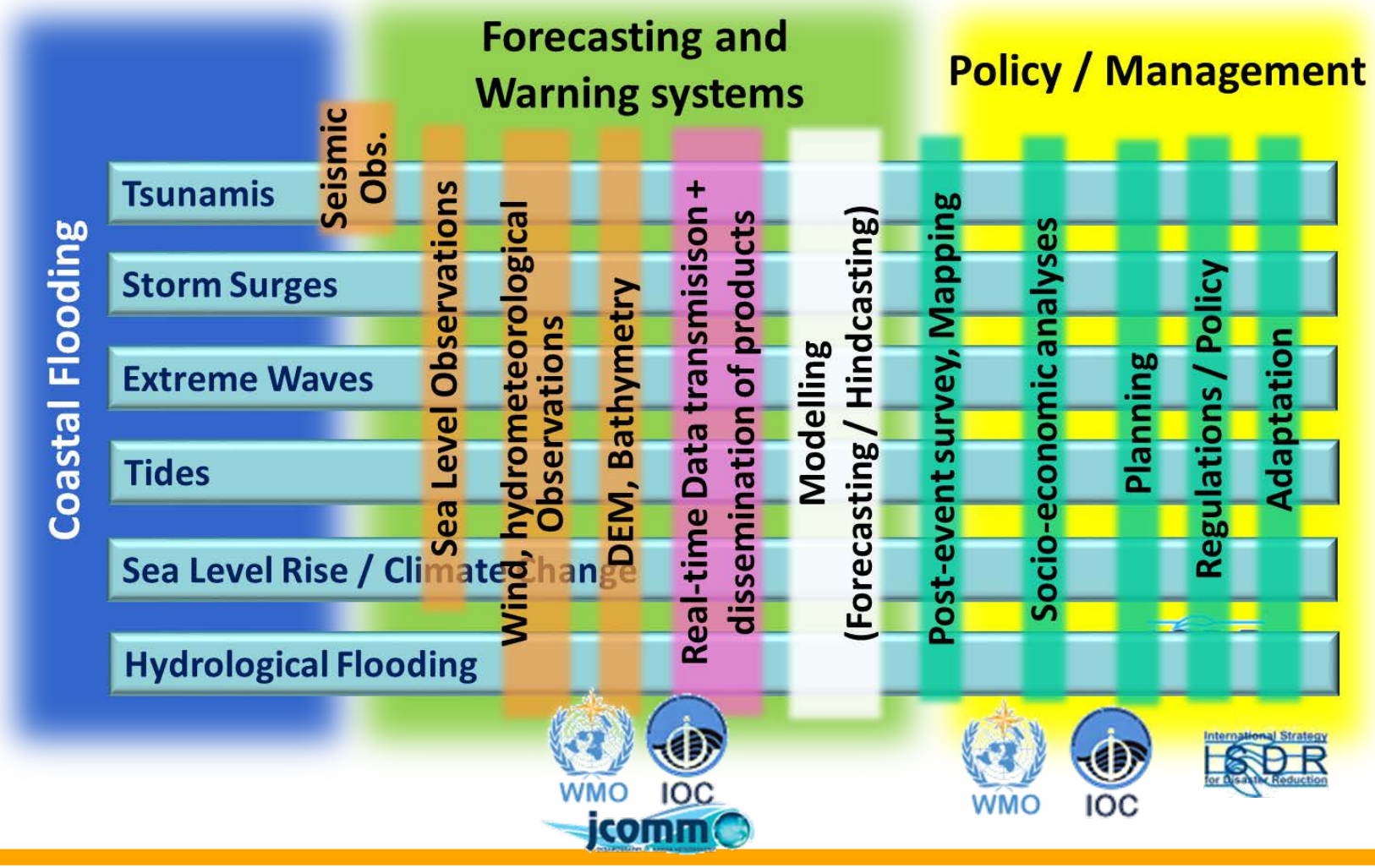
- A reactive approach to adaptation increase the vulnerability.

Casualties by Cyclones and Storm Surges

- Deaths in tropical cyclones in each year, for highest ranks in the history (with indication of relative level of casualties by major tsunami events). Most fatalities in tropical storms are due to storm surges. All casualty figures are estimates and vary widely according to sources (Dube, 2007).



End-to-end Coastal Inundation Management



Demonstration Project: CIFDP

http://www.jcomm.info/CIFDP

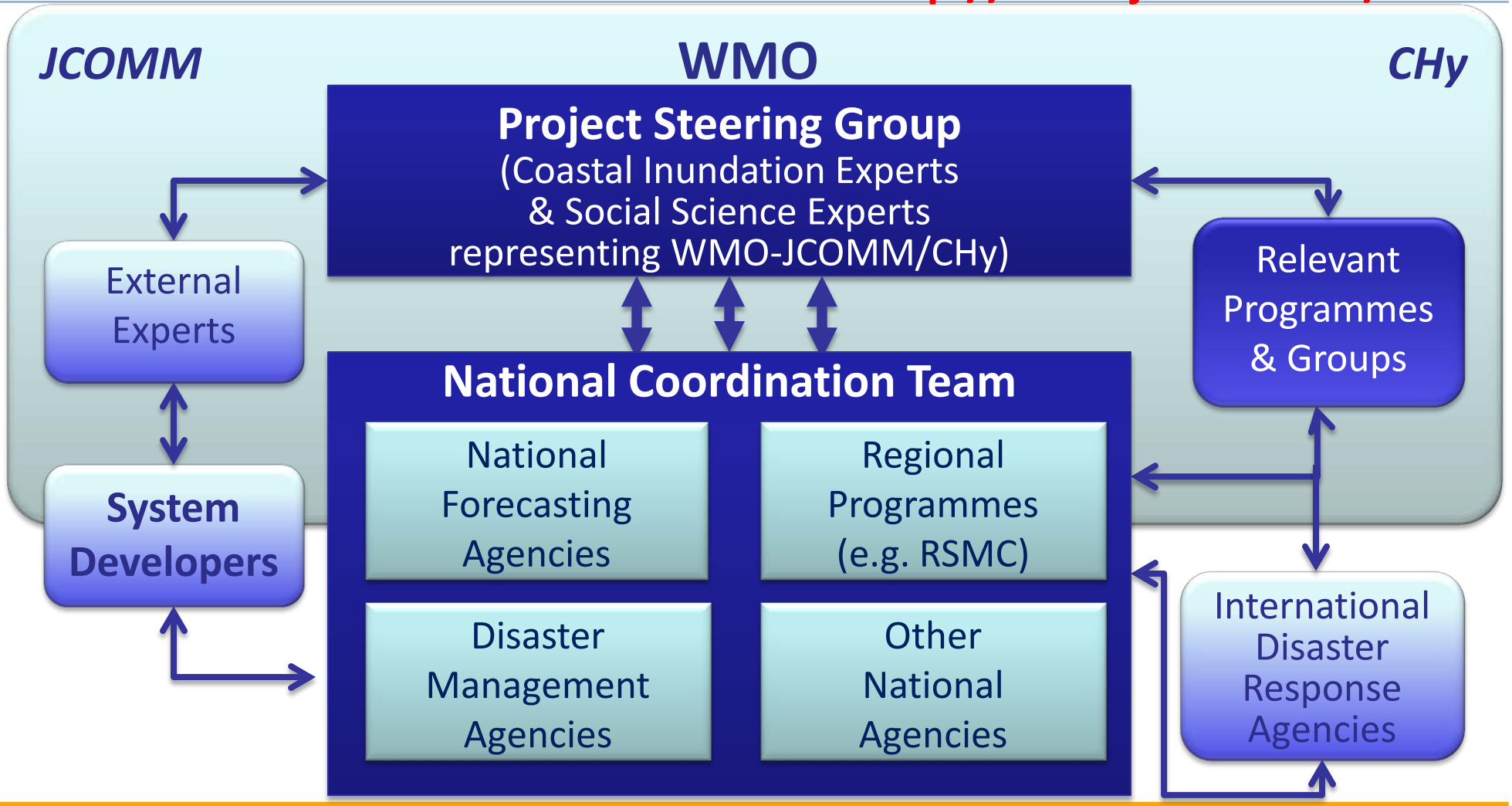
To meet challenges of coastal communities' safety and to support sustainable development through enhancing coastal inundation forecasting and warning systems at the regional scale.

*: building **improved operational forecasts and warnings capability for coastal inundation**, that can be **sustained by the responsible national agencies***

- Identify and support end-user needs;
- Encourage full engagement of the stakeholders and partners in the CIFDP from early stages, for the successful development and implementation of this project;
- Transfer technology to the adopting countries;
- Facilitate the development and implementation of warning services;
- Support coastal risk assessment, vulnerability and risk mapping;
- Assist improved and informed decision-making for coastal inundation management

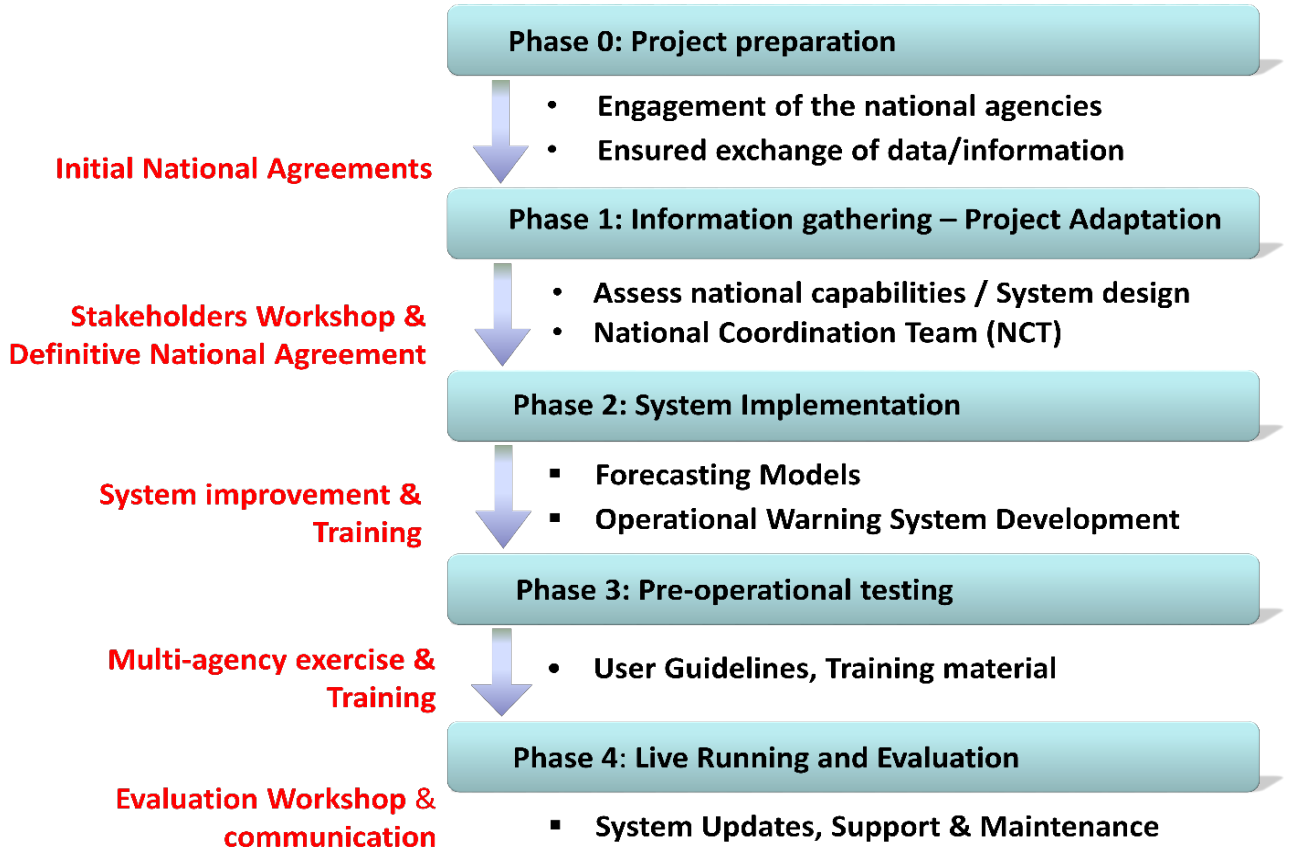
CIFDP Implementation: Key Players

http://www.jcomm.info/CIFDP



CIFDP: Scope and Implementation

The main focus of the CIFDP will be to facilitate the development of efficient forecasting and warning systems for coastal inundation based on robust science and observations:



CIFDP: Technical foundation

Applying available techniques for integrated operational forecasting/warning

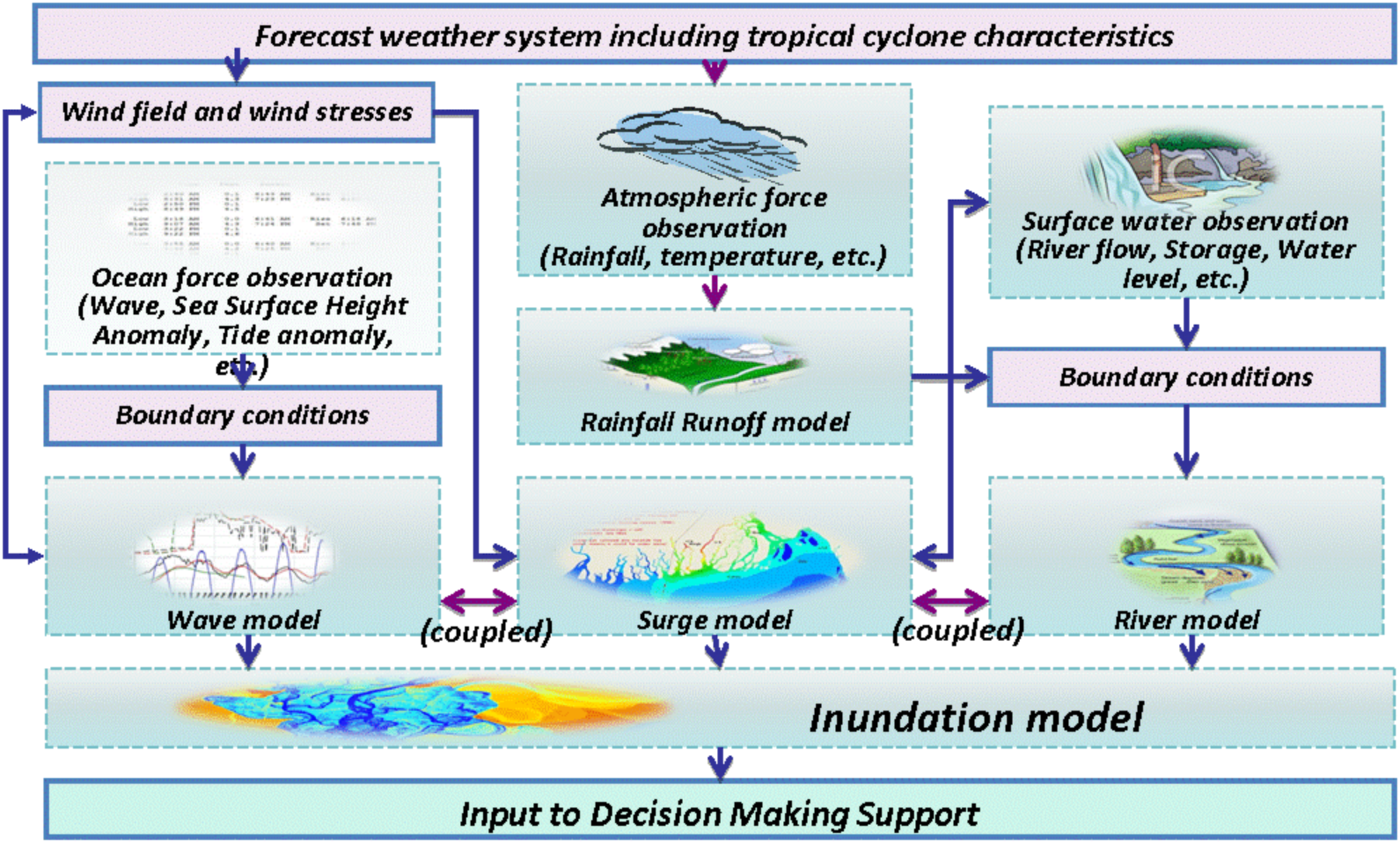
- Assessment of the regional coastal inundation forecasting/warning **capacities**
- Identify **gaps**
- Provide an **overview on the technical aspects** for definition

Each Sub-Project Plan and following documentation will include:

- Existing models and modeling capabilities
- Communication / access to real-time data and quantitative forecast data
- Boundary (Bathymetry, DEM…), GIS Data and data for Validation
- Organizational aspects

The project will focus on integrating the forecasting models already in operational use as 'plug-and-play' modules. The modelling components will be developed and adapted to fit in an **open, flexible and easily extendable forecasting system**: the future CIFDP system.

CIFDP: Technical Development for Coastal Inundation Forecasting/Warning



CIFDP Implementation

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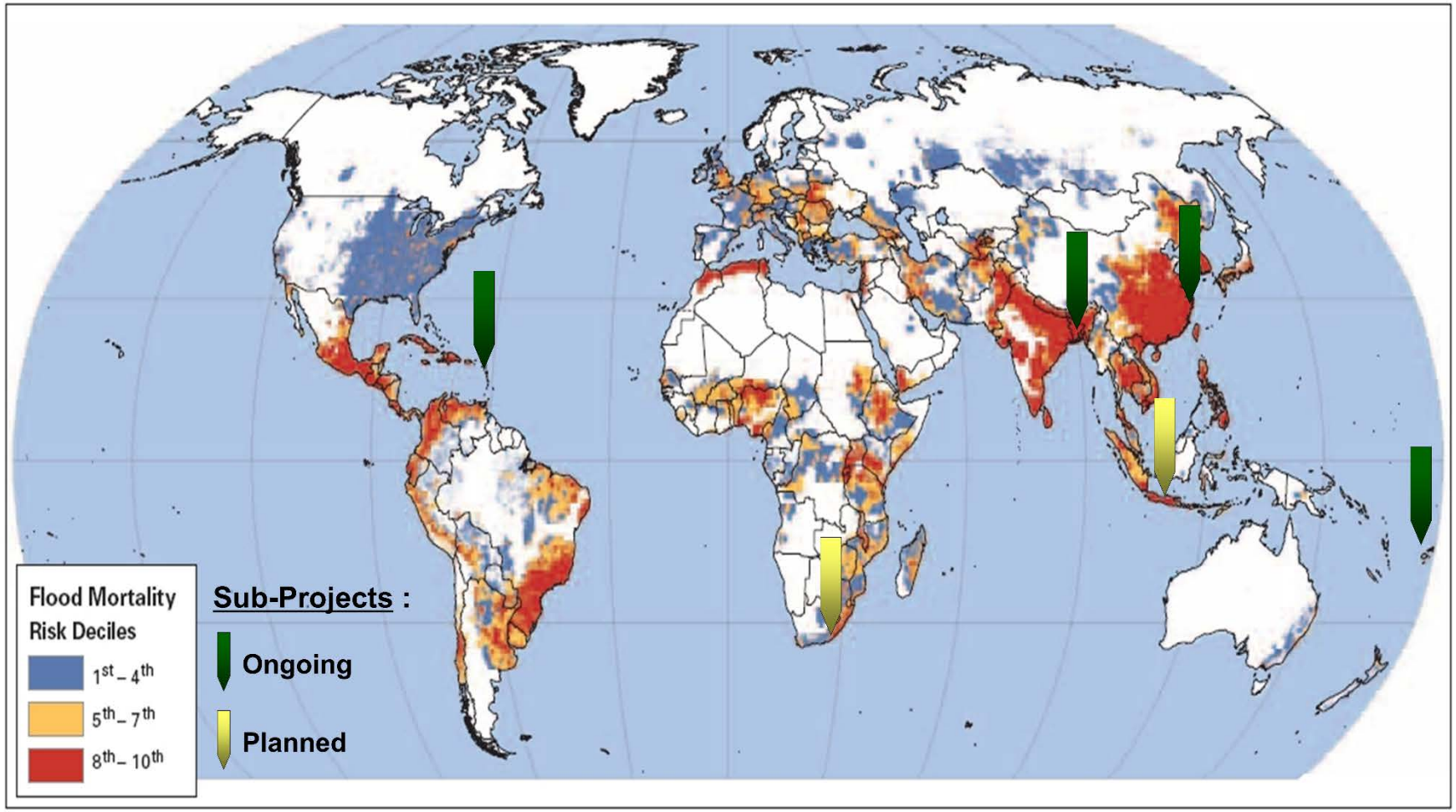

Natural Disaster Hotspots: A Global Risk Analysis. World Bank, 2005

CIFDP Implementation

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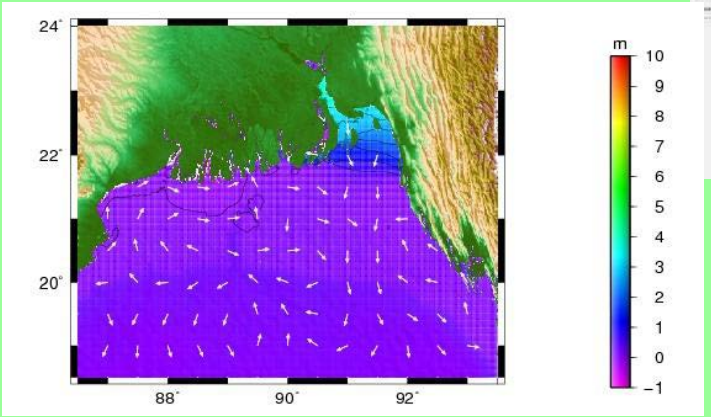
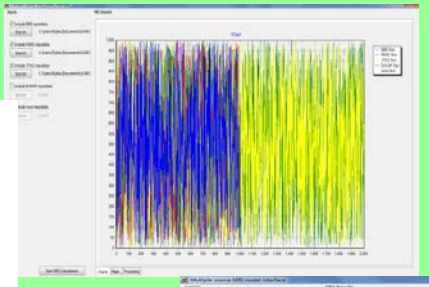
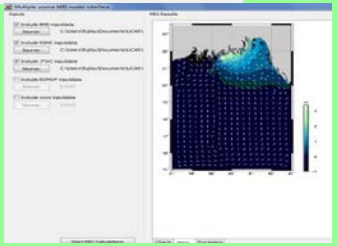
CIFDP-B (Bangladesh): Phase 2

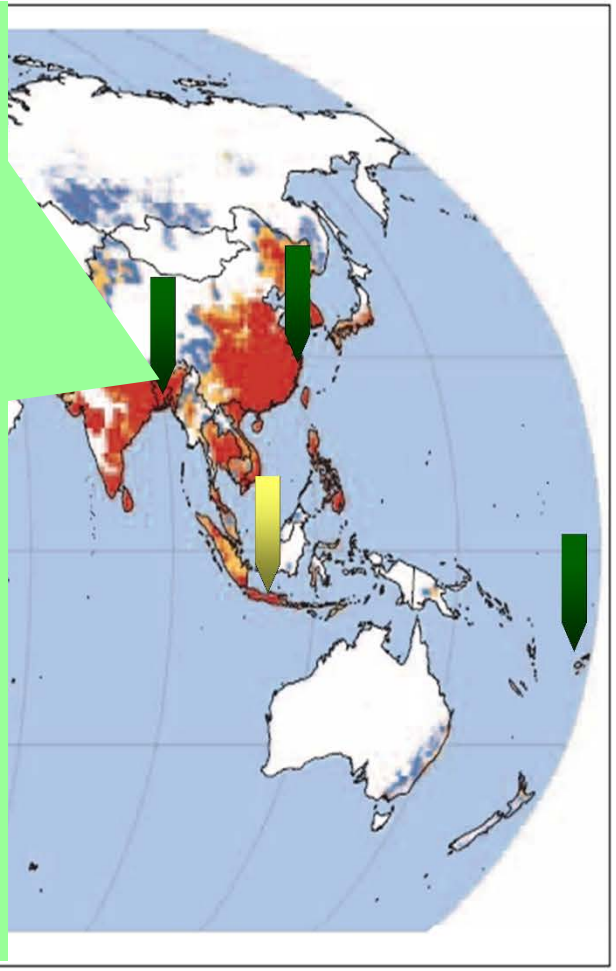
USAID FROM THE AMERICAN PEOPLE

Oct'11 Initial National Agreement
Dec'11 National Stakeholders Workshop – Phase 1
Feb'13 Definitive National Agreement
May'13 Phase 2 (system implementation) launched









Natural Disaster Hotspots: A Global Risk Analysis. World Bank, 2005

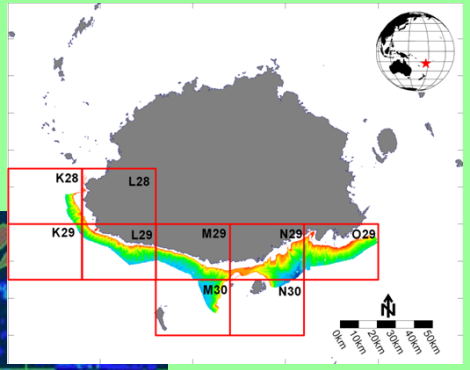
CIFDP Implementation

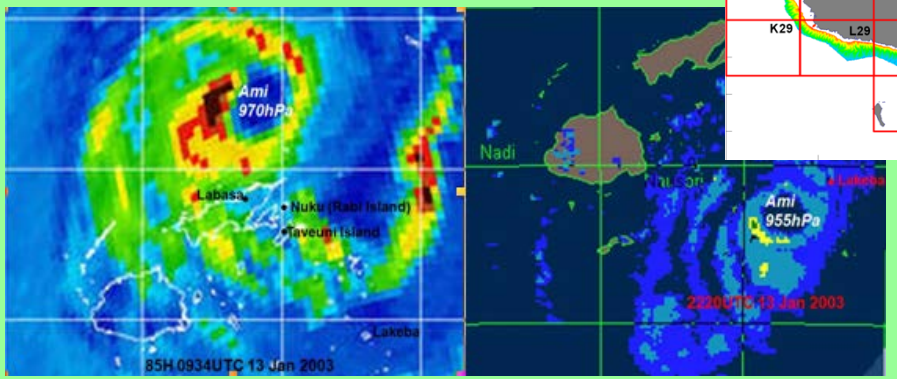
http://www.jcomm.info/CIFDP

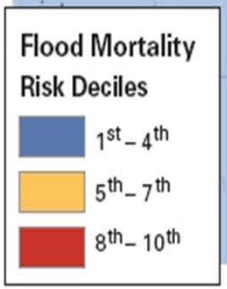
CIFDP-F (Fiji): Phase 1

KOICA 한국국제협력단
KOREA INTERNATIONAL COOPERATION AGENCY

Mar'12 Initiation at the request by Fiji Government
Feb'13 National Stakeholders Workshop – Phase 1
June'13 Definitive National Agreement
Oct'13 Phase 1 review







World Bank, 2005

CIFDP Implementation

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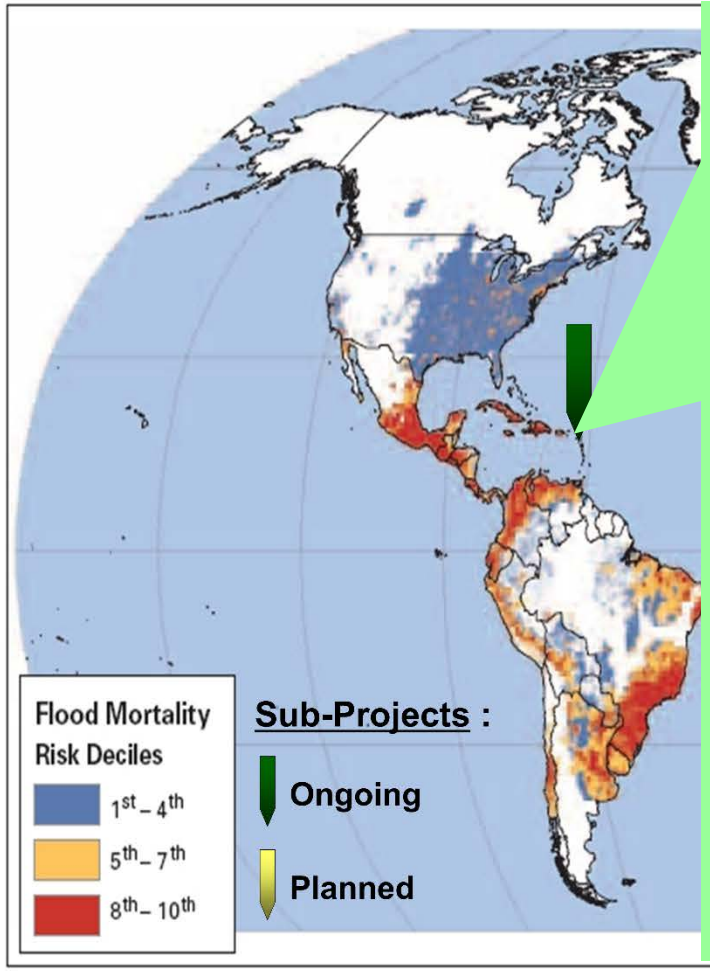
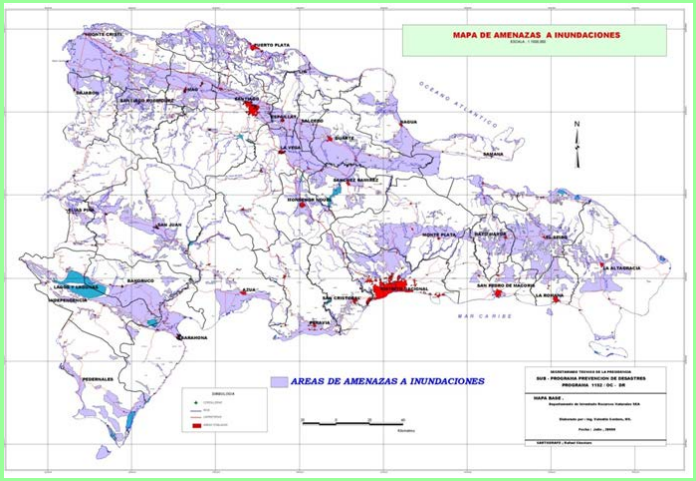


CIFDP-DR (Dominican Republic): Phase 1

Nov'11 National Stakeholders Workshop – Phase 1

Feb'13 Definitive National Agreement



Natural Disaster Hotspots: A Global Risk Analysis. World Bank, 2005

CIFDP Implementation

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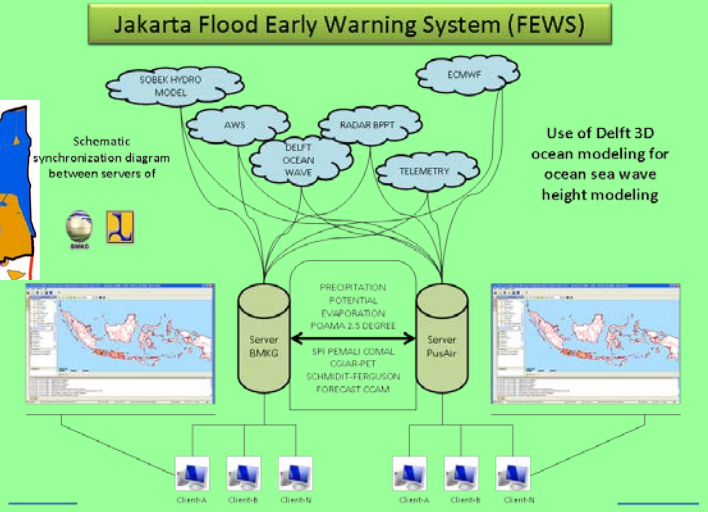
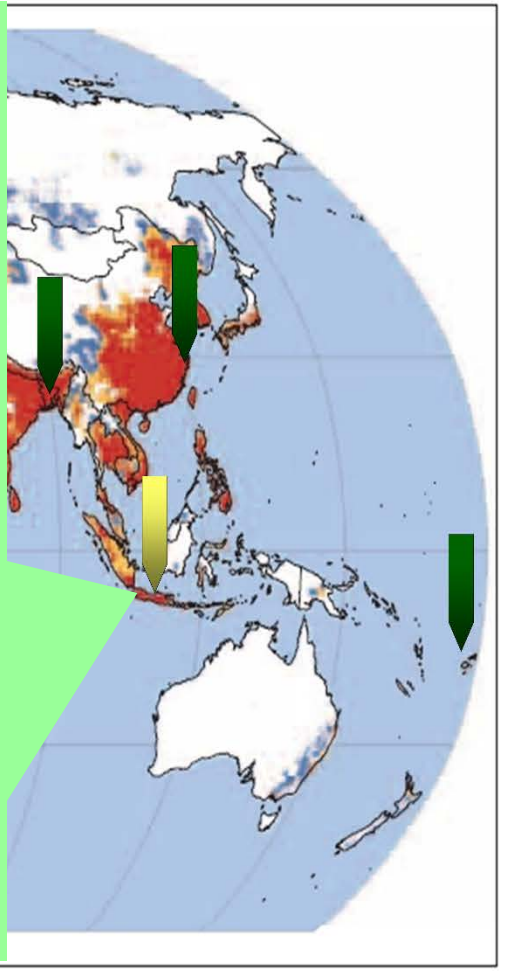
CIFDP-I (Indonesia): Phase 0/1

May'11 Initiated National Focus Group Discussion
Apr'13 Initial National Agreement / Request WMO to launch CIFDP-I
Dec'13 National Stakeholders Workshop – Phase 1

SLR: 1.00 cm/year with land subsidence





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System Design

	Bangladesh	Fiji
SSurge Model	JMA-MRI	TBD (MRI, Delft3DFM)
- Wave input	Fixed value (TBD)	Fixed value (TBD)
- Wind Input	Parametric - BMD	Parametric – FMS (RSMC Nadi)
- Ensembles	Desirable - testing	Desirable - testing
Bathymetry	Best Available - Navy	Best Available – Navy, SPC
Wave Model	N/A	BoM model boundary conditions; SWAN, XBeach
River Discharge	Real-time flow (FFWC)	River Discharge model (TBD)
Integrating System	Delft FEWS	Delft FEWS
DEM	Best Available – SOB (*2016)	Best Available – SRTM, Nadi basin
Tides	Constituents?	Aus or global model forecast
SSHA	N/A	BoM operational forecast

For more detailed information: Please refer to
CIFDP Implementation Plan (JCOMM Technical Report No.64)
Project web site: **http://www.jcomm.info/CIFDP**

The End

Photo courtesy of Don Resio