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Joint WMO-IOC Commission for Oceanography and Marine Meteorology (JCOMM) activities relevant to hazard risk

2015 Meeting of the Disaster Risk Reduction Focal Points of WMO Regional Associations, Technical Commissions and Programmes (DRR FP RA-TC-TP)

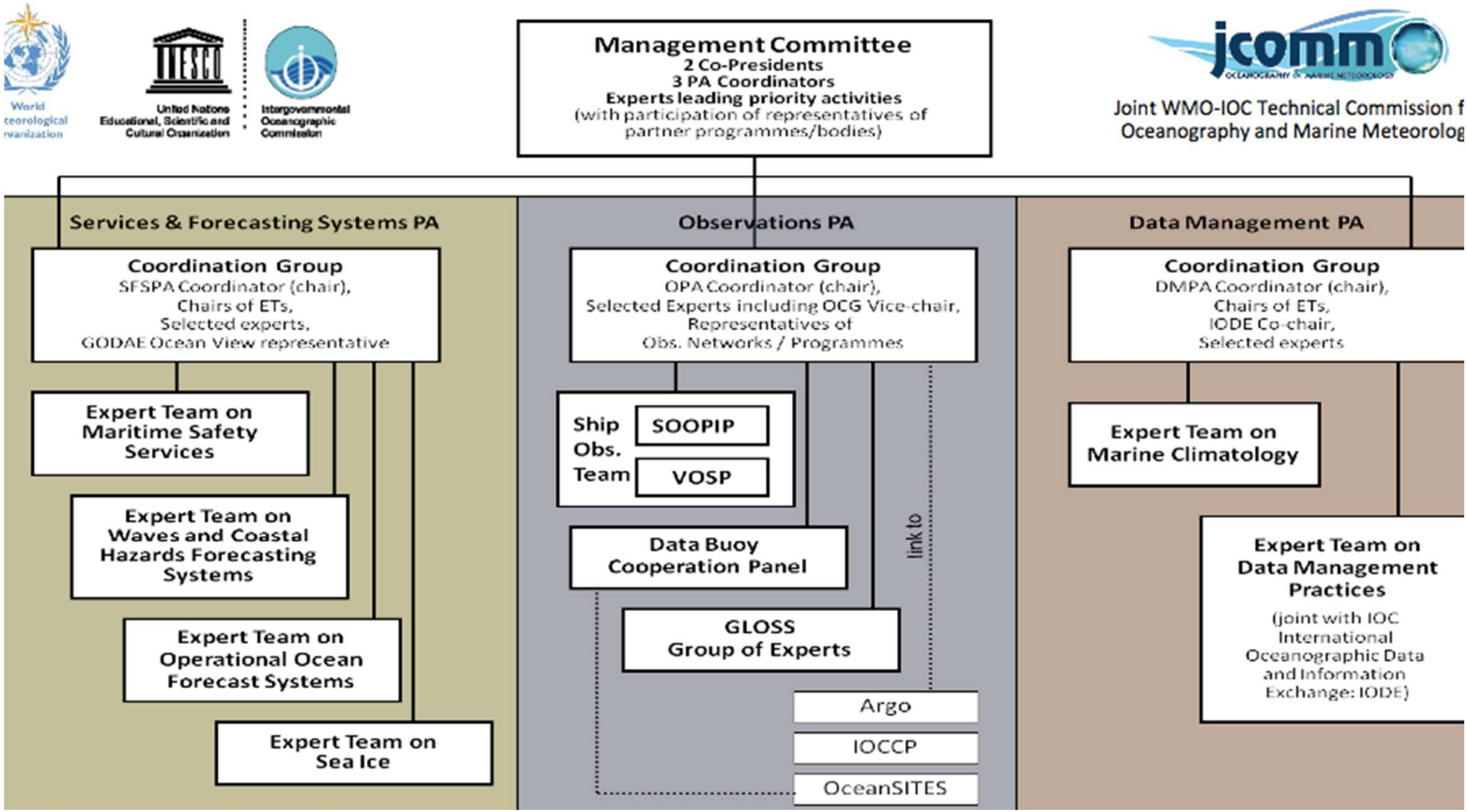
3-5 November 2015, Geneva

Prof. Kevin Horsburgh

Head, Institute for Sustainable Coasts and Oceans, National Oceanography Centre

Chair of the JCOMM Expert Team on Waves and Coastal Hazard (ETWCH) forecasting systems, DRR Focal Point of JCOMM and Co-Chair of the DRR FP RA-TC-TP

JCOMM structure



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Manuals, Guides and recommended practices relevant to Marine/Oceanic Hazards

Technical Regulations and Recommended Practices : **Directly under the purview of JCOMM**

- **WMO-No.558**: **Manual on Marine Meteorological Services**, Volume I
  - http://www.jcomm.info/558
  - to specify obligations of Members in the implementation of Marine Meteorological Services
  - to ensure uniformity in the practices and procedures
- **WMO-No. 471**: **Guide to Marine Meteorological Services**
  - http://www.jcomm.info/471
  - Supplementary to WMO-No.558
  - Guidance/recommended practices on the various marine meteorological services, including the usual services (marine climatology, weather bulletins for shipping and coastal storm warnings) and various new services over the past few years

Technical Regulations and Recommended Practices : **Directly under the purview of JCOMM**

- **WMO-No.702: Guide to Wave Analysis and Forecasting**
  - http://www.jcomm.info/WaveGuide
  - up-to-date information and guidance material on all aspects of the ocean-related activities of Members.
  - Under revision (targeting March 2016), including the development of dynamic part
- **WMO-No.1076: Guide to Storm Surge Forecasting**
  - http://www.jcomm.info/SSGuide
  - Relevant technical advice and guidance for the storm surge forecast services for a wide range of maritime and coastal activities
  - Dynamic part under continuous review

Technical Regulations and Recommended Practices : **Directly under the purview of JCOMM**

- **WMO-No.XXXX: Guide to Operational Ocean Forecasting**

  - Under development (targeting 2017)
  - Building on scientific development and best practices (e.g. Copernicus) of a number of Members / Member States for operation ocean forecasting services
  - Promotion of best practice amongst providers, document the products suites and points of contact for access as well as serve as a guide to new providers with an overview of the state of the art systems

Technical Regulations and Recommended Practices : **Directly under the purview of JCOMM with inter-agency coordination**

- **Joint IMO-IHO-WMO Manual on Maritime Safety Information**
  - In support of implementation of the Global Maritime Distress and Safety System (GMDSS), through marine weather information provision
  - Regular review and update to be approved by all three organizations
  - **Regulations on meteorological warning and forecasts, for SOLAS ships**
  - Cross-reference with WMO-No.558

Technical Regulations and Recommended Practices : **JCOMM Contribution for relevant parts**

- **WMO-No.8: Guide to Meteorological Instruments and Methods of Observation: (CIMO guide)**
  - Part II, Chapter 4: marine observations (largely physical parameters); Chapter 8: Satellite observations
    - **Regional Marine Instrument Centres**
- **WMO-No. 9: Weather Reporting**
  Volume D: Information for Shipping
  - Dynamic document (web-based), containing catalogues of marine meteorological/geophysical information:
    - **Global Maritime Distress and Safety System (GMDSS), cross-reference to WMO-No.558 & WMO-IMO-IHO Joint Manuals**
    - **Other info required for marine meteorological operations**

Technical Regulations and Recommended Practices : **JCOMM Contribution for relevant parts**

- **WMO-No.485: Manual on the Global Data-processing and Forecasting System**

- **WMO-No.305: Guide on the Global Data-Processing System (GDPS)**

  - Analysis and Forecasting for waves, surges, etc.
  - Future consideration on ocean forecasting (short-term to seasonal)

Technical Regulations and Recommended Practices : **JCOMM Contribution for relevant parts**

- **WMO-No.488: Guide to the Global Observing System**
  - JCOMM establishes requirements for marine GOS, marine/sea stations
  - Cross-reference with the WMO-No.471
- **WMO-No.781: Guide to the Applications of Marine Climatology**
  - Complementary to the Guide to Climatological Practices (WMO-No. 100)
  - reference book for standards used in the processing of marine climatological data
  - Diverse applications of marine climatological data in the service provision

(#10) Develop and update guidance documents

Expected Outcomes	• Revised Guide to Wave Analysis and Forecasting (WMO-No. 702) • Dynamic parts of wave and storm surge guides online • Contribute and review related Manuals and Guides • Promote the provision of improved sea state products
Key Activities	• Update Wave Guide, and dynamic parts of wave and surge Guides • Review guides and manuals of WMO and IOC, (e.g. GDPFS, RRR) • White paper hazardous seas information in GMDSS • Develop wave and surge model and data base questionnaires
Timeline/ milestones	• Wave and surge questionnaires (May'13); analyze (Dec'13) • Revised Wave Guide outline, with writing assignments (Jun'13) • White Paper on Hazardous Sea State Forecasting (Nov'13) • Update RRR and SoG (Jun'13) • Wave Workshop Proceedings available online (Oct'13)
Who	• ETWCH, ETMSS
JCOMM-4 decision:	• 5.2.4 (RRR & SoG update) • 8.2.2 (Proposals to include information on complex sea states) • Overall actions derived under item 10 (technical documents)

Coastal impacts and climate change

Warming Atmosphere and Oceans

Sea-level rise (0.3 – 0.8 m by 2100, IPCC AR5)	Increased vulnerability	Changes to weather systems and storms?

CHANGING RISK OF COASTAL IMPACTS

Susceptibility to a 1 in 100 yr coastal flood.

2008 OECD Study of 136 port cities with population > 1million (Nicholls et al., 2008).

Current climate: 40 million people and $3-trillion of property.

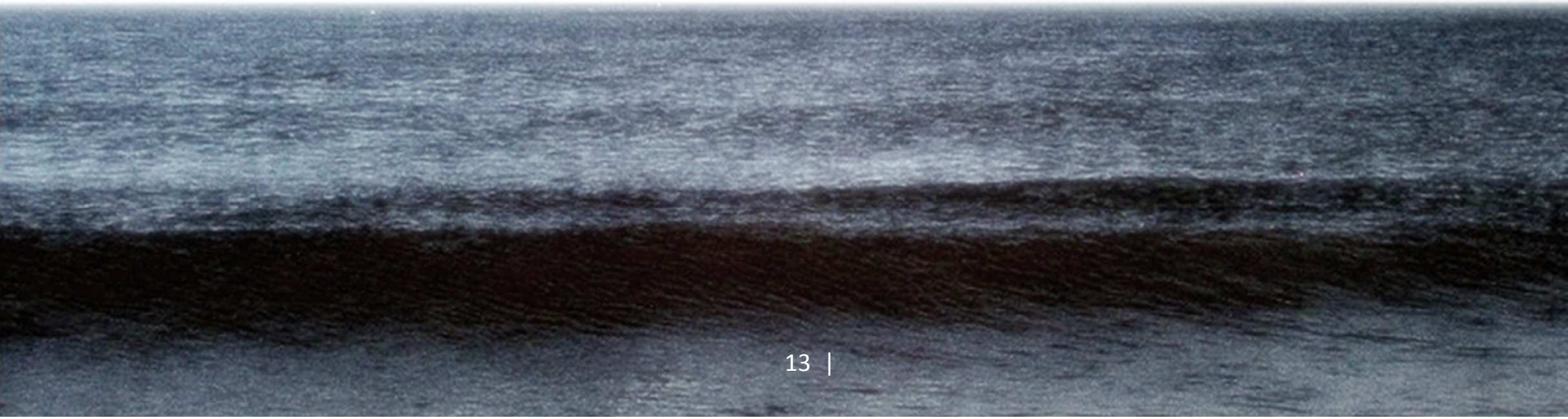
2070 Projected: 120 million and $35-trillion of property

COWCLIP Aims:

To generate global wave climate projections and aid comprehensive assessments of their cascading uncertainty by:

- Providing a systematic, community-based framework and infrastructure to support validation, intercomparison, documentation and data access for wave climate projections forced from CMIP5 datasets,
- To describe best practice for regional wave projections
- Engaging interests of the wind-wave community into wider climate community and ultimately moving to coupled wind-wave AOGCM models, enabling quantitative estimates of wave-driven feedbacks in coupled climate system.

Hemer, Wang, Weiss and Swail (2012) BAMS



(#13) Capacity Development

Expected Outcomes	• Support Capacity Development workshops • Publish the Guide for Ocean Forecast Systems
Key Activities	• Support TCP-JCOMM training workshops on wave and surge forecasting
Timeline/ milestones	• JCOMM-TCP Training Workshops on Storm Surge and Wave Forecasting • 8th - East Africa (Nairobi, Nov'12); 9th and 10th (TBD)
Who	• ETWCH, TCP, ETSI, COMET
JCOMM-4 decision:	• 8.1.11 (training) • 8.2.3 (continuing JCOMM-TCP workshop series) • 9.5 (workshop in Africa) • 9.9 (harmonized training responding to Members' / Member States' needs)

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HOME CONTACT US LIST OF TOPICS LINKS CLIMATE STATISTICS

Tropical Cyclone Programme

Programmes > WWW > TCP >

Hurricanes, Typhoons and Tropical Cyclones

Tropical Cyclone Forecaster Website (New)

First NCEP/UMD Waves Winter School

January 14 - 18, 2013, College Park, Maryland, USA

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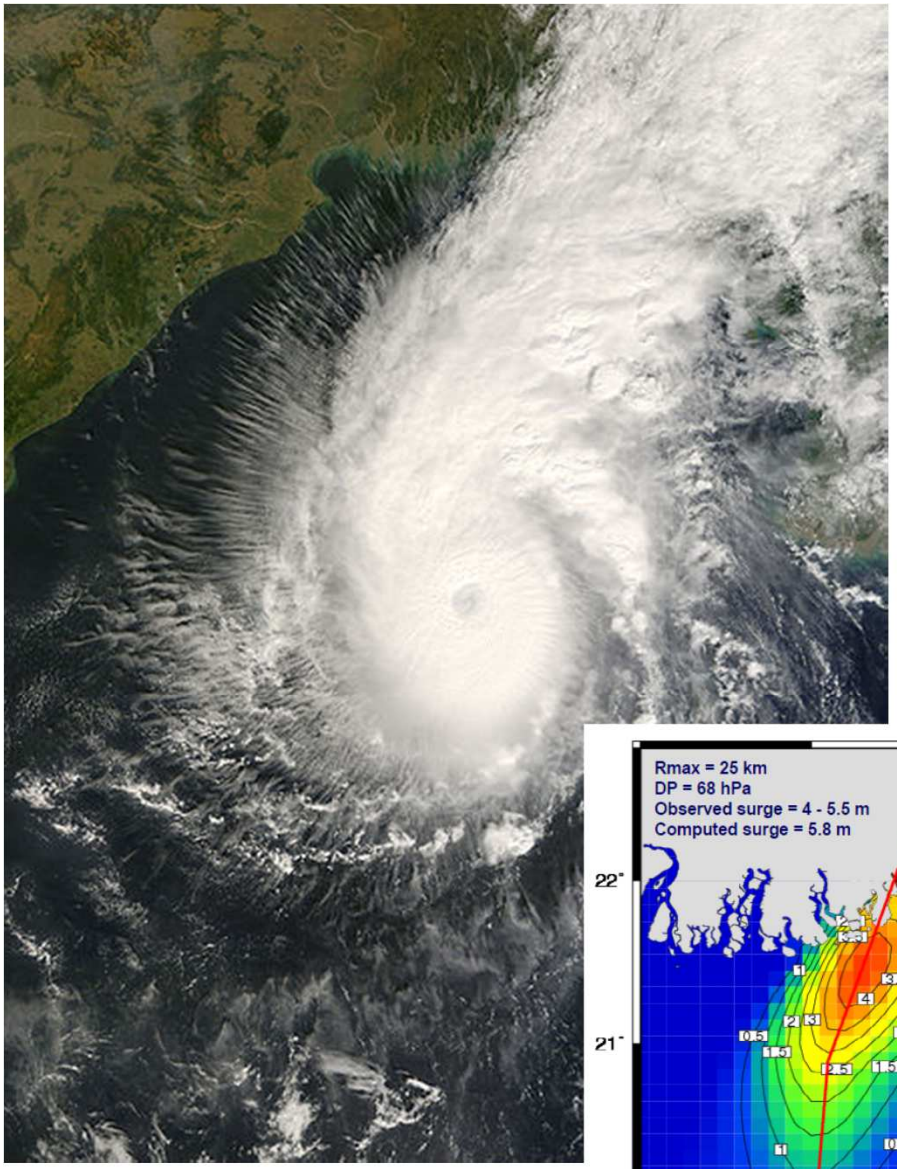
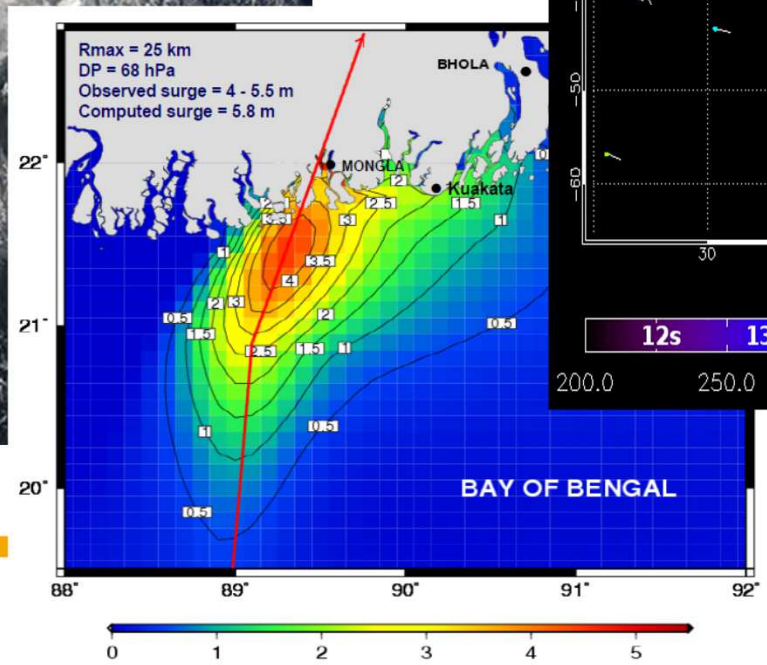
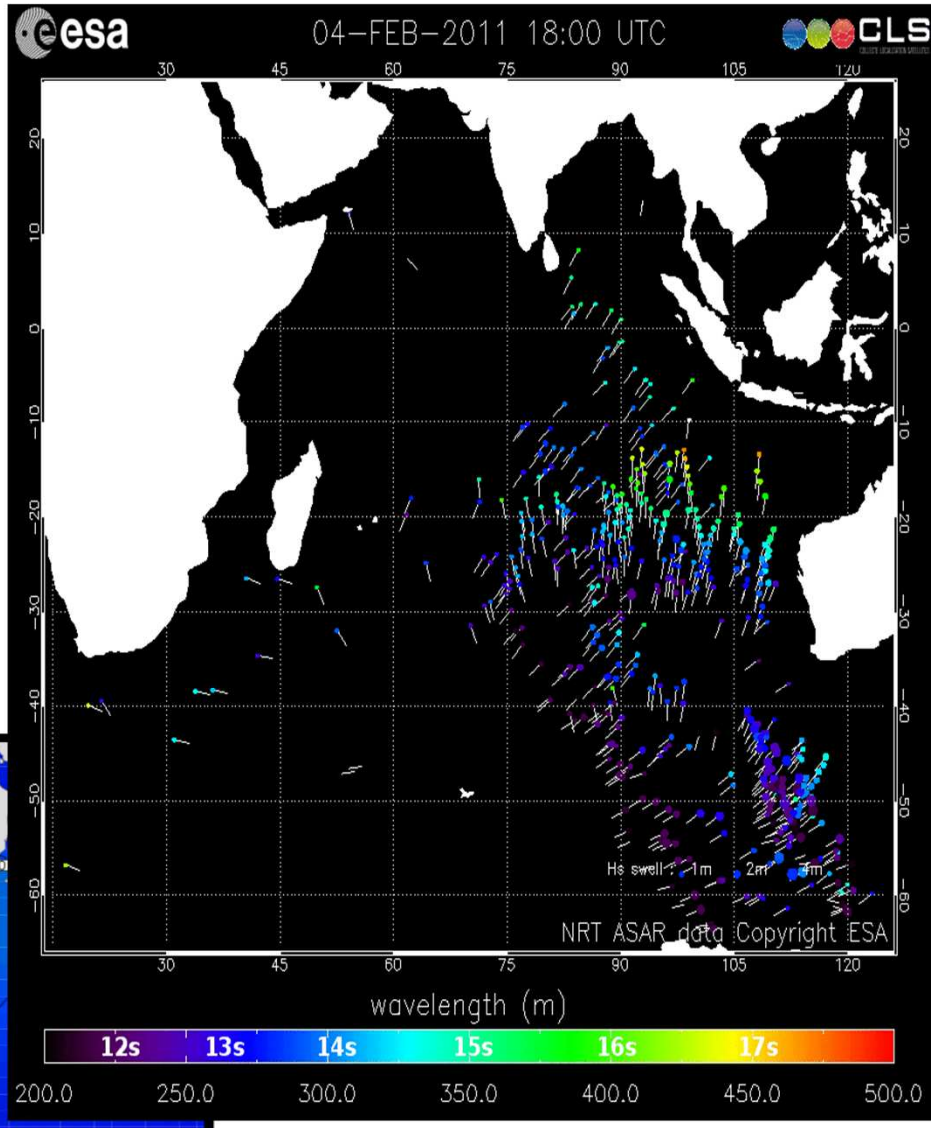
- **eSurge:** ESA DUE (Data User Element) Project for 2011-2014
- DUE runs user-driven projects to transfer research to applications
- eSurge Objectives:
  - *To contribute through Earth Observation to an integrated approach to storm surge, wave, sea- level and flood forecasting as part of a wider optimal strategy for building an improved forecast and warning capability for coastal inundation.*
  - *To increase the use of the advanced capabilities of ESA and other satellite data for Storm Surge applications*

Nowcasting destructive combinations of events



Cyclone SIDR



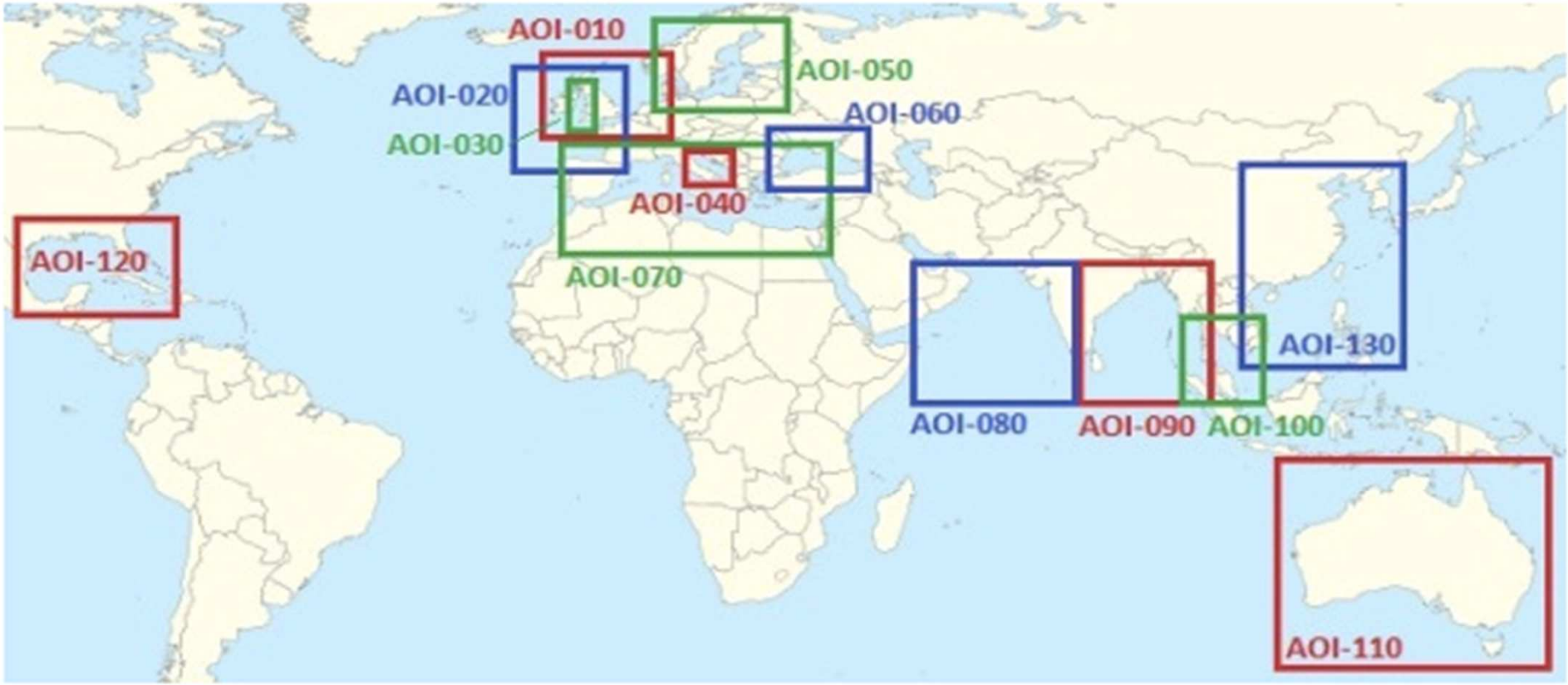


ASAR wave mode swell tracking

eSurge Data Access

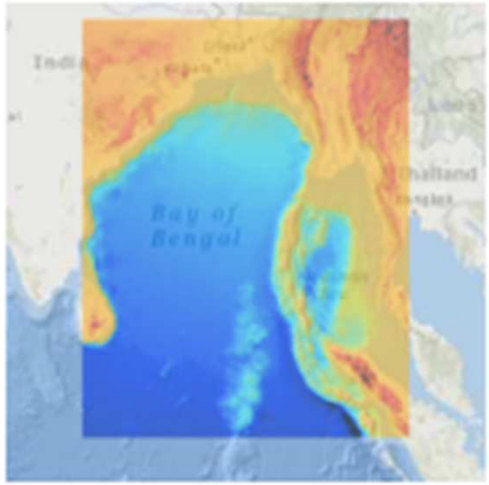
The eSurge database contains surge events (SEVs) grouped according to the area of interest (AOI) to which they are associated. To browse for an event, click on an AOI in the map below. A short presentation introducing the database is available here.

Please note: We are currently populating this database, so not all data sets are present yet. If the data you are looking for are not yet here please check back soon. To see how the complete database will look, see the examples of Cyclone Sidr (2007), Windstorm Xynthia (2010), Hurricane Katrina (2005), SE Ireland floods (2004), and Winter Storm Gudrun/Erwin (2005).



Surge Events in Database

Bay of Bengal.



This is the list of storm surge events in AOI_090 (Bay of Bengal) for which data are available in the eSurge database.

If you are interested in an event which does not appear in this list, please contact us to see it can be added.

Surge event	Nominal event date	Earliest data available	Latest data available
Cyclone Thane	30 Dec 2011	23 Dec 2011	3 Jan 2012
Cyclone Aila	25 May 2009	18 May 2009	29 May 2009
Cyclone Nargis	4 May 2008	27 Apr 2008	8 May 2008
Cyclone Sidr	15 Nov 2007	5 Nov 2007	20 Nov 2007

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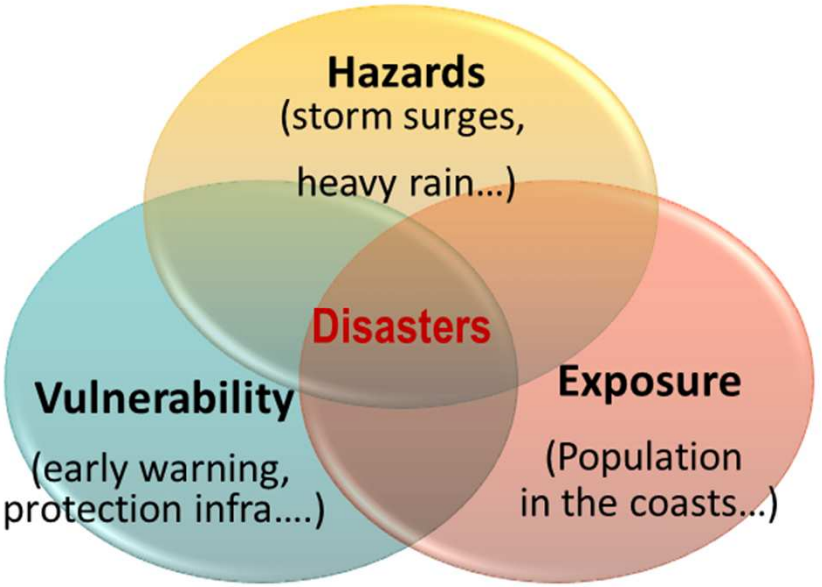
Coastal Inundation Forecasting Demonstration Project (CIFDP)

Exposure to coastal inundation is large and growing

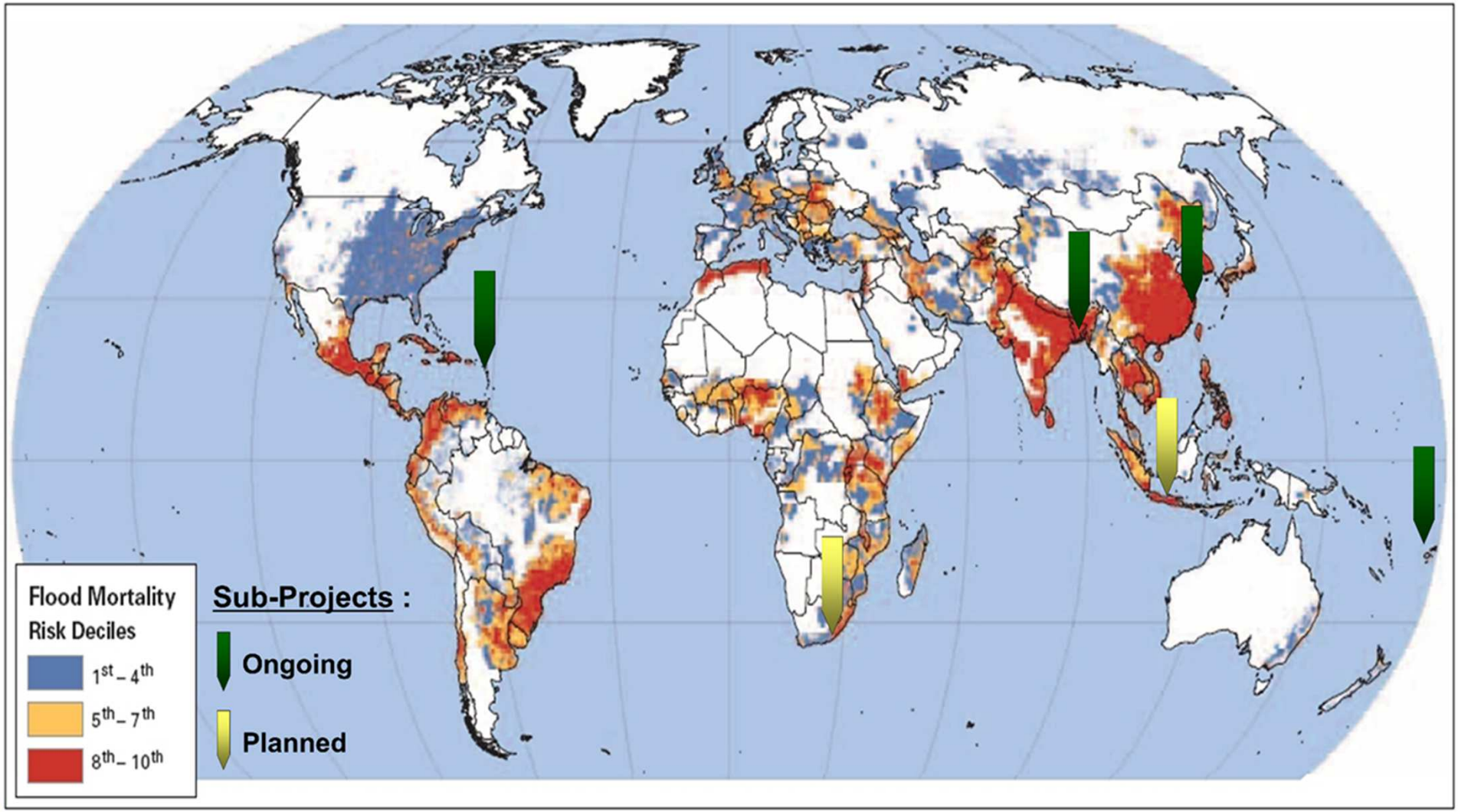
- Population is attracted to coasts by an abundance of local resources
  - Growing coastal population
  - Urbanising coastal zone
  - Tourism, recreation, retirement…
- In many parts of the world, the population is directly exposed to the coastal hazards and this will increase with Climate Change and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



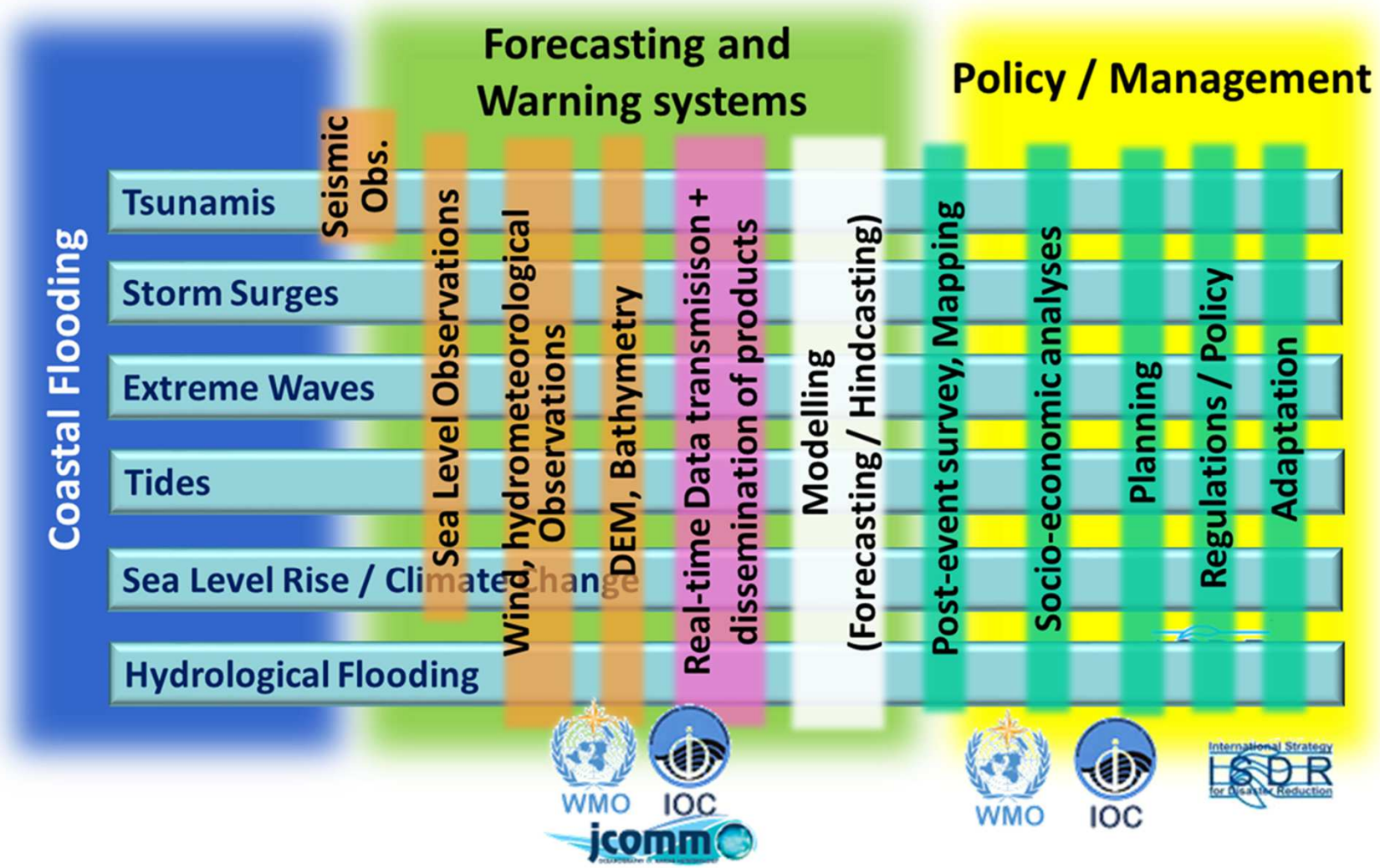
Disasters are more likely when Hazards and exposed population overlap with Vulnerability.

CIFDP Implementation (as of May 2013)

http://www.jcomm.info/CIFDP



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

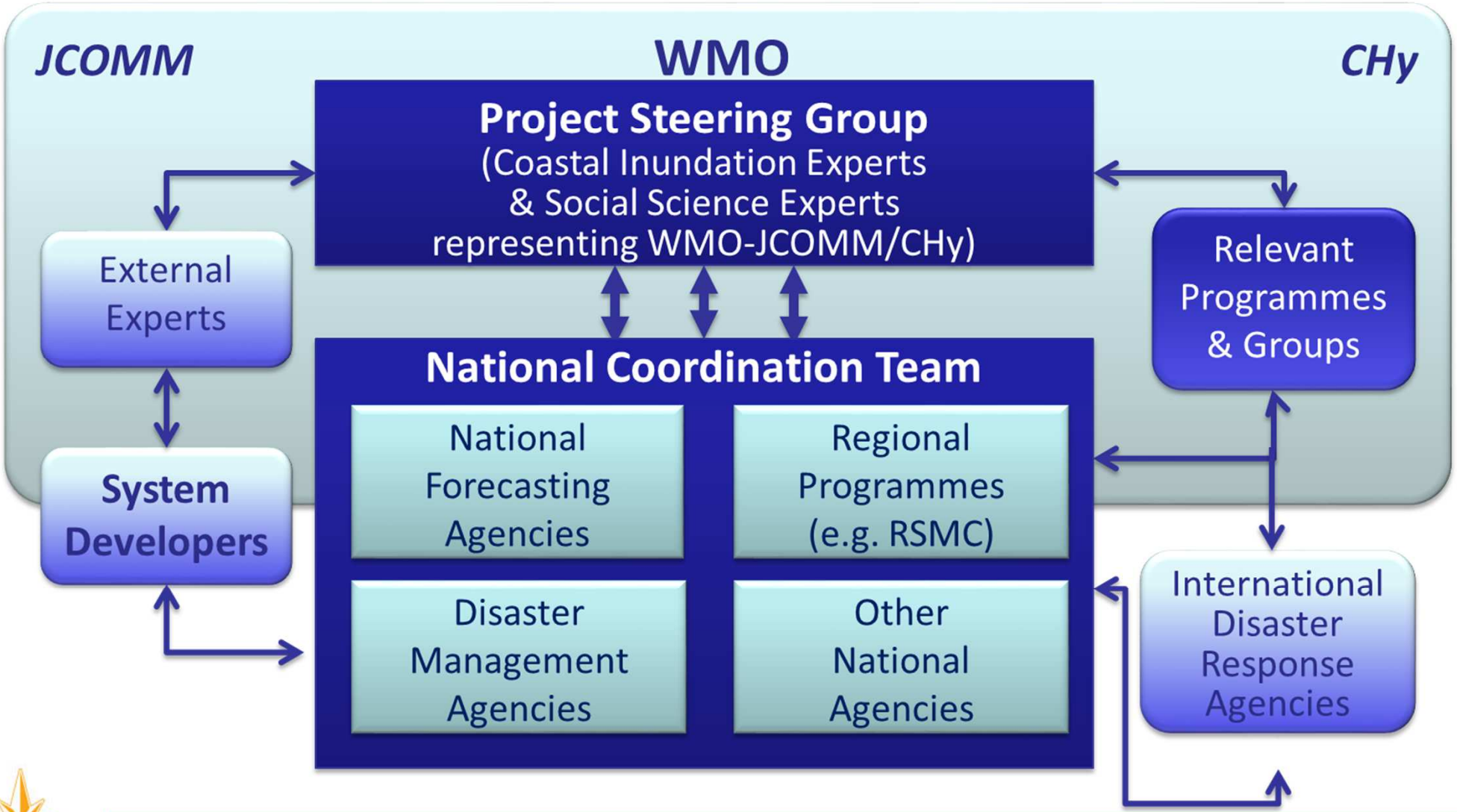
Strategy for CIFDP Implementation

- CIFDP is implemented through **national sub-projects**, launched for a country that meets the essential requirement: national agreement
- CIFDP sub-projects are designed based on **users' perspectives and requirements**, considering existing and available open source techniques. Final products of the Demonstration Project should be operated and maintained by national operational agencies which have the responsibility/authority for coastal inundation warnings;
- The procedures/best practices developed through sub-projects should be applicable to other (neighbouring) countries with common issues and interests, and should be closely linked to and cooperating with related projects and activities.

"Increased coordination and cooperation at national and regional levels for provision of meteorological, hydrological and climate information……" WMO DRR Work Plan

Key Players for CIFDP Implementation

http://www.jcomm.info/CIFDP



Technical Development for Coastal Inundation Forecasting/Warning