CIFDP PROJECT STEERING GROUP
Seventh Session
Geneva, Switzerland, 20 to 22 February 2017

WMO Hydrological activities related to CIFDP

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- Overview of WMO and its Hydrology and Water Resources Programme (HWRP)
- Flood Forecasting Initiative (FFI)
  - Review
  - Main tasks
- Decisions of the 15th session of the Commission for Hydrology affecting CIFDP
- The Flash Flood Guidance System (FFGS) riverine component
World Meteorological Organization
WMO

- Set up on 23 March 1950
- Successor to International Meteorological Organization (IMO, created in 1873)
- Specialized agency of the United Nations for meteorology (weather and climate), operational hydrology and related geophysical sciences
- UN system’s authoritative voice on the state and behaviour of the Earth’s atmosphere, its interaction with the oceans, the climate it produces and the resulting distribution of water resources
- Currently 185 Member States and 6 Territories
Purposes of WMO

- To promote and foster meteorology and hydrology and related geophysical sciences and to facilitate world-wide co-operation for the benefit of humankind in:
  - Networks for meteorological/hydrological and other geophysical observations
  - Standardization of observations and publications
  - Development of operational hydrology
  - Systems for processing and rapid exchange of data
  - Applications for socio-economic development, environment protection and policy formulation
  - Disaster prevention and mitigation
  - Research and training
WMO Technical Commissions

Technical Commissions are established by WMO’s Congress and are composed of technical experts designated by Members of the Organization to:

- Study and review advances in science and technology
- Develop technical regulations, guides and manuals
- Carry out matters relating to the planning, implementation and evaluation of the scientific and technical activities of the Organization
- Provide a forum for resolution of relevant scientific and technical issues
- Promote training and transfer of technology
- Meet once every four years
WMO Technical Commissions

**Basic Commissions**

- Commission for Basic Systems *(CBS)*
- Commission for Instruments and Methods of Observations *(CIMO)*
- Commission for Hydrology *(CHy)*
- Commission for Atmospheric Sciences *(CAS)*

**Applications Commissions**

- Commission for Aeronautical Meteorology *(CAeM)*
- Commission for Agricultural Meteorology *(CAgM)*
- Joint WMO/IOC technical Commission for Oceanography and Marine Meteorology *(JCOMM)*
- Commission for Climatology *(CCI)*
Role of WMO in the field of Hydrology and Water Resources

WMO Convention

Art: 2(e): "to promote activities in operational hydrology and close co-operation between Meteorological and Hydrological Services"

Hydrology and Water Resources Programme
Hydrology and Water Resources Programme - HWRP

The Programme is implemented through three mutually supporting components:

- Basic Systems in Hydrology (BSH)
- Hydrological Forecasting and Water Resources (HFWR)
- Capacity Building in Hydrology and Water Resources Management (CBHWR)
Hydrological Forecasting and Water Resources Activities

• WMO Flood Forecasting Initiative
  – Advisory Group
  – Global Flash Flood Guidance System
  – Coastal Inundation Forecasting Demonstration Project
  – Severe Weather Demonstration Project

• Associated Programme on Flood Management (GWP & WMO)

• Integrated Drought Management Programme – (GWP & WMO)
History of the WMO FFI

World Meteorological Congress XVI (Cg-16) passed in 2011 Resolution 15 (Res. 15 Cg-16) establishing the WMO Flood Forecasting Initiative –Advisory Group (FFI-AG) with the objective to:

- provide guidance and advice on the hydrological forecasting elements of a number of flood-related initiatives and programmes in progress under WMO programmes
- provide broad-based support to improve collaboration between the meteorological and hydrological communities for improved flood forecasting related practices.
WMO Flood Forecasting Initiative
Strategy & Action Plan (SAP) reviewed

1. Prioritize the SAP actions so that the highest priority actions reflect short to medium range flood forecasting system development. Develop generic list of requirements/best practices of flood forecasting with taking into account of high priority actions.

2. Prioritize the SAP actions so that the highest priority actions reflect flood forecasting system development (and not data rescue issues, flood design calculations etc.). Take into account of these actions in further FFI documentation (e.g. generic list of requirements/best practices of flood forecasting).

3. Ensure that all major demonstrations projects and components, including but not limited to CIFDP, SWFDP, FFGS, include the requirements for effective and sustainable flood forecasting in their design and implementation (according to generic list of requirements).

(continues)
4. Avoid such terminological complexity in the further FFI guidance documentation (e.g. generic list of requirements/best practices).

5. Develop new FFI implementation strategy based on the Demonstration projects and other FFI components implementation, guidance material development for different audiences (NMHSs, donors, NGOs etc.), development of training programs and effectively promote them so that they are available for the target audience (via IFM HelpDesk).
## Coastal Inundation Forecast Demonstration Project (CIFDP)

### Recommendation

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<tr>
<th>Recommendation</th>
<th>Possible action / expected result</th>
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<tbody>
<tr>
<td>a) Guidance material for river – ocean models coupling</td>
<td>Collect guidance material on how to unite 3 systems - sea, river and atmospheric modelling- get examples, assess functional needs – what functionality is really needed; pragmatic approaches to do so given different data availability conditions (may serve as a basis for further WMO guidance - in the moment there is no WMO documents on this problem); Guidance material in coastal forecasting (river-ocean-atmospheric coupled model)</td>
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## Coastal Inundation Forecast Demonstration Project (CIFDP)

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<td>b) Assess NHSs capabilities (data, models, capacity, etc)</td>
<td>Prepare template for collecting information on state of NHS in terms of data availability in the river coastal area (stream gauges, observations, existing models, capacity, historical data, etc.) for estimation NHSs capacity in terms of river forecasting in river’s endpoint</td>
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<td></td>
<td>Capacity of NHS in terms of riverine forecasting capabilities, forecast model defined (if not yet there)</td>
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## Coastal Inundation Forecast Demonstration Project (CIFDP)

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<td>c) Show added value if river and ocean components are coupled</td>
<td>Prepare cases for NHSs (e.g. backwater) to increase their involvement in the subprojects</td>
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<tr>
<td>d) System developer identified (for hydrological component), subproject plans include riverine forecasting</td>
<td>Build connectivity between NHSs and RSMCs</td>
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<tr>
<td>e) Donor support for riverine forecast in the coastal area, and coupling</td>
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Overall direction

1. Prioritize the SAP actions, so that top priority goes to:
   - actions for short- to-medium term forecasts;
   - actions for E2E flood forecasting system development;

2. Use high priority actions and recommendations in further FFI documentation (generic list of requirements, self assessment of end-to-end flood forecasting capabilities, guidance material etc.)

(continues)
Overall direction

3. Adjust SAP implementation strategy:
   – make sure FFI components include requirements;
   – Develop guidance material for different audiences;
   – Develop and promote training material;

4. SAP Activity plan:
   – Ineffective document;
   – Use its information in further FFI documents;
FFI main Tasks (2016-2019)

Preamble: The Flood Forecasting Initiative (FFI) is a framework to promote the enhancement of flood forecasting capabilities of National Meteorological and Hydrological Services (NMHSs).

• **Task 1:** by ensuring that all major demo projects and components, including but not limited to CIFDP, SWFDP, FFGS, include the requirements/best practices for effective and sustainable flood forecasting in their design and implementation;

• **Task 2:** by ensuring guidance material is available for NMHSs and for donors, NGOs, and other organizations working to strengthen flood forecasting capabilities in national services;

• **Task 3:** by facilitating the development of an inventory of existing training programmes and related reference materials across the entire spectrum of training needs for E2E systems for flood forecasting, identifying weaknesses/gaps, and recommending development of additional materials to overcome weaknesses/fill gaps;

• **Task 4:** by ensuring access to guidance material and training through the IFM HelpDesk.
WMO Flood Forecasting Initiative

- FFGS CIFDP SWFDP
- Requirements/best practices for effective and sustainable flood forecasting
- Implementation support

WMO Flood Forecasting Initiative

- FFI Advisory Group (work plan 2016-2019)
- Task team/Work group
  - CHy AWG members
  - OPACHE

E2E EWS for Flood Forecasting Community of practice

- Evaluation of National capabilities
- Guidance material
- Platforms & models
- Training programs
- Project implementation

Members

HelpDesk

WMO OMM
End-to-end Early Warning Systems (E2E EWS) for Flood Forecasting

E2E EWS for Flood Forecasting - Community of Practice

- EVALUATION OF NATIONAL CAPABILITIES
- GUIDANCE MATERIAL
- INTEROPERABLE PLATFORM AND MODELS
- TRAINING PROGRAMS
- PROJECT IMPLEMENTATION
The Flash Flood Guidance System with global coverage consists of eight regional FFGSs in different stages of development and operational use. Four systems are operational, initial versions were implemented for four, and one is under development.
FFGS Forecaster Console

- **Time Interval**
- **Products, Date and Time Selection Toolbar**
- **Surface Met. Observations**
- **Snow Products**
- **Products Dsc. & System Monitoring Toolbars**
- **FFGS Products**
Dashboard is designed to monitor server processes:

- 1) Quick-look;
- 2) Real-Time data downloads and inventory status;
- 3) Real-Time Data processing status;
- 4) Computational server status; and
- 5) Dissemination server status.
FFGS Products

- Flash Flood Guidance for Black Sea and Middle East FFGS.
- GHE Satellite precipitation for Southern Africa Region FFGS.
- Average Soil Moisture for South East Europe FFGS.
- Flash Flood Threat for Central America FFGS.
- Snow Water Equivalent (SWE) for Turkey.
- Forecast Mean Aereal Precipitation for Black Sea and Middle East FFGS.
FFGS Advances

- Multi-NWP Model ingestion
- Urban Flash Flood Early Warning System
- Landslide Susceptibility Mapping
- Expandable and Scalable Riverine Routing (Riverine Forecasting)

**C.1 Susceptibility Mapping**

**Example Simulation Products**
CIFDP Modelling Framework
CHY-15 Outcomes for CIFDP
The Commission discussed the possible future of such integrated approaches in coastal areas given that the CIFDP was presently limited to four demonstration projects, and it was recognized that additional countries could receive benefits from adopting a similar approach, particularly Small Island Developing States (SIDS), as several are vulnerable to coastal inundation.

The Commission noted the advances that had been made in the projects and noted that additional efforts would be needed to advance the multidisciplinary approach and concepts into national practices.
CHY-15 Outcomes for CIFDP

• The Commission discussed the transitioning of the demonstration phase to one of operational nature that would allow more countries to benefit from what has been attained through the CIFDP, and recorded its decision in draft Resolution 4.2(1)/2 (CHy-15).

• The Commission was informed that Cg-17 had noted its continued support for CIFDP and its four demonstration projects, which are to be completed by Cg-18. The Commission expressed its appreciation to Messrs Simonov and Smart for their contributions on behalf of CHy, but noted that a higher number of CHy representatives were needed to address all relevant hydrological issues properly.
CHY-15 Outcomes for CIFDP

Resolution 4.2(1)/2 (CHy-15) THE FLOOD FORECASTING INITIATIVE AND CHY’S CONTRIBUTION TO THE DISASTER RISK MANAGEMENT PROGRAMME

Requests the president of CHy, with the assistance of the appropriate members of the AWG and OPACHE experts:

- To coordinate with the president of JCOMM a joint assessment of the initial phase of CIFDP and, depending on its results, to consider the desirability of developing a governance structure and procedures that would transition the CIFDP to a more sustainable platform for the strengthening of national multi-hazard early warning systems to address flooding in coastal areas;
CHY Structure

Coordination and Implementation Support
President, vice-president, 1 AWG member
WIS/WIGOS, GFCS, GDPFS, RAs, ETR …..

Measurement, Monitoring, and Infosystems

Hydrological Applications, Products and Services
FFI (CIFDP, FFGS, SWFDP, …)

Activities Supported by Secretariat
Activities supported by Sec. with help from OPACHEs

CHy Member Activities
Activities requiring leadership by Members
CHy-15 Decisions of relevance to CIFDP

At its 15th session in December 2016, the Commission of Hydrology adopted its future program of work (Annex 1 to Resolution 8), including FFI:

**Item 1.4 (f)**

FFI: ensure that all major projects under FFI (CIFDP, FFGS, SWFDP) include the requirements and reflect best practices for effective and sustainable flood forecasting, including urban areas, consistent with the FFI-AG Work Plan of 2016-2019.

Co-chair the Project Steering Group (PSG) of CIFDP, participate in CIFDP sub-projects, coordinate closely with OPACHE member(s) participating in CIFDP and similarly contribute to the SWFDP and other projects/activities, ensuring improved flood forecasting early warning systems;

(continues)
CHy-15 Decisions of relevance to CIFDP

**Item 1.4(e):**  
Implementation Strategy for the End-to-End Early Warning Systems (E2E EWS) for flood forecasting (using the Community of Practice approach):

- develop assessment guidelines for NHSs to evaluate their E2E EWS for flood forecasting, furthering the earlier work on “Efficiency of flood forecasting services” (including testing developed procedures) possibly through the establishment of a Task Team/Working Group, consistent with the FFI-AG Work Plan of 2016-2019;

- develop access to the interoperable technologies including platforms and models for use in flood forecasting;

- provide access to training and guidance material, in conjunction with item 1.4(g) [*i.e. through the HelpDesk on IFM*], on the aforementioned items; and

- assist in the development of projects;
Thank you
Merci