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Global Flood Partnership

Partnering for global flood forecasting, monitoring and impact assessment to strengthen preparedness and response and to reduce disaster losses

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Abstract

The meeting of the Senior Officials of the Carnegie Group countries, the United Nations and the World Bank, organised by the JRC in December 2012, concluded that a new international impetus was needed to which the EU, the Carnegie Group countries and international organisations such as the United Nations and the World Bank, can contribute coherently in order to maximize the impact for citizens worldwide. One of the areas identified at the meeting where an international impetus can provide added value was *partnerships in strategic areas for better efficiency*. It was suggested that this could encompass a Global Multi-Hazard Partnership that builds upon international initiatives, regional networks and national mechanisms. As a concrete step in this direction a Global Flood Partnership is proposed. The overall objective of the Partnership is the development of flood observational and modelling infrastructure, leveraging on existing initiatives for better predicting and managing flood disaster impacts and flood risk globally. The Partnership shall achieve this through bringing together the scientific community, service providers (satellite and weather), national flood and emergency management authorities, humanitarian organisations and donors to provide operational, globally-applicable flood forecasting and monitoring tools and services, complementary to national capabilities. The Partnership aims to strengthen the sharing of hydro-meteorological data and information, foster in-country capacity building and improve flood risk management models and products.

1 Introduction

In terms of human impact, frequency and economic loss, floods are amongst the biggest natural disasters worldwide. Climate change, population increase, urbanization and land use changes continue to increase their effects globally especially in coastal cities. Without adequate warning and preparation, recovery from future floods events is expected to become more costly and prolonged than need be.

In Europe, it has been estimated that hydro-meteorological information and early warning systems save hundreds of lives and avoid between 460 million and 2.7 billion Euros of disaster losses per year (World Bank, 2012).The potential for similar benefits for developing and less developed countries is estimated to be between 4 and 36 billion USD per year. However, not all nations, especially in developing and less developed countries, have adequate national flood monitoring and forecasting systems in place: these are expensive to set up and maintain, require specific hydrological knowledge, institutional setting as well as training and, in the case of international rivers, require collaboration between countries.

With increased availability of *in-situ* and remote sensing data, and new generations of weather and flood forecasting models, building global flood forecasting and monitoring systems is now feasible. Several prototype systems have already been developed. Such systems are able to provide information useful for operational response and flood risk management. They can be coupled as well with regional, advanced lead-time, prediction systems that may be in part based on international weather models and data products.

However, although reliable international predictive capacity has been demonstrated, it is implementation that is lacking. The international community can foster in-country capacity building in developing and less developed countries through sharing technological know-how. It can also build upon existing expensive components of early warning systems (e.g. earth observation and global weather forecasts) to provide satellite- and model-based monitoring and prediction systems that deliver a common infrastructure for regional systems to build upon, and thereby develop common objective standards and goals for improved flood forecasting and monitoring. In addition,

and critically, *international humanitarian organizations* also stand to benefit from the best-available tools to adequately prepare and respond to disasters in those situations where flood events overwhelm in-country capabilities. Both improved in-country capacity and the global infrastructure are thus necessary.

The meeting of the Senior Officials of the Carnegie Group countries, the United Nations and the World Bank, organised by the JRC in December 2012, concluded that a new international impetus was needed to which the EU, the Carnegie Group countries and international organisations such as the United Nations and the World Bank, can contribute coherently in order to maximize the impact for citizens worldwide. One of the areas identified at the meeting where an international impetus can provide added value was *partnerships in strategic areas for better efficiency*. It was suggested that this could encompass a Global Multi-Hazard Partnership that builds upon international initiatives, regional networks and national mechanisms. As a concrete step in this direction a Global Flood Partnership is proposed. The Partnership would bring together the scientific community, service providers (satellite and weather), national flood and emergency management authorities, humanitarian organisations and donors to provide operational, globally-applicable flood forecasting and monitoring tools and services, complementary to national capabilities, for better predicting and managing flood disaster impacts and flood risk. The Partnership would also strengthen the sharing of hydro-meteorological data and information, foster in-country capacity building and improve flood risk management models and products.

2 Background

Under the leadership of the Joint Research Centre (JRC) and with the close collaboration of the Dartmouth Flood Observatory, key personnel from the international scientific community have met over the past 3 years to discuss global flood forecasting and monitoring systems within the framework of the Global Flood Working Group. During this period, the working group extended their dialogue to include international response organizations (including European Commission ECHO, World Bank Global Facility for Disaster Risk Reduction-GFDRR, United Nations World Food Programme-WFP and Office for Coordination of Humanitarian Affairs-OCHA, and International Federation of the Red Cross-IFRC), national flood authorities (e.g., Brazil and Namibia) as well as meteorological authorities (including World Meteorological Organisation-WMO and European Centre for Medium-Range Weather Forecasts-ECMWF), and other public and private stakeholders in flood management (including reinsurance and the commercial space industry).

Drawing upon the recommendations of the meeting of the Senior Officials of the Carnegie Group countries, the United Nations and the World Bank, organised by the JRC in December 2012, the Global Flood Working Group concluded in their annual meeting in Washington, DC[1] 2013, that *dialogue must be turned into action* to start building global flood forecasting and monitoring systems. The participants agreed that this can be accomplished by means of a Global Flood Partnership.

[1] http://portal.gdacs.org/globalfloods2013.aspx

3 The 'Global Flood Partnership

3.1 Concept and Vision

In response to one of the key conclusions on growing challenges in disaster risk management and the need for joint and coherent action, highlighted at the meeting of the Senior Officials of the Carnegie Group countries, the United Nations and the World Bank, organised by the JRC in December 2012, the JRC together with several stakeholders propose establishing a Global Flood Partnership. The Partnership would be established to strengthen preparedness and response to floods at global and national levels with the ultimate aim to reduce disaster losses. The Partnership would build bridges across international and regional initiatives and national mechanisms to bring together the scientific community, service providers (satellite and weather), national flood and emergency management authorities, humanitarian organisations and donors to provide operational, globally-applicable flood forecasting and monitoring tools and services, complementary to national capabilities, for better predicting and managing flood disaster impacts and flood risk. The Partnership would also strengthen the sharing of hydro-meteorological data and information, foster in-country capacity building and improve flood risk management models and products.

The vision of the Global Flood Partnership can be summarised as follows.

- Scientific organisations that have developed the technological capabilities contribute with their research results (including data processing algorithms, new observational methods, etc.), and they provide the data and technical know-how needed for operational implementation.
- Beneficiaries/end-users contribute with feedback to improve tools and make them fit for use. They also contribute with local or global flood monitoring expertise, e.g. sharing assessments of on-going floods with the partnership according to common standards.
- Donors contribute with political support needed to translate demonstrated capability (e.g. some pilot projects already under way) into operational reality, with community-vetted data products that are subject to technical peer review and continued improvements.

3.2 Main Components

The Global Flood Partnership is composed of the following five main components:

- Global Flood Toolbox: A toolbox of open data, services and models for supporting flood risk mapping and assessment (now and under changing climate), early warning and impact analysis, complements by training programs
- Global Flood Observatory: Provides operational global flood forecasting and monitoring services, including a group of experts providing up to 30 day flood forecasts and impact analysis for major floods
- Global Historical Flood Record: Develops and maintains a global flood hazard and loss record according to international standards
- Global Flood Training and Capacity Building Program: Provides training modules for flood monitoring capacity building and maintenance in developing countries and international organizations, which can be integrated in existing training programs of major development banks and agencies
- Global Flood User Forum: holds regular meetings between all partners in focused workshops to ensure that user needs are driving innovation and development.

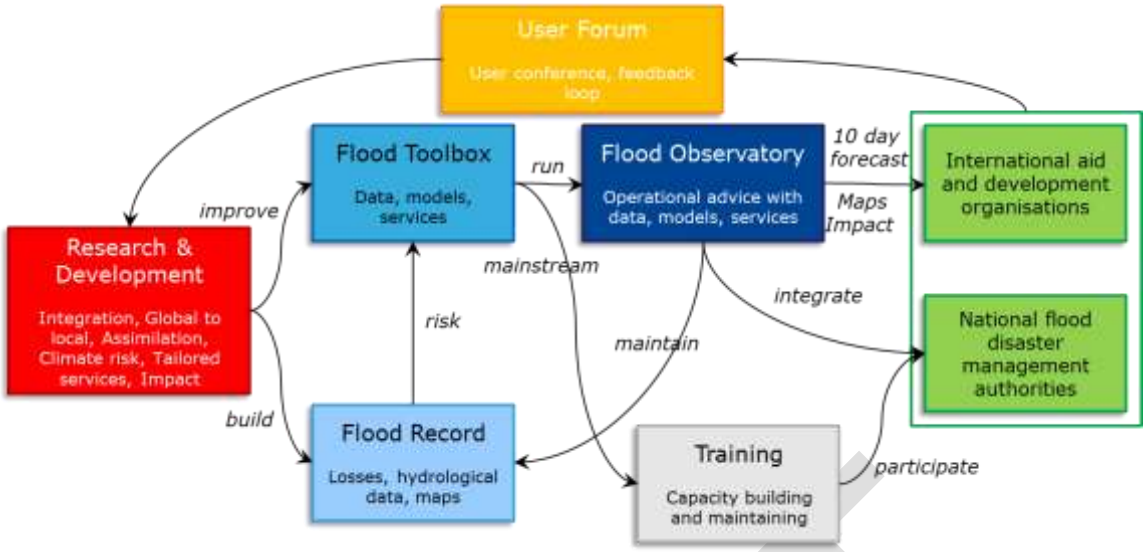


Figure 1. Overview of the core components in the Global Flood Partnership and their links. Blue: core deliverables (Flood Toolbox, Flood Observatory and Flood Record), Red: research program driving innovation; Grey: training program facilitating adoption and capacity building; Green: beneficiaries: both international and national stakeholders; Orange: User forum driving innovation.

3.3 Description of Main Components

Current research shows that it is feasible to develop flood forecasting and flood observation systems at global level that can provide information sufficiently accurate and timely to be used by national and international disaster management services. These services are based on an extensive constellation of orbital remote sensing satellites (e.g. NASA's Terra, Aqua, Suomi, Landsat-8, and Global Precipitation Mission; ESA's Sentinels 1 and 2, the Japanese Space Agency's GCOM-w, and many others) and also on a new generation of global hydrological or flood advice models and systems (e.g. JRC's GloFAS, UMD's Global Flood Monitoring System). Because of their global or large-region scope, these observational and modelling outcomes can provide flood advice and flood mapping results directly to end-users, and also constitute critical data infrastructure for more specific and customized in-country applications.

The overall objective of the Partnership is the development of flood observational and modelling infrastructure, leveraging on existing initiatives for better predicting and managing flood disaster impacts and flood risk.

Such infrastructure can provide a resource in the area of flood forecasting and response similar to that which the international network of reporting seismographic instruments already provides to the earthquake hazard community.

To accompany this data and modelling infrastructure, the Global Flood Partnership will create and distribute, through its research and development partners, a collection of open source software and services, further referred to as the Flood Toolbox. The tools include code, models and software to process satellite and/or weather data into flood-related information; web services that provide processed data in interoperable formats; web-based applications that provide information services; and a wide range of interoperable open-source flood hazard and risk modelling tools. The data (from raw to processed) can be integrated at various points in national systems, depending on the needs. This may be achieved in some cases through enriching the existing capacity building and training programs on this topic.

The Global Flood Partnership will not fund research and development, but will aim at using and aligning existing research funding programmes to support coordinated research and development of flood monitoring and modelling systems aimed at global scale initially. A global dialogue on research priorities in this field will be supported by the Global Flood Partnership.

As noted, and as the infrastructure core, the Global Flood Partnership intends to establish and operate, through its operational partners, a Global Flood Observatory with operational forecasting, monitoring and impact assessment capabilities for the entire globe. This will be accomplished by pooling resources of existing monitoring and forecasting organisations around the world (e.g. international response organizations, including the European Emergency Response Coordination Centre, WMO, Dartmouth Flood Observatory, the JRC/ECMWF Global Flood Awareness System, the JRC/GDACS Global Flood Detection System, and others). Using the developed tools, the Global Flood Partnership Flood Observatory will provide – at first in experimental mode but gradually in operational mode – operational advice to international and interested national organizations. Experience from the operational use will be discussed in the Global Flood User Forum and feed back to research and development partners to continuously improve the partnerships' products and services.

The Global Flood Observatory will also keep a Global Flood Record up to date, cataloguing floods and their consequences in a scientific way with appropriate accuracy to enable the development of better hazard and risk models and to inform global and national disaster risk reduction policies. The flood record is intended in a comprehensive way from physical processes (flood footprints and timelines), to damage and loss records (human impact, direct and indirect losses) as well as metrics based on reference scenarios to assess the severity of each flood event.

The Flood Toolbox, the Global Flood Observatory, and the Flood Record are the core deliverables of the partnership. They are supported by a synergistic research agenda: improving the flood tool kit, building the flood record, new algorithm development for all operational tools). A training component will develop common training material that can be used by partners to ensure mainstreaming of the flood toolbox and participation of national partners facilitating adoption and capacity building. International beneficiaries may utilise high level analytical products of the Global Flood Observatory, while national beneficiaries may be more interested in using raw or intermediate products to integrate in their own analytical processes. The beneficiaries of tools and information are essential in driving innovation and setting research priorities.

The Global Flood Partnership strongly encourages a free and open data policy. Within the partnership, members should be sharing data free of charge or for handling fees to serve the objectives of the Partnership to the fullest extent possible[2]. Derived products resulting from the flood partnership activities should be allowed to be re-distributed with or without modifications also to the public.

It can be envisaged to restrict full access to real time data and products to decision makers in case of upcoming disasters to avoid conflicting information to the public during crisis management. All data should be made accessible to the public after the event.

[2] Where the open dissemination of GFP data or products conflicts with international agreements or the protection of intellectual property rights attached to data and information used as inputs in the production processes of GFP data, exceptions to the free and open data policy can be made.

4 Partnership stakeholders

4.1 Context of the partnership

The Global Flood Partnership aims to be complementary to existing efforts through building bridges across international, regional and national initiatives and mechanisms. To avoid overlap and to ensure objectives address the needs, the Global Flood Partnership shall encompass the following core stakeholders and initiatives:

- The Dartmouth Flood Observatory (University of Colorado), the Global Flood Detection System (University of Maryland), and the Global Flood Monitoring project within the Deltares Institute (the Netherlands).
- The World Bank Global Facility for Disaster Reduction and Recovery (GFDRR), which is supporting the creation of a Global Flood Partnership to improve the understanding, management and reduction of flood risk in developing and less developed countries.
- Parties or groups within international humanitarian assistance remits, including the World Food Program (WFP), International Federation of the Red Cross /Red Crescent (IFRC), European Commission Directorate General Humanitarian and Civil Protection, and the USAID.
- The United Nations Office for Disaster Risk Reduction (UNISDR) in partnership with the CIMA Foundation (which is leading the flood related work within the UNISDR Global Assessment Report, GAR) can improve the global flood record and modelling tools.
- The Global Disaster Alert and Coordination System (GDACS), a joint project of the European Commission and the United Nations, which provides flood alerts to the international humanitarian community.
- The International Flood Initiative, IFI (UNESCO, WMO, UN-ISDR). This is focused on research, networking, and education.
- The Hydrological ensemble prediction experiment (HEPEX), an international initiative to demonstrate the added value of hydrological ensemble predictions for emergency management and water resources sectors, and for decisions that have important consequences for economy, public health and safety.
- The Zurich Flood Resilience Programme, an insurance driven research partnership focussed on (1) knowledge and expertise, (2) community impact and (3) role of insurance.
- Other international initiatives, including the Committee on Earth Observation Satellites (CEOS) Flood Pilot, the OECD Global Science Forum and the Willis global flood model.
- Beneficiaries and end/user countries. Bilateral work between research and technical organisations and flood prone countries is considered essential in the partnership, and best practices will be adopted as templates.

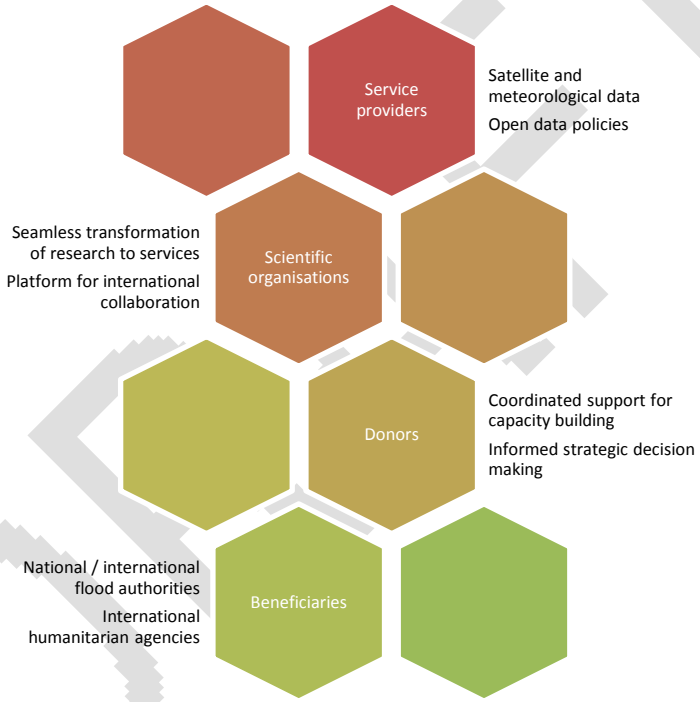
4.2 Partner Categories and Roles

The Global Flood Partnership will consist of scientific and operational organizations and authorities, as well as donors and will be heavily leveraged by existing initiatives and mechanisms. All partners have clear value to be added and will actively contribute to the partnership. In this regard, a recent essay in the science journal *Nature*, by P. Webster[3] identified the critical need: relevant organizations must come together to support the implementation of already-demonstrated

[3] Webster P.J.: Improve weather forecasts for the developing world. Nature, 2013; doi: 10.1038/493017a

technology on a global scale, implementation that will not otherwise occur. The components of the Partnership are designed to help build that bridge.

The partnership will include scientific and operational organizations collaborating at an international level in a coordinated manner and with common goals. These organisations will access satellite and meteorological forecast data from service providers (including global meteorological forecasting centres), mainly through open data policies. The partnership will identify needs and allow donors to provide effective funding to create tools and services that, for example, build in-county capacity and maintain such through training programs, or provide global predictive or observational capabilities that can form in-common infrastructure. Donors will gain access to tools and services that provide a comprehensive and up to now unavailable information concerning flood risk and flood events in the world: to allow more-informed decisions and a more strategic rather than reactive approach towards flood disasters. For international humanitarian organizations, this will allow better preparation for flood disasters, and also guide new developments through a close feedback loop with Partnership organizations. For national flood and emergency management authorities, the Partnership provides access to know-how and training to integrate data, products and services into the national systems.



In the preparatory phase of the Global Flood Partnership, the development of a partnership in each component is facilitated by one or more Coordinators. The Coordinators' main roles are:

- Define a 3 year strategy and establish a phased approach to bring the partnership from a pilot to full implementation.
- Bring relevant partners to the table and define a realistic work program with them. Over 40 organisations have expressed interest in joining the partnership.
- Establish a clear Monitoring and Evaluation framework to measure progress and partner contributions. In particular impacts on the ground must be assessed.

During the development of the Global Flood Partnership, partners will be invited to more specifically define their role (donors, beneficiaries, scientific community) and responsibilities (research and development, operations, training, steering) in the partnership through official letters of collaboration.

6 Implementation

6.1 Financial and in-kind contributions

The main driver of the Global Flood Partnership, in particular in the pilot phase, will be through in-kind contributions of partners through the dedication of staff time, computer time and providing access to data and services. However, some of the most innovative systems with the most potential are developed in academic environments where in-kind contributions are not an option. Organizational costs for the Partnership are to be minimal: the Partners make either financial or in-kind contributions.

The Global Flood Partnership aims at exploiting the potential of existing prototypes or better leverage the already operational flood risk models and early warning, systems, and in particular the development of synergies and added value systems. The Global Partnership does not provide R&D funding, which typically covers the development of a proof of concept system. It aims at transferring successful systems from the research environment to a more operational environment with routine running of systems and the development of customer-oriented services. The Global Flood Partnership aims to bridge the gap between science and operations, and in particular intends to establish a collaborative framework that through a minimum financial support and in-kind contributions cover:

- Supporting operations
  - Running costs of global and selected international operational systems
  - Conversion of semi-operational prototype systems to operational systems
  - Modifications and improvements of operational systems according to partner requests and to the benefit of several partners
  - Operational analytical support for the Flood Observatory
- Supporting integration
  - Development of standards and implementation of standard interfaces to ensure interoperability
  - Novel complex systems or products combining two or more operational systems to deliver products with higher quality, reduced uncertainty or customer-oriented information
- Common datasets and knowledge tools
  - Development of datasets for common use (e.g. digital elevation, historical archive, flood risk, exposure)
  - Training material and modules, compatible with existing training standards
  - Provision of training
- Coordination of the partnership
  - Participation to scientific and steering meetings
  - Coordination and steering of the partnership

Although the Global Flood Partnership will not finance basic research for flood forecasting and monitoring systems, it will provide a global platform to establish priorities in R&D for global flood monitoring and forecasting systems. These priorities may be proposed to existing research funding programmes, including Horizon 2020 (EU) and NASA or National Research Council (US), allowing governments to contribute in-kind to the goals of the Global Flood Partnership.

6.2 Partnership's core components

6.2.1 Structure of the preparatory phase

In the preparatory phase, the partnership will be structured in five core components. The design and development of each component will be coordinated by a Coordinator. The preparatory structure may be modified to better fit the reality of the partnership and to minimize coordination costs during the Pilot phase or the full implementation phase.

Figure 2. Five core components of the Global Flood Partnership

6.2.2 Global Flood Toolbox

Coordinator: Joint Research Centre of the European Commission and World Bank Global Facility for Disaster Reduction and Recovery

Stock taking of existing, re-usable open/non-open source tools as well as gaps in existing tools will be identified and addressed in collaborative R&D. Added value products will be developed based on user feedback. Scientific partners will agree on standards for creating output products, e.g. by using OGC standards.

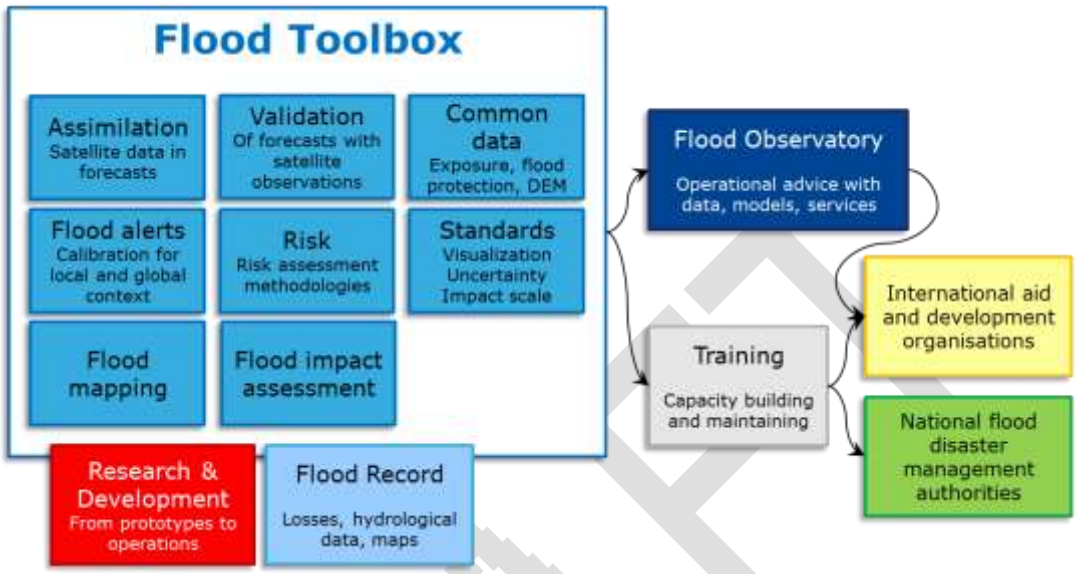


Figure 3. Schematic overview of the flood toolbox: concrete and operational products with immediate benefits for national and international users.

Based on the outcomes of the Global Flood Working Group, the following are some of the ambitions:

- Modelling and monitoring
  - Implement and adapt improved tools for assimilating satellite observations in forecasting models
  - Develop validation techniques for forecasting products using satellite observations
  - Real-time flood mapping products at various resolutions
- Hazard and risk
  - Implement (and eventually) improve flood hazard and risk assessment tools, taking into account exposure and vulnerability in present and future conditions building upon state-of-the-art methods and existing open source tools for probabilistic hazard and risk assessment
- Common Data
  - Develop databases of local flood protection measures that influence flood modelling
  - Develop and improve data products, including digital elevation and exposure products, building upon and adapting existing databases
- Standards
  - Develop a standard flood impact scale, and adopt it in all systems
  - Develop standard ways for handling and communicating uncertainty and for the incorporation of climate change uncertainty in risk modelling.
  - Develop standard ways for visualizing past, current and future flood situations
- Develop a global flood advice system

6.2.3 Global Flood Observatory

Coordinator: Dartmouth Flood Observatory and World Food Program

The Dartmouth Flood Observatory has been monitoring floods for over 30 years using a variety of techniques and methods, most of them developed for the purpose. The European Commission, the World Food Program, IFRC and other humanitarian actors have operational units that monitor and assess emergencies worldwide, including floods. International forecasting organizations are able to produce flood warnings with increasing lead times.

Based on guidelines developed by DFO and JRC in 2012, the partnership intends to provide structure and a technological platform to allow distributed organizations to collectively assess floods and their impact in a systematic and continuous way. Operational partners are expected to contribute in-kind with time of expert analysts.

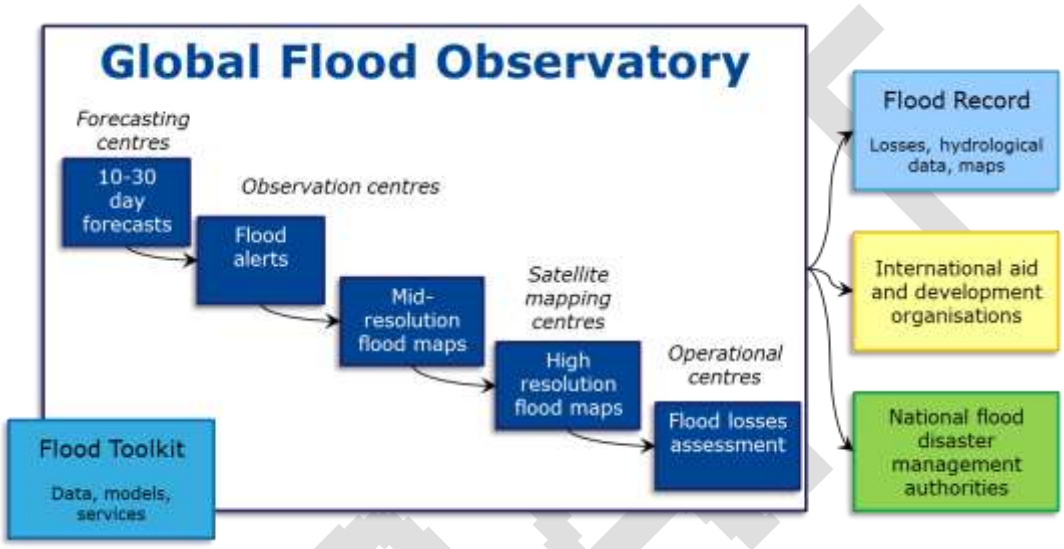


Figure 4. Schematic representation of Global Flood Observatory

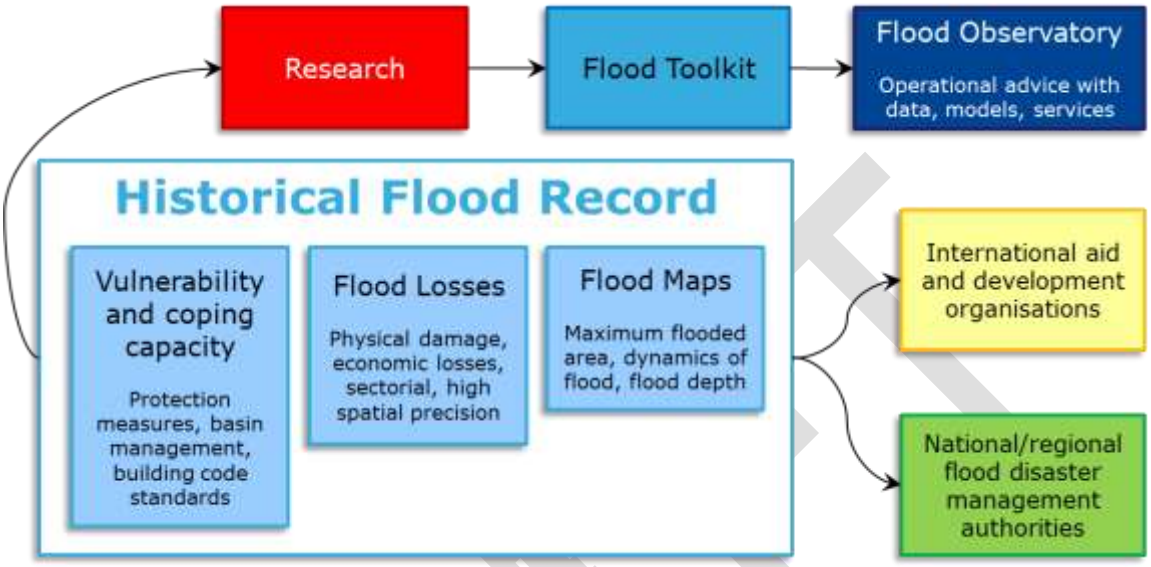
The 5 operational needs are:

- 10-30 day advanced lead time weather forecasts are increasingly reliable. These need to be translated into advanced lead time flood prediction at a dense, globally distributed array of forecast points, and whose location can be guided in part by observed flooding in the past. This will require not only global models, but also interoperability among regional models.
- Near real time, operational, flood advice capability. Latency should be under 3 hours for operational purposes. One needs to track early onset of flooding, as it occurs. Monitoring floods is also essential for improvement of the model forecasts.
- Near real time, moderate spatial resolution, high temporal resolution (daily time steps) flood mapping and immediate public data distribution in formats such as GIS that allow variety of end user access and comparisons from different systems. A combination of optical and SAR sensors is needed for robustness. Data products could include value-added versions such as a per-event total flooded area map, a flood duration map, and/or water depth maps.
- High spatial resolution flood imaging and data product dissemination, such that results can be inter-compared. Multiple data sources are required such that there is a robust capability to guarantee that the flooding WILL be imaged and mapped and data made available.
- Long term preservation of the record of inundated lands, at some standard spatial resolutions (e.g. at 250-500 m, and also, more limited coverage, at 10-50 m). We need a global public data base of such information.

6.2.4 Global Historical Flood Record

Coordinator: UNISDR and CIMA Research Foundation International

Recording the occurrence and impact of floods with enough detail to understand flood risk, be it imminent risk for early warning or medium term risk for planning, is challenging. Starting from existing global and regional archives (including the Dartmouth Flood Observatory record), the partnership will develop and maintain a better historic flood record based on best practices (e.g. standards for recording disaster losses) to describe and record floods and their associated losses.



Flood records reporting flood footprint and estimated frequency of occurrence as well as losses are the first step of risk assessment. At the moment, there is no global archive with information that is accurate and detailed enough for global flood modelling and risk assessment. This component of the global Flood Partnership aims at establishing such a record of historical floods and updating it continuously with current floods. In addition, a common database on flood protection measures, basin management practices and other elements to may influence flood routing is not existing, and will be collectively built in this component.

There is a close link with the Flood Toolbox and the Flood Observatory component: models, data and services provided by the Flood Toolbox can be implemented to develop hazard maps on a global scale as a complement to the forecast flood scenarios obtained by the Flood Observatory. As this application has a less stringent time constraint with respect to Flood Forecast and Monitoring, a higher detail in the maps produced could be reached and influence of climate change can be studied on a global scale.

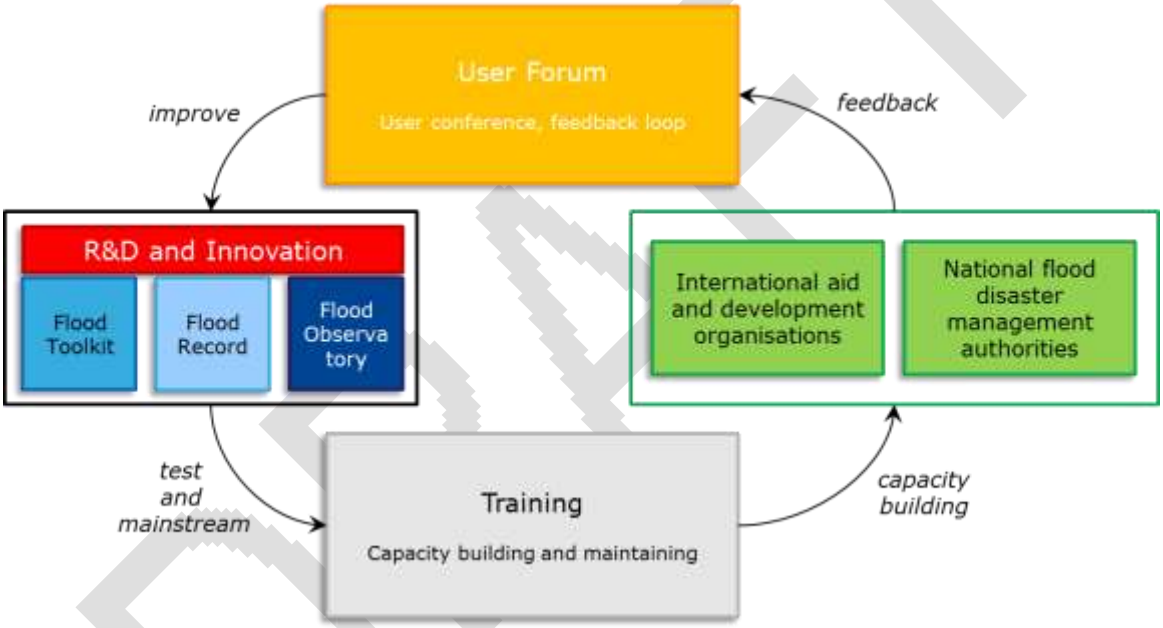
Beneficiaries of the Partnership can use such footprint maps and loss data in combination with exposure and vulnerability studies and datasets as input to models, and in turn risk information to decision makers in mid- and long-term planning to support policies and strategies for disaster risk reduction at national and global levels (e.g. for the Global Assessment Report of UNISDR), as well as in real-time in the preparedness, response and early recovery phases.

6.2.5 Coherent training modules for capacity building

Coordinator: tbd

The primary objective of the global flood partnership is to develop products at global and national levels. These products should only be used as interim tools by developing countries, while they put in place local, dedicated, high-resolution systems. An important effort of the partnership will focus on enabling developing and less developed countries to develop their own capacities by offering access to data, models and above all expertise from the Partnership.

Capacity building of hydrological authorities and civil protection authorities in flood-prone countries is a cost-effective way to reduce impacts and losses[4]. Putting in place early warning systems may lead to significant benefits, up to 50% for upper middle income countries. The partnership will establish mechanisms to transfer knowledge and systems developed in the Flood Toolbox and data produced in the Flood Observatory to flood-prone developing countries. These may include exchange of staff, summer schools organized by technical partners, or dedicated in-country training programmes. The partnership will also build on training material, modules and/or programs of partners, and jointly develop new ones, to support developing countries to better integrate existing systems and data in their operations.



[4] A Cost Effective Solution to Reduce Disaster Losses in Developing Countries: Hydro-Meteorological Services, Early Warning, and Evacuation. Stéphane Hallegatte, 2012. Policy Research Working Paper 6058.

6.2.6 Global Flood User Forum

Coordinators: Joint Research Centre of the European Commission, European Commission Humanitarian Aid and civil Protection

End-users, be it international organisations, hydrological authorities in developing countries or emergency response authorities, are an essential part of the partnership. This includes both operational actors and policy makers. The Global Flood Partnership will set up a network of users from these communities and organize regular meetings to discuss user needs, evaluation of existing tools and services, and in general get feedback and have a dialogue with the principle users. Users (especially those from hydrological authorities in developing and less developed countries) will provide feedback on both the tools' application and the progress achieved within the countries' capacity building programme including a step forward towards institutionalising and creating local, tailored detailed systems.

Initially, this will be through the continued meetings of the Global Flood Working Group. Already in the past years, the group was composed of end users at international level (humanitarian agencies). But also at national level, including representatives of the Namibian water authorities and the Brazilian federal disaster monitoring center (CEMADEN).

The network will be the essential feedback mechanism that drives innovation and sets priorities for further development.

7 Roadmap

Many of the concepts, technologies and capacities of the Global Flood Partnership have been demonstrated in a variety of projects over the years, not least in the Global Flood Working Group. Nevertheless, it is envisaged that the Global Flood Partnership would go through a pilot phase, where after successful evaluation, it is fully implemented.

7.1 Preparatory phase: 6 months

Under the overall coordination of the European Commission, the Coordinators will establish partnerships to address the various components of the Global Flood Partnership. The principles of the partnership will be established, objectives set, work plans proposed and budgets defined.

At least one technical meeting with the Coordinators is planned for December 2013.

The Kick-off for the Global Flood Partnership's pilot phase is planned for March 2014, back-to-back with the 4th Global Flood Working Group meeting which has been organized for March 2014 in the United Kingdom.

7.2 Pilot phase: 2 years

A 2 year pilot operation will allow the partners to align their activities in a coordinated manner and to develop specifications and terms of reference for the various components. A clear Monitoring and Evaluation framework will be created with criteria of success and impact based indicators.

During the pilot phase, the 5 components will be coordinated by the Coordinators. Work plans will be revised on a 6 months basis with detailed objectives and deliverables based on available in-kind resources and limited, but essential financial contributions.

The bulk of the financial contribution during the pilot operation will support meetings of the Global Flood Partnership and its component working groups.

Identified research priorities will be presented to major research funding programmes.

7.3 Full implementation

Operational implementation of the Global Flood Partnership will need to consider turning voluntary in-kind contributions into activities with dedicated funds. This may be through signature of collaboration agreements with service level agreements or through direct funding of the Global Flood Partnership.

In addition to evaluating the added value of the Global Flood Partner on strengthening flood preparedness and response contributing to reducing disaster losses, the purpose of the pilot phase is to estimate the feasibility and cost of the full implementation of the Partnership.

More information

This document is a draft concept paper for a Global Flood Partnership developed by the European Commission Joint Research Centre and collaborating partners.

For more information, please visit http://portal.gdacs.org/Global-Flood-Partnership.

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