



Brainstorming Session on Meteorological Services for Improved Humanitarian Emergency Contingency Planning and Response

**WMO Headquarters (Geneva, Switzerland)
17 April 2009**

Final Report

19 June, 2009

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I. Background

1. A brainstorming session on meteorological services for improved humanitarian emergency contingency planning and response was held at the WMO headquarters, on the 17 of April 2009. The meeting was attended by 12 experts from six international humanitarian agencies involved in humanitarian contingency planning and response, including International Federation of Red Cross and Red Crescent Societies (IFRC), United Nations Office for the Coordination of Humanitarian Affairs (OCHA), United Nations Children's Fund (UNICEF), United Nations Institute for Training and Research (UNITAR), United Nations High Commissioner for Refugees (UNHCR), United Nations World Food Programme (WFP) and experts from the World Meteorological Organisation (WMO) (list of participants in provided in Annex I).

2. The session was held in conjunction with the planned establishment of the Ad hoc Expert Team on "Meteorological Services for Improved Humanitarian Planning and Response" (hereafter referred to as the Humanitarian Task Team) by the WMO's Commission for Basic Systems (CBS) at its 14th Session, in Croatia, April 2009. The Humanitarian Task Team is to plan and work towards implementation of a project on meteorological, hydrological and climate information and services for improved humanitarian planning and response with Terms of Reference provided in Annex II.

3. The establishment of the Humanitarian Task Team was motivated by the new wave of humanitarian reforms initiated by the Inter-Agency Standing Committee (IASC) in early 2000s using the cluster approach for improved coordination among the humanitarian agencies that are IASC members. This has resulted in new opportunities for enhancing meteorological, hydrological and climate information and services, available through National Meteorological and Hydrological Services (NMHSs), and global and regional meteorological centres such as Regional Specialized Meteorological Centres (RSMCs) on an operational basis, for humanitarian agencies to improve national and regional contingency planning and response to potential disasters and ongoing humanitarian relief.

4. The brainstorming session was held to explore opportunities for enhancing the use of meteorological, hydrological and climate services for improved humanitarian contingency planning and response. The agenda is attached as Annex III. The meeting involved, (i) presentations by the humanitarian agencies that provided an overview of their current information sources, tools and needs for meteorological, hydrological and climate information and, (ii) presentations by WMO that introduced the capacities available through WMO.

II. Goals of the meeting

5. The goals of the meeting were to:
- i) Understand decision processes, and timing in emergency contingency planning and response of humanitarian agencies, including current sources of meteorological, hydrological and climate information;
 - ii) Initiate discussions on the needs and requirements of humanitarian agencies for hydro-meteorological information (contents, timing, format, distribution mechanisms);
 - iii) Discuss WMO's initiative through establishment of the Task Team and the process for nominations of humanitarian operational experts to this task team;
 - iv) Development of a preliminary report on the needs and requirements of the humanitarian agencies to be submitted to the task team for initiation of their work.

III. Discussions

The presentations focused on information frameworks, including portals and specific products and services, as developed or obtained for use of the humanitarian agencies. Presentations were complemented by preliminary discussions on needs and requirements for meteorological, hydrological and climate-related products and services.

A. Information portals used by humanitarian agencies to facilitate information sharing and coordination

6. A number of information portals are used by humanitarian agencies to ensure access to the same information to facilitate inter-agency coordination and response. These include:

- a. ***The Global Disaster Alert and Coordination System (GDACS)*** (<http://www.gdacs.org>): GDACS allows automatic synchronization of web-based disaster information systems. It provides near real-time alerts about natural hazards around the world and tools to facilitate response coordination, such as media monitoring, map requests and map-catalogues and Virtual On-Site Operations Coordination Centre (Virtual OSOCC).
 - ***Virtual OSOCC*** (<http://www.gdacs.org/virtualososcc>): Virtual OSOCC is a sub-system of GDACS that allows access only to authorized international disaster responders to facilitate real-time information exchange, disaster coordination and decision-making. This is a secured mechanism which could be used as a means for sharing meteorological, hydrological and climate information and services in support of humanitarian emergency contingency planning and response;
- b. ***ReliefWeb*** (<http://www.reliefweb.int>): ReliefWeb is a global hub for time-critical humanitarian information on Complex Emergencies and Natural hazards, coordinated by OCHA. It provides timely, reliable and relevant information as events unfold, while emphasizing the coverage of “forgotten emergencies” at the same time.
- c. ***Humanitarian Early Warning Service (HEWSweb)*** (<http://www.hewsweb.org>): This portal was created by the Inter-Agency Standing Committee prior to the development of GDACS as a means to facilitate access to early warning information available at the global level from multiple specialized institutions. In the context of the humanitarian reform and with the availability of new tools such as GDACS, the continuation and maintenance of HEWSweb is to be revisited by the Inter-Agency Standing Committee at its next retreat;

B. Information-based products and services that incorporate Meteorological, Hydrological and Climate information

7. Information-based products used by the humanitarian agencies fall into two categories, (i) products that are accessible by all agencies through connected wide area networks or the public internet to facilitate coordination among them, and (ii) customized products available via internal wide area networks or stand alone products (e.g. DVD), often developed by partner technical agencies to address specific information needs of a humanitarian agency.

- a. Information-based products used by all Humanitarian agencies to support coordination among agencies. Examples presented include:
 - (i) The Early Warning/Early Action report of the Inter-Agency Standing Committee. This report will require climate information and climate outlooks to facilitate

- contingency planning and preparedness that have become high priorities for humanitarian agencies; and
- (ii) Value-added high resolution satellite products that are focused on response, such as the products facilitated by UNITAR/UNOSAT, the map-coordinator of GDACS. UNITAR/UNOSAT has experimented with super-imposing weather and seasonal climate forecasts obtained from ECMWF (facilitated through WMO) with high-resolution satellite products to facilitate response and relief operations as was the case after the earthquake in Pakistan (See figure 1 in annex IV).
- b. Customized information-based products, developed through concrete partnerships of a humanitarian agency with a number of technical partners. These products are developed for the internal coordination and use of the respective humanitarian agency. These products are developed such that they are easy to interpret and the context is aligned with decisions of the agency. Examples include:
- (i) IFRC has established partnerships with the International Research Institute (IRI) at Columbia University; NOAA, NASA and the Dartmouth Flood Observatory (see figure 2 in Annex V). Through these partnerships, IFRC is provided with customized products such as medium range weather forecasts, to seasonal forecasts, precipitation forecasts, flood potential maps, etc. targeted at specific needs of IFRC. These products are designed to be easy to interpret for decision-processes of IFRC.
 - (ii) Similarly WFP has initiated partnership with NOAA, NASA and ITHACA (University of Turin) that collects information, interprets it and provides products such as precipitation forecasts, cyclone forecasts, etc for use by WFP.
 - (iii) WHO in partnership with the University of Agadir, Morocco, has developed the e-atlas of disaster risk (see figure 4 in Annex VII) which use climatic data to predict the spatial distribution of hazards such as floods, wind speed, heat, etc and is now expanding the partnership through the establishment of the Vulnerability and Risk Analysis & Mapping platform (VRAM)

8. Internal mechanisms and technical capabilities of humanitarian agencies vary. In general, it was noted that humanitarian agencies do not have meteorological, hydrological and climate expertise or staff, but rather outsource the analysis to other institutions that facilitate interpretation and understanding of meteorological, hydrological and climate products. Some agencies have a centralized coordinated programme that facilitates information development and access by their staff on the ground. Examples are IFRC that has a centralized mechanism for collating information and disseminating it to its personnel on the ground (see figure 3 in Annex VI) or the WHO HAC Alert Database which is an internet-based system gathering, on real-time basis, reports, news, maps and relevant correspondence on events that may evolve into a humanitarian public health crisis requiring WHO/HAC intervention.

C. Specific needs of humanitarian agencies for meteorological, hydrological and climate information

9. Through the presentations it was confirmed that that humanitarian agencies need a wide range of meteorological, hydrological and climate information ranging from data, analysis and forecasts. However, it was emphasized that simply providing any available information is not sufficient. It is important that information-based products are designed based on understanding of the needs and requirements such that they can be easily accessed and interpreted by these agencies.

10. All agencies confirmed that short to medium-range weather forecasts, information and warnings were important for response and relief to imminent threats. Specifically alerts, forecasts and warning issued by the authoritative source (such as the NMHSs for meteorological hazards) could be displayed on the information portals of the humanitarian agencies such as Virtual OSSOC.

11. However, it was stressed that there is a pressing need for predictions in relation to hazardous conditions, including hazard analysis, climate forecasts and information (next month, seasonal to longer timeframes) to enable improved prevention and preparedness planning by these agencies. It was stressed that forecast information for the next month, to seasonal and longer time frames are the highest priority for improving humanitarian preparedness and response. This includes the need for the understanding of the impacts of climate change to adjust their own climate based plans. The need for a standard classification and categorization of meteorological hazards was also expressed.

12. Floods were highlighted as the major cause of disasters worldwide and that humanitarian agencies could benefit from access to flood related information and warnings.

13. It was recommended that the requirements of humanitarian agencies for meteorological, hydrological and climate products and services need to be explored in more detail with respect to content, format, packaging and dissemination. This should be considered within the work of the Humanitarian Task Team.

14. Specifically, it was noted that that there is a critical need to ensure that the NMHSs are an integral part of national disaster risk management mechanisms, allowing them to provide authoritative information to all disaster risk management stakeholders in the country at national to local levels. This is in alignment with the work being carried out by the DRR programme in the implementation of its capacity development action plan

15. The need to explore efficient and optimal mechanisms to link offices of Humanitarian Agencies with RSMC to build networks and special products from RSMC for humanitarian application was also expressed.

D. Capacities available through the WMO System and Programmes

WMO Global Data-Processing and Forecasting System (GDPFS)

16. The WMO's Global Data-Processing and Forecasting System (GDPFS) represents the function of weather forecasting including the production of alerts and warnings of severe weather. It is a network of operational meteorological centres that produce numerical guidance, and forecasts and warnings, and is a part of a global early warning system for meteorological and environmental hazards.

17. The GDPFS centres produce routine weather and climate data products and analyses, forecasts, advisories, warnings and specialized products required by NMHSs and other Members' agencies for providing effective services for the protection of life and property, the environment, increased safety of activities carried out on land, at sea and in the air and enhance the quality of life through sustainable development. Each of the GDPFS centres are at the core of the operational infrastructure of the NMHSs and operate 24 hours a day everyday in a continuous programme of data collection and exchange and data-processing, to assimilate data into objective analyses and numerical simulations, to produce numerical predictions of the future states of the atmosphere as well as data archiving, and, through further post-processing, produce additional routine and specialized outputs and products in a wide range of applications. The end results are forecasts and warnings that support a wide range of meteorological services.

18. The GDPFS is organised as a network of: i) 3 World Meteorological Centres (WMCs) and ii) 40 Regional Specialized Meteorological Centres (RSMCs), and iii) National Meteorological Centres. While

the national centres are responsible for all forecasting and warning services within its respective territory, the world and regional centres, operated or supported by NMHSs carry out data forecasting functions at the global and regional levels. This coordinated system provides analysis, modelling, forecasting and other products and services in support of forecasting and early warnings of weather- and climate-related hazards to other Members, and to other relevant international organizations. WMO specifically ensures that capacities are implemented within the NMHSs of developing and least developed countries, for issuance of forecasts and warning of various hydro-meteorological hazards.

WMO's Global Telecommunication System (GTS) and WMO Information System (WIS)

19. WMO's information systems includes the Global Telecommunication System (GTS) composed of a dedicated network of terrestrial and satellite-based telecommunication links and centres operated by countries 24 hours a day, seven days a week all year round. It interconnects all National Meteorological and Hydrological Services (NMHS) for round-clock reliable and real-time collection and distribution of all meteorological and related data, forecasts and alerts.

20. WMO is further developing the WMO Information System (WIS) to be open to all WMO activities and partners to facilitate the exchange of information amongst WMO Members, collaborators and partners. This will include being interoperable with external networks such as those connecting and supporting humanitarian agencies activities through the use of international standards. Thus, WIS will allow UN agencies to exchange information with WMO Members including the ability to find information as well as access it when required.

Public Weather Services

21. Weather and extreme hydrometeorological events are not only a vital component in the decision processes for disaster management and weather-sensitive economic sectors, but affect the everyday life of the general public. WMO Members through their NMHSs have to provide warnings, forecasts and information on weather, water and climate-related events in a timely, reliable and comprehensive manner as part of their responsibility for the safety of life and livelihood, protection of property and the well-being of their nations' citizens. The PWS Programme of WMO includes a core component common to all NMHSs which centres on ensuring the safety of life and property. This is done through working with NMHSs to strengthen and support their efforts not only in producing and disseminating warnings of severe weather hazards, but also in developing partnerships with stakeholders aimed at effective application and use of these products and services. In general, PWS programmes of NMHSs provide the channel for communication and dissemination of NMHSs forecast and warning products, mainly through collaboration with the mass media. Since forecasts and warnings are highly perishable products, dissemination is a vital element of PWS and forms a cornerstone of the PWS Programme. With modern technologies developing rapidly, the issue is no longer how to simply spread information, but how to disseminate it in the most efficient way to the intended audience. Especially in the case of warnings, in order to avoid confusion and elicit proper response, the NMHSs, public safety officials and the media must work cooperatively to ensure that a clear and consistent message is provided to the recipients. This requires not only effective communications and dissemination systems but also an extensive and ongoing public education programme which is another focus of the PWS Programme. It is precisely to avoid public confusion in hazardous and potentially dangerous situations that WMO promotes the principle of single authoritative sources of warnings. In nearly all countries NMHSs are the single official voice for issuing meteorological warnings within the principle of national sovereignty.

22. To facilitate access to national official warnings, WMO has established the Severe Weather Information Service (SWIS). This is a WMO website that carries advisories issued by RSMS, Tropical Cyclone Warning Centres (TCWC) and official warnings issued by NMHSs (see figure 5 in Annex VII and <http://severe.worldweather.wmo.int>).

23. In response to the International Decade for Natural Disaster Reduction (IDNDR, 1990-1999), WMO through the Public Weather Services (PWS) Programme in 1995, facilitated the provision of meteorological assistance and information from the National Meteorological Centres and Regional Specialized Meteorological Centres (RSMC) serving that region that would enable the UN Department of Humanitarian Assistance (DHA), the predecessor of the United Nations Office for Coordination of Humanitarian Affairs (UN-OCHA) to provide the required assistance. The procedures for this assistance were established following wide consultations within the WMO community and with DHA. The terms of this initiative came to an end at the end of the IDNDR. Applications of the procedure to some cases, which were documented by PWS, are available for further evaluation and analysis of lessons learnt.

Disaster Risk Reduction Programme

24. Results of a country-level DRR survey conducted by WMO in 2006, in which 139 countries participated, indicated that nearly 80% of NMHSs need strengthened coordination and cooperation with disaster risk management agencies. Humanitarian agencies confirmed that there is critical need to ensure that the NMHSs are an integral part of national disaster risk management mechanisms, allowing them to provide authoritative information to all disaster risk management stakeholders in the country at national to local levels. This is in alignment with the work being carried out by the strategic activities and priorities of WMO DRR programme.

25. The WMO DRR survey indicated that NMHS authority with respect to provision forecasts, analysis and warning varies and in general fall into 3 categories:

- Type I hazards: NMHS has sole mandate for the development of the warning for the hazard;
- Type II hazards - NMHS has joint mandate for the development of the warning hazard for the hazard
- Type III hazards - NMHS provides information to other agencies that have the mandate for the development of the warning for the hazard

Development of this project should consider this factor.

26. The DRR programme has also been very active in working to improve multi-hazard early warning systems for all weather-, climate- and water-related hazards, through the identification of “good practices in Early warning Systems particularly focusing on partnerships and inter-agency coordination at the national levels” in Cuba, France, China and Bangladesh¹. These best practices reflect the multi-agency effort in these countries to better manage the risk of potential disasters and have resulted in the preparation of guidelines on "Capacity Development in Multi-Hazard Early Warning Systems with focus on institutional coordination and collaboration". These materials will be used in a number of national Early Warning System development projects that the WMO is implementing with partners such as ISDR, IFRC, UNDP and World Bank in South Eastern Europe, Central Asia and Caucuses, South East Asia and Central America.

27. The agencies were informed that WMO is working with the World Bank, UNDP and ISDR systematically to strengthen the DRR capacities at the national level in a number of countries in South Easter Europe, Central Asia and Caucuses, Central America, Africa and South East Asia. These projects present an opportunity to pilot a project linking the NMHS and WMO regional meteorological centres, such as RSMCs in these regions to the humanitarian agencies.

¹ The First Expert's Symposium on Multi-Hazard EWS, hosted by WMO in May 2006, identified criteria for “good practices” in early warning systems, examples of such practices around the world and discussed enabling factors for the development of early warning systems. WMO has been working with its partners to facilitate documentation of first set of good practices including, (i) Bangladesh Cyclone Preparedness Programme; (ii) Cuba tropical cyclone early warning system; (iii) French “Vigilance” System; and (iv) Shanghai Multi-Hazard Emergency Preparedness Programme. The documentation of these examples were carried out by teams of experts from the National Meteorological and Hydrological Services, Disaster Risk Management Agencies, Red Cross and Red Crescent Societies, and other key institutions engaged in these EWS. These good practices have been discussed during the Second Expert's Symposium on Multi-Hazard EWS, held in Toulouse in May 2009, which finalized also the guidelines on "Capacity Development in Multi-Hazard Early Warning Systems with focus on institutional coordination and collaboration”.

IV. Overall conclusions and recommendations

28. Humanitarian agencies need a wide range of meteorological, hydrological and climate information ranging from data, analysis and forecasts. However, it was emphasized that simply providing any available information is not sufficient. It is important that information-based products are designed based on understanding of the needs and requirements such that they can be easily accessed and interpreted by these agencies.

29. Short to medium-range weather forecasts, information and warnings are important for response and relief to imminent threats. Specifically, alerts, forecasts and warning issued by the authoritative source (such as the NMHSs for meteorological hazards) could be displayed on the information portals of the Humanitarian agencies such as Virtual OSSOC.

30. There is a pressing need by the humanitarian agencies for predictions in relation to hazardous conditions (trends and characteristics) within the context of climate variability and climate change, including hazard analysis, climate forecasts and information (next month, seasonal to longer timeframes) to enable improved prevention and preparedness planning by these agencies. It was stressed that forecast information for the next month, to seasonal and longer time frames are the highest priority for improving humanitarian preparedness and response. This includes the need for understanding the impacts of climate change to adjust their own climate based plans.

31. Floods are the major cause of disasters worldwide and that humanitarian agencies could benefit from access to flood related information and warnings.

32. The requirements of humanitarian agencies for meteorological, hydrological and climate products and services need to be explored in more detail with respect to content, format, packaging and dissemination. This should be considered within the work of the Humanitarian Task Team.

33. There is a critical need to ensure that NMHSs are an integral part of national disaster risk management mechanisms, allowing them to provide authoritative information to all disaster risk management stakeholders in the country at national to local levels. This is in alignment with the work being carried out by the DRR programme in the implementation of its capacity development action plan

34. There is a need to explore efficient and optimal mechanisms to link offices of Humanitarian Agencies with RSMC to build networks and special products from RSMC for humanitarian application was also expressed.

36. It was recommended that terms of reference of this task team should consider hydrological (e.g., flood related) and climate information.

V. Next Steps

37. It was mutually agreed that the Humanitarian Task Team should engage experts from the humanitarian agencies and WMO operational network to carry out the ToR as indicated in Annex II. Specifically, members of the humanitarian task team would involve:

- i) Six experts with extensive operational experience from the humanitarian agencies
- ii) Five experts from WMO network (details to be discussed).

38. Upon finalization of the report of the brainstorming session, invitation letters will be sent to the six agencies that participated in the meeting to designate operational experts for participation in the humanitarian task team.

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39. The first meeting of the humanitarian task team is scheduled for fall 2009, at the WMO headquarters, in Geneva (Weeks of Oct 26, Nov 2 and November 23 are being considered).

40. In light of the requirements and priorities stated by the participants, the terms of reference and composition of experts from WMO network to be considered together with the chair of the Humanitarian Task Team.

Annexes

ANNEX II

**Terms of reference of the WMO Ad hoc Expert Team WMO on: “
Meteorological Services for Improved Humanitarian Emergency Planning and Response”**

- 1) Review and document the needs and requirements of the international humanitarian agencies for:
 - a) Meteorological services and information for operational procedures for contingency planning, coordination and response to potential disasters;
 - b) Dissemination mechanisms for exchange of meteorological services and information;
 - and,
 - c) Training with regards to the effective utilization of meteorological services and information;
- 2) Review the institutional mechanisms and the documented procedures established through PWS in 1995 and their outcomes to enable the UN Department of Humanitarian Assistance (DHA), the predecessor of United Nations Office for Coordination of Humanitarian Affairs (UN-OCHA) to request meteorological assistance and information from the National Meteorological Centres and Regional Specialized Meteorological Centres (RSMC) serving that region;
- 3) In light of the needs and requirements of the humanitarian agencies, lessons learnt from the experiences from the PWS initiative in 1990s, new institutional and operational mechanisms resulted from the humanitarian reform, new technologies and other relevant issues, to develop an implementation plan to facilitate the provision of meteorological assistance and information to the international humanitarian agencies from NMHSs and GDPFS.



Brainstorming Session on Meteorological Services for Improved Humanitarian Emergency Contingency Planning and Response
 April 17, 2009

WMO Headquarters
 7 bis Avenue de la Paix
 Geneva, Switzerland
 Press Room (Ground Floor)

PROVISIONAL AGENDA	
0930 – 0945	Opening and brief remark on WMO initiative on Meteorological Services for Improved Humanitarian Contingency Planning and Response <i>Dr. Geoffrey Love – Director Weather and Disaster Risk Reduction Services Department</i>
0945 – 0955	Background and establishment of WMO Task team on “Meteorological Services for Improved Humanitarian Contingency Planning and Response” <i>Dr. Maryam Golnaraghi – Chief of Disaster Risk Reduction</i>
0955 – 1300	<p><u>Presentation by participating Humanitarian Agencies</u> <i>Format : 20-minute presentations by each agency and discussion</i></p> <ul style="list-style-type: none"> - OCHA - IFRC - WFP - UNOSAT - WHO - UNHCR - UNICEF <p>Humanitarian agencies' operational procedures in emergency contingency planning, emergency preparedness and response to extreme events <i>Meteorological and hydrological information needs to support emergency planning and response</i> <i>Current sources and mechanisms to access to hydro-meteorological information</i> <i>Information exchange mechanisms and needs of humanitarian agencies</i></p> <p><i>with a short Coffee break</i></p>
1300 – 1400	Lunch (WMO Cafeteria)
1400– 1500	<p><u>Presentations by WMO Technical Programmes on the operational network of WMO and National meteorological and Hydrological Services</u> WMO Global Data-Processing and Forecasting System (GDPFS), <i>Dr. Peter Chen – Chief of Data Processing and Forecasting</i> Role of National Meteorological and Hydrological Services <i>Ms. Haleh Kootval - Chief of Public Weather Services</i> WMO Information System (WIS) <i>Mr. David Thomas – WIS Project Manager</i></p> <p><i>short Coffee break</i></p>
1500 – 1630	<p><u>Discussions and next steps</u> <i>Mapping of decision processes, and timing in emergency contingency planning and response of humanitarian agencies</i> <i>Identification of needs and requirements for hydro-meteorological information (contents, timing, format, distribution mechanisms)</i> <i>Designation of experts from the humanitarian agencies to participate in the WMO task team for development of plan for operational implementation</i> <i>Way forward</i></p>

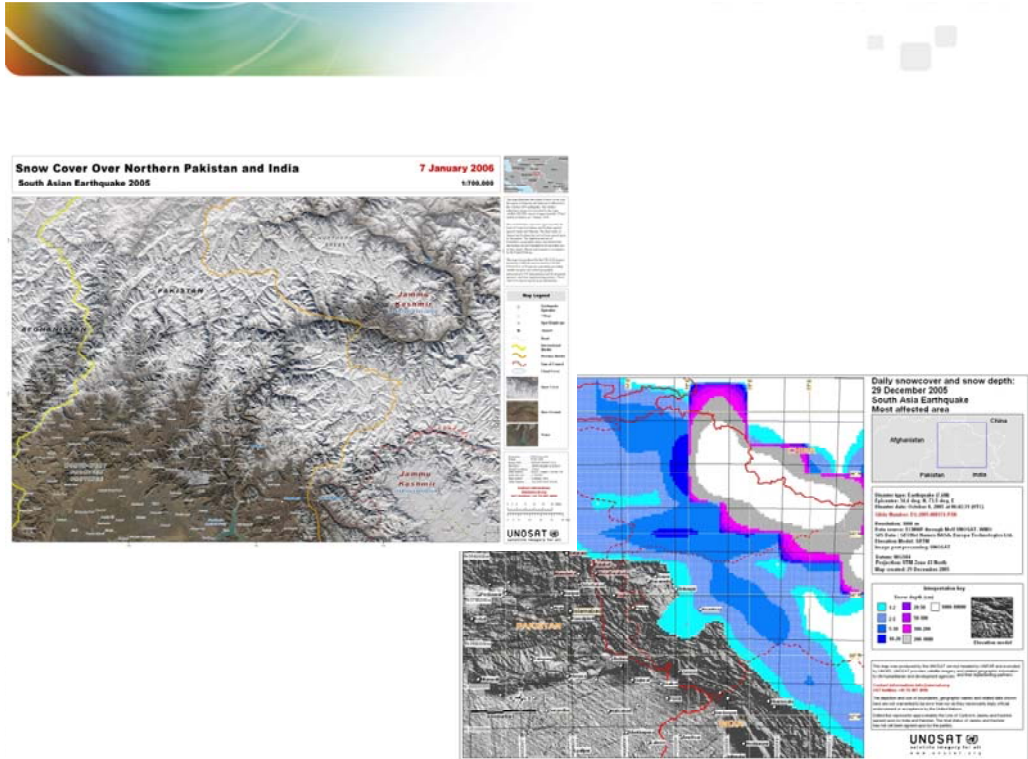


Figure 1. Sample of products developed by UNOSAT to support response after the earthquake in Pakistan

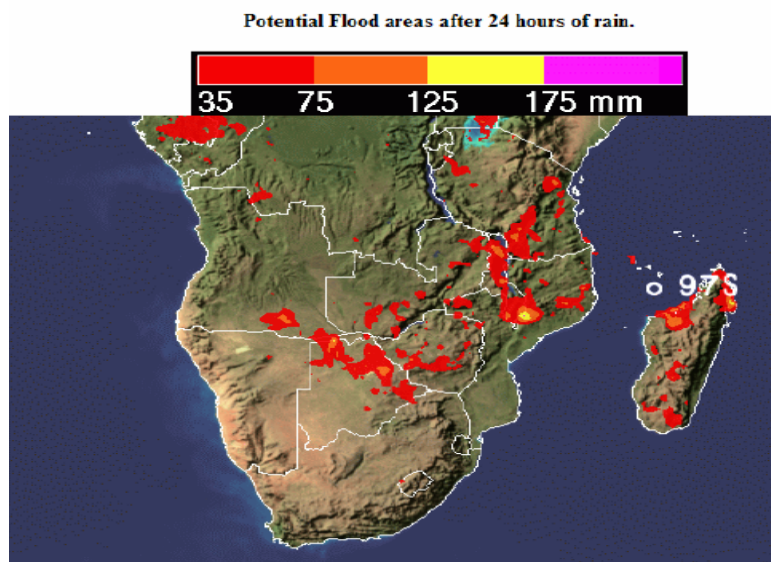
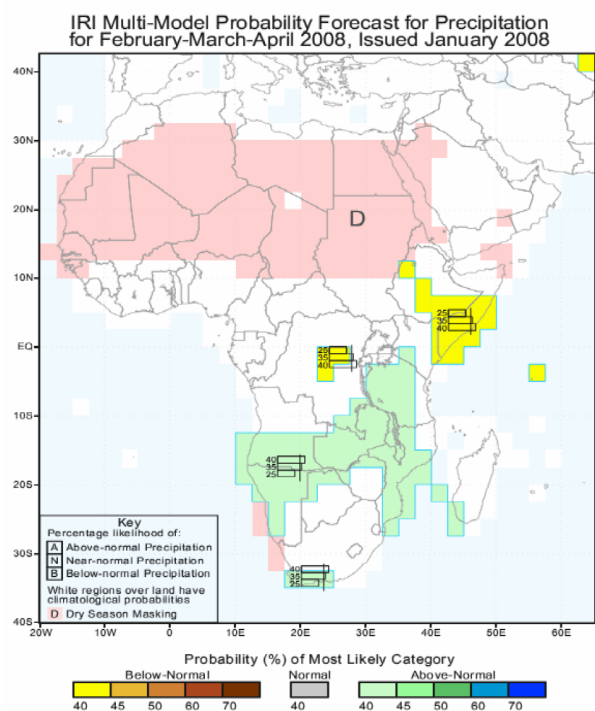


Figure 2. Example of products received by IRI on the basis of partnerships with specialized agencies

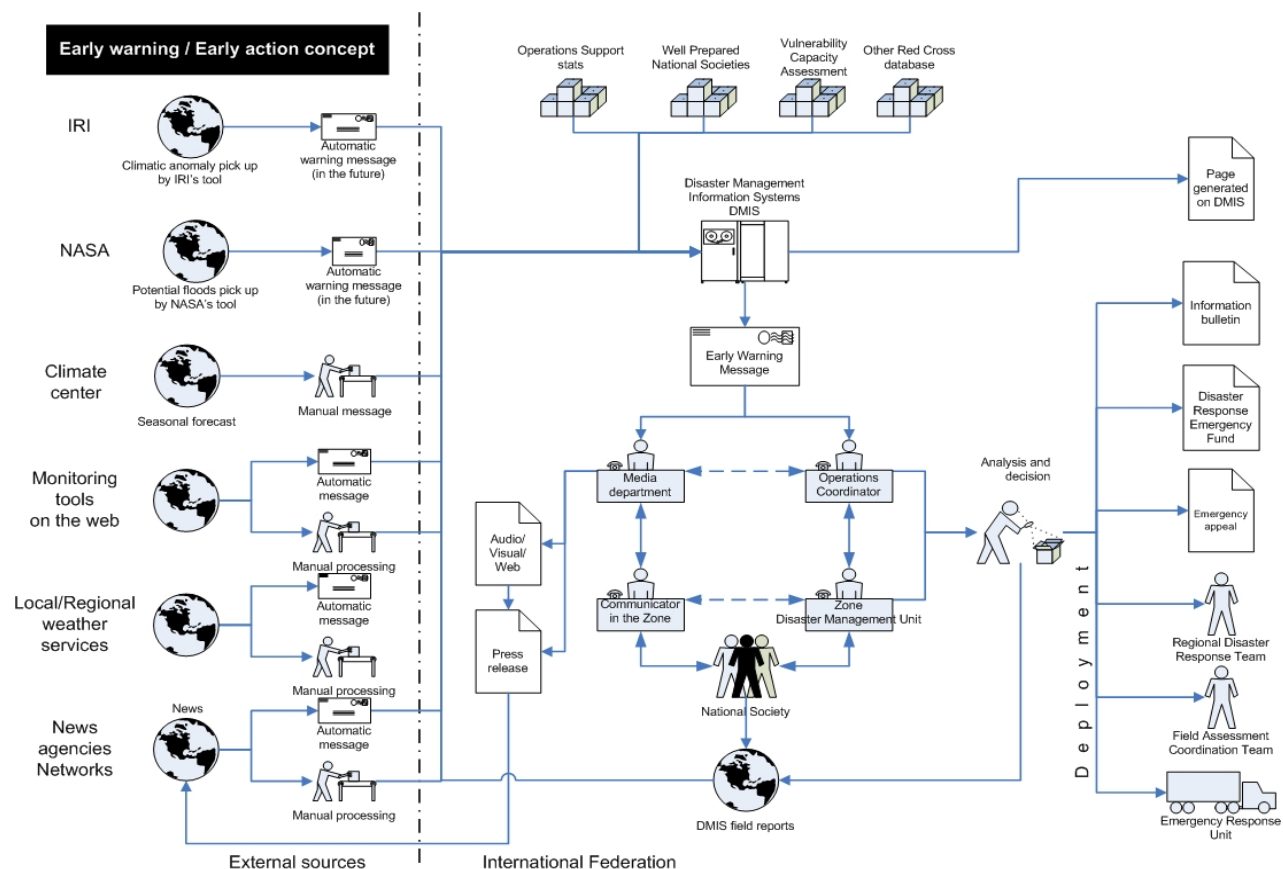


Figure 3. Diagram of the information flow mechanism at IFCR

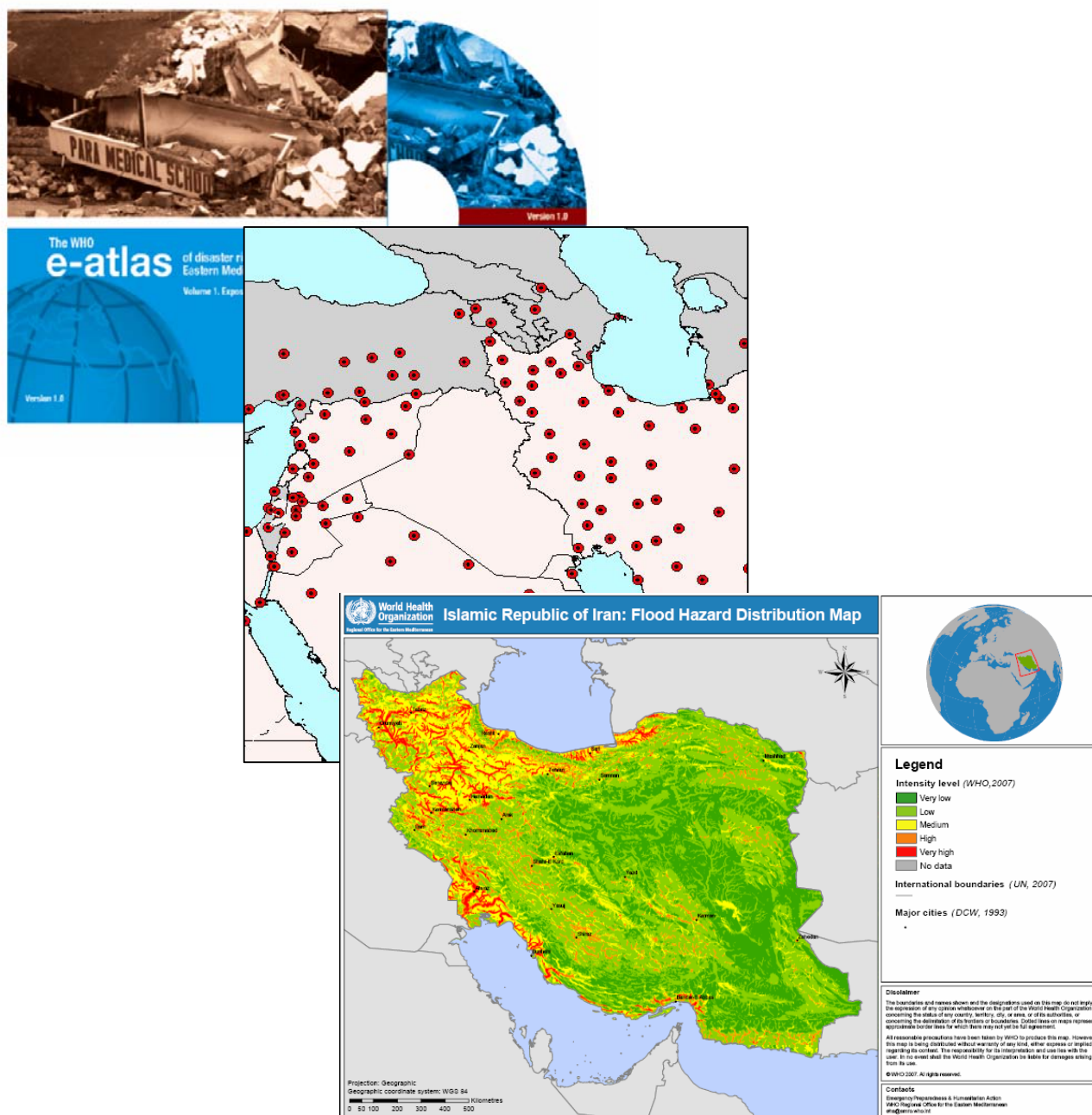


Figure 4: Cover, location of the climatic stations and sample results from the WHO e-atlas of disaster risk reduction

World Meteorological Organization
Severe Weather Information Centre
 Official Observations. Official Warnings.

HOME
 Severe Weather
 Tropical Cyclones
 Heavy Rain/Snow

What's New
 Introductory Pamphlet
 Pilot Project
 Notes To Users
 Links
 World Meteorological Organization
 Official World City Forecasts
 Disclaimer

This World Meteorological Organization (WMO) pilot website is developed and maintained by the Hong Kong Observatory (HKO) of Hong Kong, China. For more information on the pilot project please [click here](#).

NOTES

- Click on the symbol or for advisories and warnings on the tropical cyclone.
- Click on the symbol for information from individual WMO Members participating in the Pilot Project.
- Click on individual boxes to view zoom-in maps.
- This page is best viewed with a display resolution of 1024 x 768 pixels.

Last Updated at 2004-09-01 08:44 UTC

The information in this World Meteorological Organization (WMO) pilot website is based on advisories issued by Regional Specialized Meteorological Centres (RSMC), and official warnings issued by National Meteorological and Hydrological Services (NMHSs) for their respective countries or regions. The media may use this information for their broadcasting services on the radio or TV. When doing so, it should be indicated that they are issued by the respective RSMCs, TCWCs or NMHSs.

World Meteorological Organization
 Weather • Climate • Water

World Weather Information Service
 Official Observations. Official Forecasts.

Official Observations
 * Cloudiness & Rain

Official Forecasts
 Select WMO Region
 * Africa
 * Asia
 * Europe
 * N. & Central America
 * S. America
 * S.W. Pacific

What's New
 * France launched French version
 * Spain launched Spanish version
 * New domain name for WWS

World Weather Information Service
 Official Observations. Official Forecasts.

NOTES

- weather forecasts + climatology
- climatology

ENGLISH عربي 中文 PORTUGUÊS ESPAÑOL FRANÇAIS

This global web site presents OFFICIAL weather observations, weather forecasts and climatological information for selected cities supplied by National Meteorological & Hydrological Services (NMHSs) worldwide. The NMHSs make official weather observations in their respective countries. Links to their official weather service web sites and tourism board/organization are also provided whenever available. Weather icons are shown alongside worded forecasts in this version to facilitate visual inspection.

The media are welcome to make information presented in this web site available to the public. When doing so, credit to the respective NMHSs should be given.

By 1 Mar 2008, 118 Members supply official weather forecasts for 1263 cities. 1265 cities from 161 WMO Members also have their climatological data presented in this web site. Suggestions to enrich the contents of this web site are welcome.

Figure 5 WMO Severe Weather Information System

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