2008/No. 3

World Meteorological Organization

www.wmo.int/meteoworld

June 2008

MeteoWorld

Weather • Climate • Water

NEWS IN BRIEF

Multi-hazard early warning systems: the case is strengthened

Effective early warning systems involve: observing, monitoring and forecasting natural hazards; developing authoritative and understandable warning messages that include hazard and risk information; timely dissemination of warnings to authorities and those at risk; and emergency preparedness and response measures at community level, based on the warning information received.

Tropical cyclone *Nargis* made landfall in Myanmar on 2 May and swept through the Irrawaddy delta region and Yangon. Its sustained strong winds and heavy rainfall caused death and destruction but it was the storm surge of more than 3.5 m that devastated the populous delta region and decimated its population.

Nargis was the first tropical cyclone to make landfall in that region of Myanmar with such strength in 40 years. Such a rare hazard shows the need for a multi-hazard approach to early warning systems.

Since the Asian tsunami disaster of 2004, WMO, in collaboration with other UN agencies and international partners, has initiated pilot projects to demonstrate the benefits of a multi-hazard approach to early warning systems. These will provide governments with the basis for guidelines for the establishment and sustainability of these systems in a more efficient and cost-effective manner.

More resources for natural hazard prediction, better communication and public awareness of warnings, and disaster preparedness measures would save lives. Disaster preparedness measures include national and local emergency plans and legislation which clearly lay out the roles and responsibilities of the different agencies in the operational warning system in place.

In January 2008, upgrading of the WMO Global Telecommunication System (GTS) in Yangon was completed. The GTS plays a vital role in accessing the meteorological data that are essential for the preparation of warnings. Timely and accurate alerts and warnings about *Nargis* were issued from 27 April onwards.

A WMO field mission to Myanmar in the aftermath of *Nargis* concluded that the country's operational meteorological infrastructure needed to be restored and the provision of meteorological information and services enhanced.

Damaged hydrometeorological equipment and instruments have to be repaired and an upper-air observing system and a weather radar installed. The data-processing and forecasting system needs to be strengthened to generate numerical storm-surge prediction and storm-induced flood forecasting. Back-up electric power supply is required for ensuring minimum operational services under all circumstances. Staff need to be trained and public weather services enhanced for sharing weather information and warnings that are clear to, and understandable by, all.

WMO will be giving technical advice for disaster risk reduction, such as risk assessment and risk mapping, to help reduce the vulnerability of the people in the Irrawaddy delta.

Although the development and sustainability of effective end-to-end early warning systems are resource-intensive, posing significant challenges, particularly in the developing and Least Developed Countries, they are highly cost-effective.

Strengthening the capacities of African countries

Developing countries could be better protected against the damaging effects of climate change,

variability and extreme weather events if their National Meteorological and Hydrological Services were strengthened.

WMO regards such Services as actors of development. They have an important role to play in regional and international action plans, particularly with regard to evaluating and monitoring the environment, preparing for natural hazards, agricultural production, water resources and, particularly, climate change.

It is important to ensure that, in the long term, these countries can monitor and research extreme meteorological and hydrological events, such as evaluating the impacts of climate change and applying measures to adapt to, and mitigate against, such phenomena.

Many African countries are among the world's least developed and, consequently, are the most susceptible to threats posed by meteorological and hydrological disasters, such as drought, flooding, cyclones, duststorms and other extreme events. But, if more is invested in developing the observational capacities of their National Meteorological and Hydrological Services, improved weather forecasts, improved early warnings of imminent natural hazards and climate predictions can be made available to decision-makers and end-users.

Serious gaps still exist in observation networks, often due to instrument and systems failure, as well as the high costs of operation and maintenance. Statistics confirm the increasing economic impact that natural disasters have caused during recent decades. Moreover, these dangers strike harder at developing countries and, more particularly, the least developed among them, which increases their vulnerability and delays the realization of their economic and social growth targets.

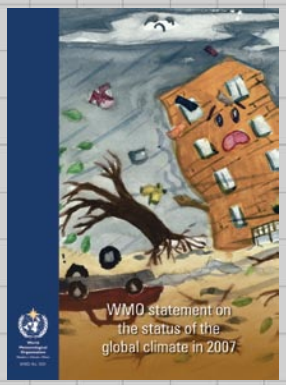
Flooding and drought cause water shortages, damage crops and threaten food security.

WMO stresses the urgent need for fulfilling commitments under the United Nations Millennium Development Goals in Least Developed Countries, which are constrained by extreme and omnipresent poverty, stifled economic growth, insufficient development of human resources and limited institutional capacities.

Investing in and developing methods that can assess the socio-economic advantages of National Meteorological and Hydrological Services highlight the importance of these Services in the context of sustainable development.

Recently issued

WMO Bulletin 57 (2), April 2008 (theme: "Adapting to climate variability and change") [E] (F-R-S in preparation)



WMO statement on the status of the global climate (WMO-No. 1031) [A-C-E-F-R-S]

International Polar Year continues

International Polar Year 2007-2008 (IPY) is an intensive and internationally coordinated campaign of high-quality bi-polar research activities and observations, sponsored by WMO and the International Council for Science (ICSU). It began on 1 March 2007 and will reach its peak during the northern hemisphere summer this year. Over 200 projects endorsed by the ICSU/WMO Joint Committee for IPY are carried out in both polar regions on the land, over the ocean, in the atmosphere and in space.

International Polar Foundation

Newly established Princess Elisabeth station in the Antarctic

Polar atmospheric research has been intensified in the Arctic by the establishment of a new international environmental observatory (Tiksi). Moreover, the establishment of a new station, modernization of equipment at several observing stations and deployment of new automatic weather stations have been positive developments in the Antarctic.

International multidisciplinary marine expeditions related to studies of physical and chemical oceanic processes, sea-ice properties and coverage, physical and chemical interactions of atmosphere, sea ice and ocean, marine geology and biology were successfully carried out in the summer of 2007 in the Arctic Ocean within various IPY projects such as DAMOCLES, SEARCH, ARCTICA-2007 and OASIS.

One of the main achievements of these activities was the deployment (for the first time in the history of Arctic Ocean studies) of 156 oceanographic moorings and arrays, as well as a large number of new underwater and under-ice mobile observing facilities across the Arctic Ocean. The first stage of the IPY project Climate of Antarctica and Southern Ocean was carried out from January to March 2008.

The successful start of IPY has been reflected by a marked increase of the number of reports from traditional observational networks in both polar regions. For example, the number of drifting buoy reports in the Southern Ocean increased five times compared with 2006.

Considerable progress is being made by space agencies towards the characterization of key high-latitude processes by means of spaceborne snapshots of the polar regions under the GIIPSY IPY project. These data include obtaining Arctic basin wide and Southern Ocean wide coverage for sea-ice dynamics mapping, obtaining continental-scale coverage of Antarctic and Greenland ice sheets and pan-Arctic lake and river freeze- and break-up.

An important part of the IPY vision is to convert the burst of observational programmes into sustainable long-term research and monitoring capabilities. The IPY Joint Committee is developing a roadmap that will lay the way towards a consolidated legacy of IPY observing systems. These could then be used by decision-makers to identify funding for their support in the post-IPY era. Establishment of

COMING EVENTS

5-9 July 2008 — The Aviation Seminar (Muscat, Oman) (co-sponsored by WMO)

7-11 July 2008 — Fifteenth International Conference on Clouds and Precipitation (Cancun, Mexico) (co-sponsored by WMO)

11-17 July 2008 — RA V Tropical Cyclone Committee for the South Pacific and the South-East Indian Ocean—twelfth session (Alofi, Niue)

14-16 July 2008 — International Fire Warning Workshop (Edmonton, Canada)

17-18 July 2008 — Meeting of the CAgM Expert Team on Agrometeorological Aspects of Sustainable Agricultural Development (Edmonton, Canada)

7-12 September 2008 — Tenth IGAC Biennial Conference Bridging the Scales in Atmospheric Chemistry (Annecy, France) (co-sponsored by WMO)

25 September 2008 — Humanitarian Community Requirements for Meteorological, Hydrological and Climate Information (Geneva, Switzerland)

a Global Cryosphere Watch would be a significant component of this legacy.

Food security

WMO co-sponsored the International Symposium on Agrometeorology and Food Security, in Hyderabad, India, in February 2008.

The issues covered were climate change and food security; agrometeorology and water resource management; extreme weather and disaster management; agrometeorology of land use and land degradation, livestock and fisheries; technologies and tools, including weather modification for improving agriculture; crop-weather modelling, decision-support systems and yield prediction; agricultural planning; pests and diseases; and operational agrometeorology and agrometeorological advisories.

The Symposium recommended the creation of an international consortium for weather and climate information for ensuring food security. A number of research and policy issues were identified as priority areas that the consortium should focus on.

WMO also participated in the Expert Meeting on Climate Change Adaptation and Mitigation, organized by the Food and Agriculture Organization of the United Nations (Rome, Italy, March 2008). This was one of a series of FAO meetings leading up to the FAO High Level Conference on World Food Security: the Challenges of Climate Change and Bioenergy, 3-5 June 2008.

The major outcome was a technical background document entitled "Climate change and mitigation in agriculture, forestry, and fisheries".

Observing the atmosphere

Aerosol observations

Atmospheric suspended particulate matter, commonly known as aerosols, can originate from many types of human activities in the form of wind-blown sand and dust, smoke from biomass burning and smog particles from fossil fuel combustion and industry. Aerosols affect climate by altering the Earth's energy budget and the water cycle by absorbing or reflecting solar and terrestrial radiation in clear skies or by affecting clouds brightness and coverage, as well as rain formation.

According to the recent Fourth Assessment Report of the Intergovernmental Panel on Climate Change, the effects of aerosols on climate and weather are poorly understood, largely because of a lack of sufficient observations and aerosol-cloud research. WMO, the South African Weather Service, the China Meteorological Administration and MeteoSwiss have announced the addition of automated suntracking sunphotometers at the global observatories of Cape Point, South Africa, and Mt Waliguan, China. This is a significant step forward towards an integrated global aerosol observation and analysis system coordinated internationally by the WMO Global Atmosphere Watch (GAW).

These remote-sensing instruments measure continuously the decrease in sunlight reaching the ground caused by aerosol particles in the atmosphere. This yields information on aerosol pollution passing overhead and ensures the routine calibration of similar instruments on satellites.

They are operated by the GAW World Optical Depth Research and Calibration Centre in Davos, Switzerland. They form part of a 12-station global reference network for a large global network of more than 100 stations operated by a number of research organizations (US National Aeronautics and Space Administration's AERONET, Asia SKYNET) and national GAW programmes of WMO Members. Most significantly, these instruments fill large gaps in the global aerosol network over Asia and Africa.

This GAW aerosol network is part of the Global Climate Observing System, the climate component of WMO's Integrated Global Observing Systems.

New ozone-measuring programme

The Argentine Meteorological Service, in collaboration with the Spanish Meteorological Agency and the government of the province of Tierra del Fuego, has started a new measurement programme for

Newly installed sunphotometer at Cape Point, South Africa

Launch of the first ozonesonde from Ushuaia, Argentina

observing atmospheric ozone from the global WMO Global Atmosphere Watch station at Ushuaia in the south of Argentina (55°S and 68°W). The measurements are carried out with balloon-borne ozonesondes that measure the ozone concentration in the atmosphere from the ground up to about 35 km. The first sounding was carried out on 16 April 2008.

The launch was coordinated with a simultaneous launch of an ozonesonde from the Marambio station on the Antarctic Peninsula (64°S and 57°W).

The plan is to launch two sondes per month outside, and two sondes per week during, the ozone hole season. The new measurement programme will allow better understanding of the influence of the Antarctic ozone hole on the southern part of South America. Occasionally, the ozone hole extends far enough to the north to cover Ushuaia, which can potentially lead to large increases in the ultraviolet radiation that reaches the ground.

This new measurement programme is a timely and valuable contribution to the global atmospheric observing effort coordinated by WMO.

Data from Ushuaia will be transmitted to the WMO World Ozone and UV Data Centre in Toronto, Canada, and thereby be available to the global community of ozone scientists and other interested parties. The data will also be used in the Antarctic Ozone Bulletins, published by WMO from August to November each year.

Climate change work: a contribution to world peace

The availability of, and access to, freshwater resources have been the cause of conflict in the past. With potentially lesser amounts of the resource and uneven geographic distribution, the potential for conflict grows exponentially.

A technical paper of the Intergovernmental Panel on Climate Change (IPCC) on the impacts of climate change on water is an important addition to its recent Fourth IPCC Assessment Report. It reinforces the need for countries, particularly in the developing world, to strengthen the monitoring and observational capacities of their National Meteorological and Hydrological Services.

The paper emphasizes the link between global warming and large-scale changes in the hydrological cycle, including changing precipitation patterns, intensities and extremes, the reduction of snow cover over continents and ice cover over the oceans, the melting of continental ice, and changes in soil moisture and runoff, including the occurrence and intensity of droughts.

All these aspects of the climate system are central to WMO's expertise and the results highlight the need to further support research and observations.

Indeed, WMO has been the principal provider of the scientific and technical information that underpins IPCC assessments through the long-term and user-driven operational systems and programmes developed by WMO and its Members.

The work of the IPCC is vital to world peace, as was recognized when the IPCC was awarded the Nobel Peace Prize in 2007. WMO is committed to supporting its activities by maintaining its scientific credibility and facilitating the increasing involvement of scientists from both developed and developing countries.

The IPCC was co-established by WMO and the United Nations Environment Programme in 1988. The Panel's efforts have become the benchmark for understanding the state of our planet's changing climate.

Forecast demonstrations during the Beijing 2008 Olympics

During the Beijing 2008 Olympic Games, the Beijing Meteorological Bureau will host, in an operational setting, the latest nowcast and mesoscale ensemble forecasting systems from Australia, Canada, France, Japan and the USA. Specifically, products from both 0- to 6-hour nowcasts, which rely more heavily on expert systems interpreting the available observations, and 6- to 36-hour forecasts based on mesoscale ensemble models will be made available to weather forecasters from the China Meteorological Administration (CMA).

The goals of this effort are to provide better weather forecasting services for the Games and to expose the CMA forecasters to the most advanced weather prediction techniques in the world, as well as to further the transfer of technology to other countries.

The Beijing 2008 exercise is a follow-up to the Forecast Demonstration Project held during the Sydney Olympics in 2000. It is another opportunity to bring together forecasters and researchers from agencies around the globe to work towards a common goal of improving forecasting services during a highly visible and important international event.

The systems will be evaluated by forecasters immediately after the Games to assess the overall scientific accuracy of the various models and their ability to deliver the desired social and economic benefits. Just as the Olympic athletes are getting ready for Beijing, the forecast participants are currently undergoing tests of their systems in preparation for the 8-24 August time-frame of the Games.

The experiences from the forecast and demonstration projects during the Beijing 2008 Olympics will be published as a technical document by the World Weather Research Programme.

Beijing 2008

World Meteorological Organization

World Meteorological Organization
7 bis, avenue de la Paix, PO Box 2300
CH-1211 Geneva 2, Switzerland
Tel.: +41 (0) 22 730 83 14 / 83 15
Fax: +41 (0) 22 730 80 27
Internet: http://www.wmo.int

We welcome your comments about MeteoWorld and look forward to hearing from you: jtorres@wmo.int