



## Hundreds killed on the Gulf of Mexico coast due to Hurricane Katrina

Hurricane Katrina, the sixth hurricane hitting the mainland US in just over a year, made landfall with maximum wind speeds reaching 230 km/h, devastating a wide area along the Gulf coast. The death toll exceeded one thousand (CNN, 23/09/05). Katrina is the second deadliest hurricane in US history after the 8 September 1900 hurricane. Preliminary estimates of privately insured losses are US\$ 40-60 billion, and the total economic losses are expected to exceed US\$ 125 billion, which makes Katrina the world's most costly hurricane (RMS, 09/09/05).

### PPEW Analysis - Did the early warning system work?

A complete early warning system consists of four elements: 1) prior risk knowledge, 2) monitoring and warning service, 3) dissemination of warnings, and 4) response capacity. A lack in one part could cause the failure of the whole system.

In the case of the Hurricane Katrina the National Hurricane Center, Miami (<http://www.nhc.noaa.gov/>), predicted accurately the hurricane's projected path, time of arrival, wind speed, and the risk of storm surges. Most people in the region must have been aware of the approaching hurricane through the media, and had prior knowledge on hurricane risk as hurricanes frequently affect the region. At least a day before the hurricane actually hit, most people had been warned. Consequently, about one million people have been evacuated from the region.

It can be said that the problem lies in a mixture of the element 1 - *Risk Knowledge* and the element 4 - *Response Capability*.

First, there was a major lack of awareness of the real hurricane risk. Very few people had envisioned the real impact of New Orleans under water due to the collapsed levees except for a handful of experts and decision makers. The levees were supposed to protect the city from Lake Ponchartrain and the Mississippi River. It seems there were no well-practiced emergency preparedness or awareness and response plans for many vulnerable communities. Despite the mandatory evacuation order issued by authorities, many people did not evacuate the area. There were many socially vulnerable people who cannot afford to own a private vehicle or who lacked in cash for



People preparing their homes for the forecasted hurricane Katrina. Most of the people who were able to leave the city followed the advice to evacuate to low-risk regions. Source: FEMA



A gas fire burns next to this New Orleans home from underneath the flood water. Source: Liz Roll/FEMA

several days traveling or who feared for their pets. The handicapped, the elderly and children are especially vulnerable. Another factor is that poorer housing is more fragile and easily destroyed when exposed to strong winds and is more vulnerable in lowlying locations. This is partly due to exploited land use and laissez-faire location decisions in the past. Specialists have warned for long time that New Orleans, which is a city built partially below sea level, was heading for a catastrophic disaster.

The US Army Corps of Engineers reported that Katrina was too strong for the levees which were only capable of protecting New Orleans in up to Category 3 hurricanes. There was a plan to reinforce the levees, but the budget was not available. Katrina tells us that disaster preparedness programmes need to be well established to secure populations before disasters occur. The combination of complete early warning systems (not just a good warning) and contingency planning is a key to protect people and communities from disasters. This is achievable through regular training and drills. Public participation is important to raise risk awareness and to integrate risk assessment into public policies such as land use planning.

Some research studies indicate that global warming would increase the intensity of tropical cyclones (<http://www.ipcc.ch/>). If so, all of the tropical cyclone prone countries may need to consider updating their national disaster reduction strategy for tropical cyclones. Katrina may be just a start.

A new study examined the number of tropical cyclones over the past 35 years, showing a large increase in the number and proportion of hurricanes reaching the strongest categories 4 and 5. (Science, Vol 309, Issue 5742, 1844-1846, 16 September 2005)

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### Progress of the global survey of early warning systems

After the 2004 Indian Ocean tsunami, the world was shocked to learn that if tsunami early warning systems had been in place in the region, many thousands of lives could have been saved. In January the UN Secretary-General called for global early warning systems addressing all natural hazards. In his 21 March 2005 report on the implementation of the Millennium Declaration, "In Larger Freedom: towards development, security and human rights for all", he requested the ISDR secretariat to coordinate a survey of the world's early warning capacities and gaps (A/59/2005).

The ISDR secretariat is carrying out the survey through its Bonn-based Platform for the Promotion of Early Warning (PPEW). A working group co-chaired by OCHA and WMO with representatives from UNDP, UNEP, UN-HABITAT, UNITAR, UNU, Asian Disaster Preparedness Center, IGAD Climate Prediction and Application Centre for the Greater Horn of Africa, Global Fire Monitoring Center, and IFRC was established to support the ISDR secretariat on the survey process and the preparation of a report. A preliminary report on the survey is available at: <http://www.unisdr.org/ppew/news/EW-Survey-progress-report-08-2005.doc>

### Flooding in Europe

#### Four floods within four months

Romania suffered 58 fatalities and 4000 destroyed houses during the worst flood period since 100 years. Early warnings provoked thousands of soldiers and fire brigades to evacuate people. Despite a newly enacted law (2004) obliging local authorities to protect their people, the weak link was at the local level from shortage of sandbags, boats and other simple equipment, to failure in the warning dissemination. Warnings were issued by the Meteorological Service, Bucharest, but not all communities received the message. Additionally many people refused to leave their homes for fear of thefts. Traian Basescu, the Romanian President complained that Romania is not ready for such disasters and emphasized the need for good concepts to apply for flood protection in Romania. It is furthermore emphasised by experts that ongoing deforestation causes rapid drainage during heavy rain and snowmelt, and the lack of maintenance of riverbeds and channels worsens the floods. (Source: Reuters AlertNet)

#### High priority for investments in flood protection

After the destructive floods in Switzerland in August 2005 experts expect that in the near future there is the need to replace or improve construction works along all three main rivers in Switzerland. Costs for the river Rhone alone will sum up to about 1m CHF. A new risk map of Switzerland will demonstrate which areas need to be included into the plans of intense protection measures. Swiss federal council member Leuenberger praised the exemplarily flood protection measures undertaken in Engelberger Aa region after floods in 1987; there the damage is small compared to other regions. It was calculated that some 26m CHF invested avoided estimated loss of 100m CHF - a good example for the effectiveness of preventive measures. The Swiss early warning system for floods operates a riverbed network consisting of 200 stations and measures the levels daily and if needed up to every two hours. An automatic alarm will be given to communal authorities, crises cells, power plants, shipping industry and private persons if a defined level is exceeded.

#### *PPEW comment:*

*Hurricane Katrina as well as the devastating floods in Romania, Bulgaria, Switzerland, Austria and Germany demonstrate that industrialized countries also have to be prepared for the worst. "We need to pay more attention to social vulnerability to hazards. People easily forget risks and they often see natural hazards as dangers that only threaten others. Even countries that are well prepared can do better", said Salvano Briceño, director of the Secretariat for the International Strategy for Disaster Reduction.*



### Call for proposals - early warning projects

The EWC III - to be convened by the Government of Germany under UN auspices, from 27 to 29 March 2006 in Bonn - will be a project-based conference, aiming to stimulate concrete action towards implementation of the Hyogo Framework for Action.

A call for proposals for early warning projects has been issued by the Conference organisers (see [www.ewc3.org](http://www.ewc3.org)).

The proposals will be assessed on their impact, feasibility, urgency, sustainability, efficiency, cost effectiveness and regional balance. PPEW will manage the project review process. A pool of expert referees will make assessment of submissions through a project review process. Only a limited number of projects will be presented at the conference plenary, but all promising proposals will be collated in a portfolio of project proposals which will be soon publicly available at the PPEW website.

One stream of the conference is the Priorities & Projects Forum focusing on presentations of early warning projects and discussions surrounding the three themes of hazards of the earth, water and air. The other is the Scientific Symposium discussions on (i) mega-events, (ii) multi-hazard approaches and, (iii) people, politics, economics. It will be coordinated by an International Scientific Advisory Board led by Prof Zschau of the GeoResearch Centre in Potsdam, Germany. The call for scientific abstracts will be issued via the EWC III website shortly. For further information see: [www.ewc3.org](http://www.ewc3.org)

### G8 calls for more effective early warning system

Significant commitments on extreme natural catastrophes and especially early warning to reduce the impacts of disasters were made by the G8 in Gleneagles, Scotland. Disaster risk reduction and early warning are essential to achieve development goals for Africa, climate change and poverty reduction. Recognizing that disaster and poverty are widely linked with each other, the G8 agreed to provide more resources for disaster risk reduction and early warning systems for the poorest countries. The Natural Hazard Working Group established by Prime Minister Tony Blair in the aftermath of the 26 December tsunami evaluated the mechanisms that need to be put in place for the detection and early warning of natural hazards of high global or regional impact. Full G8 tsunami response report see: [http://www.unisdr.org/eng/media-room/press-release/2005/PostG8\\_Gleneagles\\_Tsunami.pdf](http://www.unisdr.org/eng/media-room/press-release/2005/PostG8_Gleneagles_Tsunami.pdf)

### One million Japanese prepare for "the big one"

On 1 September 2005 more than one million people took part in drills across Japan to prepare for tsunami related disasters. The drill was imitating a commonly forecasted scenario such as an earthquake of 7.3 on the Richter scale hitting Tokyo Bay.

Schools, offices and police posts practiced how to head for safety from seismic waves and how to protect themselves in the event of a major earthquake. Even the Prime Minister Junichiro Koizumi was participating by holding a mock press conference after a hypothetical earthquake, his cabinet also held a mock emergency meeting. Military planes flew physicians and nurses from Tokyo to Chiba and transferred the "injured" to outlying hospitals. Schoolchildren were shown how to put out fires as they put handkerchiefs over their mouths to protect themselves from smoke. The exercise also included Japan's new Disaster Medical Assistance Team, a medical unit on standby only for emergency rescue. (<http://www.terradyaily.com/news/tectonics-05zzzs.html>)



**SPECIAL BRIEFING****Early Warning for Wildland Fire**

Recent wildfires in Portugal and Spain and land-use fires in Indonesia, Peru and Bolivia clearly demonstrated the negative impacts of wildland fires on the environment and on societies. According to the Global Fire Monitoring Center (GFMC) an increasing occurrence of extreme wildland fire episodes has been globally observed in the last decade. The fires on the Iberian Peninsula reveal the mutual influences between ecosystem properties and human interventions. The majority of these fires have been caused by people.

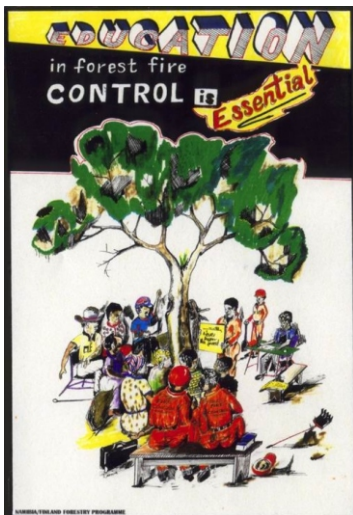
The August 2005 Bulletin of the UN/ISDR Global Wildland Fire Network reveals that the total area burned in 2005 in Portugal is lower than in 2003 when in this country alone more than 400,000 hectares of land been affected by fire. About 80% of all fires in Portugal were either set intentionally or caused by negligence (127 persons have been arrested).

The severity and uncontrollability of fires are a consequence of land-use change, notably fuel accumulation, and a lack of appropriate policies. The increasing vulnerability of rural and urban societies to be affected by fire and its consequences is obvious. Thus, early warning systems for wildland fires must consider the human component.

Wildland fires have major impacts on the environment, human safety, health, regional economies and global climate change. Only 10-15 % of wildfires are started by lightning, but the majority are started by humans, or due to inappropriate use of fire in agriculture, pastoralism and forestry.

**EWS for Wildland Fires**

Early warning systems for wildland fire help to identify critical time periods of fire danger, in order to initiate crucial steps to implement fire prevention, detection and pre-suppression plans before fire problems starts. A fire danger rating system is a long proven tool using basic daily weather data to calculate wildfire potential. Sophisticated systems include both fixed and variable factors of the fire environment (i.e. topography, fuel, fire weather) to determine the ease of ignition, rate of spread, difficulty of control, and fire impact. These, supported with satellite data such as on early fire detection, and land cover and fuel conditions, allow forecasts up to 14 days in advance.



Wildland fire awareness-raising poster. GFMC archive

**Community based early warning system is needed**

All sophisticated wildland fire early warning systems will be of limited use if local people do not know how to use the information or do not appreciate the benefit. Community-based fire management systems involve participation of local rural people in wildland fire prevention, application of safe agricultural burning practices and local fire fighting. These participatory approaches must include an early warning

component with locally agreed measures to be taken at times of high fire danger. GFMC supports in many parts of the world workshops and training to educate and build local capacity on how to run the system and use the information that the system produces. It is very important to assist developing nations, in establishing their own expertise and taking ownership of such systems.

**Regional and international cooperation**

The development of an advanced, multilaterally agreed wildland fire early warning system requires strong regional cooperation. GFMC serves as facilitator of the UN/ISDR Global Wildland Fire Network and distributes early warning system outputs. It works closely together with national and international agencies, such as the World Meteorological Organization (WMO) which focuses on monitoring and predicting weather factors and calculating smoke trajectories for air pollution warnings.

Satellite data for wildland fire early warning could be provided by the Global Observation of Forest and Land Cover Dynamics for crucial information on land cover, fuel types, or spatial weather information. Various national fire management organisations such as the Canadian Forest Service or other fire research agencies such as Australia's Bushfire Cooperative Research Centre will play an increasing role within the network.

The Food and Agriculture Organization (FAO) and the United Nations Environmental Programme (UNEP) recently held a working session in Geneva on wildland fires with the Joint UNEP/OCHA Environment Unit, the UN/ISDR secretariat and the GFMC. The FAO is currently cooperating with the UN/ISDR Wildland Fire Advisory Group to develop a global strategy for enhancing international cooperation in wildland fire management.

Unlike the majority of the geological and hydrometeorological hazards wildland fire represents a natural hazard, which is predominantly influenced by humans, and hence can be predicted, controlled and, in many cases, prevented.

For more information on early warning systems for wildland fire see GFMC at: <http://www.fire.uni-freiburg.de/fwf/fwf.htm>



Both public awareness-raising posters from Africa were developed by local artists in Namibia, in the frame of the Namibia-Finland Forestry Programme. GFMC archive



Fire Index sign used in Thailand to inform local populations on the daily fire danger. GFMC archive

**News****Increasing costs of major storms**

A report from the Association of British Insurers shows that the worldwide cost of storms is likely to increase by two thirds taking the total cost in an average year to U\$ 27 billion. Some of the costs could be avoided by taking preventative measures such as improved coastal defences, said ABI's director Nick Starling. <http://www.abi.org.uk>

**Tsunami Early Warning System in Thailand**

The UN Development Programme (UNDP) and Asian Disaster Preparedness Center (ADPC) jointly support the Royal Thai Government's Department of Disaster Prevention and Mitigation (DDPM) to implement a community-based, multi-hazard early warning and disaster preparedness system in Thailand. The project includes the installation of two sea level gauge stations and five monitoring towers, training courses for DDPM personnel, and awareness raising in vulnerable communities. More: <http://www.adpc.net/adpcundp.html>, [http://www.undp.or.th/whatsnew/signing\\_earlywarningsystem.html](http://www.undp.or.th/whatsnew/signing_earlywarningsystem.html)

**Massive floods in India**

Heavy monsoon rains and floods at the end of July 2005 caused deaths of 1,000 people, billions of dollars of damage and days of serious disruption. The drainage and electricity supply in Bombay failed to cope. Environmentalists argue that much of the flooding could have been prevented if builders had not built on wetlands, the city's natural drainage system. <http://www.irinnews.org>

**Disaster prevention and preparedness in Central Asia**

The European Commission's Disaster Preparedness Programme contributed € 3.5m to bolster disaster prevention in the region, focusing on capacity building of local communities to provide early warning and to respond to and cope with disasters. It is expected that 1.4 m people will directly benefit from the project and it is likely that a far greater number of people may benefit in the long term as a result to the capacity building and awareness raising components of the programme. <http://www.irinnews.org>

**Fragile dam - a known risk**

Geologists warn of the instability of the natural dam of the volcanic Crater Lake Nyos in North West Cameroon. A collapse would release tonnes of water pouring down the surrounding valleys. Additionally, deep within the lake huge amounts of carbon dioxide gas are dissolved, and a disruption in the water column above it could trigger the release of carbon dioxide that would kill the surrounding population, as happened in August 1986 when a cloud of carbon dioxide displaced oxygen-bearing air and suffocated up to 1,800 people in their sleep without any warning. <http://www.irinnews.org>, <http://www.guardian.co.uk/science/story/0,3605,1579125,00.html>

**Publications**

**Climate Change and Africa** (2005): Edited by Pak Sum Low Cambridge University Press. The book presents issues of relevance to Africa in respect of climate change, such as science, sustainable energy development, mitigation and policy, vulnerability and adaptation, capacity building, and lessons from the Montreal Protocol. Reid Basher, PPEW-Coordinator and Salvano Briceno, Director UN/ISDR wrote the chapter: Climate and disaster reduction in Africa.

**Natural Hazards** (2005): Edward Bryant, Cambridge University Press. The readable and well supported by more than 180 maps, diagrams and photographs book explains how hazards occur, examines prediction methods, considers recent and historical hazard events and explores the social impact of such disasters.

**More tidal gauges needed**

The authors of a study reconstructing wave heights and speeds of the 2004 Indian Ocean tsunami suggest that an early warning system for the Indian Ocean would need more tidal gauges measuring real time sea level changes. <http://www.agu.org/pubs/crossref/2005/2005GL022610.shtml>

Also online at <http://www.unisdr-earlywarning.org>

**Dealing with Disasters**, Special Section in Science Vol 309, 12 August 2005. <http://www.sciencemag.org/sciext/disasters/>

**Tsunami: learning from the humanitarian response**

Forced Migration Review. The July 2005 issue is dedicated to the Indian Ocean tsunami 2004. Full article in English: <http://www.fmreview.org/FMRpdfs/Tsunami/full.pdf>

**Project of risk evaluation, vulnerability, information & early warning**

The PreView - IMS project aims to identify risk and human vulnerability to natural hazards in relation with socio-economic and physical factors. Data on natural disasters could be visualised combined with information on population density, Human Development Index or the Gross Domestic Product. The UNEP product was developed in partnership with the UN International Strategy for Disaster Reduction (ISDR).

<http://www.grid.unep.ch/activities/earlywarning/preview/>

**FAO Global Information and Early Warning System**

The new website includes a special note on "Tropical Storms" Typhoons and Monsoon Floods in Asia. <http://www.fao.org/giews>

**Upcoming Meetings**

**18th Emergency Preparedness Conference: Community Resilience; a Future for All**, in Vancouver, British Columbia, Canada, from 4-7 October 2005. <http://www.epconference.ca/>

**Australasian Fire Authorities Conference 2005 - Innovation & Technology** in Auckland, New Zealand, from 5-7 October 2005. <http://www.afac.com.au/>

**Regional Training Course on Skills for Effective Training**, in Bangkok, Thailand, from 17-21 October 2005. <http://www.adpc.net/training/brochure/SET1-brochure.pdf>

**Third Biennial Caribbean Association of Fire Fighters Conference** at Trinidad & Tobago, from 17-22 October 2005. <http://www.caff-secretariat.org/conferences/>

**Tsunamis: Past Events and Future Risk**, 18 October in London. Benfield Hazard Research Centre: [www.benfieldhrc.org](http://www.benfieldhrc.org)

**Special Session Marine Natural Hazards** in Townsville, Australia, from 31 October - 3 November. <http://www.conferenceplanners.com.au>

**Thirty-eighth session of the Typhoon Committee** of UNESCAP and WMO at Hanoi, Viet Nam, from 14 - 19 November. Contact details: [icd.hms@pt.vn](mailto:icd.hms@pt.vn)

**International Symposium "Worldwide Disaster Prevention Awareness is the key"** at Hohenkammer/Munich, Germany, from 16-17 November. <http://www.munichre-foundation.org/StiftungsWebsite/TopicsAndProjects/DisasterPrevention/InternationalSymposium/default.htm>

**International Workshop on Strengthening the Resilience of Local Communities in Coastal Areas and Water Related Natural Disasters** at Copenhagen, Denmark, from 16-18 November. For more information contact: Palle Lindgaard Jørgensen ([plj@dhi.dk](mailto:plj@dhi.dk))

**12th Session of the Inter-Agency Task Force on Disaster Reduction** in Geneva, Switzerland, from 22-24 November. <http://www.unisdr.org/meeting-conference-2005.htm#nov>

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