



THE SECOND INTERNATIONAL CONFERENCE ON EARLY WARNING: 16-18 OCTOBER 2003

The Second International Conference on Early Warning (EWC-II) took place in Bonn, Germany, from 16-18 October 2003, at the Internationales Kongresszentrum Bundeshaus. It was hosted by the Government of Germany and supported by the UN Inter-Agency Secretariat of the International Strategy for Disaster Reduction (ISDR). Over 300 participants attended, including ministers and government officials, representatives of UN and other multilateral organizations, assistance agencies, technical and research institutions and non-governmental organizations.

EWC-II built on regional consultations and workshops undertaken between May and July 2003, and served as a follow-up to the International Conference on Early Warning Systems for Natural Disaster Reduction, held in 1998 (EWC'98).

Participants at EWC-II heard statements from high-level officials, and attended a number of presentations on good practices in early warning and on emerging issues. Panel discussions were held on solutions for integrating early warning into public policy, new technologies and low-technology solutions for early warning systems, the responsibilities of policy makers in the context of early warning and urban risks, and early warning as a decision tool for emergency management. Additional sessions were also held to discuss flooding, the use of hazard maps for effective early warning, integrated approaches to reduce societal vulnerability to droughts, integrating early warning into public policy processes, the implementation of transboundary early warning systems for floods, and new technologies and scientific networks.

Three working groups discussed elements of a future international early warning programme, on the basis of which two conference documents were drafted. One includes specific recommendations from EWC-II, and the other is the Conference Statement. The drafts were to be left open for comment for a week following the conclusion of the Conference.

A BRIEF HISTORY OF UN DISASTER REDUCTION INITIATIVES ON EARLY WARNING

In recent years, disaster reduction has become an increasingly important issue in the international arena. Disasters caused by the impacts of natural and technological hazards on vulnerable human

beings represent a growing concern, due to factors such as global population growth and urbanization, a rising proportion of poor and the onset of global environmental changes, including climate change, desertification and loss of biodiversity. The prevalent view is that disasters are increasing in number and intensity. Most policy makers and academics acknowledge that vulnerability due to poor planning, poverty and other factors contributes as much to the magnitude of disasters as do the natural hazards themselves. Action to reduce exposure to risk from hazards is now considered necessary in order to safeguard sustainable development efforts and human lives. The development of early warning systems is a key step towards reducing this risk.

INTERNATIONAL DECADE FOR NATURAL DISASTER REDUCTION: An increase in human casualties and property damage in the 1980s motivated the UN General Assembly in 1989 to declare the 1990s the International Decade for Natural Disaster Reduction (IDNDR) (resolution 44/236). The aim of the IDNDR was to address prevention of disasters in the context of a range of hazards, including: earthquakes, windstorms, tsunamis, floods, landslides, volcanic eruptions, wildfires, grasshopper and locust infestations, and drought and desertification. One of the main outcomes of the IDNDR with relation to early warning was the Yokohama Strategy and Plan of Action, adopted at the 1994 World Conference on Natural Disaster Reduction in

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Yokohama, Japan, which identified one of the key goals of the IDNDR as the “realistic assessment of hazard, risk and vulnerability including early warning and response capabilities.”

In 1995, the UN General Assembly requested the IDNDR Secretariat to conduct a review of early warning capacities and to suggest ways and means by which global practices could become better coordinated and more effective. A number of activities were carried out in the area of early warning, including six expert working groups to study: geological hazards; hydrometeorological hazards, including droughts; fire and other environmental hazards; technological hazards; the use and transfer of related modern technologies; and national and local capabilities pertinent to the effective use of early warning.

INTERNATIONAL CONFERENCE ON EARLY

WARNING SYSTEMS: The International Conference on Early Warning Systems for Natural Disaster Reduction (EWC’98) took place in Potsdam, Germany, in 1998 and organized by the Government of Germany and the Secretariat for the IDNDR. EWC’98 was held in response to an affirmation by the IDNDR’s Scientific and Technical Committee that early warning was an essential goal of the Decade, and was mandated by the Yokohama Plan of Action and three UN General Assembly resolutions adopted between 1994 and 1997. Participants at EWC’98 agreed on a number of conclusions on early warning, including that: early warning represents a cornerstone of disaster reduction; the issues of early warning should be brought to the highest levels of deliberation within the UN system and in other intergovernmental organizations at regional and international levels; and an action plan should be prepared and presented to the IDNDR based on conclusions and recommendations of EWC’98.

INTERNATIONAL STRATEGY FOR DISASTER

REDUCTION: In 1999, at its 54th session, the UN General Assembly decided to continue activities already carried out during the IDNDR on disaster prevention and vulnerability reduction, and established the International Strategy for Disaster Reduction, supported by the scientific and technical expertise and knowledge accumulated during the IDNDR. An Inter-Agency Secretariat and an Inter-Agency Task Force for Disaster Reduction (IATF/DR) for the implementation of the Strategy were also established (resolution 54/219 and 56/195, respectively). Among its mandated tasks, the IATF/DR is to convene *ad hoc* meetings of experts on issues related to disaster reduction.

At its first meeting in April 2000, the IATF/DR identified early warning as a priority area for its future work. Effective early warning is considered to be of high importance for the successful implementation of the ISDR.

REPORT OF THE CONFERENCE

Session Chair Hans-Joachim Daerr, Director General for Global Issues, Federal Foreign Office, Germany, opened the conference on Thursday, 16 October 2003. He noted the significance of natural disaster mitigation and welcomed EWC-II’s focus on experts’ warnings as a step towards greater security against natural disasters.

Jürgen Trittin, Federal Minister for the Environment, Nature Conservation and Nuclear Safety, Germany, highlighted the inter-relationship between natural and anthropogenic disasters and their economic significance. He urged the adoption of a multilateral, preventive approach, focusing on early warning systems.

Jan Egeland, UN Under-Secretary-General for Humanitarian Affairs, noted that reducing human, economic and environmental losses from natural disasters remains a key challenge for the international community. He said that people are increasingly impacted by natural disasters and stressed that EWC-II should: consider the interlinkages between development and humanitarian concerns; strengthen early warning systems; and build capacities at all levels. He emphasized the importance of partnerships in successfully implementing effective early warning and disaster risk reduction.

OPENING MESSAGES: Dahou Ould Kablia, Deputy Minister of the Interior, Algeria, reported on efforts undertaken to address threats posed by natural hazards in his country. He stressed the importance of international solidarity and the transfer of relevant technology and financial resources for dealing with natural disasters.

Yang Yan-Yin, Vice Minister of Civil Affairs, China, outlined the measures adopted in China to improve early warning systems and response capacity, including through space monitoring. She called for increased cooperation within the UN and with other countries, and suggested establishing a worldwide disaster monitoring and early warning system.

Chris Murungaru, Minister of State for Provincial Affairs, Kenya, highlighted the increasing frequency and severity of extreme events in his country. Noting the high priority of food security, he outlined institutional arrangements in Kenya for monitoring and assistance.

Jean Seth Rambeloalijaona, Minister of the Interior and Administrative Reform and President of the National Security Council, Madagascar, described his government’s national risk and disaster management strategy, which calls for full transparency in public aid management.

Paul-Uwe Söker, Secretary of State, Ministry of the Interior of Saxony-Anhalt, Germany, evaluated the response to the flood disaster of August 2002. He said that notwithstanding the success of the disaster protection system, forecasting measures, communication and training must be improved.

Michel Jarraud, Deputy Secretary-General, World Meteorological Organization (WMO), stressed that mitigation of hydrometeorological hazards requires accurate monitoring, detecting and predicting weather patterns and issuing warnings with sufficient lead time.

Ad de Raad, Deputy Executive Coordinator, UN Volunteers, highlighted the indispensable role of volunteers in early warning and disaster risk reduction. He noted that much can be learned from the creative disaster prevention methods in poor communities.

Richard Kinley, Acting Deputy Executive Secretary, UN Framework Convention on Climate Change (UNFCCC), noted that although single extreme climate events cannot be linked to climate change, the Intergovernmental Panel on Climate Change has acknowledged that the frequency and magnitude of such events increase with even a small rise in global temperature. Highlighting adaptation as a response measure promoted by the UNFCCC, he said early warning systems are one way of reducing vulnerability and enhancing adaptive capacity to weather events and climate change, and urged collaboration between the climate change and disaster reduction communities.



Stressing the intimate relationship between desertification and disaster reduction, Grégoire de Kalbermatten, Deputy Executive Secretary, UN Convention to Combat Desertification (CCD), outlined the work of the CCD's *Ad Hoc* Group on Early Warning Systems.

Jagdish Dharamchand Koonjul, Permanent Representative of Mauritius to the UN and Chair of the Alliance of Small Island States (AOSIS), noted that the need to address the vulnerability of small island developing States (SIDS) is established in Agenda 21. In light of the upcoming 10-year review of the Barbados Plan of Action, he hoped EWC-II would offer progress on financial instruments, building and development standards, education and awareness, regional networks, incorporation of SIDS vulnerability factors into indices, and the creation of a special SIDS fund to incorporate vulnerability considerations into sustainable development. He suggested the establishment of a permanent focal point to monitor progress on recommendations from EWC'98 and EWC-II.

KEYNOTE SPEECH: In his keynote speech, United Nations Environment Programme (UNEP) Executive Director Klaus Töpfer highlighted the work done by UNEP in the field of early warning and assessment. He stressed that natural disasters threaten the sustainable development agenda by disproportionately affecting and disadvantaging the poor. He noted that most disasters, and the increase in their frequency, are caused by extreme weather conditions, and provided examples of climate change impacts and the consequences of ill-conceived human activities. He called for sound environmental planning, data and information pooling, improved observation systems, best practices exchange, strengthened technical cooperation, and close cooperation with policy makers.

The following report summarizes the presentations and discussions held at EWC-II, which addressed all aspects of early warning for disaster management. The Conference took the form of thematic presentations, discussions in Plenary and small groups, several high-level panels, and three working groups that reported back to Plenary. The results of the deliberations were used as a basis for drafting two Conference documents. The report follows the format of the Conference agenda.

GOOD PRACTICES IN EARLY WARNING

Eight thematic sessions on good practices in early warning were held in two rounds. The first round, comprising parallel sessions on the roles of the community, global early warning systems, early warning systems for geological hazards, and wild-land fires, was convened Thursday afternoon, 16 October. The second round, comprising parallel sessions on integrating flood early warning systems into national policies, technological means for information sharing, effective early warning systems for tropical cyclones, and early warning systems for extreme climate-related events, was held on Friday afternoon, 17 October.

THE ROLES OF THE COMMUNITY: This session was chaired by Seth Vordzorgbe, ISDR.

Shaukat Ali Awan, Flood Forecasting Division, Pakistan, presented on scientific input into community-oriented early warning for disaster reduction. He outlined initiatives and networks on local, national, regional and global levels for advance warning of floods in the Indus Basin. He stressed the need for awareness-raising for successful implementation of early warning, and feedback to assess the effectiveness of warnings.

Auriol Miller, Concern Worldwide, Democratic Republic of Congo, spoke on initiatives to strengthen community preparedness to volcanic hazards after a 2002 volcanic eruption. She said lessons learned include the importance of gender-sensitive approaches and the use of local metaphors to express complex ideas.

Ailsa Holloway, University of Cape Town, South Africa, spoke on an incidence of misunderstanding an early warning during an extreme weather event in the Western Cape in March 2003, which resulted in the exclusion of many affected households from early warning and relief assistance. She suggested considering "disaster risk early warning systems," rather than simply "early warning systems."

Participants raised questions about ensuring effective early warning in the context of political distrust and conflict.

GLOBAL EARLY WARNING SYSTEMS: This session was chaired by Slobodan Simonovic, Institute for Catastrophic Loss Reduction, Canada.

Ryosuke Kikuchi, Infrastructure Development Institute, Japan, addressed the use of real-time flood forecasting to support flood control decision making. He demonstrated the employment of precipitation monitoring to issue flood alerts, and suggested the establishment of a relevant global system focused on developing countries.

Wolfgang Steinborn, German Aerospace Center, explained the operation of the international charter "Space and Major Disasters" with respect to flood warning. He emphasized the need for a new generation of satellites and a higher resolution observation system accessible to all countries, and for continued monitoring of disaster-prone areas.

Laura Kong, International Tsunami Information Center, US, described work done on early warning systems for tsunamis by countries in the Pacific and by international organizations. She emphasized the need for rapid, accurate and reliable response, and suggested improving sea-level and seismic evaluation systems, to embrace a larger number of regions.

EARLY WARNING SYSTEMS FOR GEOLOGICAL HAZARDS: This session was chaired by Alberto Maturana, National Emergency Office, Chile.

Achmad Djumarma Wirakusumah, Ministry of Energy and Mineral Resources, Indonesia, explained that the early warning system for volcanic eruptions in Indonesia includes geological mapping, volcanic activity monitoring, awareness-raising and equipment installation.

Charley Douglas, World Organization of Volcanic Observatories, Vanuatu, described mapping, monitoring and emergency response with regard to volcanic activity in Vanuatu. He highlighted administrative arrangements and noted that the local population considers monitoring and response measures an obstacle to development, and is therefore reluctant to participate in the process.

Dario Tedesco, Office for the Coordination of Humanitarian Affairs (UN-OCHA), described the response to the 2002 eruption of the Nyiragongo Volcano in the Democratic Republic of Congo. He highlighted the spontaneity of the population's evacuation and return, the unexpected seismic and gas activity, and UN-OCHA's response. He called for cooperation in prevention, assessment and mitigation through funds and cooperation in low- and high-tech-ology projects.



In the ensuing discussion, participants emphasized the gap between scientific knowledge and policy making, loss of credibility of the scientific community as a result of false alarms, and the debate over responsibility for directing the public in times of crisis.

SPECIAL SESSION ON WILDLAND FIRE: This session was chaired by Pedro Basabe, ISDR.

John Roads, Experiment Climate Prevention Center (ECPC), US, explained that the "Experimental Global to Regional Seasonal Forecast System" developed by ECPC provides all the variables necessary for response by the US Forest Service and under other fire danger codes. He emphasized the importance of basic fire occurrence data to validate experimental forecasts.

Helmut Dotzauer and Lenny Christy, Integrated Forest Fire Management (IFFM), Indonesia, explained that actions taken in response to information on potential fire events in East Kalimantan, Indonesia, include developing fire preparedness, disseminating information, educating the public and land-use planning. They said that short-, mid- and long-term information on potential fire events includes daily and annual rainfall, daily hotspot detection, meteorological predictions on possible El Niño events, and dynamic fire hazard mapping.

Johann Goldammer, Global Fire Monitoring Center (GFMC), Germany, explained that GFMC promotes information sharing between countries and regions. He said that methods and systems for early warning of wildland fires include assessment of fuel loads and smoke pollution, and predictions of lightning danger, human-caused fire factors, wildfire spread and behavior, and climate change.

INTEGRATING FLOOD EARLY WARNING SYSTEMS INTO NATIONAL POLICIES: This session was chaired by Erich Plate, University of Karlsruhe, Germany.

Errol Douglas, Water Resources Authority, Jamaica, spoke on the challenges of designing and implementing community flood warning systems in his country. He outlined technical and social issues, including: the difficulty of replicating systems from one area to another due to diverse hydrological characteristics; inadequate funding; identification of stakeholders and their requirements; and limits to institutional capacities.

Thanongdeth Insisiengmay, Mekong River Commission, Cambodia, spoke about regional cooperation in reducing the negative impacts of transboundary floods in the Mekong Delta. He stressed the importance of feedback from stakeholders and local communities to improve information services, which could be simple and address the concerns of local communities.

Jean-Marie Carrière, French Meteorological Service, spoke on flood early warning in France. He explained the institutional reorganization of the service, which had been undertaken with the involvement of all stakeholders. He said flood alert systems are based on data collection in numerous local stations, and rely on links between meteorology and hydrology services.

TECHNOLOGICAL MEANS FOR INFORMATION SHARING: This session was chaired by Friedemann Wenzel, University of Karlsruhe, Germany.

Chiu-Ying Lam, Hong Kong Observatory, China, explained how his organization has harnessed the Internet to provide low-cost weather forecasts and warning services. He stressed that these services focus on developing and least developed countries.

Udo Gärtner, German Weather Service, spoke on the various methods employed in communicating severe weather warnings. He noted several lessons learned, particularly the need to use simple language, target actual users, and provide sufficient lead time. He referred to problems encountered when the media is not responsive to transmitting official hazard warnings.

Ivan Obrusník, Czech Hydrometeorological Institute, described the experience of the 1997 and 2002 floods in the Czech Republic, and the improvements made since then in the national forecasting services.

EFFECTIVE EARLY WARNING SYSTEMS FOR TROPICAL CYCLONES: This session was chaired by Le-Huu Ti, UN Economic and Social Commission for Asia and the Pacific (ESCAP).

Luc Chang-Ko, Centre for Documentation, Research and Training on the South West Indian Ocean, Mauritius, described the state of national cyclone warning and preparedness in his country, emphasizing that resilience requires an informed public.

Jeremy Collymore, Caribbean Disaster Emergency Response Agency (CDERA), presented Caribbean early warning systems for hurricanes, highlighting the significance of regional institutionalization of mechanisms and the lack of public confidence in warnings due to large margins of error. He identified the nature and reliability of information and modalities for sharing information as critical issues.

Jürgen Kronenberger, German Red Cross, described a project of disaster preparedness implemented in Orissa, India, demonstrating effective early warning and mobilization. Participants addressed the sustainability of the German Red Cross intervention and the practical response to technological improvements in forecasting.

EARLY WARNING SYSTEMS FOR EXTREME CLIMATE-RELATED EVENTS: This session was chaired by Kenneth Davidson, WMO.

José Luis Santos, International Research Centre on El Niño, Ecuador, noted that the El Niño Southern Oscillation and climate information can be used in decision-making processes. He emphasized the need to improve communication between scientists and end-users and to deliver sector- and audience-specific products.

Gérard Le Bars, French Meteorological Service, introduced France's New Vigilance Procedure, which includes four alert levels. He attributed the success of the new system to continuous communication with partners.

Michael Bründl, Swiss Federal Institute for Snow and Avalanche Research, provided an overview of the early warning for avalanche risk in Switzerland. He stressed that early warning systems are successful when the information chain is simple and rapid, users are well trained, danger levels are clearly defined and communicated, and there is only one warning standard.

INTEGRATING EARLY WARNING INTO PUBLIC POLICY PROCESSES

This session, chaired by Kamal Kishore, UNDP, was held on Thursday afternoon, 16 October, and comprised a series of presentations.

INTEGRATION OF DISASTER REDUCTION AND EARLY WARNING INTO PUBLIC POLICY: Jean Seth Rambeloalijaona, Minister of the Interior, Madagascar, described his country's national risk and disaster management strategy,



recently entrenched in law, and emphasized the need to draw popular support to risk assessment. He emphasized difficulties in implementing initiatives due to lack of technical resources.

INTEGRATING EARLY WARNING SCHEMES INTO FLOOD PROTECTION MANAGEMENT: Stanislav Tillich, Minister of State, Saxony, Germany, noted that a major problem in creating effective flood protection strategies is lack of awareness of the dangers involved. He emphasized the importance of reducing potential flood damage by excluding development projects in flood plains, and stressed the importance of increasing water retention by surface treatment and rainfall water management, afforestation and forestry measures, and mulch seed processes in agriculture. He said flood warning can be modernized by developing an automatic rainfall measurement network, ensuring that level measurement stations are flood resistant, and increasing warning periods through improved meteorological information.

INTEGRATING EARLY WARNING OF ENVIRONMENTAL THREATS INTO POLICY TO ACHIEVE SUSTAINABLE DEVELOPMENT: Norberto Fernández, Division for Early Warning and Assessment, UNEP, recalled the emphasis on disaster and risk management in the Johannesburg Plan of Implementation, and said that an increasing human influence on the environment is evident. He noted that rapid and unplanned urbanization in Latin American cities increases demand for land, and forces people to settle in high-risk areas. He urged emphasis on the root causes of vulnerability. He said early warning is not about “crying wolf,” but rather about presenting facts to improve the understanding of people and ecosystem vulnerability and to prevent and minimize disasters.

EARLY WARNING, A TOOL FOR CLIMATE RISK MANAGEMENT: Reid Basher, ISDR, described the evolution of knowledge about climate, and noted that despite technological progress, some recent events remain little understood. He said greater capacity in early warning is needed, especially as results of seasonal forecasts remain probabilistic. He proposed that early warning be considered in a broader sense, since risk emanates from a number of sources, including development projects and knowledge or leadership. He urged that linkages between early warning and causes of risk be studied and an integrated approach put in place, with extra tools employed to increase understanding of early warning.

EMERGING ISSUES

Three thematic sessions on emerging issues in early warning were held in parallel on Saturday afternoon, 18 October. The sessions addressed emerging issues, lessons learned, and the integration of local early warning into national systems.

EMERGING ISSUES: This session was chaired by Martin Owor, Office of the Prime Minister, Uganda.

Wolfgang Kron, Munich Reinsurance Company, described the insurance industry's role in early warning mechanisms and in advising clients on appropriate risk reduction measures. He said insurers can map hazard zones as a tool for determining premiums.

Andreas Küppers and Dieter Umbach, Potsdam Conventus, Germany, reviewed critical early warning issues, including a growing gap in confidence, diversity of players, the role of the academic perspective, and sectoral fragmentation. They suggested solutions including ethical standards and legal regulation, and emphasized the importance of: focusing on the institutional level of enforcement; identifying competent political and legal decision-

making institutions; determining a budgetary framework; and allocating responsibility for prevention, early warning and follow-up analysis.

Jürgen Laudien, Alfred Wegener Institute, Germany, described the process of predicting El Niño by biotic and abiotic indicators, and gave examples of potential damage containment following early warning.

Hans Günter Brauch, Free University of Berlin and AFES-Press, Germany, suggested causality between natural disasters and human conflict. He urged cooperation between natural disaster and human conflict institutions, and among political actors.

LESSONS LEARNED SESSION: The session was chaired by Jeremy Collymore, CDERA.

Anil Sinha, independent disaster management consultant, India, spoke on integrating disaster reduction and early warning into public policies. He stressed his country's increasing vulnerability, and emphasized the “new cultures” of disaster management in India: prevention, preparedness, rapid response and strategic thinking.

Silvano Langa, Disaster Management Institute, Mozambique, outlined the history of disaster management in his country, particularly in human resource development. He highlighted flood, cyclone and drought hazards, and the need for educating the public. He stressed the need for capacity building, including contingency planning, to deal with early warning and response.

Mohamed Jaliil, independent researcher, Morocco, described methods employed in his country to integrate early warning into disaster preparedness and response, taking into account local hazards such as drought, floods, and dust storms. He explained existing early warning procedures.

Erich Plate, University of Karlsruhe, Germany, discussed the results of several recent expert meetings for the assessment of early warning needs. He suggested that an effective early warning system should have five components: observation, forecasting, communication, warning methods and response. He stressed that no universal model for early warning exists, and that current models need to be evaluated against their effectiveness in saving lives and property.

INTEGRATION OF LOCAL EARLY WARNING IN NATIONAL SYSTEMS: This session was chaired by Horst Müller, Federal Ministry for Economic Cooperation and Development, Germany, and moderated by Thomas Schaefer, German Technical Cooperation Agency (GTZ).

Horst Müller stressed the paradox that disasters destroy development efforts, but insufficient development increases vulnerability to such events. He encouraged focus on prevention and explained this is becoming a goal of German bilateral cooperation.

Lucas Simão Renço, Búzi District Administrator, Mozambique, spoke on a local risk management framework in his district, developed after the floods of 2000. He explained the structure of the local committees and outlined risk management initiatives, including for early warning.

Oscar Rene Alcántara Irias, GTZ Project consultant, Honduras, spoke on integrating local early warning systems into his country's national policies. He pointed to mutual benefits of such a relationship, including enhanced communication for rapid response during disasters.



Tulio Santoyo Bustamente, GTZ Project Technical Officer, Peru, said that the effectiveness of the early warning system in the Piura River basin is defined by a combination of technology, equipment, technical personnel, institutions and stakeholders. He underscored the importance of political will and an institutional framework for the sustainability of early warning systems.

José Wilson Pereira, National Secretariat of Civil Defense, Brazil, described a programme on fire early warning in the Amazon, and noted that agricultural and pastoral activities in the vicinity of the Amazon create risks. He explained the components of the programme, which involves all stakeholders, including the military and indigenous populations.

Participants then discussed the problem that certain information, necessary for successful early warning, remains classified by the military as "top-secret."

PARALLEL EVENTS IN THE PLENARY HALL

Parallel to the session on good practices held on Friday afternoon, 17 October, presentations were held in Plenary on the use of hazard maps in early warning, and on effective drought early warning. Parallel to the sessions on emerging issues on Saturday afternoon, 18 October, presentations were given in Plenary on implementing transboundary early warning systems for floods, and new technologies and scientific networks.

EFFECTIVE EARLY WARNING – USE OF HAZARD MAPS AS A TOOL FOR EFFECTIVE RISK COMMUNICATION AMONG POLICY MAKERS AND COMMUNITIES:

This session was chaired by Satoru Nishikawa, Asian Disaster Reduction Center. He said the aim of the session was to address the gap between perceived and actual risk.

Masaaki Nakagawa, Cabinet Office, Japan, identified the efficacy of hazard maps and instructions issued to the community for ensuring successful response to volcanic eruption early warning and saving lives and property.

Ryosuke Kikuchi, Infrastructure Development Institute, Japan, said that maps help residents evacuate efficiently and allow authorities to adjust land-use and city planning.

Yang-Su Kim, National Institute for Disaster Prevention, Republic of Korea, said pertinent issues are efficient design, effective distribution and data collection.

Norman Tuñgol, Philippines Institute of Volcanology and Seismology, said the eruption of Pinatubo Volcano in 1991 boosted the use of hazard maps following accurate predictions. He noted that seismic hazard maps are used for buffer and land-use zoning and for input to building codes and disaster preparedness plans.

Muhammad Saidur Rahman, Bangladesh Disaster Preparedness Centre, lamented excessive emphasis on the national level and lack of action on the local level. He stressed that community ownership ensures transparency and, consequently, the effectiveness of a system and confidence in it.

Participants discussed the relationship between governmental and local action. One participant called for community initiatives, and another noted the difficulty of mobilizing a community unfamiliar with natural disasters.

EFFECTIVE DROUGHT EARLY WARNING – AN INTEGRATED APPROACH TO REDUCING SOCIETAL VULNERABILITY TO DROUGHT:

Donald Wilhite, Drought Mitigation Center, US, chaired this session, and called for a global drought preparedness network composed of regional networks.

Laban Ogallo, Drought Monitoring Center, Nigeria, described the regional monitoring of drought. He said lessons learned include the need to ensure coordinated reporting and dissemination, carry out pilot projects, employ local and traditional methods, and increase involvement of national weather services.

Pak Sum Low, ESCAP, described the emerging global drought preparedness network, composed of regional networks facilitating early warning systems, preparedness and policies aimed at vulnerability reduction.

Kamal Kishore, United Nations Development Programme (UNDP), said that lessons from the drought in India in 2002 include the need for spatially and temporally detailed predictions, channelled climate information for relief planning and addressing the vulnerability of systems.

Henri Josserand, Food and Agriculture Organization (FAO), underscored the deceptive distinction between naturally- and human-induced droughts.

Orivaldo Brunini, Institute of Agronomy, Brazil, shared a recent experience of drought early warning in southern Brazil, which relied on a standardized precipitation index.

IMPLEMENTING TRANSBOUNDARY EARLY WARNING SYSTEMS FOR FLOODS:

This session was co-chaired by ISDR Director Sálvano Briceño and Hans-Joachim Daerr, Federal Foreign Office, Germany.

Ernesto Ruiz-Rodriguez, Society of Engineers for Waterworks and Management, Germany, said that the Flood Action Plan developed for the Rhine aims to reduce risk, increase flood awareness, and improve flood warning systems. He said conditions for effective forecasting systems include timely dissemination and understanding of flood forecasts and appropriate response behavior.

Helmut Blöch, European Commission, explained that floods occur due to land-use change, diversion of rivers away from their floodplains, and infrastructure development in natural flooding areas. He stressed basin-wide partnerships and integrated river-basin management as central to a successful response to floods.

Tobias Oetjen, Government of Saxony, Germany, said that the most severe damage due to flooding of the Elbe and Mulde Rivers was caused to municipal infrastructure. He presented advances made in reconstruction and outlined the role of forests in flood prevention.

NEW TECHNOLOGIES AND SCIENTIFIC

NETWORKS: This session was co-chaired by Sálvano Briceño and Hans-Joachim Daerr.

Walter Hürster, T-Systems International, Germany, noted that components of computer networks for crisis management include surveillance systems, threat analysis and prediction, online situation displays, decision support, early warning and information. He stressed the need to develop more computer networks in crisis management.

Bruno Merz, GeoForschungsZentrum (GFZ), Germany, introduced the Helmholtz Association, which promotes in networking and partnerships among scientific research centers. He emphasized that networking and partnerships are necessary within the scientific community and between the scientific community and stakeholders, to create input for disaster mitigation.



PANEL DISCUSSIONS

Four panel discussions were held. The first addressed new technologies and low-technology solutions for early warning systems and took place on Thursday afternoon, 16 October. The second, focusing on early warning as a decision tool for emergency management, was convened on Friday morning, 17 October. A panel discussion for local authorities, held on Friday afternoon, 17 October, addressed the responsibilities of policy makers. On Saturday morning, 18 October, a high-level panel discussed solutions for integrating early warning into public policy.

NEW TECHNOLOGIES AND LOW-TECH SOLUTIONS FOR EARLY WARNING SYSTEMS:

Kenneth Davidson, WMO, explained that WMO focuses on mitigation and prevention, which lead to preparedness, response and ultimate recovery. He raised questions on the role of early warning, including the type of early warning needed, whether different countries require different technologies and whether the latest technologies can be sustained in all countries.

Laban Ogallo, Drought Monitoring Center, Nigeria, explained that key early warning activities of African monitoring centers include daily monitoring of weather and climate patterns, estimating the probability of certain weather and climate extremes, and determining risk zones. He noted current challenges, including: building capacity; sustaining observation activities; exchanging data; and translating global information into useful regional early warning products.

Juan Carlos Villagrán, Villa Tek, Guatemala, highlighted his country's experience in involving the local community, including volunteers, in early warning. He emphasized the importance of taking into account the actual capacity of people to operate sophisticated systems or instruments. He said the use of simple, locally-produced measuring tools, while losing in precision, draws members of the community into forecasting activities that increase awareness and a sense of personal responsibility for natural disaster preparedness.

Maureen Fordham, University of Northumbria, UK, highlighted key elements for successful implementation of early warning systems. She said systems must combine all-inclusiveness, awareness, appropriateness, and be integrated with policy and practice.

Douglas Patty, CCD, drew attention to the potential value of combining traditional knowledge with high-technology solutions. He said traditional knowledge is practical, well disseminated, ecologically viable and less expensive.

Thomas Schaefer, GTZ, Germany, stressed the importance of determining local communities' capacity when designing early warning systems for them. He stressed that although technology for local warning systems is cheap, the sustainable implementation of such systems is relatively costly. He highlighted the importance of integrating local warning systems into national policies and disaster reduction strategies.

Session Rapporteur Ailsa Holloway, University of Cape Town, South Africa, summarized the session, stressing: that information needs to be placed in the relevant social context; the value of indigenous and traditional knowledge; and the development of appropriate and accessible technologies, without setting aside cultural heritage.

EARLY WARNING, A DECISION TOOL FOR EMERGENCY MANAGEMENT:

The panel was chaired by Everett Ressler, UNICEF.

Carlo Scaramella, World Food Programme (WFP), highlighted the WFP's monitoring process and the platform of information. Referring to lessons learned, he suggested that humanitarian assistance organizations strengthen their early warning capacities, and that the international community, especially donors, share responsibilities for managing disaster response.

Detlev Runger, Federal Foreign Office, Germany, said that the work of a donor government as an action-generating mechanism can be facilitated by competent partners and by using coordinated, assessed information rather than raw material. He suggested establishing a permanent coordinating body.

Peter Billing, European Commission Humanitarian Aid Office, called for the integration of existing alert systems into a single platform covering all potential types of disaster in all disaster-prone areas of the world. He said a coordinating body is necessary and suggested that it be placed within the UN system.

Helga Leifsdottir, International Federation of Red Cross and Red Crescent Societies, emphasized the importance of access to early warning information at the community level. She urged progress on collecting information at the grassroots level and matching it with global information.

Chair Ressler said top-down approaches do not generate the necessary responses, and stressed that the problem is not lack of information, but lack of action.

In the discussion, participants noted that information quality must be maintained at all levels, and questioned the ability of local people to access such information. Participants emphasized the need for international, regional and national-level focal points to analyze and collect information. One participant stressed the importance of combining top-down and bottom-up approaches in developing early warning systems.

EARLY WARNING AND URBAN RISKS – RESPONSIBILITIES OF POLICY MAKERS:

This panel for local authorities was chaired by Irmgard Schwaetzer, German Committee for Disaster Reduction.

Aoto Ken-Ichi, Hyogo Prefectural Government, Japan, described the Prefecture's disaster management center, established in response to a major earthquake in 1995, stressing that it enables response within 15 minutes.

Miegombyn Enkhbold, Governor of Ulaanbaatar, Mongolia, said a new Mongolian law establishes local implementing agencies for disaster management. He said disaster prevention measures taken by the Ulaanbaatar municipality, its organizational capacity, and financial resources allocated by the central government, reduced the potential damages of a flood in July 2003 by an estimated 20%.

Hugo Marcelo Pineda Luna, Mayor of Baños, Ecuador, outlined his municipality's programme for addressing the reluctance of evacuated people to return to Baños following a recent volcanic eruption. He said the programme was based on: strengthening the monitoring system of volcanic eruptions; ensuring shelter, sanitation, water and food, and law and order; and raising awareness and consciousness of civil society and local authorities.

Hartmut Bosch, Secretary of State, Ministry of the Interior, Mecklenburg-West Pomerania, Germany, described the mechanisms for early warning and steps taken to rectify deficiencies.



Bärbel Dieckmann, Mayor of Bonn, Germany, explained that Bonn is well prepared for responding to flooding, and can request regional assistance in serious emergencies. She noted the local authorities' intention to establish an inter-regional prevention system.

Badaoui Rouhban, UNESCO, stressed the need to shift from post-disaster reaction to pre-disaster action, and emphasized that public, corporate and private entities must jointly invest in early warning systems and disaster prevention. He underscored the need to build local capacities and ensure the sustainability of early warning systems.

Participants then debated the availability of useful scientific information and the implementation of public-private partnerships.

SOLUTIONS FOR INTEGRATING EARLY WARNING INTO PUBLIC POLICY: This high-level panel was chaired by Claudia Roth, Member of Parliament and Commissioner of Human Rights and Humanitarian Aid, Germany.

Henri Jossierand, FAO, presented a policy guideline, which targets political authorities and supports the existing IDNDR "Guiding Principles for Effective Early Warning." He said that the guideline addresses key elements for successful implementation, including: understanding the threats and likelihood of disasters and potential consequences, and establishing priorities; developing institutional networks with clear responsibilities; strengthening legal frameworks; and securing resources.

Jean Seth Rambeloalijaona, Minister of Interior and Administrative Reform and President of the National Security Council, Madagascar, described the legal framework adopted by his country to govern disaster management at all levels. Appealing for financial support, he emphasized the individual's right and duty of solidarity and mutual aid, the need to clearly divide responsibilities and strengthen capacities.

Roberto White, Minister of Public Works and Housing, Mozambique, said that his country's national strategy includes: contingency plans based on a participatory approach at all levels; an inter-ministerial committee coordinating stakeholders; and the establishment of an institute for disaster management. He said that disaster management needs to: be human centered; include awareness campaigns, promotion of best practice and building codes in disaster areas; rehabilitate field networks; and maintain high-level political commitment. He called for international support for technology transfer and funding.

Pubenza María Fuentes, Minister of Planning, Ecuador, said the Disaster Reduction Council for the Andean countries, set up in 1998, focuses on disaster reduction and mitigation, with early warning playing a key role. She stressed the importance of educating the public and international cooperation.

Yang Yan-Yin, Vice Minister of Civil Affairs, China, emphasized the importance of integrating early warning into government policies. She noted that China has implemented regulations for disaster reduction and has made progress in increasing awareness.

Jagdish Dharamchand Koonjul, AOSIS Chair, stressed the importance of improving people's understanding of expected risks following alerts. He stressed the need to improve expertise and technical capability for disaster forecasting and added that strengthening resilience to disasters must also be improved, and the use of traditional knowledge explored in greater detail.

Dahou Ould Kablia, Deputy Minister of Interior, Algeria, described his country's legal framework for disaster management. He said that the national policy is driven by the State, implemented by local authorities through on-going consultations with various agencies, and is guided by various principles, including precaution, concomitance and participation.

Thomas Broni, Deputy Minister of the Interior, Ghana, noted that the major hazards faced by his country include floods, drought, epidemics and the influx of refugees, and outlined the institutional measures to confront these problems. He emphasized the need for regional and global cooperation in risk assessment and disaster management, and called for increased assistance, including technology transfer and capacity building for early warning.

OVERVIEW OF PREPARATORY REGIONAL CONSULTATIONS

On Friday morning, 17 October, representatives provided overviews of the regional preparatory consultations that took place between May and July 2003.

AFRICA: Hespina Rukato, New Partnership for Africa's Development, reported on the consultations held in Nairobi, Kenya, from 23-24 June 2003. She said that progress in early warning system development must be expedited. She noted that the consultation's recommendations for action include steps to: strengthen local, national and subregional capabilities for early warning; modernize and expand basic data and information; enforce the rule of law; integrate early warning and disaster risk management into development plans; and strengthen selected institutions as regional disaster reduction centers.

ASIA AND THE PACIFIC: Le-Huu Ti, ESCAP, reported that in the regional preparatory consultations in Bandung, Indonesia, held from 26-28 May 2003, participants had: addressed the importance and patterns of natural hazards, advances, constraints and experiences; identified success factors; and compared economic loss trends. Workshop recommendations include developing national guidelines and community-based preparedness programmes. He said follow-up activities to EWC-II should be linked to implementing the Yokohama Plan of Action, build on expected achievements of regional efforts, and include pilot projects.

EUROPE: Jochen Zschau, GTZ, Germany, reported on the regional preparatory consultation in Potsdam, Germany, held from 28-29 July 2003. He outlined the consultation's proposal to establish an international early warning platform to act as a center for coordinating and strengthening all aspects of early warning processes.

AMERICAS: Juan Carlos Villagrán, Villa Tek, Guatemala, said the consultations held in Antigua, Guatemala, from 3-5 June 2003, had focused on early warning in Latin America and the Caribbean, and resulted in the Antigua Declaration. He pointed to the need to identify cost-benefit ratios of early warning systems.

COMPILATION OF REGIONAL FINDINGS AND RECOMMENDATIONS: Seth Vordzorgbe, ISDR, noted the need to establish and enforce guidelines, develop institutional capacity, and target warning at specific risk groups. He highlighted recommendations identified at the regional meetings, including the need to: integrate disaster risk management into building processes and policies; support capacity development; develop people-centered warning systems; improve data collection and avail-



ability; and implement the EWC-II recommendations through an ISDR-coordinated international early warning programme or platform.

In the discussion, one participant called for international cooperation at the highest political level and involving all countries.

WORKING GROUPS

Participants met in three working groups on Friday, 17 October, to discuss the elements of a future international early warning programme and platform. Discussions were based on five focus areas:

- better integration of early warning into development processes and public policies;
- improved data collection and availability for forecasting on different time scales and investigating long-term risk factors;
- improved capacities and strengthened early warning systems, particularly in developing countries;
- development of people-centered warning systems; and
- mechanisms for sustaining the early warning dialogue and supporting the development of the programme.

Findings and conclusions were reported back in Plenary and discussed on Saturday, 18 October.

WORKING GROUP 1 – EARLY WARNING TARGETS

2004-15: Working Group 1 (WG1) was moderated by Klaus Wiersing, ISDR. Participants examined shortcomings of the current early warning practices and procedures, and agreed that the issue required a multidisciplinary approach. They urged a clearer definition and common understanding of all components of early warning, and of relevant communication procedures. Several participants suggested that the gap between science and decision making should be closed by 2015. Discussants highlighted the importance of continuous education and training, and the need for capacity building and technology transfer. A participant suggested that disaster reduction and risk be integrated into long-term development planning and land-use schemes. Some speakers stressed that commercial interests should not be permitted to interfere with disaster reduction strategies. Participants agreed on the need to improve regional collaboration. The question of resources was raised, and cost-benefit analyses were suggested to promote government investment in early warning. Among other issues mentioned, were: addressing new emerging threats; establishing new partnerships; creating an inventory and analysis of existing early warning systems; and setting indicators. The question of a monitoring mechanism was discussed, with preference expressed for an ISDR role in a multi-agency setting.

Findings and conclusions: The results of WG1 were presented by Klaus Wiersing. The group confirmed their understanding of early warning as an integrated process, composed of: monitoring and forecasting; vulnerability analysis; information dissemination; and preparedness. The group recommended possible targets:

- first, integration of early warning into national disaster reduction, clear definition of roles and responsibilities at all levels, and raising political commitment for resource allocation by means of a cost-benefit analysis;
- second, community-oriented early warning, including education programmes, community participation in the design of local early warning systems, and preparedness measures for community response;
- third, addressing new challenges and emerging trends, in particular partnerships between science and socioeconomic

disciplines, and warning messages with risk scenarios; and

- fourth, regional cooperation, including transboundary cooperation and data exchange.

WORKING GROUP 2 – FROM POTSDAM TO BONN AND BEYOND: Working Group 2 (WG2) was moderated by Friedemann Wenzel, University of Karlsruhe, Germany.

Participants discussed possible focus areas for the international programme on early warning and stressed the importance of defining the limits of early warning. They said such a programme may attract more funding if it also includes health- and conflict-induced disasters. Participants discussed the value of cost-benefit analyses for the purpose of “selling” early warning to governments, and learning from private sector experience. It was queried whether and how ISDR could become the institution to coordinate or implement the programme. One participant highlighted the importance of providing tangible outputs to donors. Participants discussed whether early warning should be addressed differently for developed and developing countries.

Participants questioned the extent to which existing early warning systems in developing countries are funded by donors, and whether these are sustainable.

Findings and conclusions: Seth Vordzorgbe, ISDR, summarized the outcomes of WG2. He said participants had agreed that since EWC’98, early warning systems have grown significantly, and that “bold moves” are now necessary to energize this process. The group recognized that an international programme or platform should serve and address both developed and developing countries. Desirable attributes of the programme include: proactive, rather than reactive, behavior; an emphasis on partnerships, including with the private sector; and ensuring the sustainability of early warning systems.

WORKING GROUP 3 – SUSTAINING THE EARLY WARNING DIALOGUE: Working Group 3 (WG3) was moderated by Norberto Fernández, UNEP. One participant stressed the need to provide governments with incentives by demonstrating that early warning systems will positively affect their budgets. Participants agreed on the need to undertake a cost-benefit analysis and engage in awareness-raising regarding funding opportunities. Noting the usefulness of national-level focal points, one participant stressed the need to identify dialogue partners. Another emphasized the importance of engaging civil society in the dialogue to ensure its continuity despite political changes. Participants agreed on the importance of raising public awareness, continuing donor funding, and revising legal frameworks. One discussant expressed concern over the difficulty of sustaining high-technology early warning systems, while another suggested that the maintenance of such technologies be undertaken by an independent body.

Findings and conclusions: Reviewing the findings and conclusions of WG3, Norberto Fernández said that instruments identified to maintain the early warning dialogue include incentives to governments and the inclusion of early warning into disaster management plans. He stressed institutional networks, national platforms, vulnerability and risk maps, free access to data and information and their exchange. He emphasized the importance of decentralizing policy making and enhancing civil society participation in decision making. He also noted the need to: train and educate officials in the use of technology for early warning and



disaster management; consider ways to ensure long-term maintenance of high technology equipment; and promote the dialogue between donors and recipients of technology.

DISCUSSION: In the discussion of the working groups' findings and conclusions that followed, one participant suggested examining the role of conflict in the capacity to respond to hazards, and the impact of disasters on conflicts. Another noted that emphasis on community-oriented early warning ignores the importance of balance among all stakeholders. Several participants stressed that additional hazards, such as chemical, nuclear and biological ones, should be considered in the context of disaster reduction.

Some participants urged adoption of specific programmes on the role of women in decision making for risk reduction and response. Others stressed the importance of specific disaster management legislation, and defining the term "early warning." One participant noted that education and legislation are crucial for the sustainability of early warning systems.

CLOSING OF THE CONFERENCE

PRESENTATION OF CONFERENCE OUTCOME AND FOLLOW-UP: Sálvano Briceño, ISDR, introduced the draft document "Effective Early Warning to Reduce Disasters: The Need for More Coherent Action at All Levels," which contains the recommendations of EWC-II. He said that the document responds to: an increasing disaster burden; a growing recognition of the role of early warning; slow progress in effective use of warnings; specific proposals generated by EWC-II; and the need for an organized international approach.

The document identifies five focus areas for an international early warning programme:

- better integration of early warning and related disaster risk reduction and management into development processes and public policies;
- improved data collection and availability for forecasting on different time scales and investigating long-term risk factors;
- improved capacities and strengthened early warning systems, particularly in developing countries;
- development of people-centered warning systems; and
- mechanisms for sustaining the early warning dialogue and supporting the development of the programme.

In conclusion, Briceño emphasized that there is a new and urgent opportunity to develop early warning as a contributor to disaster impact reduction. He noted the commitment of partner institutions to collaborate in building a structured programme for the future. He said that this begins of a new phase in the continuing process of dialogue and productive collaboration.

PRESENTATION OF CONFERENCE STATEMENT: Briceño then introduced the draft EWC-II Statement. In the Statement, the Conference considers that natural disasters are increasingly becoming an impediment to achieving sustainable development goals, and recognizes that:

- disasters are a result of natural hazards and of human, social, economic and environmental vulnerability;
- disaster reduction is an essential component of relevant global agendas;
- progress has been achieved in understanding early warning since EWC'98; and
- ISDR provides a suitable framework for advancing early warning as an essential tool for reducing risk and vulnerability.

The Statement calls for:

- integration of early warning systems into government policies;
- support by governments and relevant organizations to implement early warning systems, as recommended by EWC-II, and to integrate the future programme into disaster reduction strategies at all levels;
- the programme to focus on integration of early warning into development action, improvement of data collection, capacity enhancement, people-centered warning systems, and mechanisms to sustain the early warning dialogue; and
- ISDR action to facilitate the implementation of the early warning programme, sustain the dialogue and mobilize resources to strengthen capacity at regional, national and local levels.

The Statement welcomes Germany's offer of additional support to ISDR, invites other governments to contribute, and expresses appreciation to the German authorities for hosting EWC-II.

In the ensuing discussion on the two EWC-II outcomes, one participant suggested including a definition of early warning, and several proposed using the terms "natural phenomena," or "natural and human-induced environmental disasters" instead of "natural disasters." Briceño said the term "natural hazards" had been used wherever possible. Participants noted insufficient consideration of risk management, vulnerability, gender, local wisdom and traditional knowledge in the Statement. A proposal was made to expand the invitation to support the early warning programme to development agencies and private institutions, and to add a provision on promoting transboundary cooperation and technical data exchange.

Germany confirmed its commitment to additional contributions to ISDR. Japan announced that it will submit a draft resolution to the UN General Assembly on its intention to host a world conference on disaster reduction in Kobe, in January 2005.

CLOSING REMARKS: In his closing remarks, Hans-Joachim Daerr, Federal Foreign Office, Germany, called for implementation of the recommendations of EWC-II, and for continued research and exchange of views on early warning. Sálvano Briceño thanked participants, the German Government and the City of Bonn for support and hospitality provided for EWC-II, as well as all individuals, agencies and organizations that contributed to its success. EWC-II concluded at 4:28 pm.

THINGS TO LOOK FOR

EARLY WARNING SYSTEMS WORKSHOP: This workshop will be held from 20-23 October 2003, in Shanghai, China. For more information, contact: Jan Stewart; tel: +1-303-497-8134; fax: +1-303-497-8125; e-mail: jan@ucar.edu; Internet: <http://www.esig.ucar.edu/warning/>

REGIONAL GEOMORPHOLOGY CONFERENCE: The conference will take place from 17 October to 2 November 2003, in Mexico City, Mexico. For more information, contact: Irasema Alcantara-Ayala, UNAM; tel: +52-55-5622-4339 ext. 45466; e-mail: IAGMEXICO2003@igiris.igeograf.unam.mx; Internet: http://www.smg.igeograf.unam.mx/smg/soc_geom.html

EMERGENCY PREPAREDNESS, "IMPROVING THE ODDS": This conference will be held from 27-29 October 2003, in Vancouver, Canada. For more information, contact: Pacific Northwest Preparedness Society; tel: +1-604-665-6097; fax: +1-604-654-0623; e-mail: info@epconference.ca; Internet: <http://www.epconference.ca>



TERRAIN DATA, APPLICATIONS AND VISUALIZATION – MAKING THE CONNECTION: This conference will take place from 26-30 October 2003, in North Charleston, South Carolina, US. For more information, contact: CONDOR registration services; tel: +1-256-852-4490; e-mail: info@condorregistration.net; Internet: http://www.asprs.org/terrain_data2003

WORLD CONFERENCE ON DISASTER MANAGEMENT, INFRASTRUCTURE, AND CONTROL SYSTEMS: This conference will be held from 10-12 November 2003, in Hyderabad, India. For more information, contact: Professor Anjaneyulu; tel: +91-40-5558-9706; fax: +91-40-2330-6095; e-mail: dmic2003@schanisj.com or jntuenvi@satyam.net.in; Internet: <http://www.schanisj.com>

CHALLENGES OF INTERNATIONAL COOPERATION IN COMPLEX HUMANITARIAN EMERGENCIES CONFERENCE: This conference will be held from 4-6 November 2003, in Honolulu, Hawaii, US. For more information, contact: Asia-Pacific Center for Security Studies, Public Affairs Office, tel: +1-808-971-8916; fax: +1-808-971-8999; e-mail: publicaffairsdivision@apcss.org; Internet: <http://www.apcss.org/Conference/ConfLarge.html>

30TH INTERNATIONAL SYMPOSIUM ON REMOTE SENSING OF ENVIRONMENT, INFORMATION FOR RISK MANAGEMENT AND SUSTAINABLE DEVELOPMENT: The symposium will take place from 10-14 November 2003, in Honolulu, Hawaii, US. For more information, contact: East West Center; tel: +1-808-944-7557; fax: +1-808-944-7399, Att: 30th ISRSE November 2003; e-mail: 30isrse@eastwestcenter.org; <http://isrse.pdc.org>

INSTITUTE FOR BUSINESS AND HOME SAFETY'S ANNUAL CONGRESS ON NATURAL HAZARD LOSS REDUCTION: This congress will take place from 12-13 November 2003, in Orlando, Florida, US. For more information, contact: IBHS; tel: +1-813-286-3400; fax: +1-813-286-9960; e-mail: info@ibhs.org; Internet: <http://www.ibhs.org/congress>

51ST ANNUAL CONFERENCE OF THE INTERNATIONAL ASSOCIATION OF EMERGENCY MANAGERS: The will take place from 14-20 November 2003, in Orlando, Florida, US. For more information, contact: IAEM; tel: +1-703-538-1795; fax: +1-703-241-5603; e-mail: info@iaem.com; Internet: <http://www.iaem.com>

THE SECOND INTERNATIONAL WILDLAND FIRE ECOLOGY AND FIRE MANAGEMENT CONGRESS AND THE FIFTH SYMPOSIUM ON FIRE AND FOREST METEOROLOGY: These two meetings will take place jointly from 16-20 November 2003, in Orlando, Florida, US. For more information, contact: AMS; tel: +1-617-227-2426; e-mail: amsmtgs@ametsoc.org; Internet: <http://www.ametsoc.org/AMS/meet/FAINST/5fire2fireeco.html>

EXPERT MEETING ON SPACE TECHNOLOGY FOR FLOOD AND FIRE MANAGEMENT: This meeting will take place from 24-26 November 2003, in Córdoba, Argentina. For more information, contact: David Stevens, UN Office for Outer Space Affairs; tel: +43-1-26060-5631; fax: +43-1-26060-5830; e-mail: david.stevens@unvienna.org; Internet: <http://www.oosa.unvienna.org/SAP/stdm/cordobainfonoteE.pdf>

ELEVENTH INTERNATIONAL CONFERENCE ON SOIL DYNAMICS AND EARTHQUAKE ENGINEERING: The conference will take place from 7-9 January 2004, in Berkeley,

California, US. For more information, contact: Institution of Engineers Singapore; tel: +65-6295-5790; fax: +65-6295-5792; e-mail: sdee@inmeet.com.sg; Internet: <http://www.sdee-ege.org>

WORLD CONGRESS ON NATURAL DISASTER MITIGATION: The Congress will be held from 19-21 February 2004, in New Delhi, India. For more information, contact: Organizing Secretary-General; tel: +91-11-2337-0168, 23370548; fax: +91-11-2337-8851; e-mail: organizing@worldcongress04.org; Internet: <http://www.worldcongress04.org>

SIXTH ANNUAL CONFERENCE OF THE GLOBAL DISASTER INFORMATION NETWORK: This conference will be held from 26-29 March 2004, in Washington D.C., US. For more information, contact: GDIN; tel: +1-202-647-5070; fax: +1-202-647-4628; e-mail: gdinconference@hotmail.com; Internet: <http://www.gdin.org>

CONFERENCE ON FOREST FIRE MANAGEMENT AND INTERNATIONAL COOPERATION IN FIRE EMERGENCIES IN THE EASTERN MEDITERRANEAN, BALKANS AND ADJOINING REGIONS OF THE NEAR EAST AND CENTRAL ASIA: This conference will be held from 30 March to 3 April 2004, in Antalya, Turkey. For more information, contact: Timber Branch, UNECE Trade Development and Timber Division; tel: +41-22-917-3240; fax: +41-22-917-0041; e-mail: christopher.prins@unece.org; Internet: <http://www.fire.uni-freiburg.de/course/meeting/ECE-FireConference2004-1stannouncement-sem-55-1.pdf>

FOURTH NEPAL GEOLOGICAL CONGRESS: This Congress will take place from 7-9 April 2004, in Kathmandu, Nepal. For more information, contact: Dr. R. M. Tuladhar, Nepal Geological Society, Kathmandu, Nepal; tel: +977-1-411-396; fax: +977-1-414-806; e-mail: rameshtula@hotmail.com; Internet: <http://www.ngs.org.np/4thcongress.htm>

FIRST MEDITERRANEAN CONFERENCE ON SATELLITE OBSERVATION OF THE EARTH – REMOTE SENSING: This conference will take place from 21-24 April 2004, in Belgrade, Serbia and Montenegro. For more information, contact: Branislav Trivic; tel: +381-11-3219-273; fax: +381-11-3220-497; e-mail: britivic@meceo.info; Internet: <http://www.meceo.info>

IX INTERNATIONAL SYMPOSIUM ON LANDSLIDES: The symposium will convene from 24 June to 4 July 2004, in Rio de Janeiro, Brazil. For more information, contact: Secretariat 9 ISL, Rio de Janeiro; tel: +55-21-2562-7200; fax: +55-21-2280-9545 or +55-21-2290-6626; e-mail: 9isl@geotec.coppe.ufrj.br; Internet: <http://www.quattri.com.br/isl/interior.html>

THIRTEENTH WORLD CONFERENCE ON EARTHQUAKE ENGINEERING: This conference will take place from 1-6 August 2004, in Vancouver, Canada. For more information, contact: 13th WCEE Secretariat; tel: +1-604-681-5226; fax: +1-604-681-2503; e-mail: 13wcee@venuewest.com; Internet: <http://www.13wcee.com>

32ND INTERNATIONAL GEOLOGICAL CONGRESS: This Congress will convene from 20-28 August 2004 in Florence, Italy. For more information, contact: Chiara Manetti, Scientific Secretariat; tel: +39-55-238-2146; fax: +39-55-238-2146; e-mail: casaitalia@geo.unifi.it; Internet: <http://www.32igc.org/home.htm>