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**Indian Ocean Disaster: risk reduction for
a safer future**

**Information paper submitted by the delegation of
the United States of America entitled
“Development of a global tsunami warning
system: U.S. next steps”**

Note by the Secretariat

The delegation of the United States of America has submitted the attached paper to the secretariat of the Conference with a request that it be circulated as an official document of the Conference. It is reproduced as received.

Development of a Global Tsunami Warning System: U.S. Next Steps

1. The U.S. will expand and enhance the existing Pacific Ocean tsunami warning system into the Atlantic Ocean and Caribbean Sea to protect U.S. Atlantic and Gulf Coastal areas from tsunami threats. Those system expansions will be planned and implemented as a part of the Global Earth Observation System of Systems (GEOSS) being developed by the Group on Earth Observations.
2. The U.S. will work through the Group on Earth Observations to expedite the development of a global tsunami warning system, including the Indian Ocean, as part of GEOSS. The U.S. believes that this global system should be an expansion of the existing Tsunami Warning System in the Pacific, which is coordinated by UNESCO/IOC (a GEOSS partner).
3. The U.S. will propose that the development of a global tsunami warning system be a top near-term priority for the Group on Earth Observations when the Group meets in Brussels on February 16, 2005.
4. The U.S. will continue to work through the G-8 in 2005 to ensure high-level leadership and full implementation of the global tsunami warning system, noting that the Group on Earth Observations initiative was a core element of the June 2003 G-8 Evian Action Plan on Science and Technology for Sustainable Development and that the U.S. hosted the first Earth Observation Summit in Washington, D.C. in July 2003.
5. In addition to expanding the network of sensors for detecting tsunamis, the U.S. will work with international partners to develop and improve the system of communication, warning, and public education that serves to warn the threatened populations, and to ensure that such a system is suitable and for many kinds of hazards and disasters. The all-hazards philosophy – consideration of all potential natural and technological hazards -- should permeate the plans to develop the tsunami warning system under the GEOSS protocols.

The U.S. is strongly committed to the Group on Earth Observations (currently consisting of 54 nations and welcoming additional members) and its efforts to develop an integrated and sustainable Global Earth Observation System of Systems (GEOSS). The intergovernmental Group on Earth Observations was formed in 2003 to provide 1) improved coordination of strategies and systems for observations of the Earth and identification of measures to minimize data gaps, with a view to moving toward a comprehensive, coordinated, and sustained Earth observation system or systems; (2) capacity in developing countries to ensure their access to and effective utilization of observations, data, and products, and to sustain their contributions to global observing systems, as well as their access to and effective utilization of observations, data and products, and the related technologies by addressing capacity-building needs related to Earth observations; and (3) the exchange of observational data recorded from *in situ* sensors, aircraft, and satellite networks in a full and open manner with minimum time delay and minimum cost, recognizing relevant international instruments and national policies and legislation. The G-8 nations have placed a particularly high priority on GEOSS. The Group on Earth Observations will meet in Brussels on February 16 to formalize its status and to adopt its ten-year implementation plan.

U.S. agencies specifically responsible for implementing and managing earthquake and tsunami warning systems are the National Oceanographic and Atmospheric Administration (NOAA) and the

U.S. Geological Survey (USGS), collaborating with the National Science Foundation (NSF) via its network of Incorporated Research Institutions for Seismology (IRIS). Several other agencies have significant supporting roles in the U.S. global observations strategy and the proposed expansion of the U.S. warning system, which will be planned and implemented under GEOSS protocols. We urge other nations that plan to upgrade earthquake or tsunami detection and warning systems to do so through the GEOSS process.

A detection and monitoring system for tsunamis is necessary but not sufficient, by itself, to reduce a tsunami disaster. The technical systems for detecting and monitoring earthquakes and tsunamis must be complemented by an assessment of existing warning capabilities, training of local officials, installation of national and local warning communications systems, and a process of public education that will enable citizens in susceptible areas to respond appropriately to the warnings when they are issued. In addition, monitoring and warning systems should be designed with the intent that they will, to the extent possible, serve to alert and inform at-risk populations about all major hazards in their area; integrating the entire system under an "all-hazards" approach is most effective and most cost-effective. USAID has the lead responsibility for U.S. government assistance in this type of international capacity development.

The U.S. believes that a nominal disaster reduction system for tsunamis (and, indeed, for all hazards) would include the following processes and characteristics:

- Risk Assessment: Advance modeling of coastline communities determines hazard areas and risk probability. Susceptible areas can be targeted for hazard mitigation and warning.
- Detection: Observations and monitoring detect sub-sea earthquakes or other geologic process and reliably indicate whether a tsunami has been generated.
- Warning: A warning message is issued by the monitoring institutions via communications centers. Those warnings are received by national and local officials in threatened nations within minutes. The warning is communicated to the local at-risk population via sirens, mass media, specialized radio systems, and other notification technologies.
- Response Plan: A local response plan exists and is activated. Clearly, the response plan must be developed well in advance of the hazard event and must be communicated to the public.
- Ready Public: Public responds appropriately, having been prepared and educated in advance.
- Situational Awareness: The hazard situation is monitored until the "all-clear" is sounded. Because tsunamis often consist of a series of waves, and because subsequent tsunamis may be generated by earthquake aftershocks, people should not enter the hazardous zone again until the hazard is truly over.
- Resilient Lifeline and Protective Infrastructure: Hardened shelters, protective shelters, and reliable supply routes for emergency response, food and water supply, and medical evacuation should be constructed in accordance with international building codes appropriate for locations at risk of hazard events.

The United States is committed to providing support and leadership to reduce disasters from natural hazards throughout the world through international partnerships that promote these processes and characteristics.
