WMO and IOC/UNESCO Press Conference
Background on storm surge warning systems

On 2 May, cyclone Nargis hit Myanmar, causing extensive damage. The origin of this disaster was a 3-metre high storm surge, accompanied by torrential rains. There was a particularly high death toll, because Nargis hit highly populated low-lying areas. Moving rapidly, the cyclone reached inland areas as well as the coast.

Storm surges are provoked by meteorological phenomena. Following a storm, a combination of strong winds and low atmospheric pressure causes a sudden rise in coastal sea level, bringing massive amounts of water onto the coast.

Tropical cyclones are among the deadliest of natural disasters, mainly because of the massive surges of water they bring in their wake. The cyclone, accompanied by an exceptionally high storm surge, that swept over the coastal wetlands of Bangladesh in 1970 killed 300,000 people.

These are not isolated events. The rise in sea level linked to global climate warming could lead to even more violent storms. Meanwhile, the increase in population density in coastal regions makes humans even more vulnerable to the effects of cyclones. Eight of the world's largest cities are on the coast. There is also a fear that a rise in sea surface temperatures could lead to an increase in the number and intensity of violent tropical storms hitting the coasts, and thus also in the number of storm surges. According to the Intergovernmental Panel on Climate Change (IPCC), "Many coastal areas will experience increased levels of flooding, accelerated erosion, loss of wetland and sea-water intrusion in freshwater sources" as a result of global warming and climate change.

But despite the growing frequency and scale of these disasters, it is becoming increasingly possible to predict them and thus reduce their effects. Of all environmental problems, natural hazards are, in a way, the easiest to manage, notably because they are so easy to identify.

Storm surges, then, are predictable. They can be detected several hours, even several days ahead. But in order to warn populations at risk, the right data have to be available, such as high-resolution topographic and bathymetric charts, in order to be able to model these phenomena and draw up risk maps (notably of flooding). These elements are lacking in a number of coastal States, such as Myanmar.

Warning systems, such as the UNESCO / Intergovernmental Oceanographic Commission's (IOC) Indian Ocean Tsunami Warning System (IOTWS), in which Myanmar participates, could serve as a model for preventing and reducing the impact of these phenomena. Of course, these are different phenomena - tsunamis are mainly generated by under-sea earthquakes. Nevertheless, they have several points in common. And it should be possible to draw upon the experience gained in reaching a maximum number of people, by preparing populations through education and training, or building structures in estuaries beyond the reach of flood waters.

Since 1999, the Joint WMO/IOC Committee on Oceanography and Marine Meteorology (JCOMM) has been responsible for global coordination of programmes of

observation, data management and capacity building in meteorology and oceanography. JCOMM is currently preparing a *Guide to Storm Surge Forecasting*,

For further information on the IOC:
http://ioc-unesco.org

For further information on Joint WMO/IOC Committee on Oceanography and Marine Meteorology (JCOMM):
http://www.jcomm-services.org/Development-of-the-JCOMM-Guide-to-Storm-Surge-Forecasting.html