



MARINE MULTI-HAZARDS WARNING SYSTEMS Challenges in Implementation and Future Opportunities

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Close to 50 years ago, and in close cooperation with member states, UNESCO-IOC helped establish a very successful Tsunami Warning System in the Pacific Ocean. This early warning system involved elements which needed to be supported by governance, coordination and collaboration mechanisms from national to local levels and additionally supported by appropriate and continuously improving instrumental infrastructure. The system was successful because it dealt with one marine hazard only – a potentially destructive Pacific-wide tsunami generated by a measurable large earthquake along a tectonic subduction zone. Such a system required observation and detection of an earthquake of large magnitude, assessment of potential risks to Pacific member countries, integration of risk information in warning messages and distributing, rapidly and reliably, understandable warnings to authorities, risk managers and the population at risk in the potentially vulnerable areas. Educational efforts under the same program required emergency preparedness and response to warnings at all relevant levels to minimize potential impacts. Similar successful programs of Tsunami Warning Systems were supported by UNESCO-IOC for other regions of the world, with the ultimate objective of providing adequate protection at local, regional and global scales. Following the great earthquake of 26 December 2004, UNESCO-IOC took again a lead role in coordinating activities in establishing a Tsunami Warning System (TWS) in the Indian Ocean. However, given the infrequency of tsunamis in this region and in order to improve on cost-effectiveness, it was believed that the evaluation and warning capabilities of such a system could be integrated into a system that could include other potential marine hazards. However, such a multi-hazard warning system created a number of challenges and thus was difficult to implement. This presentation reviews and evaluates the problems that made such a marine multi-hazard warning system difficult and proposes strategies for future implementation.