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**Abstract:** The devastating impact of the Sumatra tsunami of 26 December 2004, raised the question for scientists of how to forecast a tsunami threat. In 2005, the IOC-UNESCO XXIII assembly decided to implement a global tsunami warning system to cover the regions that were not yet protected, namely the Indian Ocean, the Caribbean and the North East Atlantic, the Mediterranean and connected seas (the NEAM region). Within NEAM, the Gulf of Cadiz is the more sensitive area, with an important record of devastating historical events. The objective of this paper is to present a preliminary design for a reliable tsunami detection network for the Gulf of Cadiz, based on a network of sea-level observatories. The tsunamigenic potential of this region has been revised in order to define the active tectonic structures. Tsunami hydrodynamic modeling and GIS technology have been used to identify the appropriate locations for the minimum number of sea-level stations. Results show that 3 tsunameters are required as the minimum number of stations necessary to assure an acceptable protection to the large coastal population in the Gulf of Cadiz. In addition, 29 tide gauge stations could be necessary to fully assess the effects of a tsunami along the affected coasts of Portugal, Spain and Morocco.

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