

Advisory Report on the First Year Meeting of NEAREST in Marrakech

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This report summarizes the impression and opinions to the past activity and possible directions of the European Project NEAREST (Integrated observations from NEAR shore sourceS of Tsunamis: towards an early warning system).

First of all, everyone would agree that the research group has already done a lot of work since the initiation of the project about a year ago. The research group has been subdivided into 9 subgroups: (1) Tsunami source identification (WP1), (2) Tsunami source characterization (WP2), (3) Seismological monitoring (WP3), (4) Tsunami signal detection (WP4), (5) Data integration / Integrated Tsunami Detection (WP5), (6) Paleotsunami and Paleoseismic records (WP6), (7) Modeling of tsunami impact in SW Portugal (WP7), (8) Feasibility study and prototype for an EWS (WP8), and (9) Circulation of project information to end-users (WP9).

WP1 studies tectonic settings surrounding the gulf of Cadiz using various structural survey data, WP2 plans to conduct further surveys using OBS'es, WP3 tries to expand permanent seismological/geodetic monitoring network including TopoIberia using Broadband OBS'es, WP4 has mainly worked on pilot engineering study using GeoSTAR, WP5 tries to integrate all available seismic observation data for tsunami generation mechanisms, WP6 is reconstructing the 1755 Lisbon tsunami using fossil geological records on land, WP7 models tsunami impact, WP8 plans to build a tsunami hazard simulator, and WP9 thinks about outreaching with products from the project. At a glance, the way they have taken expresses a concerted action as an approach towards the common objectives.

After a year of independent researches by different groups, I believe that it is the time to start agglutinating the individual efforts to accelerate the research efficiency in the project. I would like to classify possible directions of the project into the following categories.

- (1) Tectonic Studies (WP1, WP2, WP3, WP5, WP6): WP1 could build a set of hypotheses on the tectonics of the area, which could be testified by WP2. Since the efficiency of structural surveys is defined by hypotheses, a good coordination between these two groups would surely profit the group to understand the nature of possible hazardous earthquakes of the area even if preplanned number of OBS'es is somehow to be prepared. Also, hypotheses would justify what have been planned for high frequency sampling or the number of seismometers, etc. Integration of other geophysical data such as gravity or geodetic deformation may be added for building hypotheses as well. Tectonic information would also profit the tsunami parameter estimation by WP5. Piston coring in the Gulf of Cadiz may contribute paleotsunami studies (WP6) as well as for the confirmation of geological development of submarine sediments. Seismic observations (WP3, WP5) may provide crustal structure data after obtaining receiver functions of seismic monitoring sites. Interdisciplinary integration of geophysical and geological data needs to be considered to finalize tectonic modeling of tsunamigenic or seismogenic zones of the area.
- (2) Engineering Development (WP4): Unfortunately, some problems have been obstacles to conduct the first pilot observations by WP4. Since the success of the future observation relies on the development and customization of GeoSTAR, I would like to suggest putting stronger efforts to achieve the pilot observation as soon as possible.
- (3) Tsunami Dynamics (WP5, WP6, WP7, WP8): Earthquake or fault parameters are important parameters. Earthquake parameter

estimation (WP5) could be collaborated with early warning system development (WP8) since the tsunami generation mechanism is strongly related to earthquake fault parameters in recent tsunami studies. Products from paleotsunami/seismic studies (WP6) could be input to analysis and planning group (WP7) after certain identification of tsunamigenic processes.

- (4) International Collaboration (WP3, WP5, WP6, WP7, WP8): The 1755 Lisbon tsunami might have influenced Moroccan people on the southern side of the gulf of Cadiz as well as future tsunamis will. Seismic and geodetic observations would gain certain accuracy after the inclusion of Moroccan observation data. In this regards, the collaboration of the whole research group with Moroccan researchers and resources is encouraged.
- (5) Public awareness (WP9): Continuous stimulation to the public is pretty important not only for future disaster mitigation but for the success of the whole research project. I would like to suggest to keep, or possibly to enhance, the outreach activity.

I believe that the realization of the project objectives would surely rely on the coordination among subgroups. Although it is not a simple task, I would like to encourage to keep up the existing level of the individual efforts and to initiate collaboration among the individual groups for common or coalescent objectives.