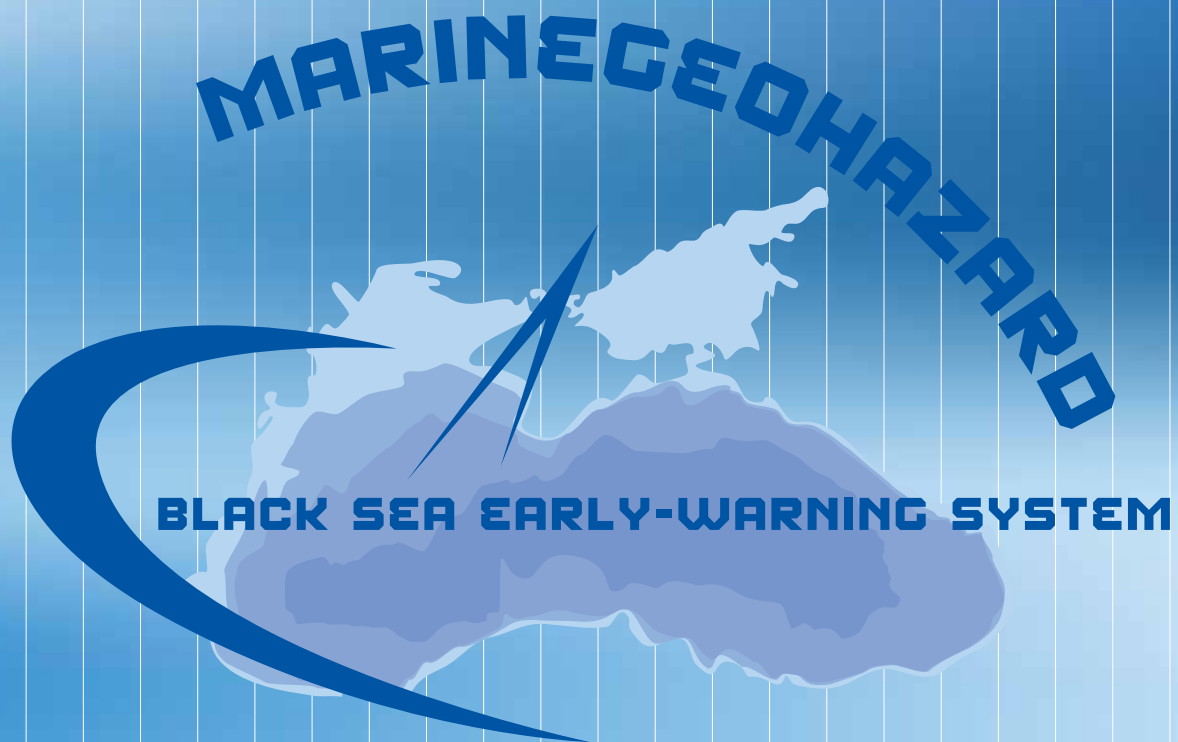




# MARINE GEOHAZARD

Set-up and implementation of key core components of a regional early-warning system for marine geohazards of risk to the Romanian-Bulgarian Black Sea coastal area



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## MARINEGEOHAZARD: activities within the project

During July-November 2012, according to the Implementation Plan of the project MARINEGEOHAZARD, took place a series of activities:

Activity II, *“Set-up of Black Sea joint early-warning system for the cross-border area through acquisition and installation of real-time detection equipment and data processing and reporting capacity, and of decision support, dedicated software package and database of scenarios”*, was dedicated to preparation of the tendering documentation, implementation of the tender

ing procedures and management of the contracts, in compliance with the in - force Romanian and EU legislation for public procurement.

The actions related to the implementation, including the contribution of the Lead Partner - NRD GeoEcoMar, Romania were:

1. Signing of the supply agreement with ORION Europe for:

- Lot 1 - Network of automatic marine gauge stations, with real time communication - Network “EUXINUS
- Lot 2 - Coastal Network of Seismic Monitoring, Coastal gauge and Coordination Centers, data processing computers and information presentation systems (hardware and software)
- Lot 5 - Network of Mechanical Extensometers and Strong Motion Seismometers
- Lot 6 - Assistance for adaptation and implementation of marine geohazard consequence assessment software package, including software itself;

2. Signing of the supply agreement with Emma Technologies for:

- Lot 3 - Ocean Bottom Seismometers (OBS) and Marine Seismic Acquisition System;

3. Lot 4 - Reception of all GNSS equipments from Geodis RO.

All technical documentation for Lots 1, 2, 3 and 5 was received by the Lead Partner. Technical meetings and site survey, in Romania and Bulgaria, with Orion representatives, were done.

During 11 - 13 November „Emma technologies” (Germany) has visited Romanian R/V Mare Nigrum (owner NRD GeoEcoMar), to establish the on-board positions of the Marine Seismic Acquisition System components (e.g. streamer winch, compressor, LARS and air-gun).

Activity III, *”Developing the required expertise for operation of the early-warning equipment and of propagation and inundation software through training of operational staff”*, stipulates the organization of different training sessions, involving technical personnel that will be responsible for the operation of the early-warning system and of data assessment as well as of forecasting software package.

Each training session will include theoretical and practical aspects related to marine geohazards evaluation, prediction and notification, and will be jointly attended by Romanian and Bulgarian experts.

The training sessions will be assured by international experts nominated by the equipment suppliers (Emma Technologies, Orion Europe, Geodis RO). The Activity 3 will start when the equipment will be in charge. The training sessions will be opened to representatives of emergency and environmental protection authorities from the cross-border area.

Activity IV, *”Elaboration of joint updatable marine geo-databank needed for predicting and managing emergency situations related to geohazards in the Ro-Bq Black Sea cross-border area”*

The next activities were approached:

- Synthesis of information regarding the distribution of bottom sediments lying on the Romanian - Bulgarian continental shelf of the Black Sea.

- Processing of all geophysical information (multibeam bathymetry, gravity, magnetometry), acquired during the cruises of R/V „Mare Nigrum” on the Romanian and Bulgarian offshore (validation of data, individual line separation, import of raw data in dedicated databases). The 2nd cruise of E/B „Carina” for the geophysical covering of Romanian shallow water (sector Vadu - Costinesti). Validation, processing of raw geophysical data, import in the dedicated databases.

- Synthesis of information regarding possible damages and prevention from earthquakes and tsunamis for the coastal region between Cape Sivriburum and Cape Shabla

- Analysis and presentation of the seismogenic process modeling, regarding the earthquakes occurrence within the Black Sea region by using statistical methods.

- Validation and processing of the raw geophysical (singlebeam bathymetry and magnetometry) data acquired on the Romanian shallow waters during the 2nd cruise of E/B Carina.

- Uploading of all magnetometric lines acquired within the project in the joint Romanian - Bulgarian geo-database.

- Topographic maps, scale 1:25.000 - 1:50.000 digitized for the DEM of Aofl.

Activity V, *”Dissemination of results, information and publicity”*. Recognizing the importance of dissemination the Communication Plan of the MARINEGEOHAZARD Project established that the information on all aspects of the project, will be

disseminated through out the life of the project, as well as beyond its funded duration.

All Partners have an active role in dissemination, and the activity is implemented under coordination of Lead Partner, which use for its specialized Office for Editing, Dissemination, and Public relations. An expert in media relations, qualified to understand and “translate” the technical results that is presented, is employed to assist the Project Manager in relation with media.

## MARINEGEOHAZARD, a constant presence in national and international scientific congresses

In the last months the MARINEGEOHAZARD Project was presented within different international or Romanian and Bulgarian conferences.

In August , project MARINEGEOHAZARD was introduced to the scientific community present at the 34th International Geological Congress, Brisbane (Australia). Within the natural hazards topic, Gheoghe OAIE PhD, (NRDI GeoEcoMar), the Project Manager of MARINEGEOHAZARD, had an oral presentation, named: “MARINEGEOHAZARD - Implementation of a regional early-warning system for marine geohazards of risk to the western part of the Black Sea basin.” Authors: Oaie Gh., Ranguelov B., Dimitriu R., Dimitrov O., Dobrev N., Diaconescu M. 2012.



Photo 1 - 34th International Geological Congress, Brisbane (Australia)

On 25th of October 2012, the Regional event, highlighting the strategic importance of innovation and technology transfer for sustainable development of the Romanian society, took place in Bucharest. The event was attended by about 70 people. During the event, Gheoghe OAIE, PhD, Project Manager of MARINEGEOHAZARD,, had an oral presentation related to the project, as a case study regarding the importance of innovation and technology transfer.

Romanian National Conference of Research and Innovation - 2012 was held during 7-9 November, at the National Library of Romania, in Bucharest. The project MARINEGEOHAZARD was presented at the Romanian Research Exhibition, open during the National Research and Innovation Conference. The event was organized by the National Authority for Scientific Research (ANCS), with the support of the Executive Unit for Financing Higher Education, Research, Development and Innovation (EUFHERDI) and was attended by approximately 450 persons.

During 8-9 November 2012, Sofia, Bulgaria, took place THE XXII INT. SYMP.MODERN TECHNOLOGIES, EDUCATION AND PROFESSIONAL PRACTICE IN GEODESY AND RELATED FIELDS, Mr. Boyko Rangelov presented: MARINEGEOHAZARD project - Key- Core Elements of the Tsunami Early Warning System in the Black Sea”.

## NEWSLETTER INTERVIEW

MARINEGEOHAZARD, a project with impact on the Romanian and Bulgarian scientific community

Interview with Radu George DIMITRIU PhD, responsible for Activity 4 within the project MARINEGEOHAZARD



*Question: Do you consider that the project MARINEGEOHAZARD had contributed to the development of the Romanian- Bulgarian scientific cooperation?*

Answer: Undoubtedly, yes. The project MARINEGEOHAZARD resulted in breaking many of the barriers of communication between the scientific communities of the two countries. Of course, there were already existing bilateral contacts between different Romanian and Bulgarian entities ( such as institutes, universities, research centers, etc.), between Romanian and Bulgarian geoscientists, but the collaboration was usually focused on achieving some punctual objectives, within well-defined terms . Instead, the project MARINEGEOHAZARD had proposed a totally different approach: the main objective of creating a cross-border infrastructure and a unified strategy capable of managing the risk on the Romanian-Bulgarian coastal area due to marine geohazards, could not be achieved without extensive interdisciplinary approach: implementing of up to date technologies (state of the art technology), geology, geophysics, topo-geodetic, hydrology. Also, early warning system, once begun functional, will provide continuous, 24/7, an extensive range of geodetic, seismic, hydro-meteorological, physical and hydro-chemical information that will be extremely valuable, representing the basis for further indefinitely Romanian-Bulgarian cooperation and even the extension of it.

*Question: From your point of view as geophysician, what do you think you have achieved working in this project?*



Answer: For all members of the project team it was a real challenge. For me, however, was a chance to achieve at least two of the objectives that I promote for a very long time: the first would be the resumption, after 20 years, of the systematic geophysical mapping process (gravimetry, magnetometry, bathymetry), at a regional scale, of the western continental margin of the Black Sea and the advancement, on this basis, of the level of knowledge of the deep geological and tectonic structure of the basin. This was achieved through four expeditions of the research vessel “Mare Nigrum” which in 2011-2012 covered, with a continuous network of observation profiles, amounting over 15400 km, an area of about 47,000 km<sup>2</sup> belonging exclusive to economic areas of Romania and Bulgaria. This impressive volume of data, available to the Bulgarian and Romanian specialists, represent the basis of the further development of new ideas and projects. The second objective achieved, due to the project, is represented by the establishment of the GeoPontica geodynamic network, composed from 18 GNSS permanent stations, of which 13 are in Romania and 5 in Bulgaria. By putting into operation this network, the monitoring of the geodynamic regime of the main tectonic blocks which compose the Earth’s crust corresponding to the Romanian-Bulgarian coastal area, will become possible. In the future, by capitalizing data obtained from this network, we will be able to differentiate the meaning and the magnitude of the phenomena that appear and contribute to the continuous change of the relative ratio between land and the mean sea level: epirogenetic movements, subsidence, young sediments com-

paction and the secular variation of the sea level (secular mean sea level rise), with immediate consequences on coastal zone management policies.

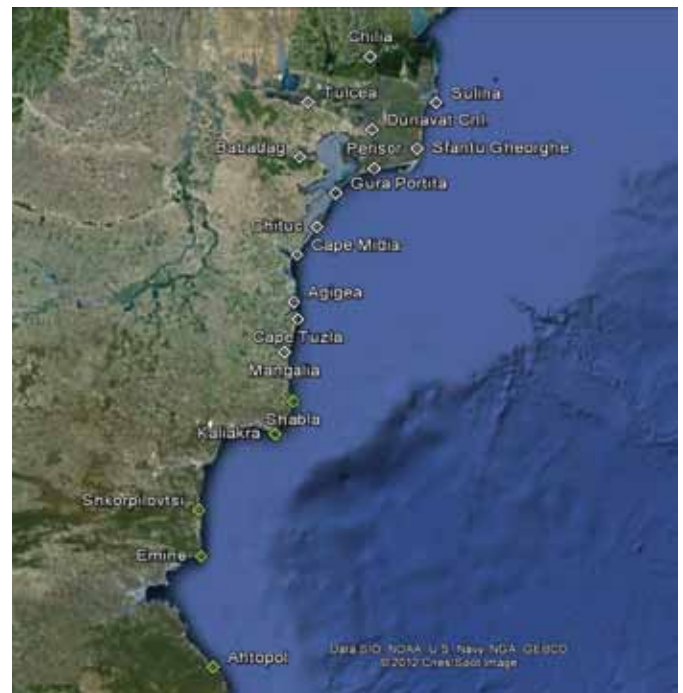


Photo 2 - GeoPontica Network

*Question: Could you mention the most important objectives achieved within the Activity 4?*

Answer: Undoubtedly, the main objective of the Activity 4 was the development of the joint Romanian-Bulgarian geo - database, that brings together the main historical information, previous to the project, or purchased within it, relevant to the overall objective of the project: knowledge of the structure and the mechanisms capable of generating hazards in marine and terrestrial

zones of risk for coastal areas. Also, it should be mentioned, the sustained effort for documentation and synthesis of the existing geological, geophysical, topographic, hydrological information, etc., performed by geoscientists from Romania and Bulgaria, as well as the acquisition of the new marine geophysical data, achieved during the cruises of the R/V „Mare Nigrum” and of the E/B „Carina”. All these had supplied the new created common geo-database. Another important objective of the Activity 4 is represented by the interconnection of the national seismic database with the new created geo-database in which were selective introduced the relevant seismic information for the Black Sea basin.

*Question: Could MARINEGEOHAZARD be considered a strategic project for Romania and Bulgaria ?*

Answer: The project MARINEGEOHAZARD is mainly addressed to the existing communities and infrastructures from Romanian-Bulgarian coastal areas and aims to supply the management authorities of the emergency situations with an effective early warning system in case of marine geohazards occurrence. Taking that into consideration, the project MARINEGEOHAZARD is, for sure, one of a strategic importance.



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