

## Partners

21 partners from 7 nations of the Euro-Mediterranean area. The partners include universities, research institutes and agencies:

<b>KOERI</b>	Kandilli Observatory and Earthquake Research Institute - Bogazici Universitesi
<b>KOU</b>	Kocaeli University Geophysical Department
<b>UNIPV</b>	Engineering School of University of Pavia
<b>IU</b>	Istanbul University Department of Geophysics
<b>ITU</b>	Istanbul Technical University Eastern Mediterranean Center for Oceanography and Limnology
<b>CNR (ISMAR-IREA)</b>	Consiglio Nazionale delle Ricerche
<b>CNRS</b>	Centre National de la Recherche Scientifique
<b>EUCENTRE</b>	European Centre for Training and Research in Earthquake Engineering
<b>EMSC</b>	European-Mediterranean Seismological Centre
<b>GFZ</b>	Deutsches GeoForschungs Zentrum
<b>TUBITAK</b>	Marmara Research Center Earth and Marine Sciences Institute
<b>IFREMER</b>	French Research Institute for Marine Studies
<b>INGV</b>	Istituto Nazionale di Geofisica e Vulcanologia
<b>BRGM</b>	Bureau de Recherches Géologiques et Minières
<b>INERIS</b>	National Institute of Industrial Environment and Risks
<b>AMRA</b>	Center of Competence in the Field of Analysis and Monitoring of Environmental Risk
<b>IFSTTAR</b>	French Institute of Sciences and Technology for Transport, Development and Networks
<b>ESA</b>	European Space Agency
<b>GURALP</b>	Systems Ltd
<b>DAIMAR SRL</b>	National Council of Researches
<b>SARMAP SA</b>	Earth Observation Gateway

## Beneficiaries

Wider scientific community  
Stakeholders and decision makers in the Marmara Sea region  
Industrial domains  
Members of the consortium

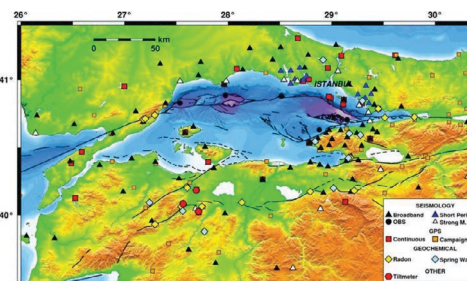
## Contact person - Coordinator

Nurcan Meral Ozel is the Project Coordinator. She is responsible of all seismological operations in KOERI and presently acts as a vice director.



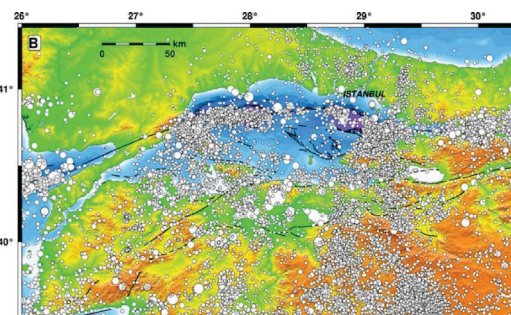
## Collaboration with other EU projects

Build on past and on-going European projects (TERRAFIRMA, PREVIEW, LESSLOSS, NERIES, SERIES, TRANSFER, SHARE, SYNERG, TRIDEC, NERA and REAKT) by including their contributions and principal partners, avoiding duplication and using their successes and momentum to create a better understanding of geo-hazards.



Instrumental observation infrastructure of Marmara.

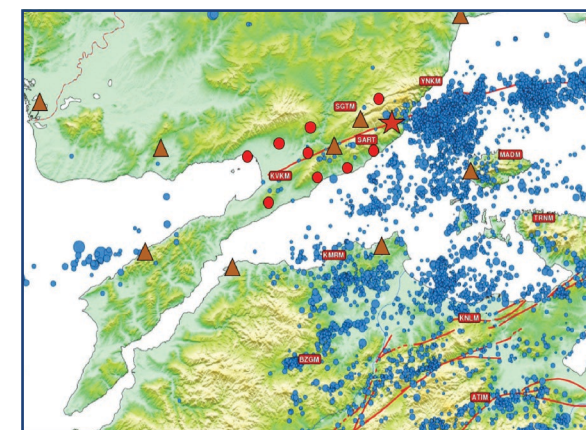
Complement actions conducted in EPOS (European Plate Observing System) and EMSO (European Multidisciplinary Seafloor Observatory) ESFRI large-scale Research Infrastructures, in the GMES initiative (Global Monitoring for Environment and Security) and in the GEO Work Programme 2009-2011.



The seismicity of Marmara Region from combined catalogues of KOERI and TUBITAK (1964-2011;  $M \geq 2.5$ )



## New Directions in Seismic Hazard Assessment through Focused Earth Observation in the Marmara Supersite



The locations of borehole ★ earthquake recording stations.

- ▲ permanent KOERI stations
- TUBITAK temporary stations
- surface array stations which will be installed in the frame of this project.



Funded by FP7 Infrastructure project (2011-2015) THEME [ENV.2012.6.4-2] [Long-term monitoring experiment in geologically active regions of Europe prone to natural hazards: the Supersite concept]

## MARsite ID card

Project acronym: MARsite  
 Contract n° 308417  
 Project type: Collaborative project  
 Start date: 01/11/2012  
 Duration: 36 months  
 Total budget: 7.769.608.60 €  
 Funding from the EC: 5.965.286.45 €  
 Person-month: 763  
 Key words: Marmara Sea, Borehole  
 Observation, Seismic Risk and  
 Hazard  
 Coordinator: Prof. Nurcan Meral Ozel - KOERI

Website: [www.marsite.eu](http://www.marsite.eu)

## Working plan

**WP1** Consortium Management, assessment of progress and results obtained.

**WP2** Collection and integration of seismological, geochemical, and geodetic data to detect and model the interactions between fluids, crustal deformation and ruptures of the active tectonic structures of the Marmara area and, thereby, to contribute to its seismic hazard assessment.

**WP3** Long-term continuous monitoring of the crustal deformation by exploiting the existing land and space based geodetic crustal deformation monitoring systems.

**WP4** Measure continuously the evolution of the state of stress of the fault zone surrounding the MMF and to detect any anomaly or change which may occur before earthquakes by making use of the data from the arrays already running in the eastern part of the Marmara Sea.

**WP5** Real- and quasi-real-time Earthquake & Tsunami Hazard Monitoring, where an integrated approach by harmonizing geodetic and seismic data to be used in early warning applications will be implemented.

**WP6** Improve the preparedness of those seismically induced landslide geohazards, through the using and the improvement of monitoring and observing systems in hydrogeotechnical and seismically well-constrained areas within the supersite.

**WP7** Re-evaluation of the seismo-tectonics of the Marmara Region.

**WP8** Monitoring seismicity and fluid activity near the fault using existing cabled and autonomous multiparameter seafloor instrumentation.

**WP9** Early Warning and Development of the real-time shake and loss information for the supersite.

**WP10** Integration of data management practices and coordination with ongoing research Infrastructures.

**WP11** Dissemination activities and public outreach strategy.

**WP12**

## Objectives

To fulfil the requirements of the call, MARsite identifies a number of objectives that drive its implementation, the definition of the activities and the composition of the consortium.

The MARsite strategic objectives are to:

**Achieve long-term hazard monitoring and evaluation** by in-situ monitoring of: earthquakes, tsunamis, landslides, displacements, chemical-radioactive emission and other physical variables by the use of space-based techniques.

**Improve existing earthquake early-warning and rapid-response systems** by involving common activities, participants, competences, knowledge and experts from Europe.

**Improve ground shaking and displacement modelling** by the development/updating of source models and the use of probabilistic and deterministic techniques with real-time and time-dependent applications.

**Pursue scientific and technical innovation** by including state-of-the-art R&D in developing novel instruments and instrumentation.

**Interact** with end users and **contribute to the improvement** of existing policies and programs on preparedness, risk mitigation and emergency management.

## Motivation

In the last 12 years, Europe experienced destructive earthquakes such as 1999 Izmit (Turkey), 1999 Athens (Greece) and 2009 L'Aquila (Italy).

More destructive earthquakes happened earlier: Istanbul in 1509 and 1766, Izmir in 1688, Eastern Sicily in 1693 and Lisbon in 1755.

Such catastrophic event is now expected in the Marmara region, with a probability in excess of 65% in 30 years, due to the existing seismic gap and the post-1999 earthquake stress transfer at the western portion of the 1000km-long North Anatolian Fault Zone (NAFZ), passing through the Marmara Sea about 15 km from Istanbul.

Istanbul is fully aware of this impending problem and the authorities are in the process of taking all conceivable physical and social steps for preparedness and mitigation of the risk.