



## Thematic Actions

### Coordinating Universities for the Proposal: UCM and UPM

Title of Action	Moncloa Natural Hazards Network		
Participating partners	UCM, UCM-CSIC, UPM	Other participants	IGN, IGME, CSIC (MNCN); INIA, AEMET, Ministry of the Environment, IGC (Geological Institute of Catalonia) Evora University, Mohamed V University (Morocco) and Civil Protection
Personnel involved (indicate institution)	UCM (Physics, Geology, Mathematics), UCM-CSIC (IGEO), UPM (School of Topography, Geodesy and Mapping, Schools of Mining, Forestry, Aeronautical, Industrial, Civil and Telecommunications Engineering); Royal Observatory of the Navy (ROA).		
Start date	2010	End date	
Cluster	Global Change and New Energies	Other clusters	
Areas of action	Teaching Improvement and EHEA Deployment / Research / Knowledge Transfer / Local and Territorial Interaction / Comprehensive Social Campus.		
Location	UCM (Physics, Geology, Mathematics), UPM (School of Topography, Geodesy and Mapping, Schools of Mining and Telecommunications Engineering), UCM-CSIC (IGEO).		
Infrastructures involved	UCM-ROA Western Mediterranean broadband seismic stations network (at present there are 12 stations, which should be completed with 4 more and an OBS). The WM network is coordinated with the IGN, Evora University, Mohamed V University.		
Keywords	Natural risks; Modeling; Data processing; Alert systems		
<p><b>Objectives:</b></p> <p>The chief objective of this proposal is to foster research and development into new technologies that study the processes that trigger natural risks, so as to develop strategies to minimise damage. More specifically, the aim is to promote the study of seismic and volcanic hazards, -hazards associated to land instability, forest fires, floods, thunderstorms and hurricanes, hazards generated by spatial meteorology, and anthropogenic hazards.</p>			
<p><b>Description of the action:</b></p> <ol style="list-style-type: none"> <li>1. Fostering of studies in the fields of seismicity, seismotectonics, earthquake and volcano geology, danger levels, hazards and seismic engineering. Site effect studies. Region of special interest: Ibero-Maghreb area and Canary Islands.</li> <li>2. Development and innovation of automated systems for the permanent control and early alert of hazards and their application to vital infrastructures (railways, airports, tunnels, mines, electric power plants, reservoirs, etc.), Spain's urban centres, rural areas, crops and forests and rivers and coastlines.</li> <li>3. Improved knowledge of the factors and processes that trigger forest fires and the development of land management technologies and strategies that minimise their occurrence and spread.</li> <li>4. Study of hazard scenarios induced by climate change.</li> <li>5. Analysis of the effects of adverse space meteorology (magnetic storms) on present-day technology (satellites, communication systems, electrical transformers, etc.) and in living beings.</li> <li>6. Improvement and upgrading of existing geophysical infrastructures.</li> <li>7. Development of new methodologies (studies of self-organisation phenomena, cellular automatic devices, etc.) and data integration systems.</li> </ol>			



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<p><b>Planned key results:</b></p> <ul style="list-style-type: none"><li>• Creation of a device for the geophysical (seismic), geodetic and gravimetric monitoring of the Earth's surface in Southwest Europe and Northwest Africa.</li><li>• Implementation of early alert systems.</li><li>• Improvement of the danger and hazard evaluation systems for the different destructive geological processes.</li><li>• Raising awareness on the importance of spatial meteorology, especially in high solar activity periods and awareness of existing damage prevention resources.</li></ul>	
<p><b>Rationale for the action:</b></p> <p>Every year volcanoes, earthquakes, tsunamis, land instability, floods, hurricanes, fires, etc., kill thousands of people and directly affect many more by destroying their properties and means of living. Infrastructure damage costs are very high, and estimated to run to trillions of euros.</p> <p>Furthermore, everyday life increasingly depends on communication, navigation and remote sensing systems based on satellites or technological resources vulnerable to increases in geomagnetic activity. This is why more attention must be paid to spatial meteorology-related hazards. This is particularly necessary during high solar activity periods such as the one that will occur in 2012-13 and in medium-high latitude areas (including our own) there is already a significant technological presence.</p> <p>There is a clear and urgent need to step up research into natural hazards. This research allows us to use information about the phenomena and their evolution in order to give guidelines for monitoring these hazards, for minimising or reducing damage, for facilitating decision-making by Civil Protection bodies in crisis situations; and for promoting sensible land planning by public and private agencies.</p> <p>The Ibero-Maghreb area and Canary Islands are areas prone to seismic and volcanic hazards. Furthermore, fires in natural systems are increasingly dramatic in the Mediterranean area.</p>	
<p><b>International aspects:</b></p> <p>Numerous research groups of the partner entities are currently taking part in R&amp;D projects funded by international programmes: GlobVolcano, TOPO EUROPE. This laboratory will supplement the ESF Eurocores TOPO EUROPE initiative and global scientific programmes such as the GEM: Global Earthquake Model (<a href="http://www.globalquakemodel.org/">http://www.globalquakemodel.org/</a>).</p>	
<p><b>Planned impact:</b></p> <p>Acquiring further information on geological processes that trigger disasters is especially necessary in areas such as the Ibero-Maghreb region where geodynamic processes evolve slowly and therefore social awareness of the hazards is low. Hazard forecasts would therefore improve significantly and, consequently, so would correct hazard management.</p> <p>In spatial meteorology, it is hoped the following specific objectives will be achieved:</p> <ol style="list-style-type: none"><li>1. Increase technology companies' and services companies' knowledge of the hazards associated with increases of geomagnetic activity triggered, ultimately, by increased solar activity.</li><li>2. Foster a damage prevention culture through promoting knowledge on existing alert systems and developing new ones</li><li>3. Conduct interdisciplinary spatial meteorology studies through analysing its effects on satellite positioning, telecommunications, power lines, human health and living beings in general. Study the effects on railway systems</li><li>4. Take part in the European projects that are being promoted in this field via the FP7 Space Call framework.</li></ol>	