

Phase 2- 2015

Task	Partner involved	Final data	Expected Results
<i>Task 2.1.</i> <i>Geodata base design and new data acquisition plan</i>	CO, P1, P3	20.12.2015	Baze de date geofizice si geospatiale pentru zona Vrancea
<i>Task 2.2.</i> <i>Selection of geophysical models for seismicity monitoring and assessment in Vrancea zone from geospatial GPS, satellite and in-situ data in Vrancea region</i>	CO	20.12.2015	1 ISI published paper. 2 papers presented at international conferences
<i>Task 2.3.</i> <i>Seismic precursors and preseismic crustal displacements monitoring in Vrancea zone</i>	CO. P1, P2, P3	20.12.2015	Scientific Report - Earthquake precursors in Vrancea zone.

Results Phase II

Phase II of VRAGEO Project targeted three distinct tasks:

- a) Geodata base design and new data acquisition plan
- b) Selection of geophysical models for seismicity monitoring and assessment in Vrancea zone from geospatial GPS, satellite and in-situ data in Vrancea region
- c) Seismic precursors and preseismic crustal displacements monitoring and assessing in Vrancea zone.

Have been established the procedures for geodata base design for multiparametric monitoring, surveillance and awareness from geospatial and in-situ data of seismic hazard in Vrancea area. This project is focused on relevant connexions findings between different geophysical, geochemical (radon gas), geodinamical, geomagnetic, ionospheric, atmospheric, seismic parameters and different natural hazard indicators based on time-series satellite , GPS and in-situ monitoring data as well as data provided by national seismic and geodynamic networks aiming at development of an innovative methodology for presignals associated with seismic activity assessment in Vrancea area. Geodata base designed includes multiparametric geophysical data for monitoring and analysis of presignals phenomena for selected test sites for seismic precursory activity located at seismological observatories Vrâncioaia (VRI), Ploștina (PLOR) in Vrancea area, Cheia – Muntele Roșu (MLR) and Bucharest (BUC) at different distances of Vrancea source. The monitoring of the geodynamic activity of Vrancea zone will be done based on GPS, LEVELLING networks and field data. Observations campaigns including GNSS will be performed in the area of geodynamic line Tg.Secuiesc-Tulcea and GNSS/leveling observations in the area of geodynamic polygon Tulnici-Valea Sării-Vrâncioaia.

Also has been established an achizition plan for new geospatial and in-situ data for continuously monitoring of seismic precursors in active geotectonic Vrancea area and its neighbouring.

Monitoring and detection methods of the geophysical parameters anomalies having precursory character in Vrancea area time-series geospatial data have been used in three distinct directions: 1)Preseismic crustal deformation with millimeters-centimeters precision order through GPS, LEVELLING network and radar satellite interferometry (TerraSAR-X,ALOS, Sentinel 1); 2)Geomagnetic and Ionospheric anomalies, short term or immediate seismic precursors over strong earthquakes areals expressed through Total Electron Content TEC provided by GPS permanent network stations or from real-time IPS - WDC for Solar-Terrestrial Science data; 3)Possible thermal surface anomalies inferred through surface latent heat flux (SLHF) and Land Surface Temperature (LST) changes from time-series satellite data in IR regions (NOAA-AVHRR, Terra/Aqua-MODIS, Landsat TM/ETM, ENVISAT, Sentinel 2/3). Will be quantified long-, medium-, short- and immediate- term of geophysical parameters and radon concentration variations, sensitive to seismic events. Information derived from time-series satellite data will be used in synergy with in-situ monitoring data provided by geophysical, geodetic, geodynamic, electromagnetic, solar, seismic, meteorological monitoring networks of Romania.

As VRAGEO project aims at geophysical activity anomalies detection in Vrancea area and its vecinity in relation with earthquake occurrence based on geospatial and in-situ information, the selection of investigation methods and geophysical models for seismicity monitoring and assessment in Vrancea zone from geospatial GPS, satellite and in-situ data in Vrancea region is a very important task in frame of detection of seismic precursors and preseismic crustal displacements in Vrancea zone. Selection of the proper monitoring methods and models represents an important step directed to limit negative socio-economic and environment impact of future earthquake events.

In frame of II phase VRAGEO's project web page was permanently updated :
<http://vrageo.inoe.ro>.

Have been published 5 scientific papers (1 ISI and 4 in ISI web base) and was sent for publication 1 ISI new paper. Are under publishing 5 new papers in other data bases. Have been presented 17 papers at International and national Conferences.