

Phase 1- 2014

Task	Partner involved	Final data	Results
<i>Task 1.1</i> <i>Selection of geospatial and in-situ methods and monitoring test sites in Vrancea seismic active area and surroundings.</i>	CO. P1, P2, P3	20.12.2014	Geophysical and satellite maps of selected test sites. Scientific Report
<i>Task 1.2. VRAGEO's project Geoportall design and implementation</i>	CO	20.12.2014	Web page design and update

Results Phase I

Phase I of VRAGEO Project targeted two distinct tasks:

- a) Selection of geospatial and in-situ methods and monitoring test sites in Vrancea seismic active area and surroundings.
- b) VRAGEO's project Geoportall design and implementation

First task established the location of pilot test areas for multiparametric monitoring in-situ and from geospatial data of potentially seismic precursors for surveillance and seismic hazard assessment in Vrancea area. The 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 geodinamic networks aiming at development of an innovative methodology for presignals associated with seismic activity assessment in Vrancea area. The selected test sites for seismic precursory activity are located at seismological observatories Vrâncioaia (VRI), Ploștina (PLOR) in Vrancea area, Cheia – Muntele Roșu (MLR) and Bucharest (BUC) located at different distances of Vrancea source. The monitoring of the geodinamic 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.

Monitoring methods of the geophysical parameters having precursory character in Vrancea area time-series geospatial data will be 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 vicinity in relation with earthquake occurrence based on geospatial and in-situ information, the selection of investigation test sites and of the proper monitoring methods represents an important step directed to limit negative socio-economic and environment impact of future earthquake events.

In frame of I phase was built the geoportal : <http://vrageo.inoe.ro>.

Have been published 3 scientific papers (1 ISI and 2 in ISI web base) and was sent for publication 1 ISI new paper. Have been presented 3 paper at International Conferences in applied Remote Sensing field.