succession. So we can test some existing ideas for the zonation of magmatism and mineraliztion along NW-SE structures and provide new data for a substantiated geodynamic model of the Tertiary evolution of the region.

On the scale of a single ore-forming magmatic-hydrothermal systems we will concentrate on two or three important deposits (e.g. Buchim, Ilovitza) applying mainly the following methods: i) precise age dating (Ar-Ar on magmatic and alteration minerals, Re-Os on molybdenite, U-Pb on zircons from magmatic dykes that bracket the ore formation); ii) stable isotope analyses; iii) isotope-geochemical tracing (Sr, Pb and Nd). They will help us to constrain or to refine the genetical models of the deposits. Analytical works will be performed mostly in the labs of ETH, Zurich and in the new LA-ICP-MS laboratory at the Geological Institute of BAS.

First field results, isotope-geochronological, isotope-geochemical and petrological data will be presented and discussed during the CBGA-Congress.

## Reconstructing the rotational landslide near Frixa (Greece, Peloponnese) with a combination of different geophysical methods and terrestrial laser scanning

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After the 2007 wildfires in the western Peloponnese (Greece) we started an investigation in 2009 in this area at different sites, aiming at the reconstruction of different landslide types and to investigate the relation between fire-induced deforestation and landslides. The village Frixa, particularly its southern part, has massive problems with big rotation slides, shallow slides and erosional features. Tertiary Flysch units and Neogene deposits in the Pyrgos area are generally landslide prone. The slopes in the area have the typical morphological features of a “landslide landscape”. Many recent effects from landslides like slope failures, cliff break ups, road failures, destroyed retention walls, and cracks in houses (structural damage) can be observed in the burned areas even 2 years after the great fires. We assume that the intensity and the frequency of shallow landslides and rotation slides are increasing due to the wildfires, since the lack of vegetation results in a lowered retention potential.

In this case study we present our preliminary results of the slide investigations in Frixa near the ancient city of Olympia. For the study we used different geophysical methods (the capacitive coupled DC geoelectrics system “OhmMapper” and Ground Penetrating Radar, GPR) and a remote sensing tool (ground based t-LiDAR). The terrestrial laser scanning (TLS) is an effective remote sensing technology for reconstruction and observation of natural phenomena or geohazards as it is well founded of high spatial and temporal resolution. TLS was used for the reconstruction of the landslide geomorphology. To ensuring the complete recording of the landslide morphology it is necessary to scan the object from different angles. The entire scan sequence in this case study includes six different scan positions with approximate 2.5 million points with around 4 cm point distance. The t-LiDAR data allowed achieving a 0.5 m digital terrain model after the data processing (alignment the different scan windows, data filtering and cleaning, data interpolation).

We used 100 MHz and 270 MHz antennae and the SIR-3000 data collection system (GSSI) for the GPR investigations. Since penetration depth and spatial resolution depend on the antenna frequency, we used two different antennae that cover a depth of up to 7 m and a resolution of up to 7 cm, depending on the underground conditions. Penetration depth is in inverse ratio to conductivity, so clayey and humid materials lead to a high attenuation of the radar waves.

The OhmMapper was used to determine the resistivity distribution in the soils up to a depth of approx. 5 m. Layer depths determined by GPR can be used to improve geoelectrics data inversion, while information from geoelectrics measurements help to interpret the GPR signals. The combination of geophysical surveying and remote sensing allows mapping the surface topography and the thickness of the landslide bodies, thus enabling us to create a three-dimensional model of slides.

## EuroGeoSource – a web GIS system harmonizing geo-energy and mineral resource databases in Europe

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The EuroGeoSource is a project co-financed by the European Union under the Information Communication Technologies Policy Support Programme (ICT PSP), part of the Competitiveness and Innovation Framework Programme (CIP). The project started in 2010 and will last for three years, having the objective of making up a web Geographical Information System (GIS) regarding geo-energy resources (oil, gas, coal etc.), metallic and non-metallic minerals, as well as construction materials (gravel, sand, ornamental stone etc.) from twelve countries: Denmark, the Netherlands, Belgium, Portugal, Spain, Italy, Slovenia, Bulgaria, Romania, Hungary, Poland, Estonia.

The web GIS will incorporate a set of spatial data services according to Open GIS Consortium (OGC) specifications. The system will allow users to identify, access, use and reuse in an interoperable and seamless way and for a variety of uses, aggregated geographical information on geo-energy and mineral resources, covering a significant part of Europe and coming from a wide range of sources.

The project uses spatial and attribute information in GIS format on oil, gas and mineral fields in the participating countries, which is typically maintained and stored by the geological surveys. The data will have to be harmonized by defining a common set of attributes for geo-resources objects of the same type. For the key economic and geological parameters, an exchange format has to be agreed, taking into consideration the recommendations of the INSPIRE Directive 2007/2/EC (Infrastructure for Spatial Information in the European Community), as well as existing operational geo-data exchange formats, implemented in previous geo-data projects (e.g. eEarth, eWater, Geomind, OneGeologyEurope).

The system will include three main layers: 1) a central web GIS application, providing access and visualization of the spatial data sets; 2) data delivery services, including Web Map Service (WMS) and specialized web services for translation and delivery of spatial objects attributes; 3) a national database, storing spatial data sets and spatial object attributes.

Typical usage of the EuroGeoSource system based on preliminary analysis of the potential user needs comprises the following steps:

- starting in the central geo-source data catalogue application, where the user can search the available maps from all countries participating in the project and select the language;
- browsing the search result (a list of available maps), consultation in detail of the metadata associated to the data set of interest, followed by adding the data set as a layer to the geo-data viewer;
- consulting the data set layers at different scales and within different contexts (extent, background layers, etc.) in the map viewer;
- gathering detailed economic/reserve information, accessible either free of charge or based on the ‘data delivery cost recovery’ pricing model, depending on the provider.

A special group of users (e.g. Institute for Energy of the Joint Research Centre of the European Commission or commercial companies) will be able to incorporate the data provided by the EuroGeoSource system into their decision processes or models using special