

A crustal seismic profile across Sicily: Preliminary results

F. ACCAINO^{1*}, R. CATALANO², L. DI MARZO³,
M. GIUSTINIANI¹, U. TINIVELLA¹, R. NICOLICH⁴,
A. SULLI² AND V. VALENTI²

¹OGS, Borgo grotta Gigante 42/c Sgonico, Italy,
(*correspondence: faccaino@ogs.trieste.it)

²University of Palermo, Dipartimento di Geologia e Geodesia,
Via Archirafi 22

³Geotec S.P.A., Via Barbato 20 Campobasso

⁴University of Trieste, Dipartimenti di Ingegneria Civile e
Ambientale, Via Valerio 10

In the frame of the Italian National Project Sicilia a Riflessione PROFonda (SIRIPRO), during the winter 2007-2008 a crustal seismic line was acquired in Sicily with the aim of identifying the deep structures of the crust. A crustal reflection seismic profile, more than 100 km long, has been recorded across central Sicily, from the Tyrrhenian shore to the Sicily Channel, to understand the deep structures and the collision mechanisms between Europe and Africa and the subsequent geodynamic evolution. The seismic profile was acquired using explosive sources and 240 active channels recorded by a Sercel 408-XL, 24 bits A/D converter, with a 12 km spread and a 24 fold coverage. The data has been processed following a non conventional procedure in order to preserve the relative amplitudes of the reflections and to better investigate the deep structures.

By using the ad hoc acquisition and processing, the dramatic flexure of the Iblean platform, the huge through of Caltanissetta filled by deep seated thrusts, olistostromes and nappes, the stack of thrusts characterizing the northern Maghreb chain have been highlighted in the stacked section.

Moreover, the deepest parts of the Caltanissetta through are imaged for the first time, and its bottom is now fixed at around 7 s TWT.

The seismic experiment allowed us to investigate for the first time the deep structures of the crust beneath Sicily. The results obtained and the further data elaboration and interpretation, utilizing well data and regional correlations, will help to better understand the geology of the area, giving more constraints to the structural and geological interpretation of Sicily and neighbouring areas.

In situ conditioning and stabilisation of dredging and mineral sludge

F. ACCOE^{1*}, S. VAN ROY¹, M. DAEMS¹, A. RYNGAERT¹,
L. DIELS¹, W. DEJONGHE¹, D. CICHOCKA²,
D. SPRINGAEL², L. BARBETTI³, P. VAN IMPE³,
G. VAN STAAYEN⁴, B. MEESSCHAERT⁴, L. DUERINCKX⁵,
J. VANDEKEYBUS⁵, A. PIETERS⁶, G. IDE⁶, H. SEFFELAAR⁷,
S. PENSART⁸, M. GEERAERT⁹, R. RAMDAS¹⁰,
B. CARPELS¹⁰, A. HEYLEN¹¹, E. VAN GOYLEN¹¹,
M. BERTELOOT¹² AND M. DUBOIS¹³

¹VITO, Boeretang 200, 2400 Mol

(*correspondence: frederik.acco@vito.be);

²Catholic University of Leuven (KUL), Heverlee, Belgium;

³University of Ghent (UGent), Zwijnaarde, Belgium;

⁴KHBO, Oostende, Belgium;

⁵MWH, Mechelen, Belgium;

⁶ENVISAN, Hofstade-Aalst, Belgium;

⁷Rasenberg Milieu N.V., Grobbendonk, Belgium;

⁸DEME Environmental Contractors, Zwijndrecht, Belgium;

⁹Ghent Dredging, Gent, Belgium;

¹⁰WVRB, Oostende, Belgium;

¹¹Port of Antwerp, Antwerpen, Belgium;

¹²Agency for Maritime and Coastal Services, Belgium;

¹³Nyrstar, Balen, Belgium

Contaminated inorganic sludges are causing worldwide a large threat for humans and ecology. This is not only related to their often high contents of toxic compounds (heavy metals and organic pollutants), but also due to the huge amounts of sludges that need to be processed or disposed in landfills.

In the '*In situ* sludge consolidation' project, techniques are being studied and developed for the *in situ* consolidation and stabilization of inorganic sludges, both in landfills as directly in contaminated sediments.

This presentation will first explain the main objectives and research goals of the project. The research activities at VITO focus on *in situ* bioprecipitation (ISBP) of heavy metals and *in situ* chemical oxidation or reduction of organic pollutants. Batch experiments have been conducted with mineral sludge originating from the zinc industry, to study the effect of different types of additives on ISBP, by stimulating sulfate reducing bacteria, and on chemical precipitation of heavy metals. The stability of the metal precipitates formed during the batch tests was evaluated by sequential extraction. The technical and economic feasibility of chemical oxidation of organic pollutants (PAHs, mineral oil) in sediments has been evaluated by performing batch tests with different types of oxidants. The potential release of heavy metals by chemical oxidation of sediments has also been investigated.