



National Institute of Marine Geology and Geocology - GeoEcoMar

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The National Institute of Marine Geology and Geocology - GeoEcoMar is the Romanian pole of excellence for research in marine, coastal and fluvial geology, geophysics and geo-ecology, as well as an international reference center for marine and Earth sciences in the Black Sea region.

An “institute of national interest” since 1996 due to its technical potential and scientific performances, the main objective of GeoEcoMar is to perform complex and multidisciplinary research of sea – delta – river macro-systems, having as key focus the Black Sea – Danube Delta – Danube River system. In the last twenty years, GeoEcoMar has experienced a continuous scientific and financial growth, both at national and international levels.

Headquarters and a part of laboratories are in Bucharest. Constanta Branch hosts the marine geochemistry, mineralogy, grain size, biology and geo-ecology laboratories.



GeoEcoMar headquarters



GeoEcoMar Constanta branch

The main scientific activities and expert services of GeoEcoMar are focused on geology (paleo-environmental studies – sedimentology, stratigraphy, paleontology, sediment investigation - geochemistry, mineralogy, grain size analysis; carbon capture and storage, etc), coastal research and integrated management, geophysics (seismo-acoustics, 2D marine seismics, magnetometry, gravimetry, electrometry), environmental quality investigations (hydro-chemistry, gas chromatography, eco-toxicology, green house gas emissions), real time monitoring and study of marine geo-hazards, geo-archaeology and geological mapping of the Romanian Black Sea continental shelf.

The major scientific projects of the institute are financed by different national and international funds, such as:

- 7th Framework Program of DG R&I, EC (PERSEUS, EUROWLEETS(1), EUROWLEETS2, COCONET, ARCH, CGS EUROPE, DANCERS, UP-GRADE BLACK SEA SCENE, HYDRALAB IV, FAST, RISES-AM, etc);
- Romanian – Bulgarian Cross Border Cooperation (MARINEGEOHAZARD, HERAS);
- Black Sea Joint Operational Program 2007 – 2013 (MAREAS);
- Bilateral cooperation (France, Italy, Switzerland, Bulgaria);
- National funds (Plan II for Research & Development and Innovation, Core Programs, including National Coordination for the development of DANUBIUS - the Danube International Centre for Advanced Studies for River-Delta-Sea systems.

The main important projects of the institute are:

1. GeoEcoMar as lead partner:

FP7 DANCERS Project (*Danube macro-region: Capacity building and excellence in river systems: basin, delta and sea*) aims to develop new instruments and tools that will enhance environmental research and promote innovation in Danube Region, including the Danube Delta and the Black Sea. Importantly, the new instruments and tools do not start *ab initio* but will build on existing projects which will be identified and clustered.

The project undertakes a critical analysis of what has been achieved so far in the region and builds upon results of achievements to-date, to design innovative solutions to strengthen knowledge transfer in this area. This is achieved by gathering top level representatives of the academia and business communities, as well as decision makers specialized in various sectors of integrated management of the Danube –Black Sea macro-system.

The specific objectives of the project are: critical analysis of achievements in integrated river-delta –sea management in the Danube Region; understanding of links between the achievements, deliverables and results of the work performed; to define a set of instruments to enhance environmental research and innovation in Danube Region.

MARINEGEOHAZARD Project (*Set-up and implementation of key core components of regional early-warning system for marine geohazards of risk to the Romanian-Bulgarian Black Sea coastal area*) represented the first major initiative to address in an integrated and coordinated manner the establishment of a geo-hazard early-warning system for the Black Sea. Having as strategic objectives to develop in the Romanian – Bulgarian cross-border area the early-warning capabilities for marine geo-hazards, the project stimulates regional collaboration, underpinning the development of a Black Sea regional system in-line with ongoing European and intergovernmental initiatives. As a final result of the project, two national centers dedicated to the monitoring and *in situ* early warning system for Black Sea geo-hazards (submarine landslides, Earthquakes, active faults, tsunamis) are now operational in Constanta (Romania) and Varna (Bulgaria), as well as a network of GNSS stations for geo-dynamic surveillance of the Western Black Sea coastal area.

DANUBIUS Project (*Danube International Centre for Advanced Studies for River-Delta-Sea systems*), financially supported by Romanian Government (Ministry of National Education), is a developing pan-European research infrastructure, led by Romania with support from other EU

Member States. Its aim is to provide a multidisciplinary approach to understanding large river basins and connected coastal seas, using as case study the Danube River – Danube Delta – Black Sea system. DANUBIUS will contribute to delivering the following EU priorities: specific action of the EU Strategy for the Danube Region Action Plan; to connect the Danube Region with the whole Europe; to protect the environment in the Danube Region; to build the prosperity in the area; to strengthen the Danube Region; to perform all five major goals of the EU strategy Europe 2020: employment, innovation, education, poverty reduction and climate/energy. DANUBIUS will represent a new world leading novel science and innovation infrastructure, providing a Hub for a new Pan-European Research Infrastructure European focused to characterize a complex river-delta-sea system of continental importance (Danube – Black Sea) and interconnect centres dealing with other complex systems across Europe (Nodes). DANUBIUS will be a good example of Smart Specialisation that will gather and integrate excellent expertise and facilities in Europe by providing world class services through accessibility to the most important natural laboratory in Europe: Lower Danube – Danube Delta – Black Sea. The Centre will be a focal point to develop joint R&D programmes for monitoring, identifying best practice and promoting international collaboration. Romania's unique geostrategic position in the Danube basin will help increase the collaboration with EU countries, including those from the Black Sea – Caucasus Region. DANUBIUS uses the Romanian governmental support, with provision of land (Danube Delta area), and commitment of funding for design and construction costs. Research institutions from other nine Member States have expressed interest in joining DANUBIUS so far. An international committee is working with the GeoEcoMar, as Project Coordinator, and providing advice and help in preparing an application for inclusion in the ESFRI Roadmap in 2015.

2. GeoEcoMar as partner:

FP 7 EUROFLEETS Project (*Towards an alliance of European research fleets; 2009 - 2013*) aims at bringing together the European research fleets operators to enhance their coordination and promote the cost-effective use of their facilities. The project supports marine research services for a sustainable management of the regional seas and the oceans, organizing common access to all European scientists on sole condition of scientific excellence. In the same time, **EUROFLEETS2 Project** (*New operational steps towards an alliance of European research fleets; 2013 – 2016*) is the enhancement of EUROFLEETS, with the aim of developing a new pan-European distributed infrastructure with common strategic vision and coordinated access to research vessels (RVs) and to the expensive and complex marine equipment. EUROFLEETS2 will furthermore undertake specific actions to consolidate research fleets' organization, methodology and tools through operational initiatives (like virtual fleets), leading to more interoperable and cost effective European research fleets.

FP 7 PERSEUS Project (*Policy-oriented marine environmental research in the Southern European Seas*) has as scientific objectives to identify the interacting patterns of natural and human-derived pressures on the Mediterranean and Black Seas, to assess their impact on marine ecosystems and, using the Marine Strategy Framework Directive (MSFD) as a vehicle, to design an effective and innovative research governance framework based on sound scientific knowledge. The new knowledge will advance the understanding on the selection and application of the appropriate descriptors and indicators of the MSFD. Other objectives of the

PERSEUS Project: to evaluate the current environmental status of the southern seas, combining monitoring and modeling capabilities and using the existing observational systems; to develop a concept of an innovative, small research vessel; a scenario-based framework of adaptive policies and management schemes will be developed; to design management schemes for marine governance and to promote the principles and objectives outlined in the MSFD across the Southern European Seas.

GeoEcoMar has a specialized **research infrastructure**, dedicated to the aquatic fluvial, deltaic, coastal and marine areas. The main components of the infrastructure are:

- multidisciplinary marine research vessel Mare Nigrum (length-82 m., breadth -13.6 m, max draft -5 m, gross tonnage -2495 t), which represents a research infrastructure of national interest ;
- fluvial and coastal research vessel Istros (length -32 m, breadth – 6,80 m, max draft 1,25 m, gross tonnage- 143 t);
- “The Black Sea Security System” for the Western Black Sea Earth Crust and Sea continuous observation and monitoring composed of: EUXINUS network – automatic marine gauge stations, as an early warning system for marine geohazards and GeoPontica network - with 18 GNSS stations (13 on Romanian territory and 5 in Bulgaria) for the geo-dynamic surveillance of the Western Black Sea coastal area ;
- Scientific equipments for submarine measurements (bathymetry, seismo-acoustics, 2D seismics, ACDP etc.), for water, sediment and biota sampling and for direct underwater investigation (ROV “Geos”).



R/V Mare Nigrum



R/V Istros

The main beneficiaries of the expert services of GeoEcoMar are: Ministries (Education, Environment, Development, Economy and Business), national administrations (Danube Delta Biosphere Reserve, Lower Danube Fluvial Administration, Romanian Waters National Administration, National Agency for Mineral Resources), Romanian or European private companies (OMV-PETROM, ExxonMobil, Melrose, Midia Resources, Peter Gas, Marexin BV etc).



EUXINUS network – Automatic marine gauge



Coastal automatic marine gauge station (Mangalia, Romania)

Strong points of GeoEcoMar:

- over 40 years of tradition and experience in marine geological and geophysical research;
- staff with expertise in geological, geophysical, biological and geo-ecological research in aquatic environment;
- research infrastructure specialized in investigation of marine, coastal, lacustrine and fluvial aquatic environments;
- flexibility and dynamism in national and international collaboration;
- high rate of success within national and international project competitions;
- very good relationship with educational and business environment.

For more information, please visit GeoEcoMar's homepage: www.geoecomar.ro