

Geology Laboratories - GEOLAB

Geology Laboratories (GEOLAB) provide specialized services and assure maintenance & development of know-how for experimental geology, remote sensing & surface/near surface prospecting, crustal geodynamics & paleoclimatology for exploration and reservoir studies, integrating them with the other disciplines needed for basins geological reconstruction and modelling.

Activities are divided into main four macro-areas:

Experimental Geology

Maintenance of know how, execution and technology development of laboratories activities with particular focusing on electron microscopy, mineralogy, analog modelling and paragenesis of both reservoir e cap rocks.

The starting point of the activities are qualitative and quantitative analyses carried out on cores, sidewall cores, cuttings, depositions on filters and scales in wellbores by using also last development technologies in Scanning Electrone Microscopes (SEM), X Ray Diffrattometry (XRD), X Ray Fluorescence (XRF).

The results are used as input to carry out mineralogical analyses and among the others two powerful methodologies which allow the characterization of reservoir and cap rocks: the minero-chemostratigrafy (which provides a vertical stratigrafy of the reservoir when other methodologies aren't available) and the reservoir quality prediction in sandstone (which making use of forward modelling allows to verify both the mechanical compaction the quartz precipitation/cementation and how they affect porosity and permeability).

A further experimental activity involves the analog modelling (Sand Box) which is aimed at reconstructing/assessing the geological-structural evolution during the time of the sedimentary basins.



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Geology Prospecting and Remote Sensing

In support of the entire exploration process, are assured the acquisition, processing and interpretation of surface (geology field campaign and prospecting), near surface and airborne/satellite data and the execution of studies aimed at definition of the geological-structural model in integration with the other geological disciplines.

Airborne/satellite data and images find several uses during the different phases of the exploration process both for supporting the exploration goals and for assisting the relevant activities (i.e. seismic planning, field geology campaign planning and execution, reconnaissance and monitoring of anthropic factors, environmental monitoring). Airborne/satellite data allow effective and robust geological-structural reconstructions over widespread areas and in explorative remote or difficult access areas (because, logistical limitation and/or environmental restrictions which prevent from any field activity). The analysis and the interpretation of satellite data in frontier zones lead to the lithological and structural definition of surface models which provide valuable preliminary information to the other geological and geophysical disciplines (i.e. gravity, magnetic and seismic interpretation sismica).

Crustal Geodynamics and Paleoclimatology

Experimental activity based on the execution of plate tectonic modelling backwards through geologic times in integration with paleogeography and paleoclimate reconstructions. The history of a sedimentary basin is reconstructed and its evolution is tracked through the geological ages till the present-day.

The final goal is to verify if during the above evolution have been generated or not the conditions for an effective deposition of the source rock which is an important factor for evaluating a sedimentary basin as a candidate for oil and gas exploration.



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Core Laboratory

Core laboratory activity consists in receiving, archiving, sampling and preparing cores and cuttings from wells drilled worldwide by eni in order to support the specialistic studies carried out by the other specialistic eni E&P departments. Geolab Dept. has to be considered as the Hub of reference for eni E&P and its affiliates.

At the present time in the Core Store-house are stored about 155.000 boxes of cores and cuttings representative of about 8700 wells drilled worldwide in 94 countries starting since 1930 (first well drilled by eni as former AGIP).



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Experimental Geology

- Pore network characterisation by Image Analysis
- Minero-chemostratigraphy for reservoir zonation and characterisation
- Scanning Electron Microscope observations and quantitative analyses
- Chemical and mineralogical analyses through X-Ray
- Reservoir quality modelling through Exemplar TM
- Analog Modelling & Sand Box



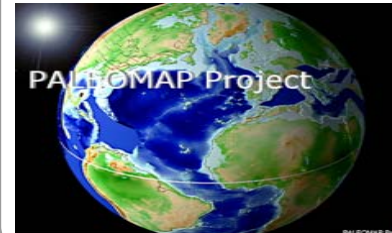
Geology Prospecting Remote Sensing

- Regional geologic and structural setting
- Basin recognition
- Assist to identify fractured reservoirs
- Oil & gas seeps & microseeps
- Aid for exploration of unconventional resources
- Aid for seismic planning



Crustal Geodinamycs & Paleoclimatology

- Plate tectonic modelling
- Paleogeography and Paleoclimatology reconstruction
- Basin evolution
- Prediction of Hydrocarbon System and Source Rock



Core handling & sampling

- Storing activity started in year 1930
- 2 store-houses dedicated for storing
- 155,295 boxes of Cores & Cuttings stored
- 8694 wells represented and distributed worldwide in 94 countries
- Average of 2000 new boxes got in and stored every year
- Average of 3500-4000 boxes/year handled to carry out specialistic studies



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