

GeoSubSight

Your way  
to the subsurface

# Integration Interpretation Visualization

of multi-scale geological, geophysical and geochemical data by combination of innovative and efficient techniques of data analysis.

Who ?

GeoSubSight is an independent company which offers a broad range of geological and geophysical services in the field of marine earth sciences, from seafloor mapping to formation evaluation and reservoir appraisal.

How ?

GeoSubSight utilizes the cutting-edge interpretative skills and experience of its founder Alain Rabaute, gained through more than 10 years of fundamental and applied R&D in the field of marine earth sciences.

What for ?

Provide you with the most advanced and constantly evolving techniques of seafloor and sub-surface geophysical data visualization and interpretation, made possible through permanent contact and knowledge exchange with its academic partner, the Department of Geology of the Ecole normale supérieure in Paris.



Ocean Drilling Program drillship R/V JOIDES Resolution close to port-call in Bermuda.

A case study, an expertise, an external consulting, we offer our clients a panel of services including

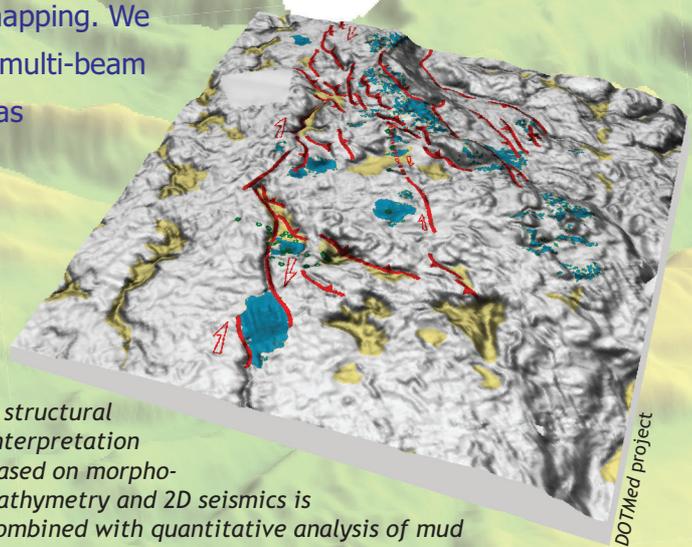
- ◆ Technical assistance in integration and interpretation of geological, geophysical and geochemical data
- ◆ R&D expertise and consulting
- ◆ Project planning and specifications
- ◆ Contractors selection and supervision
- ◆ Reformatting old data into modern digital formats
- ◆ On-call guidance

## INTEGRATION OF GEOMARINE DATA

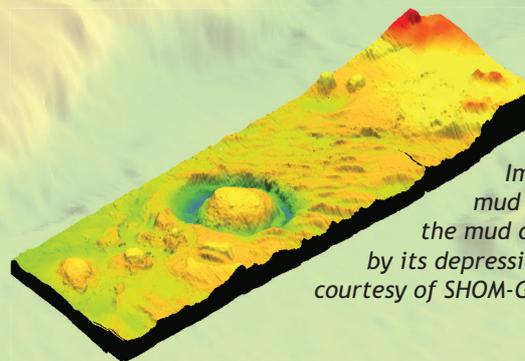
Recent qualitative advances in multi-beam bathymetry allow now to achieve very high resolutions in seafloor mapping. We specialize in multi-tool / multi-scale integration of multi-beam data with other geophysical measurements, such as acoustic reflectivity, 2D/3D seismics, 3.5 kHz mud penetrator, coring, in-situ fluid sampling.

When available, we use well data (well-logging, geometry, geochemistry), regional geophysics (gravity, magnetics, heat flow) and core data to constrain the interpretation and gain full insight into sub-surface formations.

Such an integrated interpretation scheme provides 3D high resolution mapping of structures such as active faults, fluid paths, potential slope failures, areas of potential under-consolidation, in sensitive geological contexts such as unstable margins and deforming basins.

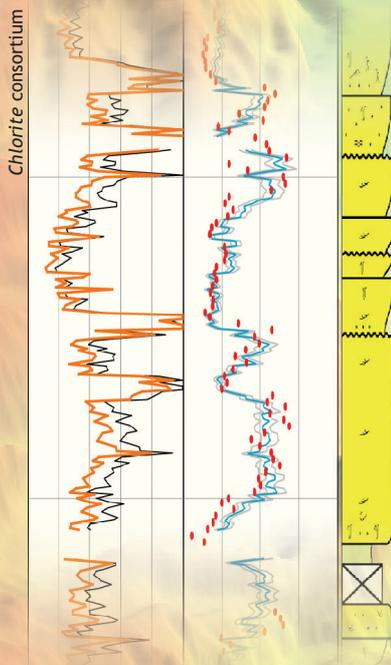


*A structural interpretation based on morpho-bathymetry and 2D seismics is combined with quantitative analysis of mud outflows to gain insights on the complex relationships between tectonics and mud volcanism.*



*Imprint of an active mud volcano showing the mud dome surrounded by its depression ring (data courtesy of SHOM-Geosciences Azur)*

## FORMATION EVALUATION



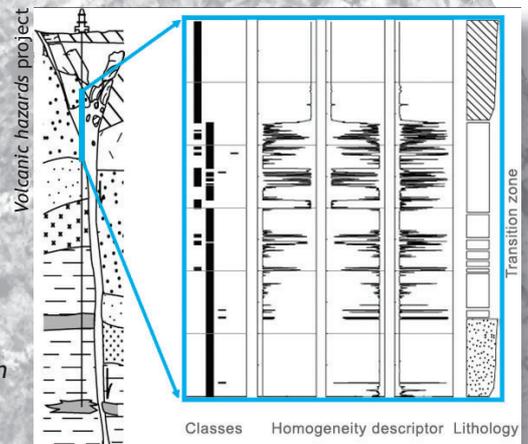
*Quantitative analysis of well-log data provides independent porosity estimate.*

- ◆ Core description and sample selection, thin section analysis (optical and electronic microscopy)
- ◆ Multi-sensor track operating, calibrating and interfacing
- ◆ Well-logging data normalization, quality control, analysis and interpretation:
  - Classical interpretation methods (QuickLook methods like log-core and multi-well correlations, synthetics construction)
  - Original and innovative analysis schemes using multivariate statistics, inversion methods, neural networks and Bayesian inference to calculate continuous profiles of mineralogy and petrophysical properties, and describe the sedimentary pile in terms of fluid flow, fluid and thermal alterations, under or over-compaction and over-pressures.

## EXPERTISE AND CONSULTING

- ◆ Multi-tool / multi-scale data processing and integration
- ◆ Definition of measurement protocols and integrated analysis schemes
- ◆ Automation of acquisition-analysis procedures
- ◆ Numerical modeling (limits and drawbacks, sensitivity and uncertainty analysis, boundary conditions)
- ◆ Technical workshop planning
- ◆ On-call guidance

*Fuzzy clustering makes it possible to handle complex formation evaluation (altered layers, transition zones) or bad quality data sets.*



## TRAINING

- ◆ Computing assistance on major operating systems (Unix, Linux, Windows, MacOS): loading, cleaning, merging complex data files
- ◆ Transcription of proprietary formats (DLIS/LIS) into standard text files (LAS, CVS, TXT)
- ◆ Scanning and digitizing old data to obtain electronic data files
- ◆ Easy and quick interfacing of complex data analysis schemes and procedures
- ◆ Using GIS for best visualizing and mapping multi-layered data files
- ◆ Making convincing and attractive oral presentations

Chlorite consortium

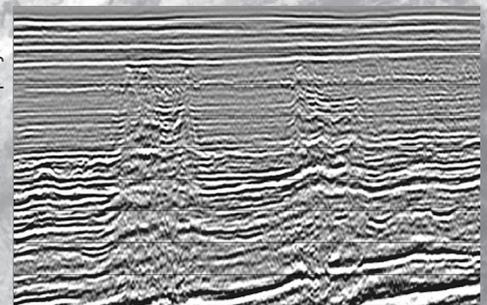


*Pore-lining chlorite is a critical issue for reservoir exploration and appraisal. Unconventional data interpretation schemes are needed for sound reserves evaluation and safe production.*

## PROJECT MANAGEMENT

- ◆ Project planning and specification
- ◆ Specifications follow-up
- ◆ Contractors selection and supervision

Geomound project



*Fluid escapes through the upper layers of a sedimentary basin, and makes its way out slightly differently depending on the physical properties of the penetrated formation.*

## CONTACT US

Alain Rabaute

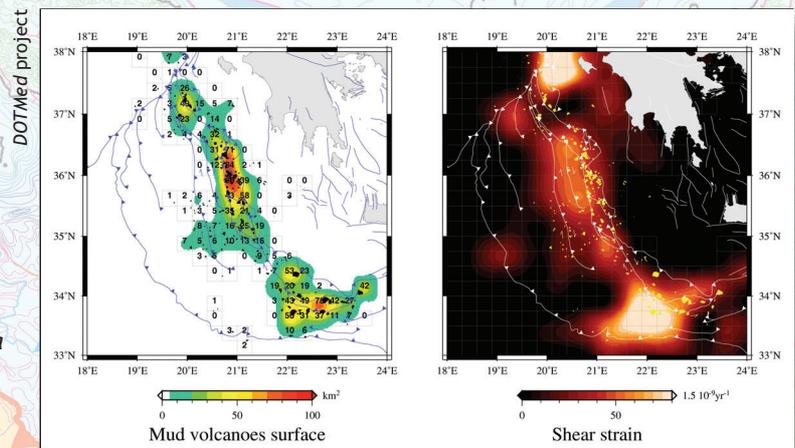
06 20 32 66 62

[www.geosubsight.com](http://www.geosubsight.com)

[contact@geosubsight.com](mailto:contact@geosubsight.com)

*Basin scale numerical analysis of active deformation based on earthquakes and GPS measurements: implication for reservoir tectonics and geohazards.*

*Correlation between the surface of expelled mud, quantified from seafloor acoustic reflectivity data (left), and the shear strain obtained from numerical modeling constrained by strain measurements (fault styles, GPS data, ...).*



## REFERENCES

- ◆ **Institut Français du Pétrole:** reservoir appraisal and CO2 sequestration
- ◆ **Schlumberger:** carbonate reservoir interpretation
- ◆ **Total, Agip, BP, Anadarko:** pore-lining chlorite in siliclastic reservoirs
- ◆ **Exxon, Conoco:** deep offshore tectonics in the eastern Mediterranean basins
- ◆ **Unocal:** modelling large-scale strain and velocity field in central South-East Asia
- ◆ **Ocean Drilling Program:** fluid flow and mud volcanism in accretionary contexts
- ◆ **Ecole normale supérieure:** active tectonics and mud volcanism
- ◆ **Institut de Physique du Globe de Paris:** well-logs interpretation in active volcanic settings
- ◆ **CEREGE:** oil-driven fluids migration from reservoir to surface in a marginal basin