



# Integrated services in Geosciences

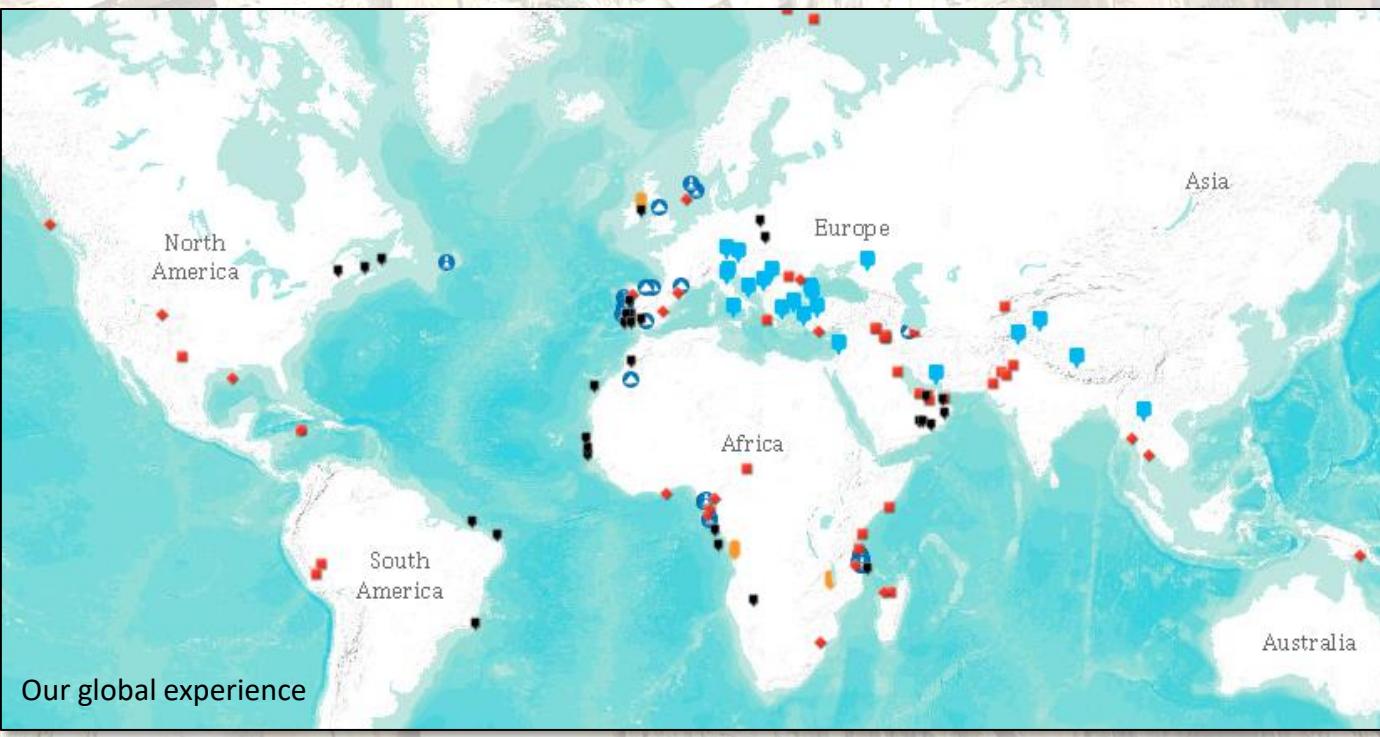
**Activities**

Chronosurveys is a Geological Consultancy that offers integrated services to the Oil & Gas and Mining industries, Research institutions and Geological surveys internationally.

Chronosurveys brings together the best of the Oil & Gas Industry and Academia. We are a group of Geoscience consultants and specialist researchers in Academia with vast international experience on Precambrian to recent sediments in a variety of geological settings.

Our main areas of activity are:

- ***Stratigraphy***
- ***Source Rock evaluation***
- ***Petroleum Geology***
- ***Training***
- ***Regional prospectivity studies***
- ***Research***



Our partner laboratories located in Portuguese and European Universities use standardized, industry-recognized methods.

Our consultants' experience includes the whole geological column, from Precambrian to recent sediments in different regions of the World.

All of our work is performed using standard routines and presented in digital format (on paper if requested) though a secure website and/or password blocked files.

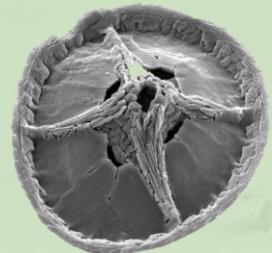


## Palynology

Multiple organic-walled fossil groups can be analysed from rocks of terrestrial or marine origin. Allows age determination (biostratigraphy), Paleoenvironmental analysis (palynofacies), sequence stratigraphy (quantitative analysis of fossil groups).

## Nannofossils

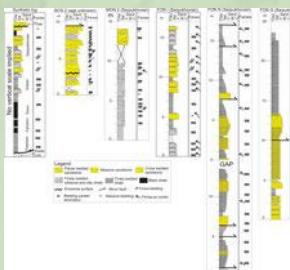
Some of the smallest fossils you can find, but also some of the most useful for age determination from the Jurassic to recent marine sediments. Even small (ca. 2g) samples may allow a statistically valid quantitative analysis.



## Foraminifera



Shell forming protozoa which can provide detailed age determination in sedimentary rocks from the Late Paleozoic to the Quaternary. Equally useful for paleoenvironmental determinations in the marine realm. Either as loose specimens or in thin sections, they can be easily analysed from outcrop, cuttings, side wall core or conventional core samples.



## Biostratigraphic campaigns and vintage data

We can advise on the biostrat sampling

campaign of your new well and to re-interpret old reports and other material, returning revised well tops, sedimentation ages, well correlation and other types of interpretation as requested.

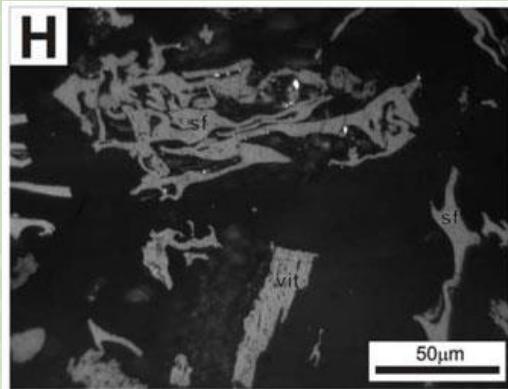


## Conodonts and other fossil groups

Our network of consultants can also use not-so-commonly used fossil groups to refine the stratigraphy of your project, including conodonts, trilobites, brachiopods among others.

We provide a comprehensive array of analyses to evaluate source rocks and the thermal maturation of a Petroleum System, as well as its interpretation in the context of the basin or specific field.

When used together, Organic Geochemistry and Visual Kerogen typing allow a powerful tool to characterise source rocks and understand what type and the amount of hydrocarbons that can be generated.



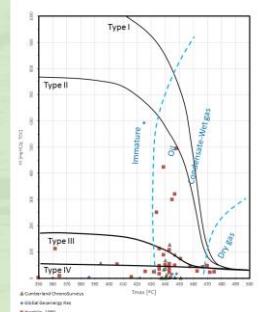
### Thermal maturity

Our consultants use the industry standard - Vitrinite reflectance – to measure paleotemperatures, in addition to other methods such as organic matter fluorescence and spore color. Thermal maturity analysis allow to understand the potential of your source rock but also the thermal history and basin evolution of your project.

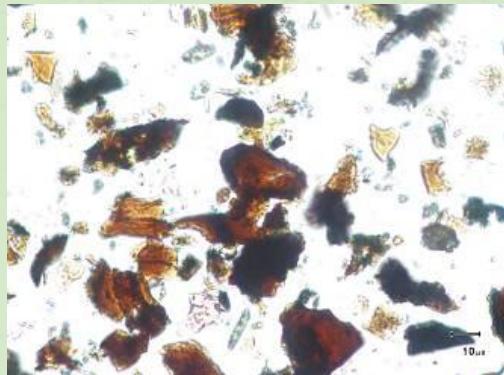
### Organic Geochemistry

We can provide Total Organic Carbon (TOC) measurements as well as RockEval pyrolysis analysis of your rock samples.

Stable isotope and biomarker analysis of oil, gas and rock samples can also be included in the evaluation of your source rock potential, oil-rock and oil-oil correlations.



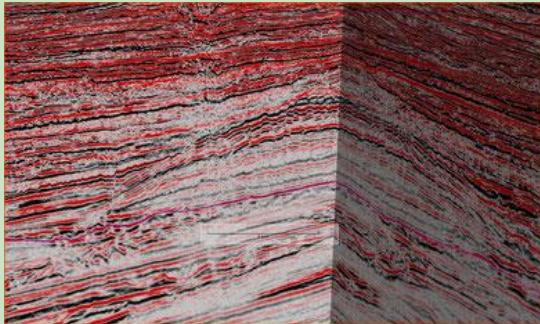
### Visual kerogen typing



Quick and inexpensive visual analysis of the organic matter in a source rock can provide insight to its potential – by analysing the palynological content. It can also be used to calibrate the organic geochemistry, by identifying oil- and gas-prone types of organic matter and also “dead kerogen”, not contributing to the generated hydrocarbons.

We provide integrated services on multiple areas of Geoscience.

Our consultants' experience includes several areas of Petroleum Geology and partner companies in other areas such as petrophysics, petroleum system analysis, reservoir modelling, among others.

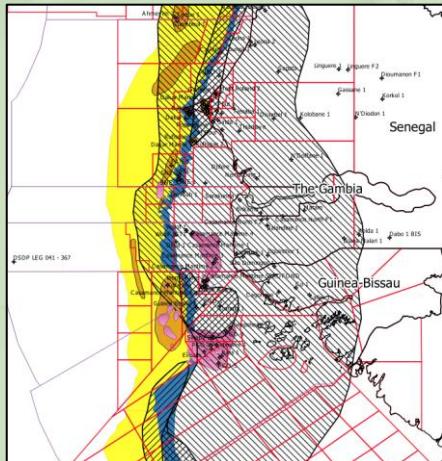


### Petroleum asset evaluation

Need to evaluate the hydrocarbon value of an asset in a data room or bid round? We can interpret the available seismic, well data and assess the prospects from regional prospectivity evaluation to seismic interpretation, prospect generation with volumetrics and risking.

### Reservoir characterization and sedimentology

Need a petrographic analysis of your reservoir to calibrate your wireline porosity measurements or evaluate the depositional environment of your well samples? We provide detailed descriptions of outcrop, core and cuttings samples, including thin section and XRD as well as interpretation of the sedimentary environments where they deposited, sediment provenance and detrital framework analysis.



### Regional prospectivity reports

Chronosurveys produces regional prospectivity reports of areas where its consultants have worked in the past. These are supported by a dynamic GIS application. The areas of expertise include:

- MSGBC Basin (West Africa)
- East Africa
- Gulf of Guinea

We provide integrated services on multiple areas of Geoscience. In complex areas of low-grade metamorphic rocks, coal deposits and evaporites, biostratigraphy can also be used, thanks to our innovative approaches to these rocks.



## Coal stratigraphy

Need to evaluate the stratigraphy of coal measures, correlate between wells or mine sections? Palynology of coal beds and interbedded sediments can provide the needed calibration. Well, outcrop and mine samples are suitable.

## Shale-hosted metal deposits and other sediment-hosted ores

Many transition metal deposits around the World are hosted by black shales and other fine-grained sedimentary rocks. Despite the common metamorphic alteration, palynology can still be used in for stratigraphic purposes.



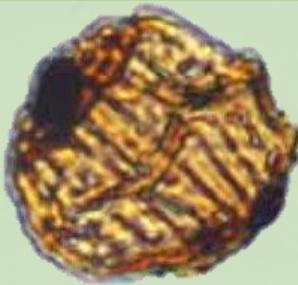
Other fossil groups can be used in metamorphic terranes, from macrofossils to conodonts, depending on the type of rocks and age.



## Rock salt and evaporites

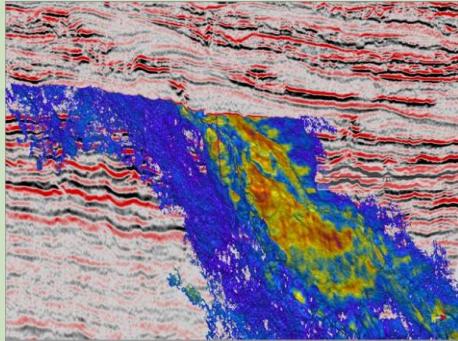
Chronosurveys refined a method to extract microfossils from evaporites and associated sediments. The method has been effectively used in samples from Permian to Miocene age, well, mine and outcrop, allowing to refine the stratigraphy and depositional environment interpretation.

Our consultants can provide training in several geological themes for technical assistants, geoscientists, non-technical staff, managers, etc.  
We can provide training in house or in another venue according to your preference.



### Biostratigraphy applied to the oil industry

2 to 5 days course, full of practical examples and exercises.  
Aimed for geoscientists looking to develop their capacity to use stratigraphic data.



### Seismic interpretation course

This 2 to 5 days course will cover the main concepts underlying the interpretation of 2D and 3D seismic data, from its History, the methods of data acquisition, processing, visualization and software. Participants use an interpretation software with real exploration/production seismic data.

### Exploration and production for young geoscientists and non-technical staff

This 2 to 5 days course focuses on the main stages of Petroleum Exploration and Production, from basin screening to discovery and development. Aimed for non-technical staff working with upstream themes. Optional day trip to the Lusitanian Basin.



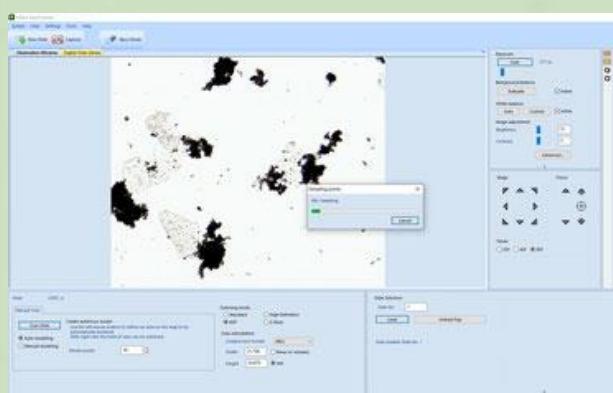
### Geological tour of Lisbon

Stone, water and earthquakes, the geological forces building and destroying Lisbon over the centuries. Enjoy a cultural/geological day trip in Lisbon's historical neighbourhoods. Ideal for a team-building or day-out event.



As a technology-based company, drawing knowledge from Academia and transferring to the industry is one of our assets.

Here are examples of present and past projects:



## Artificial Intelligence applied to biostratigraphy

We have developed a service to digitize palynological slides and automatically identify types of organic particles, providing quantified paleoenvironmental analyses.

## Salt biostratigraphy

We continuously search for improved techniques of extracting palynomorphs from rocks. These include metasediments, evaporites and other "difficult" samples. We are also refining non-acid palynological techniques.

Know more about [biostratigraphy of salt](#) and [palynology in metasediments](#).



## Petroleum Systems of Western Iberia

Chronosurveys has a deep understanding of the Lusitanian, Alentejo and Algarve basins of Western Iberia.

We are actively involved in several ongoing projects on these basins, together with

Universities and researchers. In addition to the underexplored petroleum potential of these basins, they are fantastic analogues for other regions of the World – for example Jurassic carbonates of the Middle East



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