

COMPAS

A Joint Industry Project

Cretaceous outcrop analog from Argentina for microbial pre-salt Atlantic Series



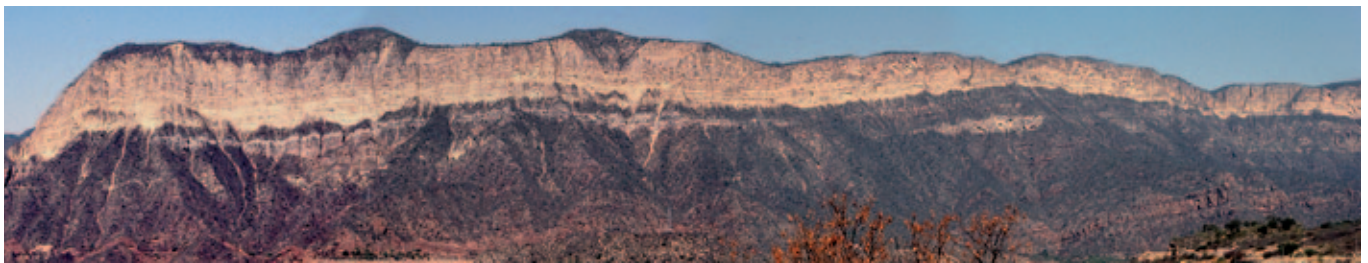
Introduction and background

The objective of the COMPAS project is the study of an outcrop analogue of the Atlantic pre-salt carbonate reservoirs. These carbonates consist of stromatolitic and bioclastic carbonate facies which were deposited in lacustrine or shallow marine depositional environments during the Sag phase (transition from syn-rift to post-rift) of the South-Atlantic Ocean opening. At a regional scale, the distribution of such algal carbonate

facies is poorly understood regarding the structural context and the climate control. At the reservoir scale, the heterogeneity distribution in microbial carbonate systems is almost unknown, as well as the diagenesis which also interacted with the sedimentary heterogeneity. Reservoir models are thus poorly constrained, and even the simulation workflow has to be adapted to such peculiar reservoirs.

It is proposed to better understand the reservoir distribution and to characterize its heterogeneity by studying an outcrop analogue of the

pre-salt reservoirs in Argentina: the synrift to postrift transition – Sag phase, outstanding quality outcrops of shallow bioclastic to bioconstructed microbialites carbonates deposited in lacustrine/marine environment – Yacoraite Fm. In these outcrops, the reservoir and source rock distribution can be studied at rift scale, and the reservoir architecture and facies distribution can be described in 3D. This dataset can then be used for testing different geostatistical algorithms that will provide some guidelines for constraining reservoir modeling in the subsurface.



Objectives

The goals of the JIP COMPAS are:

- to develop a comprehensive model of the deposition of the Atlantic pre-salt reservoirs based on a field analogue study in NW Argentina;
- to evaluate the relationships between microbial carbonate, diagenesis and tectonism;
- to quantify facies architecture and heterogeneities in lacustrine/shallow marine microbial carbonate environments;
- to propose a methodology for simulating the heterogeneity distribution of microbial, stromatolitic and bioclastic limestones in an outcrop analogue in Argentina.

Program and deliverables

The project is planned over three years and includes three phases:

Phase I (Year 1): Rift scale model

Characterization of the reservoir/source rock distribution of the Yacoraite Fm in a sequence stratigraphic and rift/sag dynamic framework at rift scale.

- Main deliverables: depositional model, sedimentological sections, thin section analysis, Rock-Eval analysis, cross-sections at rift scale (60-100km long), technical report, workshop, field session and outcrop presentation.

Phase II (Year 2): Reservoir model

Characterization of the reservoir architecture and heterogeneities: sedimentology, sequence stratigraphy and reservoir architecture focusing on lacustrine

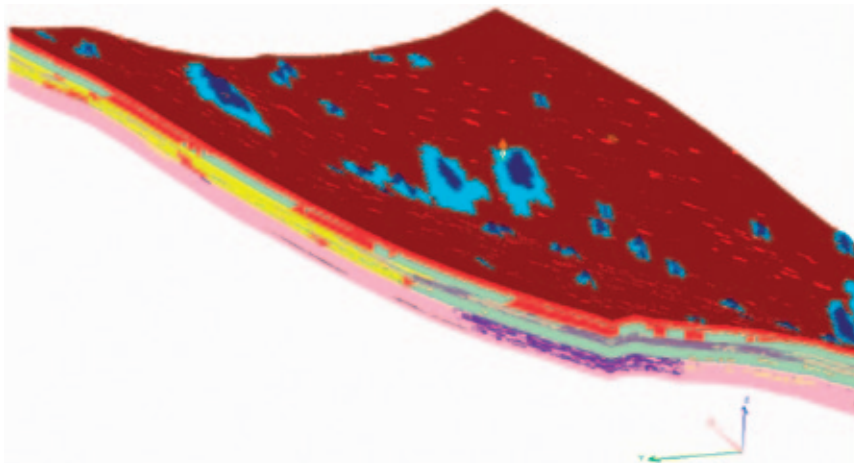
and lagoonal/marine stromatolitic carbonates of Yacoraite Fm.

- Main deliverables: atlas of the main facies, early diagenesis characterization, sedimentological sections, database of the distribution/size of microbial bodies, panel correlation at reservoir scale, thin section analysis, Rock-Eval analysis, technical report, workshop, field session and outcrop presentation.

Phase III (Year 3): Reservoir modeling

Geostatistical modeling at reservoir scale and final reporting.

- Main deliverables: geostatistical database, 3D geomodel (10x5km) populated with facies index, benchmark between different geostatistical algorithms, final report, final workshop



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