

Characterization of a continental dune system from El Baix Empordà as a reservoir analogue

Reservoir Geology and Geophysics Master's Degree 2021-2022

Author: Juan Serrano Luna

Tutors: Mahjoub Himi Benomar and Antonio Miguel Calafat Frau

Abstract

Dune systems, generally, have high porosity and permeability and good lateral continuity, constituting excellent reservoirs around the world. The use of geophysical data to study dune systems can provide useful information to characterize these reservoirs. This project is focused on the study of a continental dune system of El Baix Empordà (Girona, Spain), to understand the system architecture, as well as to analyse his potential as a reservoir analogue. In the present work, we show the results of different profiles of electric tomography resistivity and ground penetrating radar that have enabled us to characterize the internal structure of the dune system, allowing us to differentiate dune and interdune deposits. Moreover, several surface samples were extracted in order to analyse granulometry, porosity and hydraulic conductivity of the system.

We have determined that the dune system is composed by dry sands with high porosity and permeability. Dunes are coarser, more porous and permeable in relation with interdune areas. Although now it is not filled with any fluid and therefore it does not behave presently as a reservoir, the continental dune system of Montgrí is a potential future reservoir and may be used as a contemporary analogue to ancient reservoir deposits.