

## **FIELD TRIP # 2**

### **Late Cretaceous to Cenozoic evolution of the Sierra Nevada de Santa Marta and surrounding onshore/offshore basins**

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#### **Brief Description**

The Sierra Nevada de Santa Marta, earth tallest coastal mountain, it is an isolated Andean range surrounded by sedimentary basins whose Cretaceous to Neogene sedimentary record differ among them. To explore these differences and the impact in the hydrocarbon exploration activities, this 2-days field trip will explore a comprehensive analysis of the tectonic and hydrocarbon evolution of northern South America and the Caribbean region. Stops will include key exposures of the Cretaceous, Paleogene and Neogene strata that record the extensional, compressional and transtensional tectonism that affected both the orogen and surrounding basins. An updated review of its stratigraphy, sedimentary petrology, chronology and structural peculiarities including discussion on specific seismic and well data from the offshore region will provide a critical review of the paleogeographic and hydrocarbon habitat of each of these basins and its record of the Caribbean tectonics.

The proposed itinerary will take us from the collisional margin into the less deformed sedimentary basins on the continental plate:

#### **Friday August 25<sup>th</sup>**

Arrival to Valledupar city. Dinner and hotel at Valledupar is included in the budget.

#### **Saturday August 26<sup>th</sup>:**

DEPARTURE: 7 am;

In this day we will visit the Mesozoic stratigraphic record including the transition from volcanic dominated extensional and continental environments towards the Early Cretaceous marine invasion (Figure 1), and its associated sedimentary record including accumulation of La Luna Formation, the main source rock in northern South American basins. We will evaluate the lateral continuity of this unit with the Caribbean basins. In the afternoon, we will visit the Paleogene record of the Cesar-Ranchería basin near Cerrejon Mine (Figure 1). A review and discussion on the stratigraphy, basin formation mechanism in the Paleogene and the subsequent Eocene to Oligocene basin inversion of the Perija and Rancheria basins, as well as comparison on the Eocene record of major reservoir units in northern South America. Night at Waya Guajira Hotel ([www.hotelwayaguajira.com](http://www.hotelwayaguajira.com)).

#### **Sunday August 27<sup>th</sup>**

DEPARTURE: 7 am;

In the morning, Along the road from Cerrejon coal mine to Palomino, we will visit field evidences on the older basement and associated deposits of fault activity, and we will do a review of the evidences of Oca Fault activity and its paleogeographic meaning for Baja Guajira and offshore basins. Discussion on the origin of this basins and their relation with oblique Caribbean convergence will be complemented by reviewing seismic and well information. In the afternoon, we will visit extremely deformed sedimentary strata formed in the South American margin, the record of accreted oceanic remnants in the margin, and how plutonic rocks dates the end of collision and metamorphism. We will discuss the role of the first collision with the Caribbean front in controlling the character and age of the older preserved basins, and how the

Santa Massif become a potential source area for all the basins around since Paleocene. Timing of formation and filling of the adjacent lower Magdalena basin will be discussed.



Figure 1. Two possible source rocks in the Ranchería basin, the Upper Cretaceous La Luna Formation (left), and the Paleocene Cerrejón Formation (right). During the field trip, we will discuss the lateral continuity of these rocks in basins surrounding the Santa Marta massif.

**COST (Colombian pesos):**

- Undergraduate student: \$1.000.000
- Graduate student: \$1.500.000
- Professionals: \$3.000.000

This price includes: (1) Ground transportation; (2) two nights of hotel in double occupancy at Valledupar and Waya Hotel in Albania, with breakfast and dinner included; (3) lunch and refreshment for August 26 and 27; (4) guidebook.

**Airplane tickets to Valledupar are not covered**