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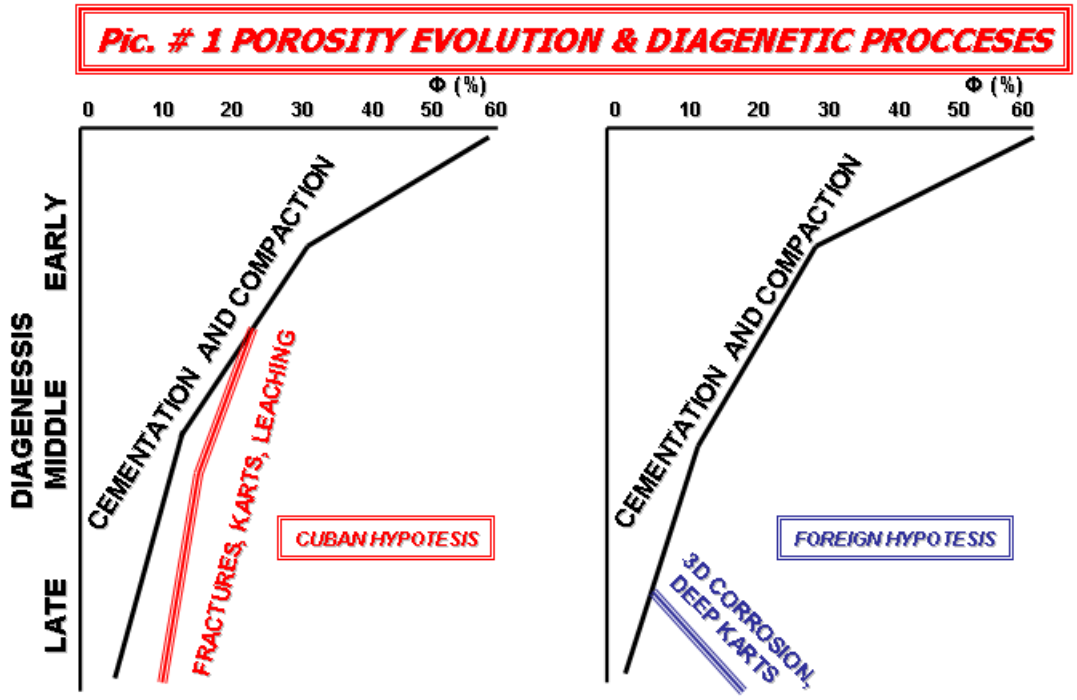
Silvia Valladares-Amaro[1], Rafael Segura Soto[1], Jose Alvarez Castro[1], Olga Castro Castineira[1], Barbaro Villavicencio Rodriguez[1], Maritza Rodriguez Viera[1], Osvaldo Lopez Corso[1], America Sora[1], Sonia Toucet[1], Sofia Lopez[1] (1) Centro de Investigaciones del Petroleo, La Habana, Cuba

**Reservoirs and Seals of the Cuban Exclusive Economic Zone in the Gulf of Mexico**

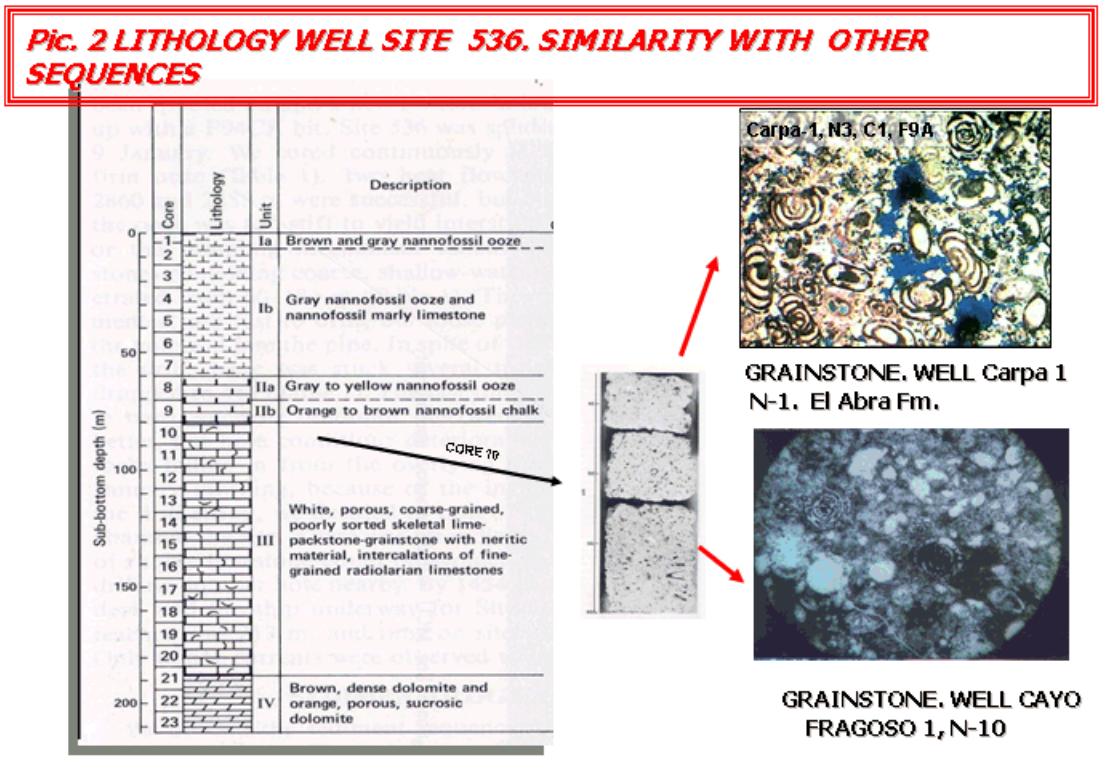
Carbonate rocks related to the Bahamas and Yucatan continental margin are the most important reservoirs in the cuban onshore. The large Cuban oil fields of Varadero and Boca de Jaruco, Puerto Escondido - Canasí, Yumurí - Seboruco and Martín Mesa are composed of those rocks. These reservoirs exhibit high porosity: 15 % average and high permeability more than 1 Darcy average. They are found in grainstones, wackestones and mudstones that were sedimented during Jurassic and Lower Cretaceous. But the age of reservoirs depend on the age of the diagenetic processes that were responsible for creating their actual porosity and permeability.

Some diagenetic processes get worse or enhanced primary porosity and new porosity is formed during middle and late diagenesis. Two hypothesis about these diagenetic processes were examined: fracturing, normal karst and "deeper" karst. The influences of these processes were studied in thin sections and conventional cores obtained from deep wells; however the same is seen in logs and seismic too.

These two hypothesis are showing in the picture 1. In the left part the hypothesis development by Cuban sedimentologists is exposed, which consider that the cementation and compaction are the most important processes that decrease initial porosity and fracturing; karst and leaching are the most important processes that increase




**Picture 1.**




**Picture 2.**

porosity. These processes start during the middle diagenesis due to the compression regime and continue during the late diagenesis due to new tectonic regime represented by strike slip faults. In the right part the non-cuban hypothesis is presented (Vicente J.C., 2001), which consider that the cementation and compaction are the most important processes decreasing initial porosity and "deep" karst the most important process increasing porosity; this event start during the late diagenesis due to corrosion through a three-dimensional net composed of fractures, pressure - dissolution planes, karstics ducts and another type of porosity. They suppose that this change of diagenetic tendency is developed at the end of the Paleogene or during Neogene, probably associated to post- orogenic tectonic event, maximum picks of oil generation and corrosive liquids in *roll - front* or another mixed corrosive processes during the hypo- genetic step.

Carbonate reservoir rocks deposited in platform, slope and basin settings are present at DSP 535 and 536 wells drilled in the Cuban Exclusive Economic Zone of the Gulf of Mexico; their lithologies are very similar to our main reservoir rocks in the Cuban onshore scenario and could be compared among them. In pictures 2 and 3 some cores or thin sections photographs show these similarities.

Some examples of reefal and slope facies from different ages seen in seismic lines present in the Exclusive Economic Zone of the Gulf of Mexico are showed in picture 4. These types of facies are similar to those of the El Abra and Tamabra formations in the SE part of the Gulf of Mexico.

Other two diagenetic processes as corrosion and karst are showed in seismic lines in the Exclusive Economic Zone of the Gulf of México (picture 5). The geometry of the seismic facies and the time attribution- lithology are very important characteristics in order to find good reservoirs in deep waters.

Cap rocks in the Cuban onshore are composed of shales and marls of Paleocene to Middle Eocene age. They cover the Cuban oilfields and exhibit good properties as a seal with high per cent of shale and the thickness is more than 50 m. Similar facies are present in the Exclusive Economic Zone of the Gulf of Mexico mostly covering the thrust belt and the foreland basin.

**Pic. # 3 LITHOLOGY WELL SITE 535. SIMILARITY WITH OTHER SEQUENCES**

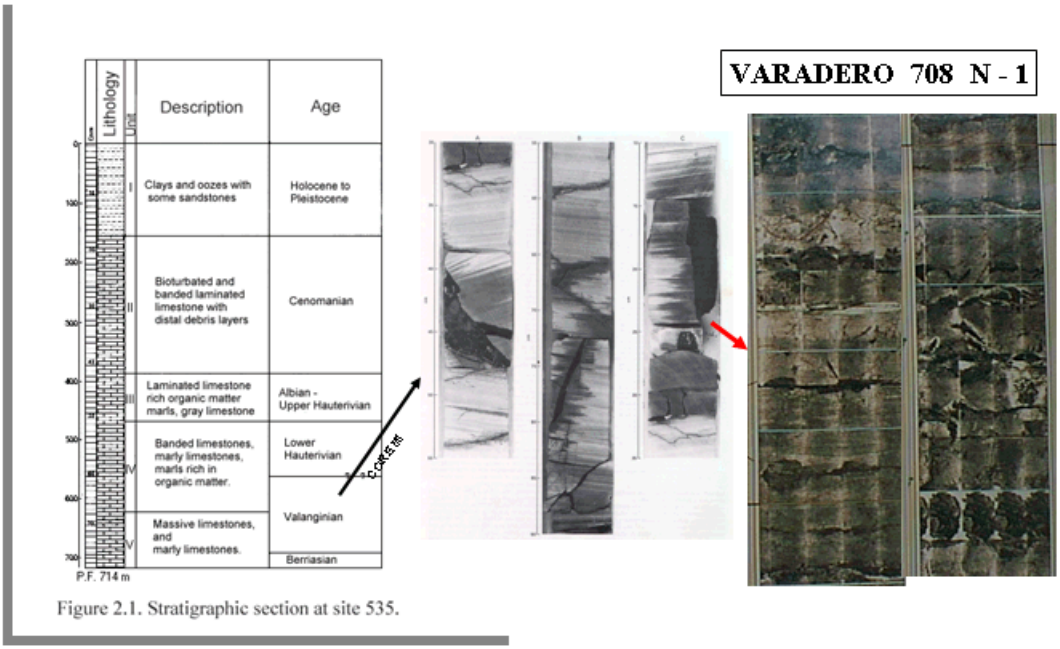
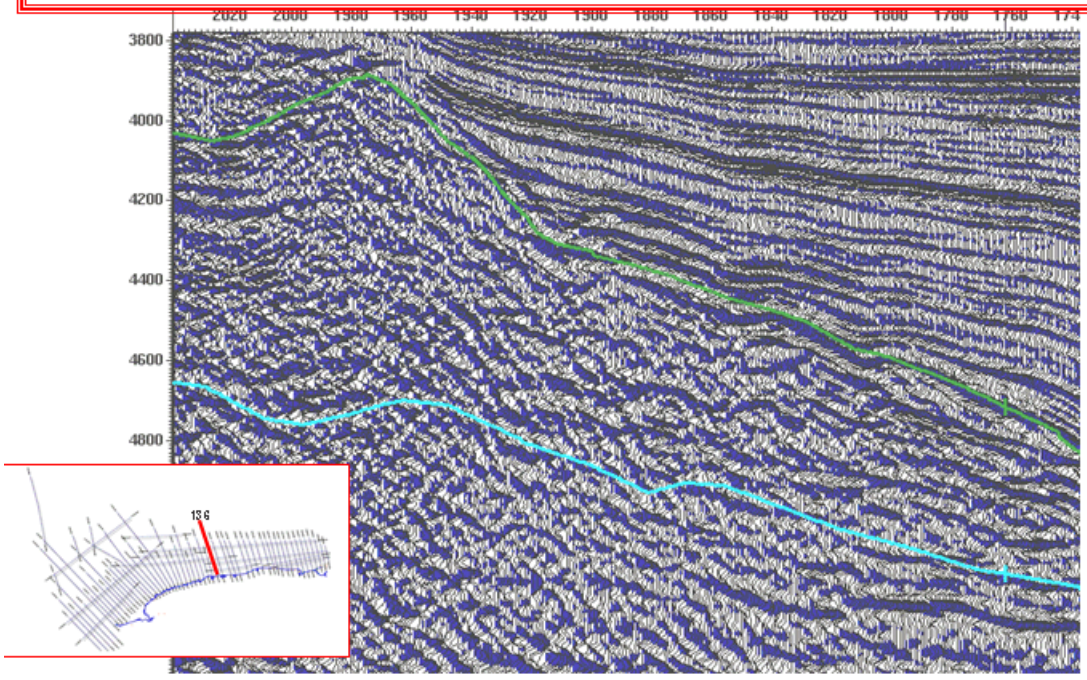



Figure 2.1. Stratigraphic section at site 535.

**Picture 3.**

**Pic. # 4 SEISMIC PICTURE REPRESENTATIVE OF CRETACEOUS REEF AND SLOPE FACIES**




**Picture 4.**

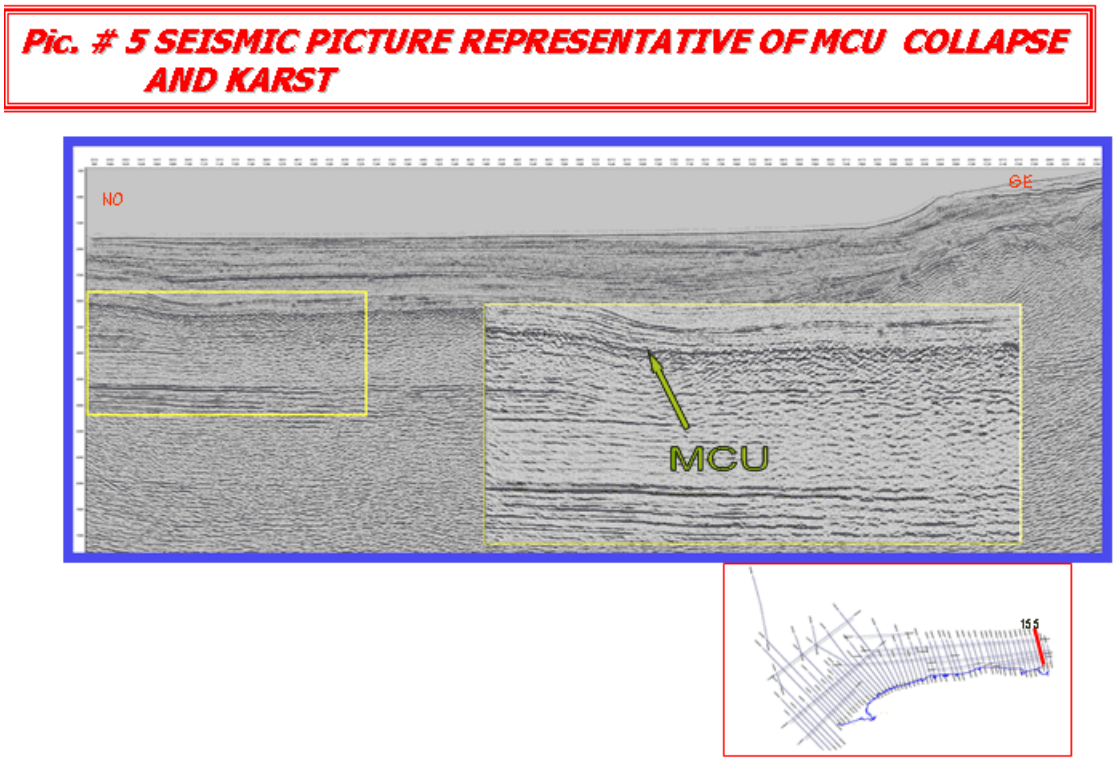



**Figure 5.**

Younger sediments from the Oligocene to the Miocene ages cover the platform sequences. These rocks are present in Cuban Tertiary Basins and could be seals mainly in the Oligocene age. In the Los Palacios basin the section is composed of shales and marls with some interbedded terrigenous components.

Additional cap rocks covering pre-Aptian platform sequences during the Upper Cretaceous are also present. They are named as the Guaney Formation and is present in some wells in eastern part of Cuba and could be recognized in seismic lines as deep waters paleochannels surrounding the backstepped platform settings.