

Stratigraphic Units in the North Marine Area: How Are They Defined and What is the Nature of the Contacts Between Them?

Nancy Gallai and Curtis Archie

Exploration & Geophysics Department, Petroleum Company of Trinidad and Tobago Petrotrin, Pointe-a-Pierre, Trinidad, W.I.

Abstract

The North Marine area is located in the east central part of the Gulf of Paria, on the western coast of Trinidad. Formations penetrated in the area range in age from the Pleistocene Talparo Formation to the early to mid Miocene Brasso and Nariva Formations. Deposition of the Pliocene Manzanilla and Springvale and the Pleistocene aged Talparo Formations was influenced by the availability of accommodation space formed by a mid-Miocene tectonic event, the interaction of the Warm Springs and Los Bajos Faults and subsequent transtensional faulting.

The existing stratigraphic chart for Trinidad is based entirely on outcrops in the onshore of Trinidad. These formations and their members have been defined either on unique lithological or biostratigraphic characteristics. They are also separated by strong angular unconformities.

Examination of well and 3D seismic data in the North Marine area indicates significant differences from the onshore picture. Cuttings and cores from wells indicate that a number of the members of the Springvale and Manzanilla Formations are missing. The 3D seismic data show that both have an angular contact with, and also onlap, the older underlying Miocene sediments. However, while members are "missing" based on onshore data, the 3D seismic data show that the contacts are all planar parallel. Examination of dipmeter data shows no significant change in either the direction or amount of dip across the formation / member contacts.

Onshore, bivalves and gastropods were originally used to define the formations. Later, benthonic foraminifera were used. In the western offshore, foraminifera have also proved useful in identifying tops. The base of the Talparo Formation is defined by the highest occurrence of *Elphidium* 15 and the top by the occurrence of small species of *Rotalia* (especially *Rotalia* 6). The Manzanilla Formation is typified by the presence of *Textularia* 22, *Anomalina* 4 and *Uvigerina* 3 with associated *Rotalia* and *Elphidium*. Pollen has proved useful in identifying the top of the Pliocene and the Miocene.