



## ORAL PRESENTATION

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# Chronostratigraphic, Landscape and Tectonic Perspective of the Oligocene to late Eocene Non-Marine Cuu Long Basin, Offshore Vietnam using Integrated Sequence Biostratigraphy and Chemostratigraphy

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The Cuu Long Basin offshore South Vietnam is a highly prospective hydrocarbon producing non-marine basin with world-class lacustrine source rocks. The whole stratigraphic succession has previously proved difficult to date as marine fossils are absent, but terrestrially derived pollen and spores and freshwater algal palynomorphs are abundant. A recent palynological study using a high-resolution sequence biostratigraphic approach relating multiple flood-fill packages to eccentricity-driven climate cycles, calibrated using index palynomorphs, has resulted in a much-improved chronostratigraphy for the basin. Palynomorphs are abundant within the mid and late Oligocene seismic groups B, C and D, where a confident chronostratigraphic framework has been developed, but are of limited occurrence in Seismic Groups E, F and G, which are currently being explored for hydrocarbons, and where increased stratigraphic resolution is needed to search for new targets.

A chronostratigraphic model for the whole stratigraphic succession has been developed by integrating palynological signals, which identify flood-fill packages, with a chemostratigraphic approach. Seismic Group D is divided into seven well-defined flood-fill sequences, and are integrated with six chemostratigraphic packages, that relate to both allocyclic and autocyclic events. Seismic Group C on the other hand is composed of five flood-fill sequences, and these are tied to three chemostratigraphic packages, that relate to the infilling and eventual drowning of the Seismic Group D palaeotopography.

Although the palynological record for Seismic Groups E, F and G is generally poor, it is good in some wells and assemblages there suggest that these sediments formed when the Cuu Long was an intermontane basin. The chemostratigraphic packages on the other hand permit correlation within these groups across the region.

The integration of sequence biostratigraphy with chemostratigraphy results in a chronostratigraphic framework which should enable detailed evaluation of stratigraphy throughout the Cuu Long stratigraphic succession, whether poorly or richly fossiliferous, and it is thought that this will considerably aid the current phase of exploration for hydrocarbons.

## SPEAKER BIOGRAPHY

Bob Morley is director of *PALYNOVA* Ltd which provides expertise in biostratigraphy to petroleum exploration companies and government research laboratories. A major interest is to solve issues of Cenozoic stratigraphy using the approach of Sequence Biostratigraphy, which applies a holistic approach using foraminifera, palynology and nannofossils integrated with logs and seismic to provide accurate and consistent stratigraphic interpretations in all facies from non- to deep marine, and to test systems tract interpretations based on seismic.

An additional interest is to understand the mode of evolution of tropical rain forests, on which subject he wrote the now classic book 'Origin and Evolution of Tropical Rain Forests', published in 2000, and to clarify the pattern of evolution and development of tropical floras by integrating pollen and molecular data and on which subject he has authored over 100 peer reviewed papers. He is also lead author for a new comprehensive Pollen and Spore Atlas for Malaysia, which will be published shortly.