

Oil Terroirs of West Africa and the South American Conjugate Basins

*W. Dickson*¹; *C. F. Schiefelbein*²; *J. M. Brooks*³; *J. E. Zumberge*⁴;

1. DIGs, Houston, TX, United States.
2. Geochemical Solutions Intl, Houston, TX, United States.
3. TDI-Brooks International, College Station, TX, United States.
4. Geomark Research, Houston, TX, United States.

Abstract Body: Just as agricultural products are identified with their terroir (a set of special characteristics deriving from the geography, geology and climate of a certain place), oils are a product of the same (paleo) influences. Continuing the analogy, as European vineyards were saved from the phylloxera blight by grafting stock from the Americas, our understanding of oil provenance and distribution has grown from combining data from conjugate basins on both sides of the Atlantic. In so doing, we gain a clearer picture of likely source rock extents and effectiveness for all the studied basins.

We present results-in-progress from a set of 1467 South Atlantic oil samples, roughly two-thirds from S America and one-third, West Africa. Repeated iterations at regional and basin levels unravelled effects of post-generative alteration processes and mixing. Oils were grouped by their geochemical characteristics relating to source, maturity and paleo history; and by spatial controls defined by the geologic architecture and paleo-history of their containers.

- oils broadly divided into five major families (Tertiary deltaic; Cretaceous marine; Cretaceous transitional; Barremian lacustrine saline (Syn-Rift II/Sag) and Neocomian lacustrine fresh (Syn-Rift I).

- family and sub-family distributions relate to sediment thickness and basin structure
- lacustrine oils show strong correlations of age (Syn-Rift I & II) and location between conjugate salt basins
- marine oils demonstrate age correlations related to global ocean anoxic events
- transitional oils demonstrate gradation in source environments
- many basins exhibit mixing of hydrocarbons generated either from mixed facies or from distinct facies with shared migration pathways

We illustrate source distribution and family assignments with a grand tour of West Africa from Gibraltar to Cape Town plus the South American conjugate basins. Brief tangents consider outliers because they typically propel us to new understandings; plus the Tertiary Deltaic system of the Niger Delta. Our focus, however, will be the Cretaceous lacustrine to marine source systems.