

**AAPG Annual Meeting
March 10-13, 2002
Houston, Texas**

Jean-Jacques Tiercelin¹, Kiram-Eddine Lezzar², Bernard Le Gall³ (1) Université de Bretagne Occidentale, Plouzané, France (2) Syracuse University, Syracuse, NY (3) Brest University, IUEM, France

Source Rocks and Reservoirs in Rift Lake Basins over the Past 300 Ma in Central and Eastern Africa

Over the past 300 Ma, the complex geological history of the African continental plate has been marked by an important development of lacustrine domains of various size. During the Upper Paleozoic (290-205 Ma), Mesozoic (160-70 Ma) and Cenozoic (65 Ma to Present) rifting phases, shallow or deep lakes developed along the N-S, NW-SE and NE-SW tectonic trends that characterize the African basement. From 280 to 205 Ma, probably more than 20 lakes alternated with giant fluvial systems within southeastern Africa. Among them, the largest and deepest lakes were probably long-lived - a 10-Ma-long life for the Madumabisa Lake in the Luangwa Rift of Zambia - some being quite similar in size with the present-day large lakes of the East African Rift. Two to 5-km-thick series of organic shales accumulated in these basins, alternating with thick sandstone beds deposited during fluvial episodes. Beginning in the late Jurassic (160 Ma), a second major phase of crustal extension resulted in the development of several systems of continental rifts collectively named the Central African Rift System. Among these rift basins, the Sudan and Anza rifts are characterized by up to 6-km-thick lacustrine and fluvial series which have been demonstrated to be oil-rich, particularly in southern Sudan. From 65 Ma, rifting processes affected again the eastern and central parts of Africa, resulting in the development of alternating fluvio-deltaic and lacustrine environments, mainly during Oligo-Miocene and mid-Miocene to Pliocene periods. Up to 7-km-thick series of organic-rich muds and sandstones accumulated in some of these rift basins, such as in the Turkana/Lokichar or Tanganyika basins. Extensive studies conducted in such recent rift basins will strongly help to understand the development of the Upper Paleozoic or Mesozoic rift lakes in Africa.