Oil from the South: Mesozoic Petroleum Systems, Proven and Potential, in Mid to High Southerly Latitudes

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The majority of world's oil is located in the Tethyan Belt, lying between the equator and mid northern latitudes; and running from Venezuela through the Middle East to China and Indonesia. Tethyan petroleum systems are characterised by facies deposited in tropical environments - carbonate and evaporites, and prolific source rocks laid down in warm lakes and shallow epeiric seaways.

However, about a third of global petroleum is in the mid to high northerly latitudes of the Boreal Realm. Though some petroleum systems rely on Palaeozoic source rocks originally deposited in low paleo-latitudes (e.g. Late Devonian shales of Timan-Pechora Basin), most are sourced from marine Jurassic-Cretaceous shales deposited in restricted rift basins in high paleo-latitudes. These include the world class source rocks of the Neocomian of the North Slope of Alaska and the Late Jurassic of the North Sea, Eastern Canada, and West Siberia. Is there a corresponding belt of petroliferous basins in the southern hemisphere?

Notable oil provinces do occur in mid to high southerly latitudes. Oil source rocks include marine Early Cretaceous shales (San Jorge and Magallanes/Austral basins, South America; Bredasdorp Basin, South Africa) and Late Cretaceous to Eocene coaly sediments (Gippsland Basin, south-east Australia; Taranaki Basin, New Zealand). Frontier Mesozoic rift basins occur in offshore East Africa, along Australia's southern margin (Bight and Mentelle basins), on the Lord Howe Rise, offshore New Zealand and in the Falklands. Regional studies of the shared history of Gondwana breakup and paleoclimatic and environmental reconstructions can guide exploration in these frontier areas.