THE LUSITANIAN BASIN (PORTUGAL) AND ITS NORTH-AMERICAN COUNTERPARTS - A COMPARATIVE APPROACH

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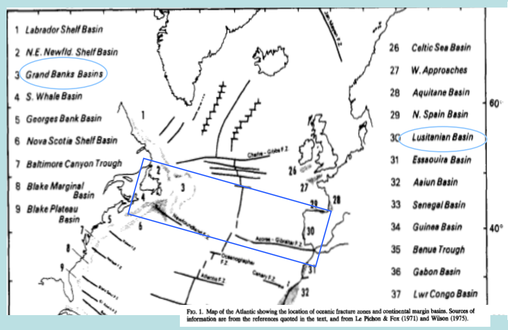
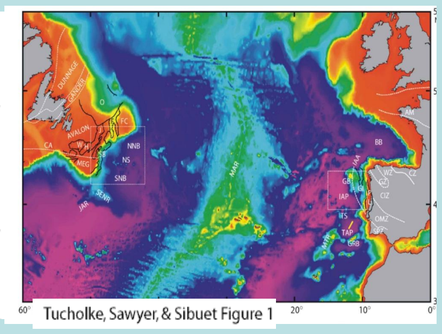
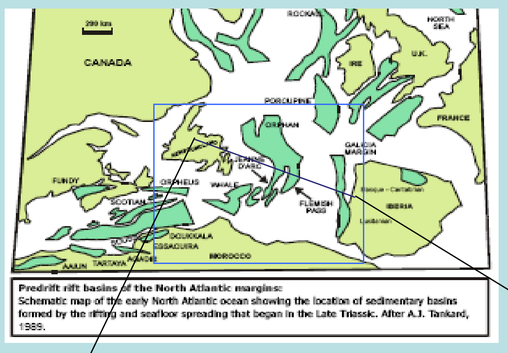
On the eastern margin of the Atlantic, the Lusitanian Basin (LB) is bordered by the Essaouira Basin (to the S) and the Galicia Basin (to the North), whereas on the western margin, just opposite to the LB, the Grand Banks, including the Jeanne D'Arc (JDA) and Flemish Pass (FP) Basins, are bordered by the NFL-Orphan Basin (NFL-O) to the N, and South Wales Basin (SW) to the S.

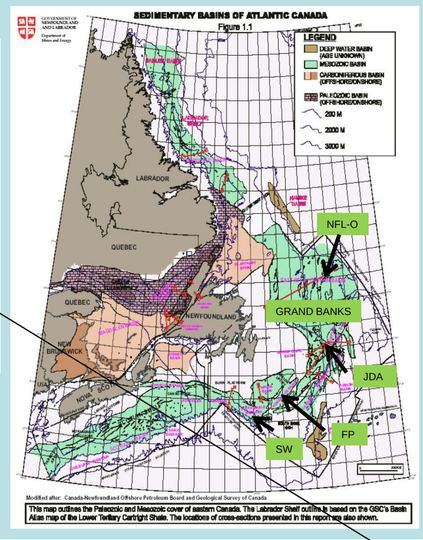
The Mesozoic evolution of the Lusitanian Basin reflects the overall evolution of the Nortern Atlantic Rift, as well as the conjugate inter-action of N America, W Europe and N Africa, including the Tethys.

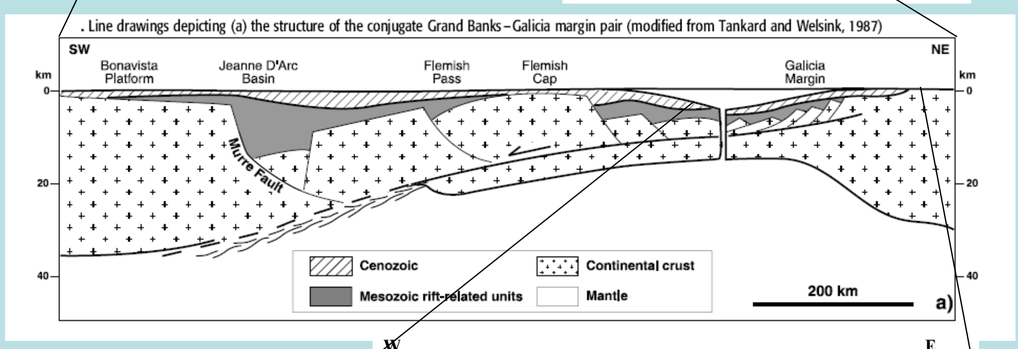


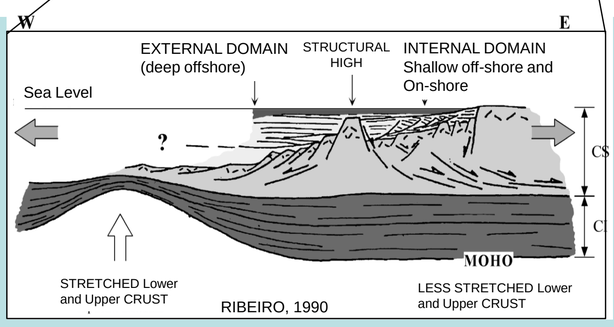




Predrift rift basins of the North Atlantic margins: Schematic map of the early North Atlantic ocean showing the location of sedimentary basins formed by the rifting and seafloor spreading that began in the Late Triassic. After A.J. Tankard, 1989.







CONTINENTAL
Red beds & Salt

Considering palaeogeographic reconstructions, the 1st Rifting (U.Triasic to M. Jurassic) presents a tethysean N-S extension, However, the 2nd Rifting (Upper Jurassic) shows an atlantic-shifted geometry and the Drift (Cretaceous) presents a clearly atlantic E-W extension.

TETHYSEAN MARINE
Marls & Black shales

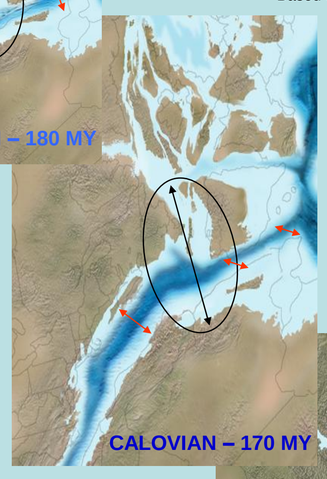
Limestones

1st RIFT

http://jan.ucc.nau.edu/~rcb7/nam.html
Ron Blakey, Northern Arizon University
Based on References updated in 2004

POST-RIFT
SAG BASIN

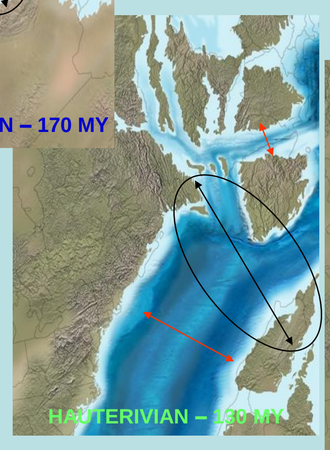
ATLANTIC MARINE
Turbidites & Limestones



FLUVIAL Sandstones

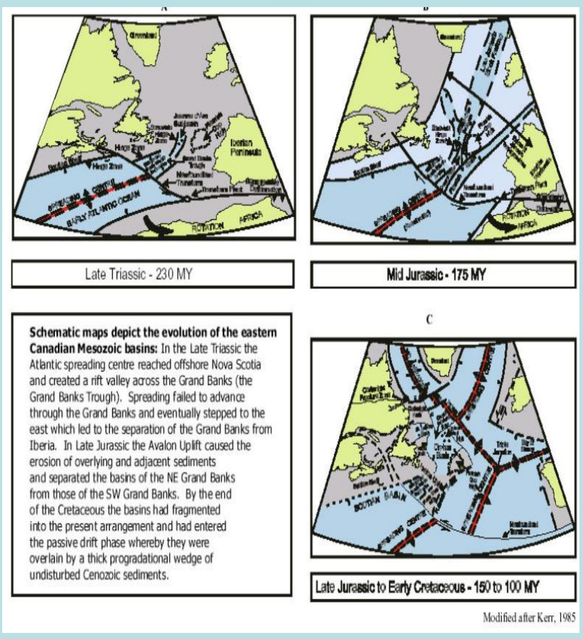
2nd RIFT

ATLANTIC MARINE



DRIFT

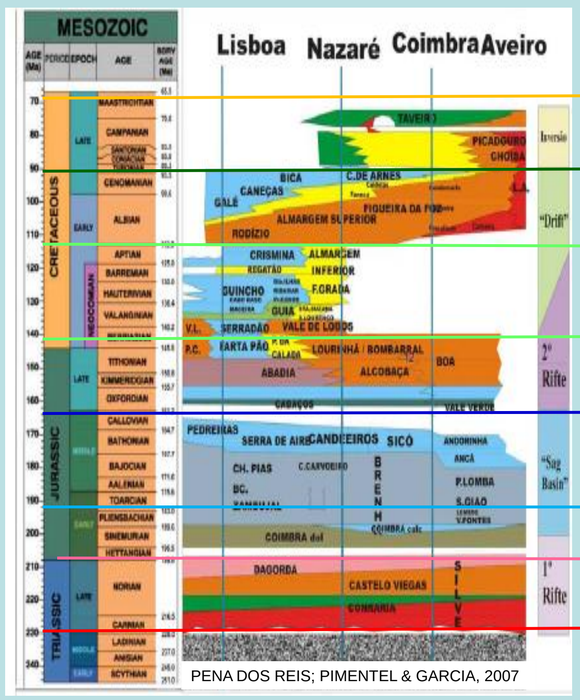
POST-RIFT



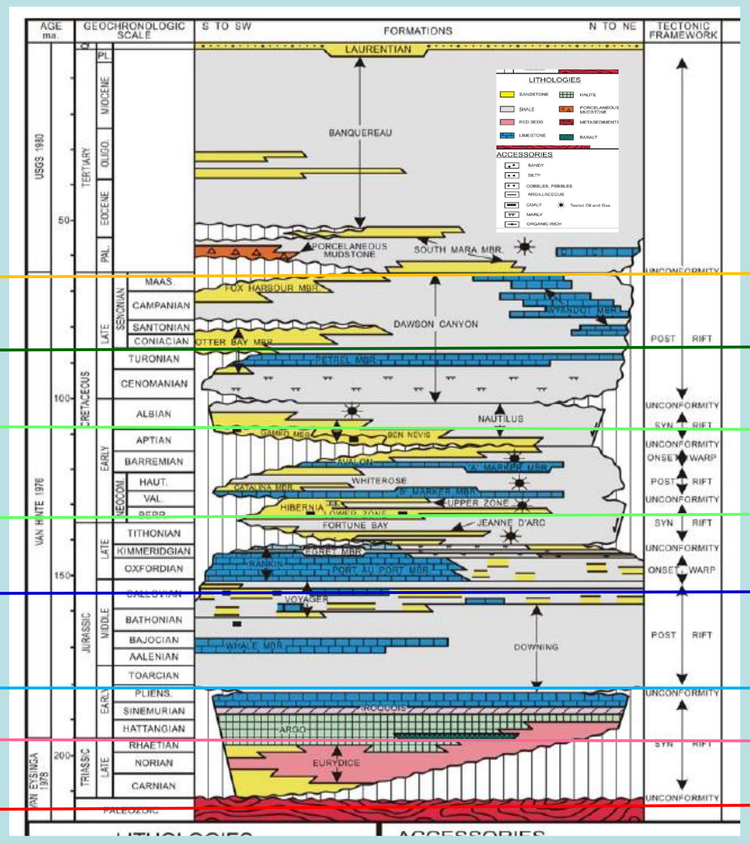
Older (e.g.Kerr,1985) reconstructions only take into account the Atlantic opening, considering it active since the Upper Triasic.

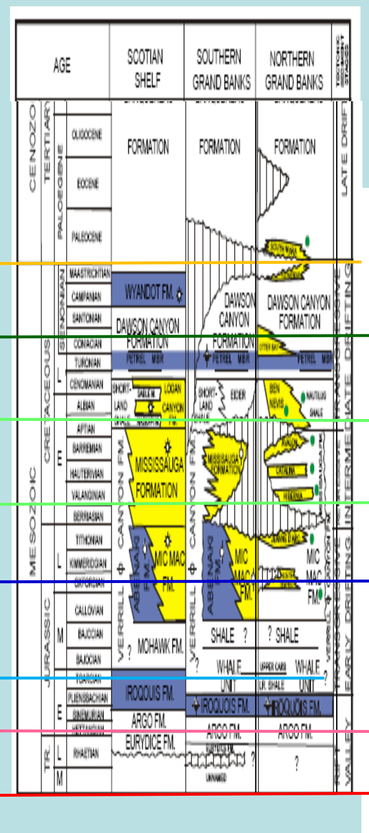
The LB is related with the Triasic crustal stretching of Pangaea and Jurassic-Cretaceous opening of the N Atlantic, and therefore considered as a peri-atlantic basin. However, an earlier peri-tethysean opening, as well as a latter peri-mediterranean closure, must be taken into account.

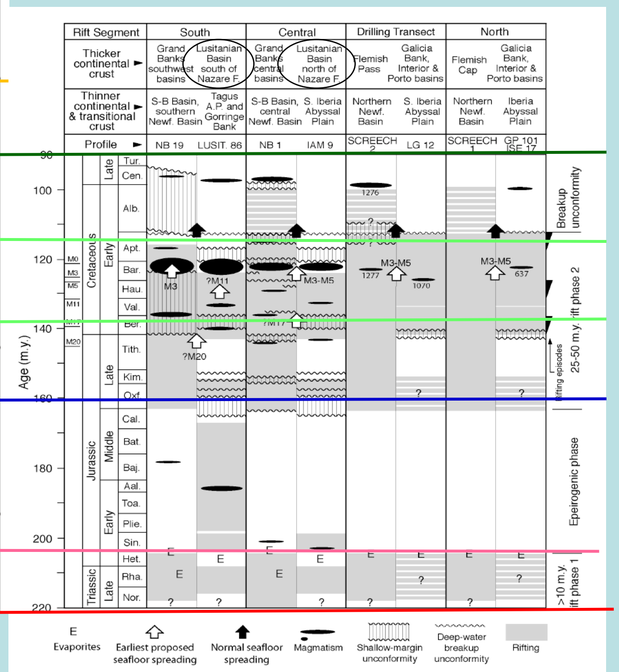
Comparing published litostratigraphic colums, it's clear the contemporaneity of the main events at these basins



SINCLAIR, 1994 & Canada NewFoundland Offshore Petroleum Company







The main evolutionary stages and unconformity surfaces are well represented in al these N American and SW European Basins, allthough correlation is not allways synchronous in Age, due to assymetric E-W and also diachronic N-S paleogeographic / geodynamic issues.

CONCLUSIONS

THE LUSITANIAN BASIN (PORTUGAL) IS A WESTERN IBERIAN BASIN FACING THE NORTH ATLANTIC AND RELATED WITH OTHER NORTH-AMERICAN PERI-ATLANTIC BASINS.
HOWEVER, A TETHYSEAN EVOLUTION, RELATED WITH OTHER WESTERN PERI-TETHYSEAN BASINS (e.g ESSAOUIRA-AGADIR BASIN) MUST BE SOUGHT, SPECIALLY REGARDING THE 1st RIFTING PHASE AND SUBSEQUENT MARINE INVASION (UPPER TRIAS TO MIDDLE JURASSIC).