

The Perdido and the Southwestern Gulf of Mexico*

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Abstract

Perdido Foldbelt (PFB) is located in the Western Gulf of Mexico, is part of the Cenozoic compressional fold system in the Gulf of Mexico and is distinctive in deformation details and structural style. PFB contains Upper Jurassic–Eocene age strata folded during the early Oligocene (36–30 Ma), with deformation most likely continuing into the early Miocene. Formed by gravity sliding, it consists of a series of southwest-northeast-trending, parallel, megascopic-scale kink bands and flanks that are cut by reverse faults containing Cretaceous to Eocene sedimentary rocks.

The “reservoir” facies are:

- Lower Cretaceous fore-reef carbonate debris analogous to the major productive section in Poza Rica field, Mexico,
- Upper Cretaceous chinks, and
- Tertiary turbidite sands related to Wilcox & Frio delta systems from the Rio Grande embayment.

A technical review of the Perdido Fold Belt in the Southwestern Gulf of Mexico. Included is a discussion on unlocking this potentially prolific hydrocarbon trend through the Energy Reform in Mexico and how it will affect the ultra deepwater exploration in this area.

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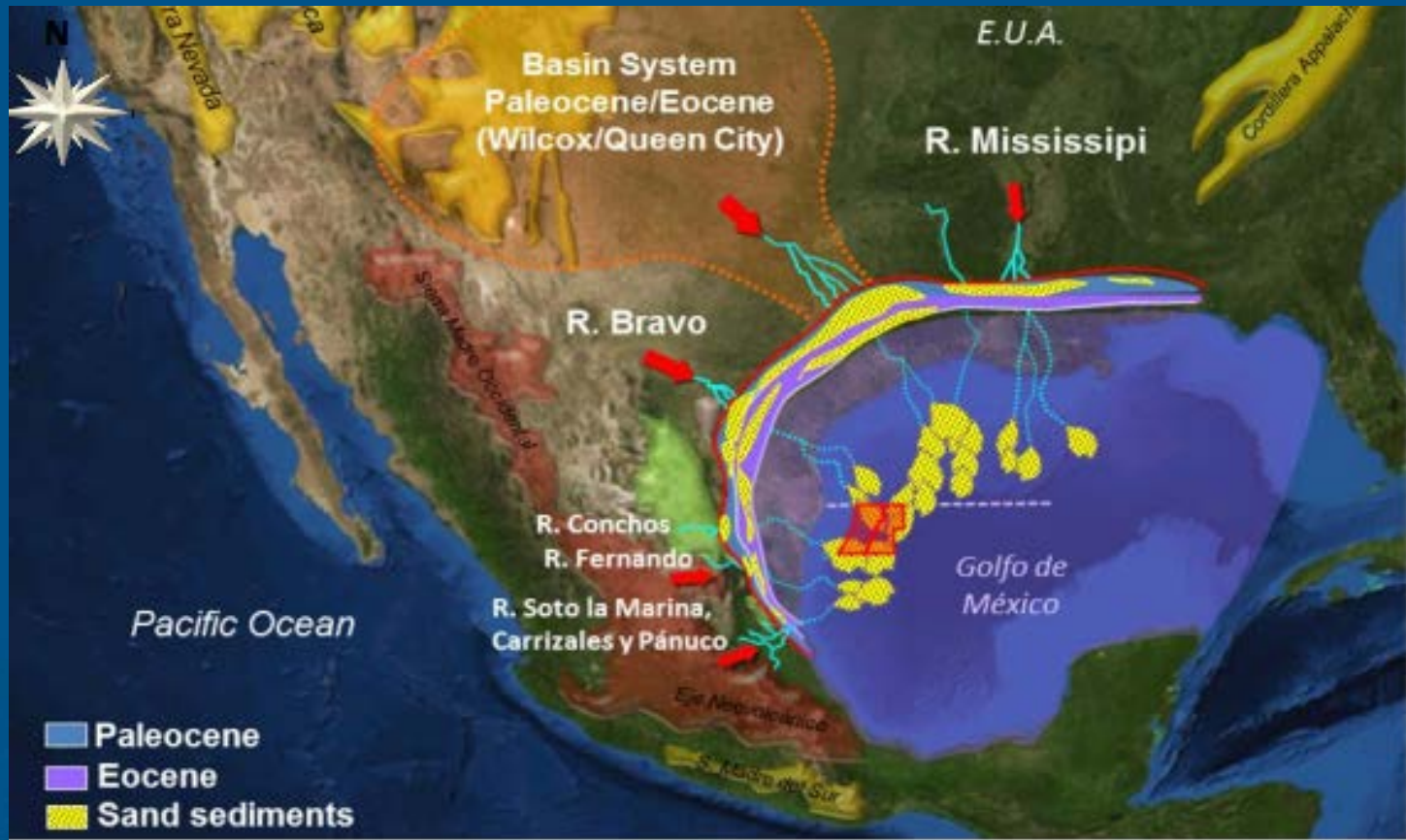
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Paleogeographic Cenozoic Map showing Depocenters for the PFB, US



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PFB Sediment Supply, Mexico



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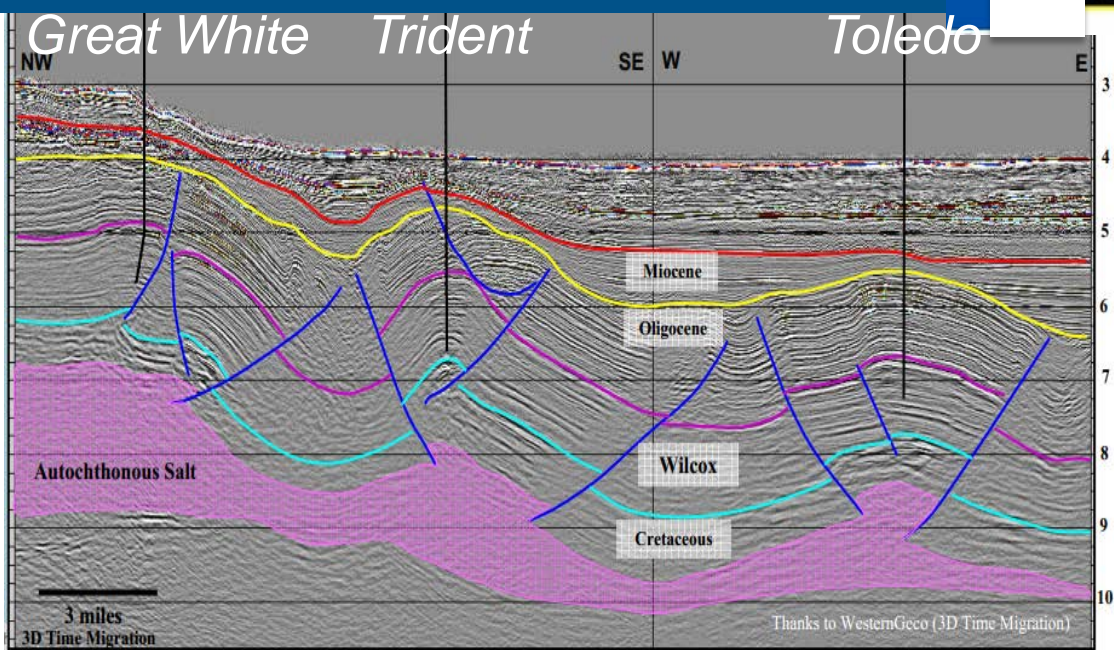
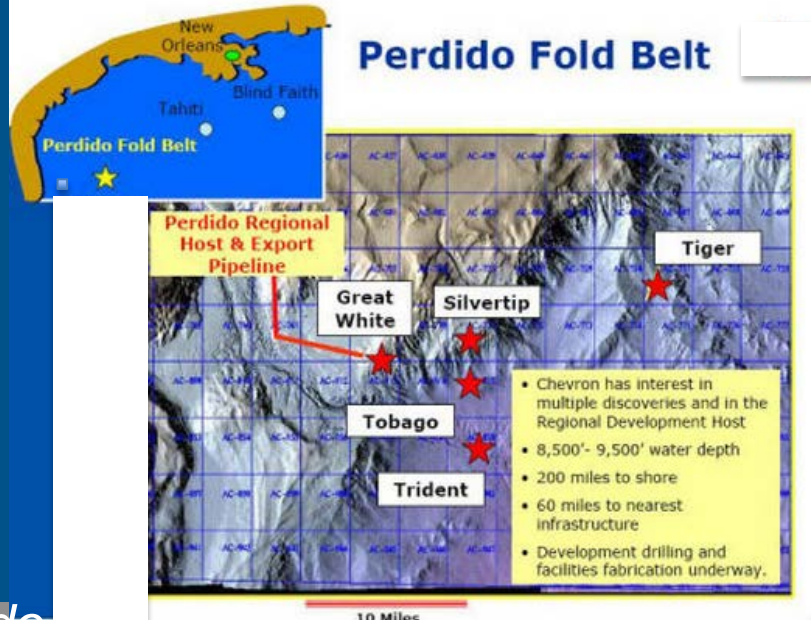
US Drilling History & Discoveries

- Since the deep test at BAHA in 2001 other wildcat discoveries have been drilled in the PFB, which include
 - Trident AC 903 in 2001,
 - Great White AC 857 in 2002, and
 - Tobago AC 859 in 2004.
- More discoveries have been drilled and many lessons learned.
 - These three wells are used as analogues for the structural alignment, the depositional system, and the hydrocarbon type of the Mexican discoveries.



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The presence of thick, widely distributed, and massive Wilcox sandstone reservoirs in the deep-water Gulf of Mexico is attributed to a several thousand feet Paleocene sea-level drop.



Wilcox Reservoir Characteristics

Very fine grained - coarse silt to fine sand

Moderately to poorly sorted feldspathic litharenites

Wilcox 1 (upper): unconfined inner, middle, and outer distributary fan; high perm tractional facies have best sorting, grain size; compaction of ductile grains.

Wilcox 2 (lower): perms generally higher in channelized fan system; more quartzose, chlorite coatings preserve poro/perm, cementation as overgrowths on quartz grains.



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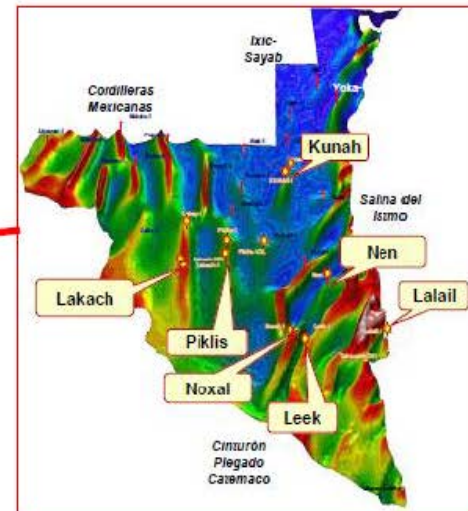
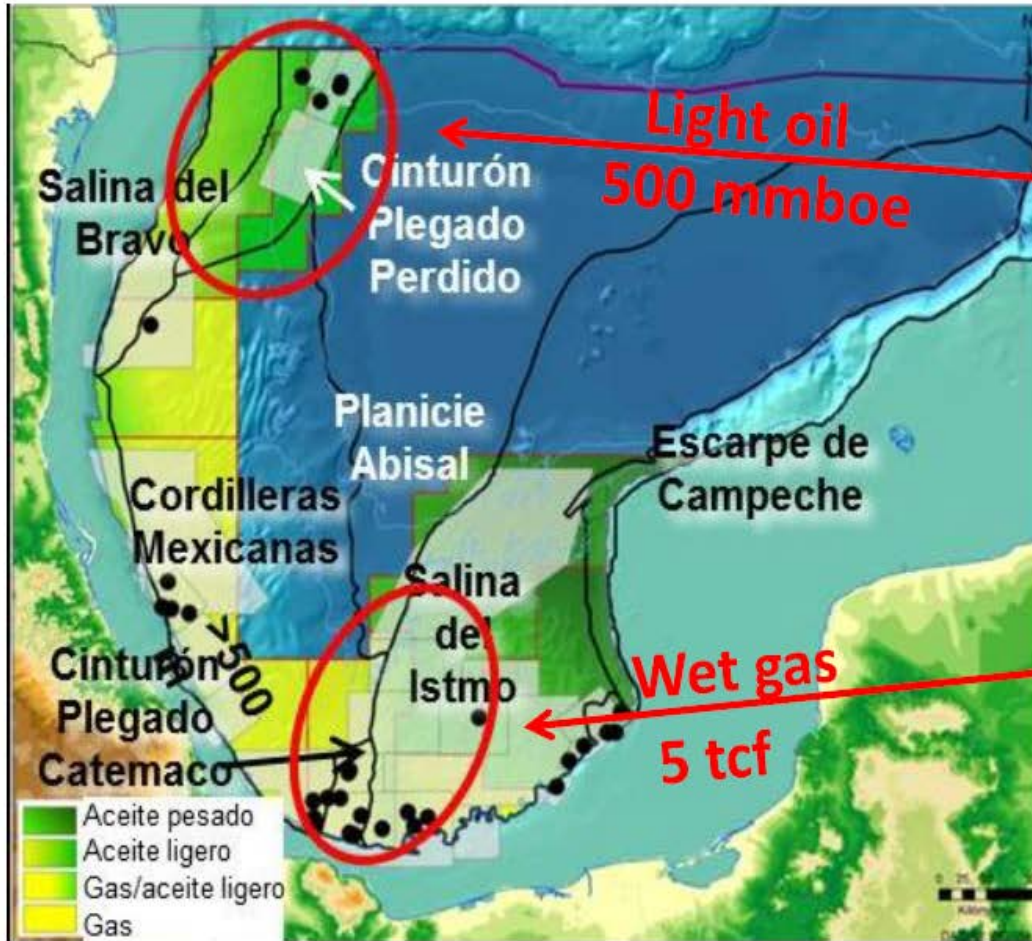
Obstacles to Development of the Perdido Fold Belt

- Seismic imaging only fair
 - Complex structures include fold dominated kink bands and angularly folded strata
- Reservoir quality e.g. Wilcox play shows low porosities & permeabilities
- Ultra deepwater environment
- High temperature / high pressure regimes



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PFB in Mexico

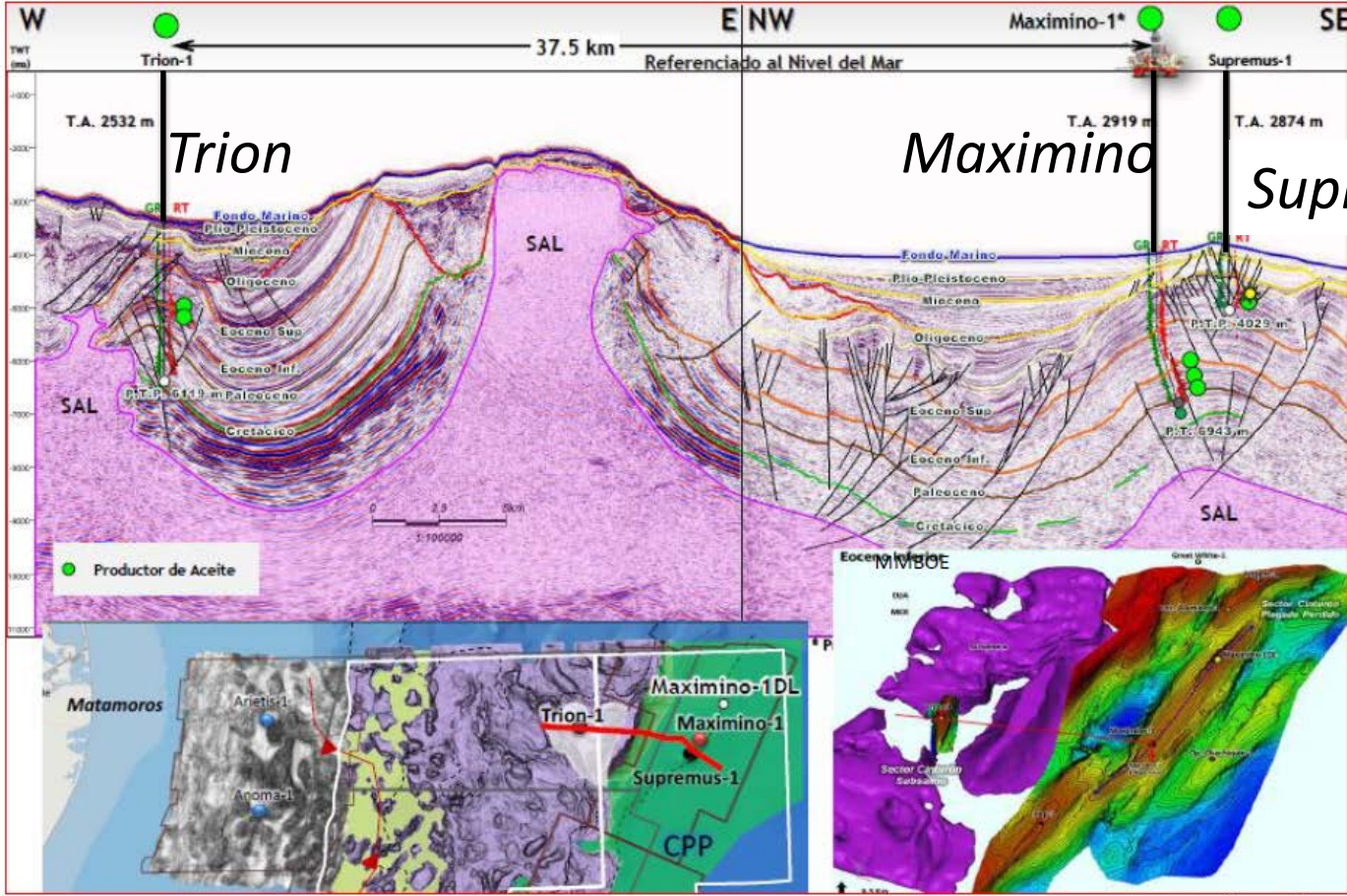


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Mexican PFB Discoveries



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Energy Reform Will Impact Deepwater Exploration

- Reform signed into Law in December 2013.
- **Article 27:** “The oil and gas resources fully belong to the Nation nevertheless the *State may contract with third parties for their exploration and production*. Hydrocarbons in the subsurface belong to the Nation which will be explicitly expressed in all licenses and contracts.
- **Article 28:** Even though the E&P of hydrocarbons are strategic activities they will no longer be carried out exclusively by the state as a monopoly. *A trust fund will manage the after tax profits generated by the licenses and contracts.* “
- *There will probably be bid rounds as early as 3Q, 2014.*
- *There will be numerous business opportunities for the geosciences community in particular and for the upstream industry in general.* “



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Conclusion:

The success of the PFB is promoted by the energy reform in Mexico and will further extend the knowledge of the Wilcox trend in the ultra-deepwater. The Challenge is set.



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Thank You

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Milena Colmenares, January, 2014



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