# Attribute Mapping in the Burgos Basin, Mexico Field

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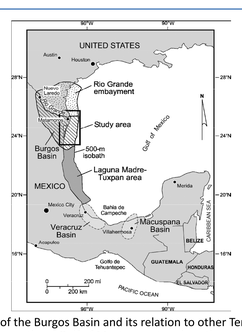
## Geologic Setting

Burgos Basin covers an area of 50,000 km$^2$, is located in the west side of Gulf of Mexico and the north east of Mexico. The origin of the Burgos Basin is associated to the opening of the Gulf of Mexico during the Jurassic. The sedimentation conditions changed in the Cenozoic, when a great regression occurred, originating a thick sequence of sediment deposition with a great gas potential represented by rocks with Type III Kerogen . This basin contains a thick sequence of progradational and retrogradational Tertiary terrigenous clastic deposits, with ages varying from the Paleocene to the Pleistocene.

On a regional scale, the overall strike of the principal tectonic features in the Burgos basin is similar to Texas; that is north-south.



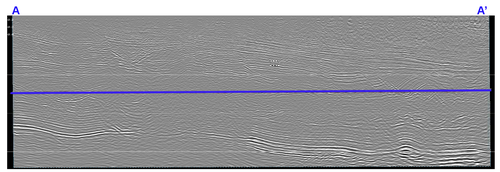

Location of the Burgos Basin and its relation to other Tertiary basins in the southern Gulf of Mexico, east and southeast Mexico. The Burgos Basin is the southern extension of the Texas Rio Grande embayment. (Hernandez-Mendoza)

## Study Area and Project Objectives

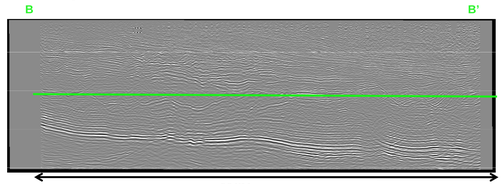
This study was conducted on an onshore 3D seismic data set of approximately 1000 Km$^2$. The ultimate objective is the generation of a seismic and sequence stratigraphic framework of the study area . The main depositional system corresponds to deep water deposits such as mass transports, channels, channel-levees and sheets sands. My focus would be the interpretation of the Eocene-Oligocene deposits that account for the major gas producers in this zone.

Implementation of the Seismic attributes on the seismic volume enhances the main stratigraphic and structural features present in the area. These attributes facilitates the process of interpretation as well as its validation.

## Inline Seismic Section

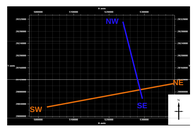



**Inline 4639 section through the seismic volume. Line correspond to different time slices.**

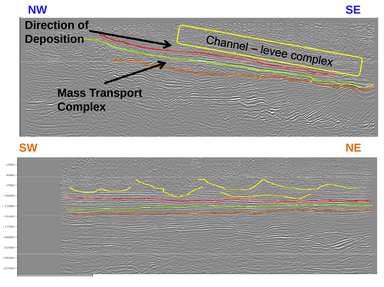



**Inline 4300 section through the seismic volume. Line correspond to 2S Time slice.**

## Inline and Crossline Seismic Sections




Location of Inline and crossline in map view.




**Seismic interpreted horizons:**

**Yellow:** ***channel-levee deposits formed***

***Red surface. Maximum flooding surface. 34my***

***Green surface- unconformity developed during late stage of sea level fall 38.5my***

***Orange surface--major glide plane. Early falling stage of sea level. 40+my.***

## Summary:

*Seismic attributes enhances the structural and stratigraphic elements of this basin.

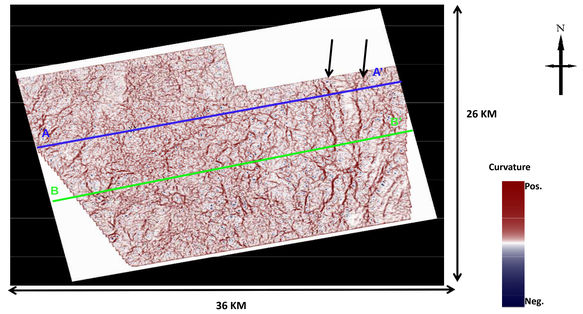
*Unconformities and channels are also visible in attributes like inline gradient.

*The combination of most negative and most positive curvature attributes were the most important on delineating the faulted areas.

*Highly dipping beds limit the visualization of stratigraphic elements in time slices.

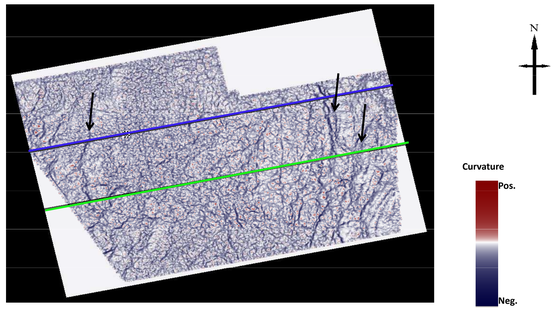
*Implementation of different attributes to 3D interpreted horizons should reflect the particular deep water elements present in the study area

## Time Slice on Most-Positive Curvature



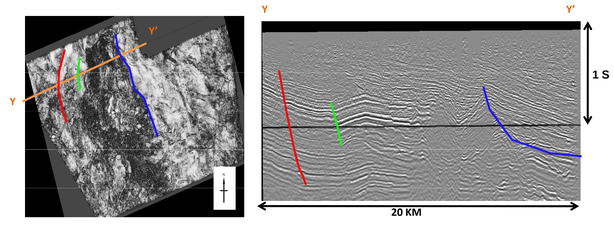

**Time slice at t= 2.0 s through the most positive curvature volume. Synthetic faults are present and enhanced by this attribute. They are pointed by the arrows.**

## Time Slice on Most-Negative Curvature



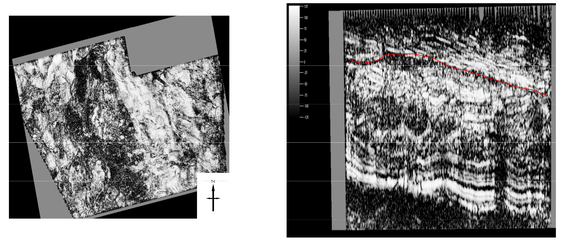

**Time slice at t= 2.0 s through the most negative curvature volume. This attribute enhances the major plane of the listric faults, pointed in this case by the arrows.**

## Fraction Derivative Amplitude




**a) Corresponds to a time slice at 1 S through the fraction derivative amplitude attribute. This attribute facilitates the delineation of the fault plain of the major growth faults. Also it highlights where the incoherent data is; this could help in the interpretation of mass transport complexes. Image b) corresponds to the Inline Y-Y'.**

## Energy Ratio



**Time slice at t= 1.0 S through the energy ratio attribute. This enhanced the location of one of the principal unconformities of the system.**

**Inline 4300 through the energy ratio volume. The red line has been interpreted as a MFS and this attribute highlights it.**

## Inline Gradient

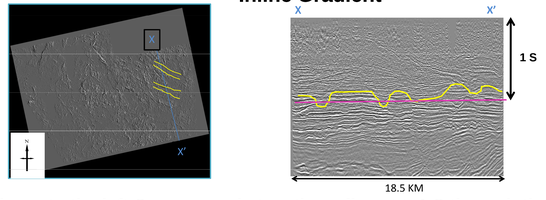
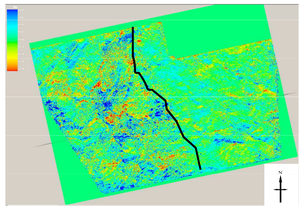



**Figure to the left Corrresponds to a time slice at t=1 S through the Inline gradient attribute. Here some stratigraphic features like the two channels are visualized.**

## Crossline Dip



**Time slice at = 1 s through the cross line dip volume. The black line represents the boundary were the dip changes.**

**In this particular case the presence of major rollover structures mainly to the east, creates this change in dip of the beds.**