In order to assess the four key risk factors for exploration – reservoir, trap, seal, and charge (source and migration) – an interdisciplinary approach is required. Both dry and discovery wells have been analyzed in an attempt to provide an appraisal of the exploration scenarios that characterize this region.

This project requires the integration of well data (geological reports, well logs, biostratigraphic reports and mud logs including cuttings and lithology data), TGS 2D and 3D seismic, petrophysical data, thermal modeling and any other publicly available data, to create a concise assessment of the petroleum systems of the US offshore Gulf of Mexico. Presentation of results as a GIS project provides easy access to data and the possibility of detailed analysis of patterns and trends.

Seismic line from TGS Justice WAZ 3D, demonstrating overall structure and potential trapping mechanism.
Using post well analysis in an interdisciplinary approach leads to a more confident understanding of complex petroleum systems.

Due to the complex nature of reservoirs and well fluids in the Gulf of Mexico, it is difficult to identify formations and sequences across wells based on seismic and wireline data alone. Integration of biostratigraphic data from the US Bureau of Ocean Management unified with the Gulf for geological parameters a well summary chart is created for each stratigraphic interval. The segments are representative of the overall rating that is applied for each reservoir unit. For example, the well above (MKW_2, Chevron, 15907164190000), Blind Faith, identified two successful intervals where the four primary pie segments display high values. Hydrocarbons have migrated via faults to charge the reservoirs at 1362 R1 and MM R1 level that have good structural trap and effective closure. The upper interval is generally found to have effective reservoir envelope and seal failed due to lack of cap and charge/evaporation pathways. The final pie is developed in an ArcGIS geodatabase format, so that each well can be included. Attachments of seismic and well images are provided for each well in the database and a query tool allows the user to further interrogate individual elements of the wells.

Rating Criteria
Hydrocarbon expulsion is a high-risk investment and risk assessment is essential for successful asset management. Exploration is a complex concept and by using the PWA we have provided an independent confidence rating on the four critical seals that are required for a successful well on wells that have been completed.

When predicting key play elements in the subsurface, the ability to place quantitative constraints on prospective reservoirs and seal intervals is paramount. The Neftex Reservoir and Seal module provides access to a continually growing, global database featuring millions of standardised, temporally and spatially located rock property data. All ready to be seamlessly integrated into your exploration projects.