**Combining Forward Sedimentary and Petroleum System Models to Consistently Evaluate Basin Evolution, SubTitle**

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A case study from the Colorado Basin (Argentine Continental Margin) was used to develop a multi-disciplinary workflow for understanding the basin-scale evolution of the petroleum system. Consistency of the geological and petrophysical descriptions, and uncertainty, are seen as key goal to addressing the various scales of physical processes.

1) Using the key interpreted seismic stratigraphic horizons, we generated the framework model by (a) subdividing the stratigraphy by well zonations and stratigraphic styles, and then (b) evaluating both crustal and bathymetric evolution.

2) A numerical stratigraphic approach (Dionisos®) was used to predict the stratigraphic architecture and facies distribution in the un-drilled areas using macro-scale physical laws over geological times taking into account the existing wells and seismic information as constraints.

3) The output of the stratigraphic simulation was used to populate a 3D basin model (Temis3D®). The dynamic evolution of the basin, including porosity, pressure, temperature, hydrocarbon expulsion was calculated through time and properties calibrated against observed well data and offset analogues.

4) The evolving basin properties are then passed onto a high-resolution petroleum migration simulator (MPath®) which evaluates the migration and trapping of the petroleum through time. Stochastic uncertainty is introduced, allowing realizations of multiple scenarios, and the distribution of pool sizes and phase type.

The workflow illustrated here combines the accuracy, refinement and efficiency of three different types of numerical models and takes full advantage of the available data. Multiple scenarios were run to test geological hypotheses such as stratigraphic architecture, thermal regime, source rock, and migration pathways.