# Squeezing every drop out of a new OBN dataset (Columbus Basin, Trinidad & Tobago)

*Author: Avinash Ramroopsing*
[1]Avinash.Ramroopsingh@shell.com - presenter, Shell  Trinidad and Tobago

Theme: FG: Geophysical techniques

Keywords: OBN, Processing, Velocity,

In 2017, in partnership with Fairfield Nodal, Shell acquired the 1125Km2 Flambeau Ocean Bottom Node 3D seismic survey over its East Coast Marine acreage to drive future investment decisions. Acquisition was completed in April 2018 and processing was accelerated to meet the business' demands with intermediate deliverables throughout the project and final data (Kirchhoff PSDM/RTLSOM0 PSDM) being delivered in February 2019. In the deeper section, the new data brought improved illumination of large structures where a complex velocity field, severe Q effects, steep dips, fault shadowing, diffraction effects and active gas migration are all in play. Residual imaging issues at depth, however, meant that confidence in prospect definition and relatedly operational safety to this uncalibrated stratigraphy remained low. A focused effort to further improve the velocity model, was kicked off six months after original data delivery. Work began in Q4 2019, and delivered by mid-March 2020, achieved image enhancement through the following: a smoothed starting velocity model derived from the original processing but with spurious areas edited and available well sonic data incorporated; more detailed velocity picking and residual move-out QC, possible given the smaller focus area; a linear delta starting model; further Q enhancement from QTomo; stacking of conjugate azimuths to increase signal-to-noise ratio; the use of Legacy Streamer data to constrain the velocity modelling, effectively increasing offset control in the dip direction for tomography; inclusion of fault boundaries in tomography constraint; three additional rounds of tomography. The outcome has led to a product with increased signal-to-noise ratio, enhanced fault definition, improved reflector continuity and a more geologically consistent velocity model for use in pore pressure prediction and rock property analysis. The results of this additional effort demonstrate the value of follow-on focused projects in the Acquisition, Processing, Interpretation, Re-processing cycle.