Argentina, as a core of world class petroleum potential, has experienced growing demand for high quality, regional datasets in advance of upcoming bid rounds. The Malvinas Basin, offshore Argentina, appears increasingly promising, as newly reprocessed 2D seismic reveals older play types and source rock potential. In this highly prospective region, all exploration play elements — structure, reservoir, seal, source rocks, maturity and timing — are in place. Both extensional and compressional structural styles exist with multiple stacked reservoir levels and world-class oil-prone source rocks.

Several prospective play levels have been identified in the Malvinas and surrounding basins in this extensional and compressional setting, including (in order of exploration prospectivity):

1. Valanginian to Albian lacustrine to shallow marine sandstones, Upper Eocene to Lower Miocene shallow marine to basin-floor sandstones, Middle Miocene to Pliocene basin-floor sandstones and Turonian shallow marine sandstones, all charged by up to six hydrocarbon systems;
2. Lower to Middle Jurassic fluvio-deltaic sandstones that potentially contain age-equivalent Los Molles Formation source rocks that would provide in-situ charge (a new play in the Malvinas Basin);
3. Upper Cretaceous reefs identified by Geleazzi (1998);
4. Upper Jurassic break-up unconformity transgressive sandstones charged by Los Molles and Vaca Muerta sources;
5. Basement highs that may be transgressed by mature Los Molles Formation.

The Searcher Seismic 2018 broadband pre-stack time migration (PSTM) reprocessing flow allows for the identification of these plays. The seismic below demonstrates four different stratigraphically aggraded rifts, each potentially with mature source rocks, as well as eight different plays including two new ones in Upper Jurassic break-up unconformity transgressive sandstones and Lower to Middle Jurassic fluvio-deltaic sandstones with intra migration from the Los Molles source rock equivalent. It is also possible to note clear differentiation between relatively and contemporaneous and between the Upper and Lower Tobifera Formations.

Within the Malvinas and surrounding on and offshore basins well density is highly variable. Onshore, basins such as San Jorge and Atuel-Magdalena are covered by thousands of wells. However, offshore the well locations are sparse, with most of the exploration drilling completed in the 1980s. The North Malvinas and South Malvinas drilling was also relatively sparse despite early success with the Sea Lion oil discovery. The 2018 Darwin 3-340 MMbbls condensate-rich discovery confirms the high exploration potential in the region. Hydrocarbon occurrences in the area are widespread at various stratigraphic levels. A rigorous post-well analysis is currently being conducted by Searcher to further understand drilling outcomes within the region.

With the approaching bid rounds and the release of new data offshore Argentina, the future is exciting for exploration in this region. Searcher’s newly reprocessed seismic will enable more confident identification of hydrocarbon occurrences and exploration plays, essential for petroleum exploration.