Genetic indexes and facies mapping of hyperpycnal systems. A case study in the Oligocene Merecure Formation, Venezuela.

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The Oligocene Merecure Formation is one of the main hydrocarbon-bearing units of the Eastern Venezuelan Basin. It is composed of more than 1,000 feet of clastic deposits accumulated by long lived hyperpycnal flows, interbedded with shelfal deposits. A facies-oriented core study was conducted in 30 wells where 17,302.79 feet of cores were described. Cores were analyzed using a genetic and predictive facies tract designed for hyperpycnal systems. This facies tract involves twelve facies which can be grouped into three main facies categories related to bedload (B), suspended load (S) and lofting (L) processes respectively. B facies are coarse grained and related to drag forces provided by the overpassing turbulent flow. S facies are composed of fine grained sandstones and relate to the gravitational collapse of the suspended load as the long-lived flow progressively wanes. L facies are the result of the fallout of very fine grained sands, silts, plant debris and micas from lofting plumes mainly in flow margin areas. The analysis of the relative abundance of B, S, and L facies allowed the definition of proximity and laterality indexes. The proximity (Pt) and Laterality (Lt) indexes are adimensional numbers that fluctuate from 100 to 0. Pt index measures how proximal the core is located respect to the hyperpycnal system as a whole. Lt index gives an indication of how lateral the core is located respect to the flow axis. Pt and Lt indexes were calculated in the whole study area and within a sequence stratigraphic framework. The genetic indexes suggest that the system could be more extended than previously considered with a main sediment source from cratonic areas located in the south and south-east. Index mapping suggest also a syntectonic accumulation during the Oligocene, which have controlled the subaqueous topography and the distribution of sandstone bodies.