Oceanographic Inputs to Shale Exploration

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Shales are fine-grained sediments deposited in tranquil/low-energy lake/ocean environments. With electric changes dominant over gravity, clays form complex microstructures from deposition through de-watering/compaction to consolidation with densities > than those of sandstones. Polygonal faulting develops in clays with ancillary breakage zones/faulting potentially extending from seafloor to basement.

Lakes can range from minute to large: Lakes Victoria, Baikal, and Great Lakes with depths from meters to kilometers. Oceans can be individual interior basins due to regional subsidence and trans-continental separate flooding with higher sea levels (Cretaceous Seaway) and as part of the then 'global ocean: Water depths for the three can up to several km, several hundred meters, and up to 4-8 kms, respectively.

Lake/oceanography currents determined by latitudinal position, extent, depth of basin and with access to 'polar bottom waters' and overlying 'deep waters' Marginal seas (Caribbean-Gulf of Mexico complex and Mediterranean) provide 'local' inputs, inserted at appropriate density level, to main basin flow system. Coriolis force operates on latitudinally migating currents and internal waves (oscillating of density layers within ocean mass) provide energy to system.

Lakes/oceans are locally impacted by hyperpicanal turbidity currents, seasonal overturning, mass wasting along basin margins, and location determines cilmate input (Hadley/ Mid-latitude/Polar climate cells separated by Inter-tropical Convergence and Artie and Polar jet-streams). Shale deposition and distribution interpretation from a core (one to more; core oriented) include distribution of partings, variation in layer thicknesses, microstructure/micro-texture, deposition mechanism (down-slope to contour-following) and basin placed within a global context.

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