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Michael H. Gardner<sup>1</sup>, Mark D. Sonnenfeld<sup>2</sup>, Jonathan Sukanto<sup>3</sup> (1) Colorado School of Mines, Golden, CO (2) iReservoir.com, Littleton, CO (3) CNOOC-SES, Jakarta, Indonesia

### **Pronounced Grain-Size Partitioning Between Shoreface and Fluvial Strata: A Stratigraphic Signature of Base-Level Rise**

Fluvial systems feeding shorefaces commonly show down-profile grain size diminution, reflecting decreased competence, hydraulic sorting, and abrasion processes, further enhanced at the shoreface by wave and tidal winnowing. Base-level rise with attendant up-dip sediment storage capacity accentuates this pattern by promoting fluvial aggradation and coarse-fraction sequestration. Consequently, anomalously thin, fine-grained, discontinuous shoreface strata are coeval with thick, coarse-grained fluvial successions. We illustrate this pattern with examples from the Miocene Gita Member of the Talang Akar Formation (Indonesia), the upper Cretaceous Castlegate Sandstone (Utah), and the lower Cretaceous Fall River Formation (Wyoming).

The Gita records a northward transgression and onset of marine deposition across the Asri-Sunda rift basins. Gita fluvial sandstones are medium- to coarse-grained with moderate to dominant tidal influence, whereas associated shoreface strata are siltstone dominated. The Castlegate consists of aggradational, coarse-grained, fluvial to tidal sandstones also recording long-term base-level rise associated with the overlying Buck Tongue transgression. Recognition of Castlegate-equivalent shoreface strata remains enigmatic because they are so poorly developed relative to underlying sandier shorefaces. The Fall River consists of coarse-grained fluvial sandstones confined to paleovalleys that filled during the long-term Skull Creek Shale transgression. Thick coarse-grained valley fills correlate to thin, discontinuous, sand-poor shorefaces.

Among these examples, coarse fluvial sediment was consistently stored as an aggradational bedload fraction recording an upward fluvial-to-tidal transition during base-level rise. This yields fine-grained shorelines differing from "typical" shoreface successions. In all these cases the principle reservoirs are fluvial, and shoreface strata have long gone unrecognized due to anomalously fine-grained facies.