Event deposits in the Bude Fm. (U. Carboniferous, S.W. England) -
turbidites, tempestites, or both?

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... and ...

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The Bude Formation consists of at least 1 km of interbedded mudstones,
siltstones and very fine sandstones, showing no obvious cyclicity, deposited in a
foreland-basin epeiric sea which embraced much of southwest England. Many
of the sandstones are thin (< 30 cm), with sharp bases, grading, and other
features indicative of deposition during a single, waning-energy event. Other
sandstones are composite units, up to 10 m thick, consisting of amalgamated
event deposits. Marine fossils are very scarce, suggesting poor oceanic
connections.

Based upon an abundance of graded beds showing the vertical sequence "sharp
base ± massive texture ± parallel lamination ± asymmetrical ripple cross-
lamination", and upon a perceived lack of evidence for wave activity or
subaerial exposure, several workers have concluded that the sandstones were
deposited as turbidites beneath storm wave base. However, recent field
observations by the author cast doubt, firstly, upon the authenticity of many of
the supposed turbidites, and, secondly, upon the validity of the deep-water
model, by revealing that most of the ripple cross-lamination in the Bude
Formation is of an asymmetrical, wave-influenced variety. Furthermore, mud-
filled scours and hummocky cross-stratification, typical of "wave-dominated"
offshore successions, seem to be common.

It is suggested, therefore, that deposition took place mostly above storm wave
base. Those event beds containing hummocky cross-stratification and/or wave-
influenced ripple cross-lamination are interpreted as tempestites, deposited
during storms under the joint influence of sediment-supplying unidirectional
currents and wave-induced oscillatory flow. Event deposits showing only
massive texture and/or parallel lamination could be either tempestites or
turbidites, since both of these sedimentary structures can form under
unidirectional, oscillatory, and (presumably) combined flows.