

Allostratigraphy Versus Sequence Stratigraphy

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Allostratigraphy is the only means available for formally naming stratigraphic units defined on the basis of observed bounding discontinuities. Sequence stratigraphy represents a powerful way of interpreting allostratigraphic units in the context of cyclic changes in accommodation and accumulation. Lack of consistency in definition and usage of sequence terms, however, shows that it is premature as a means of formal naming. Sequence stratigraphic terms are inconsistent in that they may convey either positional or temporal concepts. For example, many sequence stratigraphers reveal their temporal bias by referring to *early* and *late* subdivision within "systems tracts", despite claims that "systems tracts" are defined purely physically. Sequence stratigraphic terminology also emphasizes that units are genetically related by a particular process. For example, sequence boundaries are defined as unconformities, and their correlative conformities, that show evidence of subaerial exposure. Marine discontinuities, although highly useful for allostratigraphic correlations, do not satisfy this strict definition of a sequence boundary. In addition, there are significant practical problems in defining a sequence boundary where it is expressed wholly as a correlative conformity. This potentially limits the ability to define sequences in areas where evidence for an unconformity may be cryptic or absent. The bias towards subaerial exposure has resulted in confusion in the interpretation of tectonically produced marine erosion surfaces in the Cretaceous Seaway of North America. Marine erosion may remove evidence of prior subaerial exposure, which must then be inferred rather than observed. Allostratigraphy is inherently more practical in that it emphasizes mappable, observable discontinuities, rather than inferred exposure surfaces. Until the terminological confusion in sequence stratigraphy has been mopped-up, it must remain a highly valuable tool for interpretation but a less valuable tool for formally naming rock units.