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### **Examining the definition and significance of the maximum flooding surface through fuzzy logic modeling**

Fuzzy logic modeling is used to clarify the significance of the maximum flooding surface. Over the years, application of the maximum flooding surface to outcrop and subsurface data has produced multiple genetic interpretations for this surface. Early definitions argued that the maximum flooding surface, as part of the condensed section, coincides with the most rapid rate of sea-level rise. Subsequent models concluded that the maximum flooding surface corresponds more closely in time with the highest stand of sea level. Additionally, maximum flooding surfaces have been recognized in outcrop to represent the deepest water.

Clarifying the definition of the maximum flooding surface is critical for stratigraphic studies, for it has been suggested that the maximum flooding surface can be used as a time marker for correlation. The fuzzy model indicates, as have other previous conventional models, that the time of the most landward extent of the ocean, the most rapid rate in sea-level rise, and the time of deepest water are not necessarily concurrent events. In fact, the deepest water at any given location in a model does not necessarily coincide in time with the deepest water in other locations. The model suggests that the surface most recognizable in outcrop as widespread and most synchronous is the starvation surface, which is associated with concentrated fossil horizons. The model indicates that this surface is concurrent with the time of the greatest rate of sea level rise and does not necessarily represent the time of greatest water depth.