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Predictive modeling of processes on the surface of the Earth doesn't work

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We argue that quantitative modeling of earth surface processes, at accuracies useful for engineering purposes, is not possible. Many such models (such as climate models) involve human behavior, always an impossible parameter. Simplification of parameters is often extreme such as the frequency, nature and magnitude of future storms and floods in sediment transport models. The parameters in quantitative earth surface process models are assumed to be the most important ones but when unusual events occur other parameters are involved, not accounted for in the model. Frequently quantitative models are verified by hind casting but ordering complexity makes this impossible. Ordering complexity refers to the interactions among the numerous components of a complex system that occur in unpredictable and unexpected order and sequences. Successful reproduction of an event in a complex natural system is no guarantee that the model will successfully predict the next event.