



Considerations on the Role and Significance of Badland Research

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Research in badlands originated in the belief that they are simple, fluvially-dominated systems where highly erodible lithologies and the absence of vegetation permit rapid landform: process response adjustments, allowing them to be used as natural laboratories where concepts applicable to much more complex geomorphic systems can be developed and tested. The Perth Amboy badland, site of Schumm's original study in 1956, was a very simple system enabling Schumm to refine several important concepts of broad applicability in fluvial geomorphology, such as stream ordering and the constant of channel maintenance. However, Perth Amboy was an artificial development in lithologically simple materials. Most subsequent studies have been carried out in natural badlands, where complex climatic conditions interact with highly heterogeneous lithologies, often dominated by active swelling clays, and with seasonally-variable vegetation. Rather than providing simple "laboratory" conditions for testing broad concepts, most badlands have turned out to be extremely complex systems where multiple processes interact at diverse scales. In these circumstances, research has increasingly focused on very detailed, short-term, small-scale analysis of processes, but with much less attention to their integration at larger scales and over longer time periods. Badland research has provided abundant information on surface and subsurface erosional processes and the behaviour of lithological materials, which has been of great value in reclamation of degraded agricultural lands. However, much less progress has been made in linking results from different badland areas. More than 30 years ago Bryan and Yair (1982) provided a brief overarching review in a collection of badland studies. Themes from this review are developed in the light of more recent research in attempt to isolate critical questions and approaches for future badland research.