

**AAPG Annual Convention
Salt Lake City, Utah
May 11-14, 2003**

Nikki Strong¹, Michael Kelberer², Ben Sheets¹, Dan Cazanaci¹, Chris Paola¹ (1) University of Minnesota, Minneapolis, MN
(2) St. Anthony Falls Laboratory, Minneapolis, MN

Autogenic Variation in Experimental Depositional Systems: Time and Space Scales, and Response to Allocyclic Forcing

'Autocyclicity' is a fundamental form of self-organization in channelized systems. In general it is chaotic as opposed to cyclic, so we prefer the more generic term 'autogenic' to 'autocyclic'. In a general sense, autogenic variability could be thought of as a form of turbulence in channelized transport systems. This conceptual framework suggests that autogenic variability is best described in terms of (1) limiting frequencies and amplitudes, and (2) space-time structure. In this presentation we estimate these parameters from fluvial-system experiments in the Experimental EarthScape (XES) basin at St. Anthony Falls Laboratory, University of Minnesota and show (1) how characteristic scales of autogenic variation can be nondimensionalized in terms of basic system variables such as channel depth, sediment flux, and subsidence rate; and (2) how autogenic fluctuations respond to imposed base-level cycles.