



FIGURE 13.13. The definition of equilibrium and disequilibrium in stream geometry. (A) The channel width varies congruently with the water discharge (i.e., equilibrium) until an extreme discharge that causes excessive bank erosion and channel widening. The channel is in disequilibrium with subsequent water discharge and requires a finite lag time in order to regain equilibrium (by deposition). (B) The flow depth varies incongruently with the water discharge over seasonal floods (disequilibrium), but the flow depth and water discharge averaged over several floods are both constant (in equilibrium). There are correlations among width, depth, and discharge over various time intervals, whether or not equilibrium exists. Recognition of equilibrium and disequilibrium requires observations at sufficiently small time intervals. From Bridge (2003).