

Schumm, Stanley A., 1977, The fluvial system: New York, John Wiley & Sons, 338 p.

Chapter 7 Piedmont (Zone 3) (p. 246-264).

I. Introduction

A. Piedmont: favorable site for sediment accumulation from adjacent source area.

1. alluvial fans: characteristic dep. feature
 - a. bajada = coalesce fan apron
2. Controls on fans
 - a. zone 1 character
 - (1) geology
 - (2) geomorph.
 - (3) hydrology
 - b. Prerequisites
 - (1) large sed. supply
 - (2) lowland trap

II. Fan Morphology

A. Types

1. dry or mudflow fans = ephemeral streams, arid
 - a. fed by mudflow/debris flows
2. wet fans = perennial streams

B. Dry (Alluvial) Fans

1. Bull 1968 perspective
 - a. undissected fan surface, with deposition in head area
 - b. dissected fan, with deposition at toe of fan
 - (1) why? the diff.?, why entrenchment?
 - (a) climate and tectonism
 - (b) normal geomorph. processes as sed. supply decreases
2. Modern Fan studies
 - a. small-scale features (avg. 1-5 mi radii)
 - b. fan size related to drainage area (Bull)
 - c. lithology/geology of source will affect fan morphology
 - (1) resistance vs. sediment production
 - d. fan slope inverse to drainage area
3. Case studies of fans
 - a. examples of fan relations from several areas
 - (1) some trenched, some not

- b. Bull study of fan-slope segmentation
 - (1) overall concave up profile,
 - (a) but some segmented

C. Wet (fluvial) fans

- 1. case eg. Kosi River fan, India
 - a. Himalya source area, hunge fan
 - b. wet fan of very much larger mag. than arid fans
 - c. rapidly shifting, avulsing, dynamic channel
 - (1) fan-lobe shifting
- 2. Sedimentology
 - a. general lack of exposure except at surface and in gullies
 - (1) most fan sedimentology from ancient examples

III. Experimental Study of Alluvial Fans

A. general

- 1. fans very easy to simulate, done in 70's at CSU
 - a. simulated mudflow fans and humid fans
 - b. ppt/discharge held constant
- 2. fan morphologies were reproduced through time on the sediment table
 - a. fan head very dynamic with alternating incision and backfilling

B. Wet-fan sedimentology experiment

- 1. grain size increased down fan, in proximal part of fan
 - a. remobilizing coarse seds. to midfan position
- 2. suspended seds. were not deposited on the fan, but washed through experimental system