Key Words / Concepts

**Appalachian / Humid Fans**

(Source Notes ("what I mean is look at the following class material to help you study the following terms and concepts"): Taylor Geological Sciences Seminar; Web Site Figures to Accompany Discussion on Appalachian Fans; Taylor in-class lectures on Appalachian Fans; Readings: Kochel, 1990; Mills, 2000; Taylor, 1999)

fan accommodation model pediment-erosion valley erosion / tributary junctions karst solution / karst elevator tectonic accommodation model fluvial-dominated fan debris-flow-dominated fan Blue Ridge fans Blue Ridge Valley and Ridge Appalachian Plateau Shenandoah Valley fan-scale relationships intensity-duration relationships for debris-flow events 1949 Little River debris flow Large-scale fans vs. small-scale fans fan shape vs. accommodation fan size vs. accommodation master stream tributary stream post-depositional erosion fan pediments pediment fan incision patterns

fault scarp radiocarbon dating fault-fold stratigraphy buried fault zone fault-zone colluvium paleoseismology

**Climatic and Tectonic Controls on Alluvial Fans**

(Source Notes: Taylor class notes: Notes: Climate / Tectonic Influences on Alluvial Fans, Readings: Bull and Schick (1979) Climate Impacts on Fans Dorn (1996), Climate Hypotheses on Death Valley Fans)

Fan Aggradation Fan Incision stream power vs. aggradation stream power vs. degradation tectonic accommodation mechanism base level change hillslope-vegetation response climate change regional vs. local fan response Pleistocene climate change in US watershed weathering response geomorphic surfaces sediment yield vs. aggradation sediment yield vs. degradation precipitation vs. vegetative cover vs. sediment yield vs. fan response

fault recurrence intervals / Neotectonics

(Source Notes: Kate Scharer class presentation and handouts, Fumal et al., 1993 reading; Keller and Rockwell, 1984 reading)

recurrence interval ground motion ground velocity ground acceleration magnitude frequency San Andreas fault system fault trenching tectonics peat interbeds debris flow facies structural deformation syntectonic deformation

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Fan chronology high resolution dating
Hazards / Resource
Management in Fan Environments

aquifer resource
sand and gravel deposits
porosity / permeability
characteristics of fans
fans in the ancient rock record
flood hazards
debri flow hazards
avulsion hazards
hazards mapping
debri flow evidence
debri flow mapping
active vs. inactive fan surfaces
landuse classification

Key Concepts / Ideas

-Be able to compare styles of fan accommodation space and the effects on fan morphometry.
-How are debris flows initiated in humid climates, how do this initiation process compare to arid climates, as discus prior to the mid-term?
-Given the "Appalachian fan models" and "arid-tectonic fan models", how do these apply to the state of Oregon?
-How has the Pleistocene-Holocene climate cycle influenced fan processes in: arid SW, humid Appalachians?
-What are the landforms and depositional products that are possible in the alluvial fan environment, as related to tectonic and climatic factors?
-What types of data and analyses are employed in paleoseismic investigations?
-How are pre-historic earthquake recurrence intervals determined?
-What is GIS and what can it be used for with respect to geomorphology, surficial geology, and alluvial fan analysis?
-What types of data are derived in a GIS environment?
-What approaches are necessary to decipher climatic vs. tectonic signals recorded in alluvial fans?
-How do fans record climatic and tectonic signals?
-What are the two basic responses of fans to external and internal controls?
-How does one definitively support a climate signal hypothesis? (see Dorn, 1996)
-Why are fans an important natural resource?
-What are the hazards / landuse issues associated with alluvial fans?
-How can GIS be used to analyze and evaluate hazards in alluvial fan environments?
Lab Exercise Summary / Concepts and Skills

Appalachian fan analysis

Key question: what are the key morphometric parameters that distinguish Appalachian (humid-mountainous fans) from classic arid-tectonic fans?

How does watershed morphometry affect the size, nature and extent of tributary-junction fans in the Appalachians? How do these relationships compare to classic arid-tectonic fans?

Another question: how is the Appalachian model applicable to Oregon?