G422/522 Techniques in Surficial Mapping

Objective of Exercise: Apply the Taylor, 1999 surficial mapping technique to a watershed in the central Coast Range.

Tasks:

(1) Familiarize yourself with the following items:
- (a) Benton County Soils Survey,
- (b) Topographic map of the Soap Creek Watershed, and
- (c) County Soils Survey Map of Soap Creek Watershed

(2) Compare the Soils Survey Map (photo base) to the topographic map, identify landmarks, etc.

(3) Using the Benton County Soils Survey map unit descriptions and landform associations, fill out Table 1, converting soils descriptions to surficial map unit designations, with the approach of Taylor, 1999. This method represents a first-order approximation of generating a surficial map for an area.

(a) Goal here is to: convert "soils" terminology / map units into "surficial geology" map units, with units identified on the basis of: Age, Material, Landform, Process

Table 1. Soap Creek Soils Inventory / Surficial Map Unit Conversion.

Soils Map Unit	Soil Series	Slope percent	Soil Texture	Parent Bedrock	Surface Process	Depth to Bedrock	Topographic Occurrence (landforms)	Surfical Map Unit (Age, Material, Landform, Process)

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Table 3-5. Summary of Surficial Map Criteria for the Central Appalachians (after Kite, 1994).

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A. Type I Criteria: Age, Origin, Landform, Material.

1. Age of Surficial Material

- H = Holocene (< 10,000 years old)
- W = Wisconsin (ca. 89 to 10 ka)
- I = Illinoian
- P = Pleistocene Undifferentiated
- EP = Early Pleistocene
- MPI= Middle Pleistocene
- LP = Late Pleistocene
- Q = Quaternary Undifferentiated
- CZ = Cenozoic Undifferentiated
- Q-CZ(?) = Quaternary to Cenozoic?
- MZ = Mesozoic (applied to bedrock)
- PZ = Paleozoic (applied to bedrock)

2. Origin / Surficial Process

A. Hillslope
- r = residuum (in situ regolith)
- c = colluvium (mass wasting)
- ds = debris slide
- rf = rock fall or topple

B. Valley Bottom
- a = stream alluvium (normal flow)
- hcf = hyperconcentrated flow
- df = debris flow
- sw = slackwater deposition

C. Lacustrine
- l = lacustrine deposit, undiff.
- lb = lake-bottom deposit
- ld = lacustrine deltaic
- ls = lakeshore deposit (incl. beaches)

D. Other
- g = glaciofluvial, undifferentiated
- go = glacial outwash
- e = eolian
- co = collapse (solution)
- cr = cryoturbation
- x = anthropogenic disturbance
- f = artificial fill
- rk = bedrock (continuous outcrop)

3. Landform Units

A. Hillslope
- n = nose
- sl = side slope
- h = hollow
- veneer = < 2m of regolith
- blanket = > 2 m of regolith
- bf = boulder field
- bs = boulder stream
- pg = patterned ground
- tls = talus deposits

B. Valley Bottom
- ch = channel
- fp = floodplain (RI </= 2-3 yr)
- t = terrace (t1, t2 ...tn; height AMRL)
- f = fan
- f-t = fan terrace (f1, f2 ...fn; height AMRL)
- a = apron (footslope deposit)
- lo = lobe
- lv = levee
- ox = oxbow, abandoned channel

C. Other
- ft = flow track (debris flows)
- hm = hummocky topography
- rb = rock-block slide deposits
- x = excavated, fill, disturbed ground
- d = delta
- du = dune
- bedrock = exposed bedrock

4. Material (Composition and Texture)

- b = boulders (>256 mm; clast supported)
- c = cobbles (64-256 mm; clast supported)
- p = pebbles (4-64 mm; clast supported)
- g = gravel (>2 mm; clast supported)
- sg = mixed sand and gravel
- s = sand (0.05-2.0 mm)
- st = silt (0.002-0.05 mm)
- cy = clay (<0.002 mm)
- l = loam (mix of sand, silt, clay)
- d = diamicton undifferentiated
- bbd = very bouldery diamicton
- bd = bouldery diamicton
- cd = cobbly diamicton
- pd = pebbly diamicton
- ds = sandy matrix diamicton
- dt = silty matrix diamicton
- dy = clayey-matrix diamicton
- rk = bedrock (modify with lithology)
- rs = rotten stone, saprolite
- tr = travertine
- tu = tufa
- ma = marl
- og = organic-rich sediment
- w = water
- u = unkown

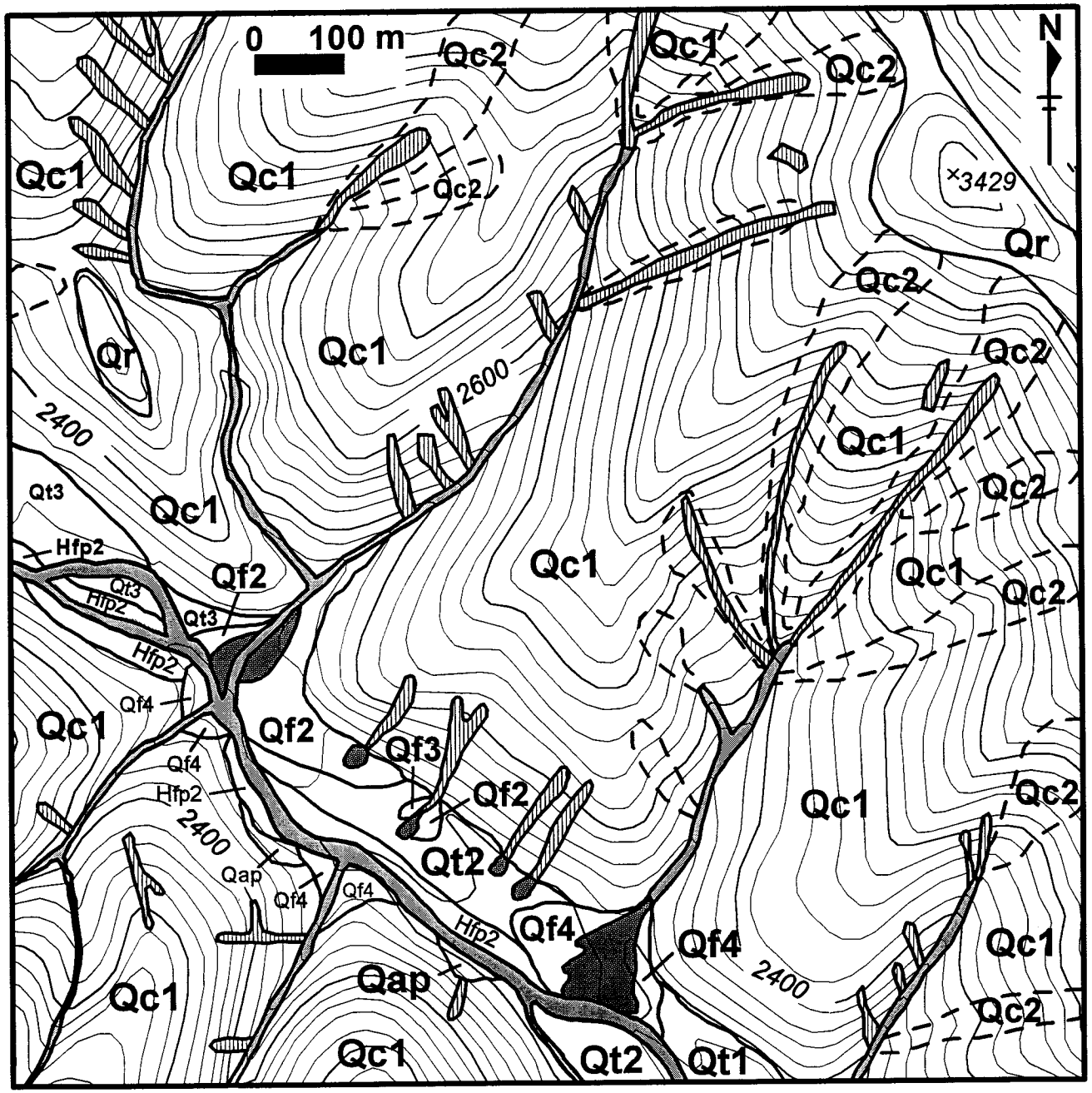
Table 3-5. Summary of Surficial Map Criteria for the Central Appalachians (after Kite, 1994).

B. Type II Criteria: 2-D Surface Features

1. Karst
   - bv = blind valley
   - ca = cave (human entry)
   - Active cave passage
   - Abandoned cave passage
   - dv = dry valley
   - kw = karst window
   - sk = sinkhole (doline)
   - skst = sinking stream
   - ks = karst spring
2. Hillslope
   - hs = headscar
   - ds = debris-slide scar
   - ls = landslide scar undifferentiated
   - rs = rotational slide (slump) scar
   - ts = translational slide scar
   - rb = rock-block slide scar
   - tc = terracettes
3. Other
   - wf = water fall
   - w = water, lake, reservoir
   - Spring
   - Seepage line
   - wt = wetland, undifferentiated
   - wh = wetland, heath
   - wm = wetland, marsh
   - ws = swamp
   - quarry (with highwall)
   - gravel pit
   - deep mine opening
   - strip mine (with highwall)
   - mine subsidence zone
   - rc = rock city
   - Scarp
   - Cliff
   - Meander scroll on floodplain
   - Lacustrine strandline

C. Type III Criteria: - Data Reference Points

- Sandwhich symbols showing stratigraphy
- Depth to bedrock (drilling or seismic data)
- Minimum depth to bedrock (log data)
- Test hole / boring
- Well
- RE = refusal (in test boring)
- Hand-auger hole, shovel hole,
- Fossil locality
- Paleocurrent direction
- Observation Point



Example Surficial Map Product

Surficial Map Units

Qr - Residuum
Qc1 - Colluvium (Side Slopes)
Qc2 - Colluvium (Hollows)
Qt - Terrace Alluvium
Qf - Fan Deposits
Qap - Apron Deposits
Hch - Channel Alluvium
Hf - Historic Fan Deposits
Hfp - Floodplain Alluvium
Hds - Historic Slide Scar