Vegetation Succession & Geomorphic Thresholds
Channel Evolution Model
(Schumm 1984, Rosgen 1996)
Vegetation = sedge dominated banks and active floodplain with willows, cottonwood and aspen occurring on less frequently flooded surfaces
Channel Evolution Model
(Schumm 1984, Rosgen 1996)

What happens between E and G?
Bank Height Ratio increases and vegetation responds: move from OBL to FACW and FAC.

Vegetation = Kentucky bluegrass (FAC) and mesic forb

What do you think is the elevation difference between the two landforms? Channel trend?
State-and-Transition Model

State 1 = reference state

Is this a new state? What attributes must be considered?
G type channel

Vegetation: remnant Baltic rush, Nebraska sedge CT transitioning to Kentucky bluegrass / dry forb
State-and-Transition cont.

Phase within State 1?

Transitional type?

New State?

What attributes must be considered?
Let's review the channel evolution model.
Incision = widened
Banks inclined
Floodplain developing

Vegetation = scirpus (OBL)
Willow (FACW), cottonwood (FACW)
F Channel type developing floodplain with OBL and FACW vegetation
How are these two stream reaches different from each other?

Vegetation at both Locations = OBL, FACW, and FAC species.

Different states? Again, what attributes do we need to consider?
Different States?

Channel Evolution Model suggests that the upper photo depicts a condition that occurs prior to the lower photo.

Is the lower photo depicting a third State or a phase within State 2?

Discussion?
My Perspective

State 1

E

State 2

G

State 3

CP a

F

CP b

C

CP c

E
Thoughts

• State 1: reference state
  – Channel connected to floodplain; water table supports OBL and FACW species
  – CP within State 1: bank height ratio increasing and vegetation reflects the lowering of the water table
  – May be additional CP caused by inappropriate grazing etc.
Thoughts

• **State 2 = entrenched G type channel**
  – Banks are vegetated with FAC and FACW species
  – Banks are unstable
  – Channel widening necessary to develop floodplain

May be additional CP within this State that occur between “G” and “F” morphologies
Thoughts

• State 3
  – CP a: F type channel that exhibits floodplain development and bank stabilizing vegetation (OBL and FACW)
  – CP b: C type channel that exhibits increasing sinuosity, point bar development and vegetation capable of holding banks during high flow events
  – CP c: E type channel similar in dimension to the reference state channel however no longer connected to the original floodplain

NOTE: in the example shown CP b may not develop
Discussion ?