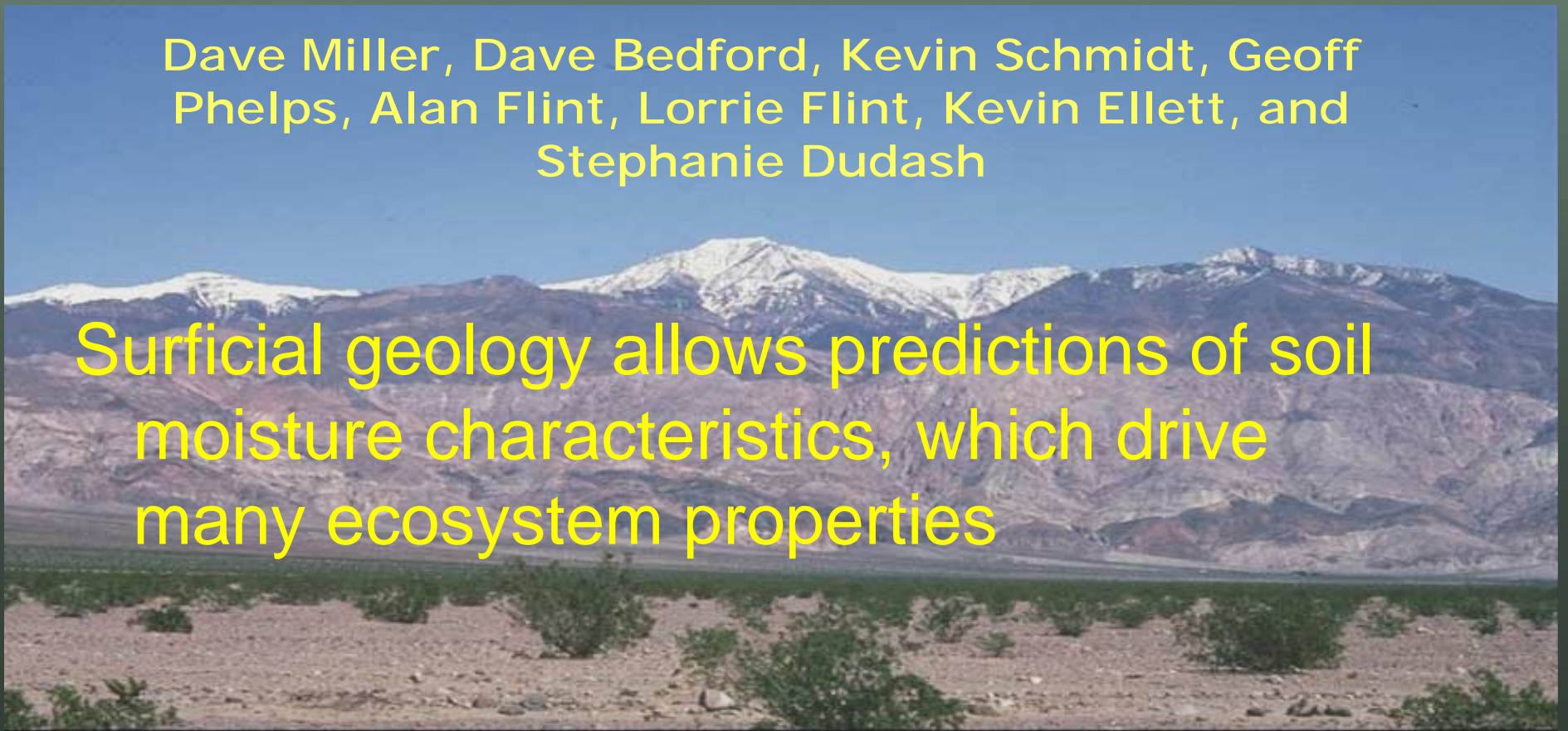




What is where: Why surficial geology predicts vegetation in the abiotically-driven Mojave Desert ecosystem

Dave Miller, Dave Bedford, Kevin Schmidt, Geoff Phelps, Alan Flint, Lorrie Flint, Kevin Ellett, and Stephanie Dudash

Surficial geology allows predictions of soil moisture characteristics, which drive many ecosystem properties





Surficial Geologic Maps

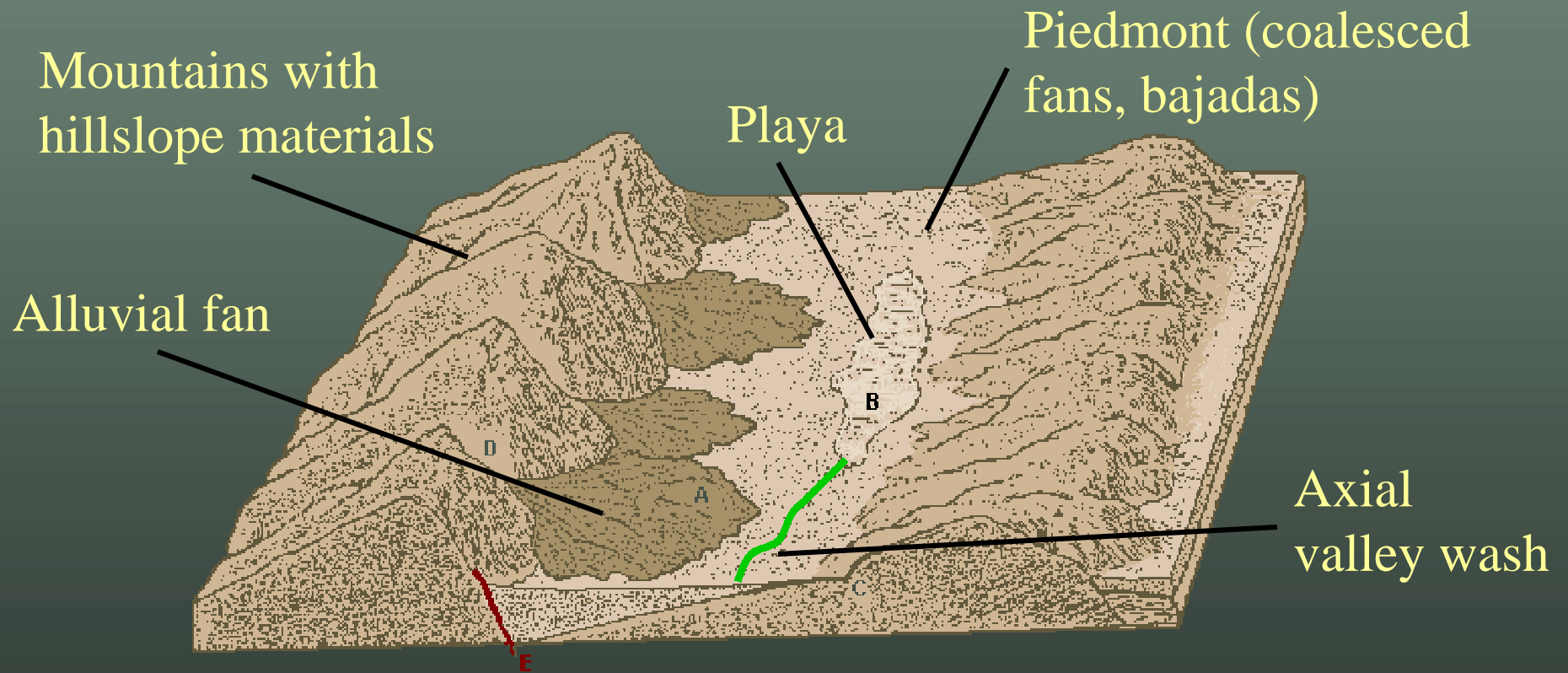
Surficial geology (geomorphic surfaces)

- Is related to vegetation patterns
- Is related to recovery rates from disturbance

If we learn how geology is related to desert ecology, we can make *spatial models* using geology spatial databases



Surficial Geologic Maps: Distinguishing deposits created by different processes



Others: Eolian sand dunes and sheets
Groundwater discharge deposits



Surficial Geologic Maps:

Advantages of mapping by geomorphic process



Extrapolate map information using
depositional process inferences

Extrapolate properties of sediments



Surficial Geologic Maps: Pedogenic processes

Soil development occurs by addition of dust, leading to progressive soil horizonation with time



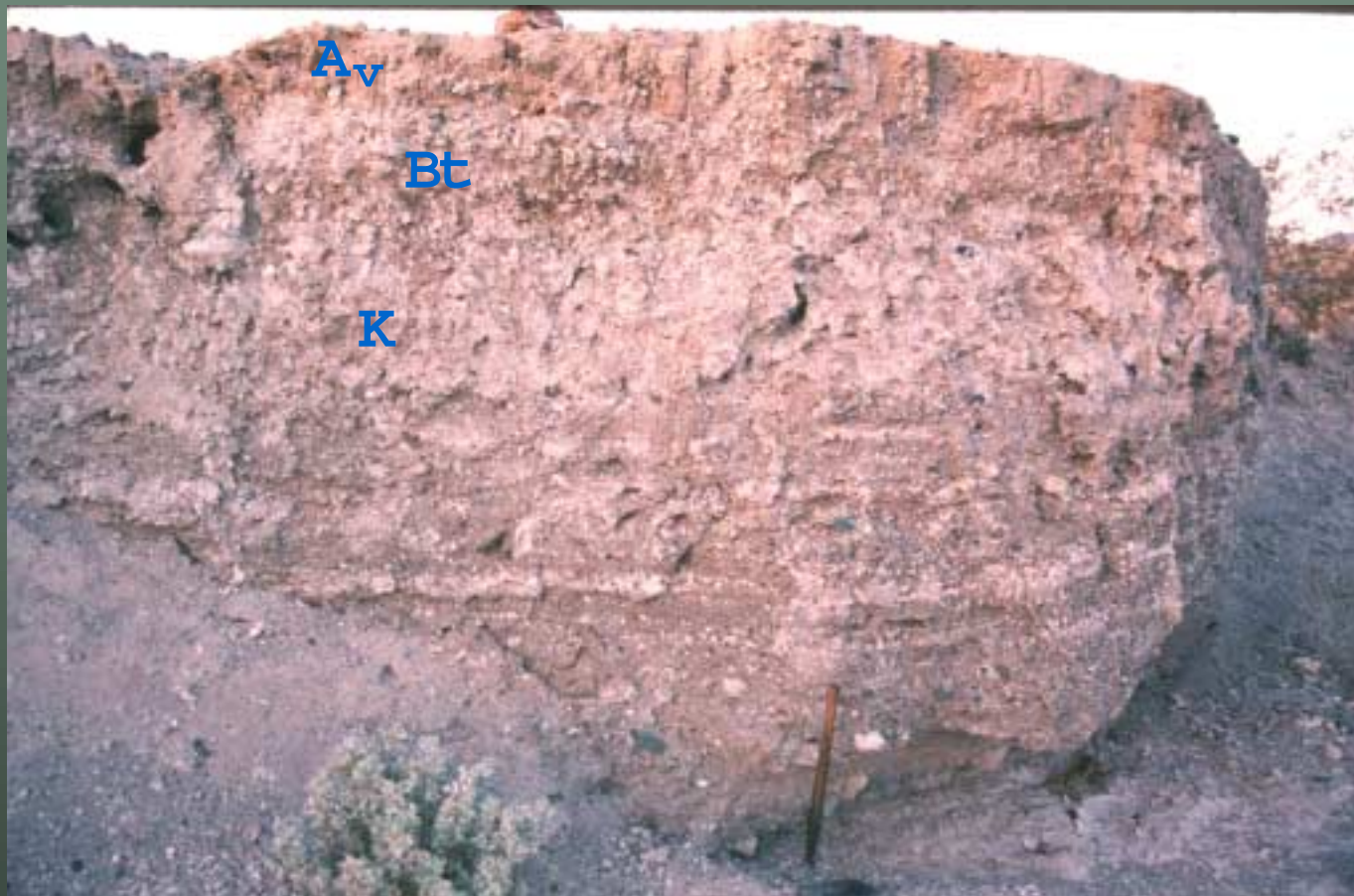


Origins of dust that drives pedogenesis





Advanced Soil Horizons



- Vesicular A (A_v)
- Bt (argillic)
- Calcic (K)

Alluvial piedmont,
Valjean Valley



Surfaces, Soils, and Plants

Observed changes in vegetation with surface age



Alluvial piedmont,
Valjean Valley



Surfaces and Soils