

# TECTONIC LANDFORMS

Tectonic scarp: steep, abrupt slope or cliff along margin of topographic bench such as plateau or terrace, results from differential movement of Earth's surface

Fault scarp: fault displaces ground surface so that one side is higher or lower; usually at the angle of repose ( $25^{\circ}$ - $40^{\circ}$ )

Lineament: linear feature in the landscape that is produced by a fault scarp

Triangular facets: planar surfaces with bases aligned or parallel to the fault trace

Sag ponds: closed basins at the foot of recent fault scarps



Google Earth





Shutter ridges: half-displaced ridge crests along a strike-slip fault

Horst: fault block uplifted relative to blocks on either side

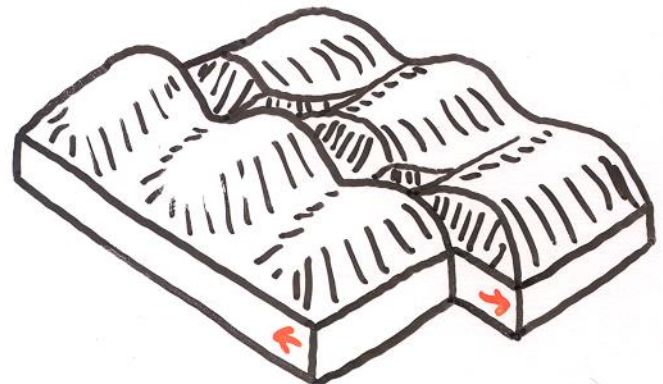
Graben: depression produced by subsidence along faults

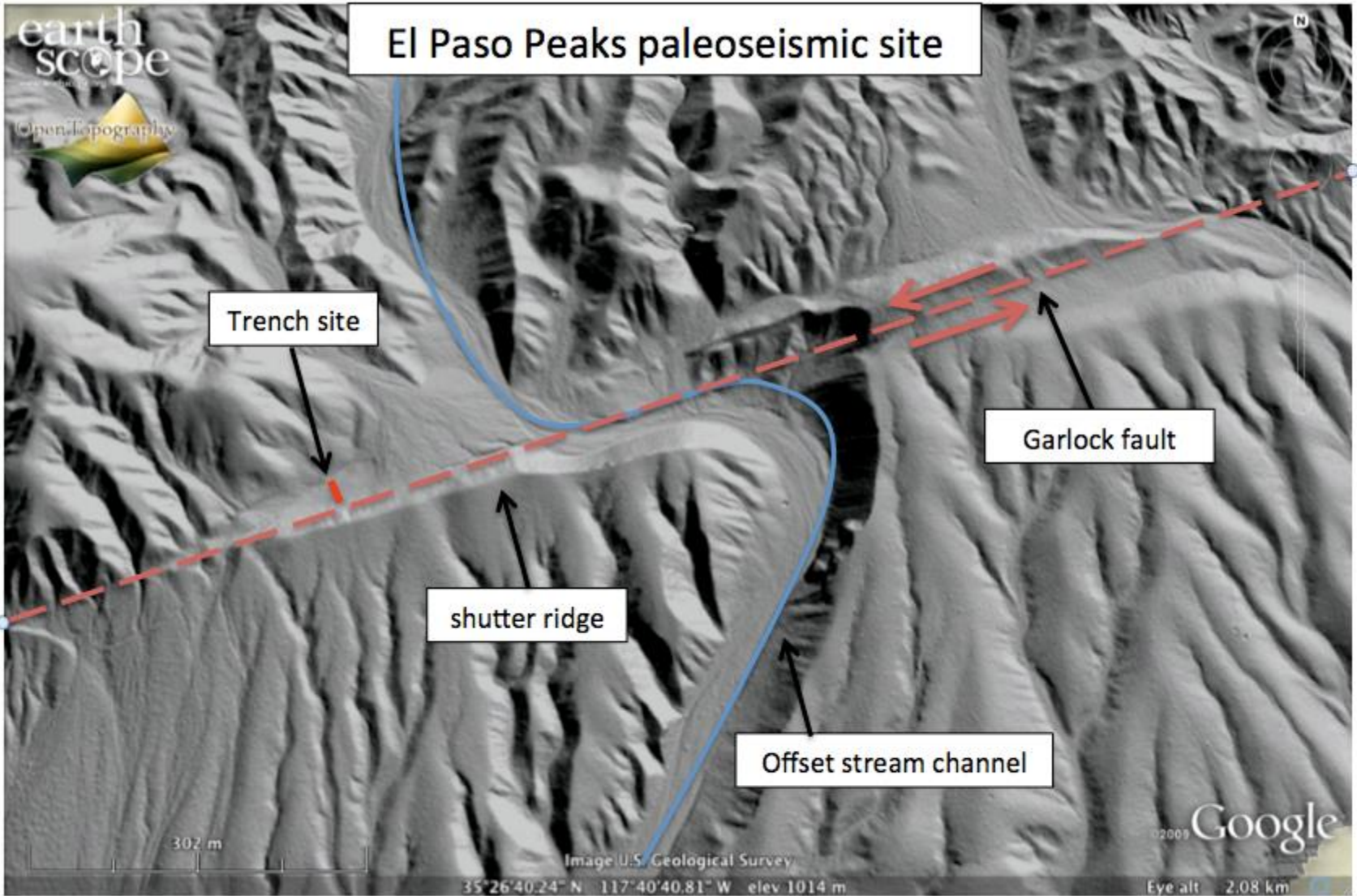
Fault block mountains: uplifted & tilted (e.g., Teton Range, WY)

Rift valleys: large, complex, branching grabens (eg. Rhine, East Africa, Lake Baikal, Jordan Valley)

monoclinial scarps  
salt domes

> folding



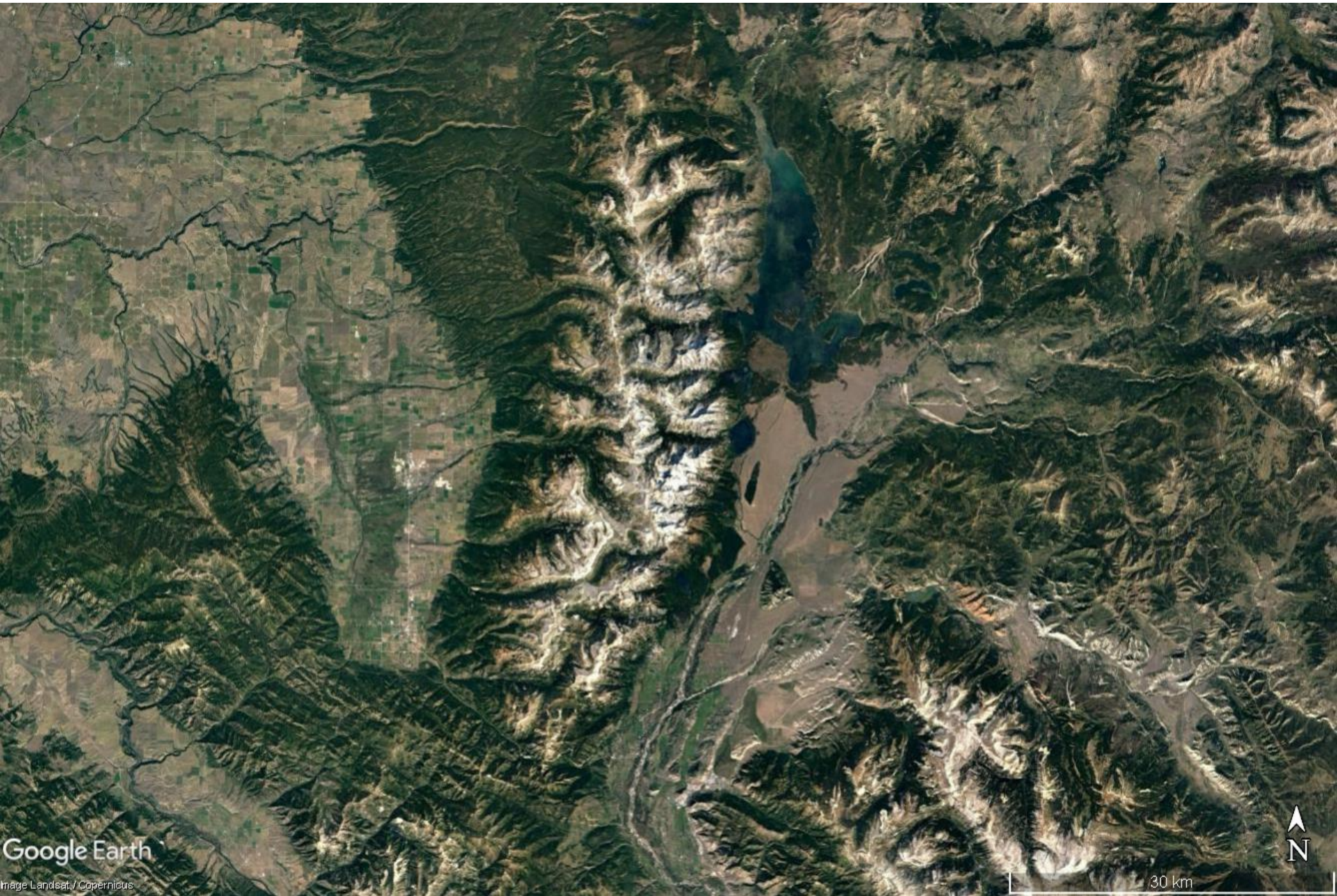




Google Earth

600 m



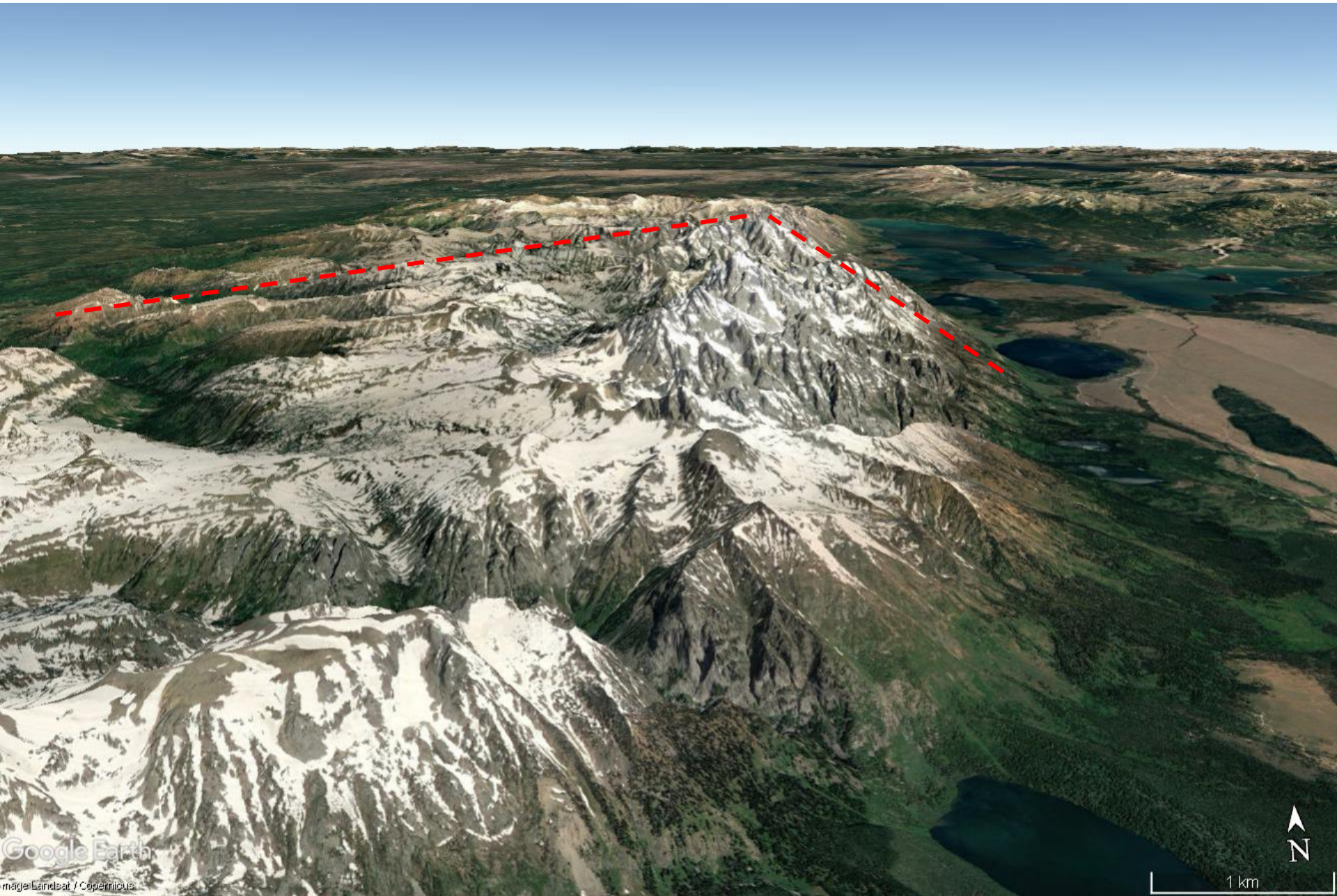


Google Earth

Image Landsat/Copernicus



30 km





Rio Grande entering Santa Elena Canyon  
fault block, Big Bend National Park, Texas

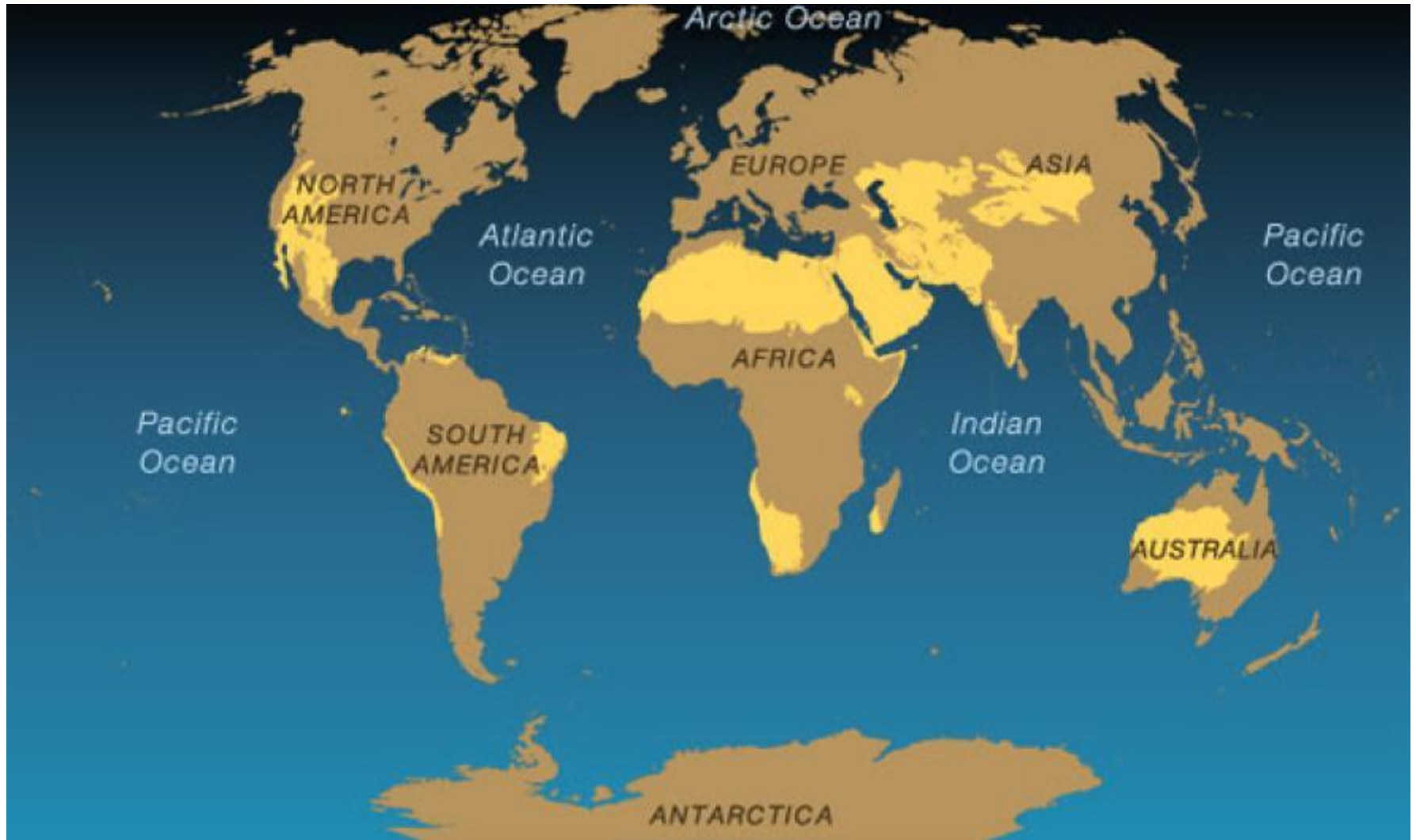
# ARID, SEMIARID, & SAVANNA LANDSCAPES

Dry region: where seasonal/annual precipitation is insufficient to maintain vegetative cover & perennial streams; single largest identifiable morphogenetic region on Earth (& growing)

There are various definitions for this category, but essentially  $\frac{1}{4}$  to  $\frac{1}{3}$  of Earth is dry

Two belts of aridity in the low latitudes coincide with the subtropical anticyclonic belts of high atmospheric pressure at  $15^{\circ}$ - $30^{\circ}$  N & S of the equator – these are fringed by semiarid zones

# National Geographic Society map of deserts



In middle latitudes, it tends to be dry

- 1) in the interiors of large continents (although lower temperature & evaporation than in the subtropics)
- 2) on the western sides of continents, where cold ocean currents flow offshore
- 3) on the downwind, or rain shadow, side of mountain ranges

Savanna – dry for a significant part of the year, although total precipitation is greater than in arid regions; 15% of Earth's land area; ground cover during wet season, barren during dry season

Semiarid – sparse grassland or steppe vegetation; soils don't develop strong diagnostic horizons except for salt crusts or concretionary layers (eg.  $\text{CaCO}_3$ ); slow weathering rates; streams flat, wide, steep-walled, coarse sediment loads

Arid landforms: playas (saline lakes)

reg (stony desert) or desert pavement

dunes

piedmont/alluvial fans & bajadas/pediment

internal drainage

Semiarid landforms: steppes/prairies/veld/pampas

grass cover

rivers graded externally to region

generally plains or low dissected plateaus

pediments/alluvial fans

Savanna landforms: inselbergs & plains

chemical weathering extends to great depths

rivers seasonal, & braid or flood across

flat plains underlain by deep, weathered

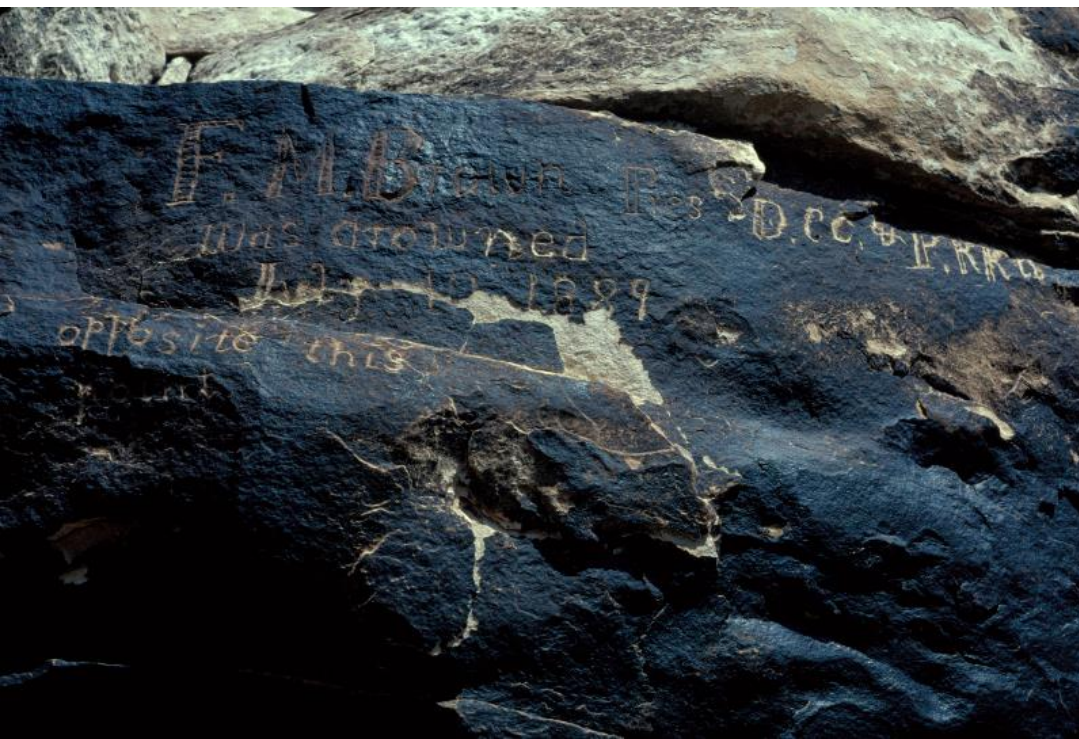
rock to weathering front

when plain is lowered by rejuvenation or

climate change, exposes inselbergs

double surface of leveling

desert varnish,  
central AZ

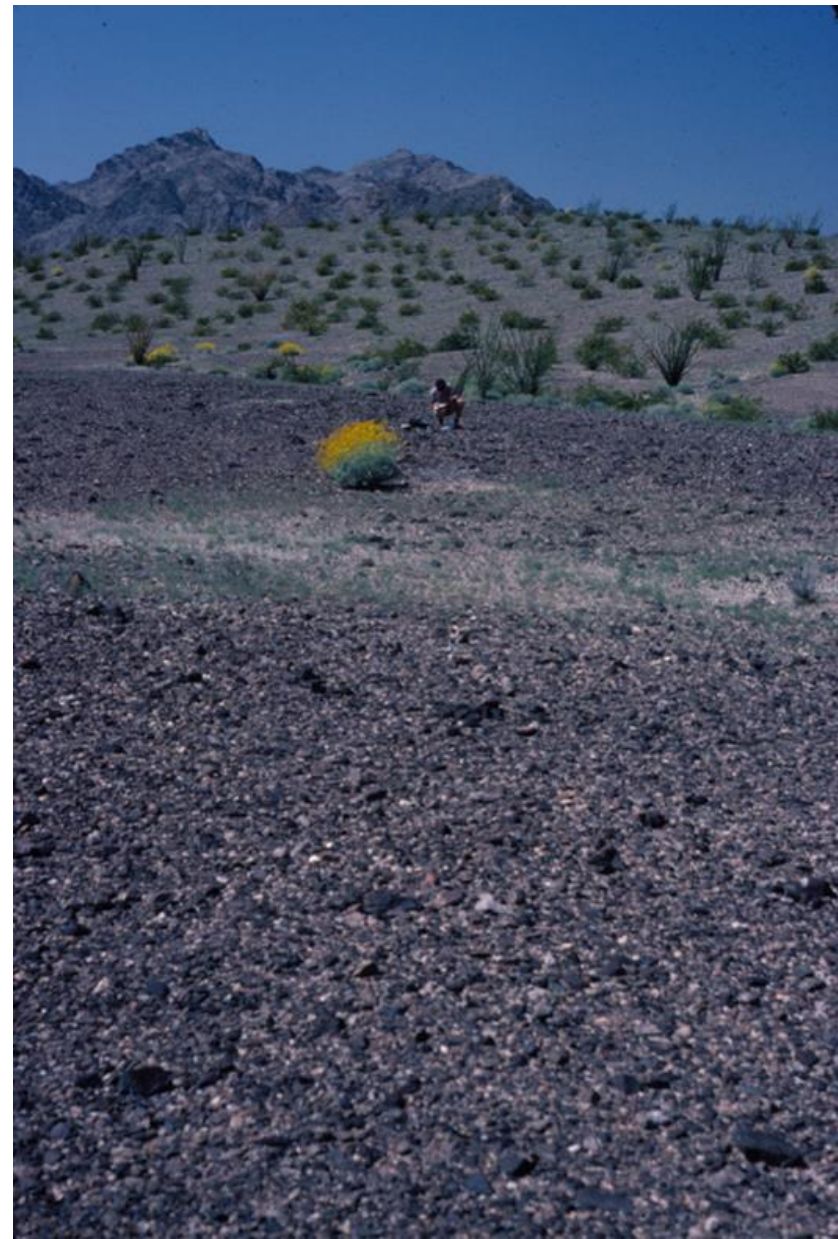


desert varnish, Grand Canyon,  
AZ

playa, White Sands, NM



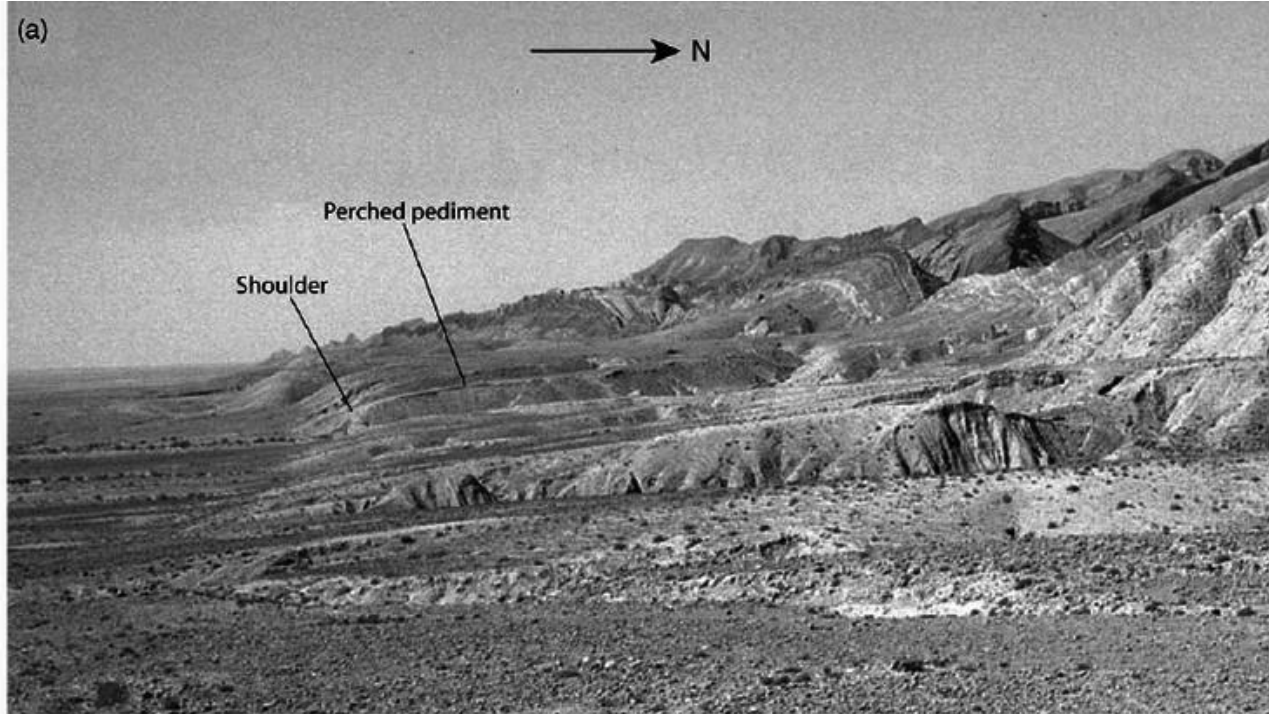
playa, Death Valley, CA



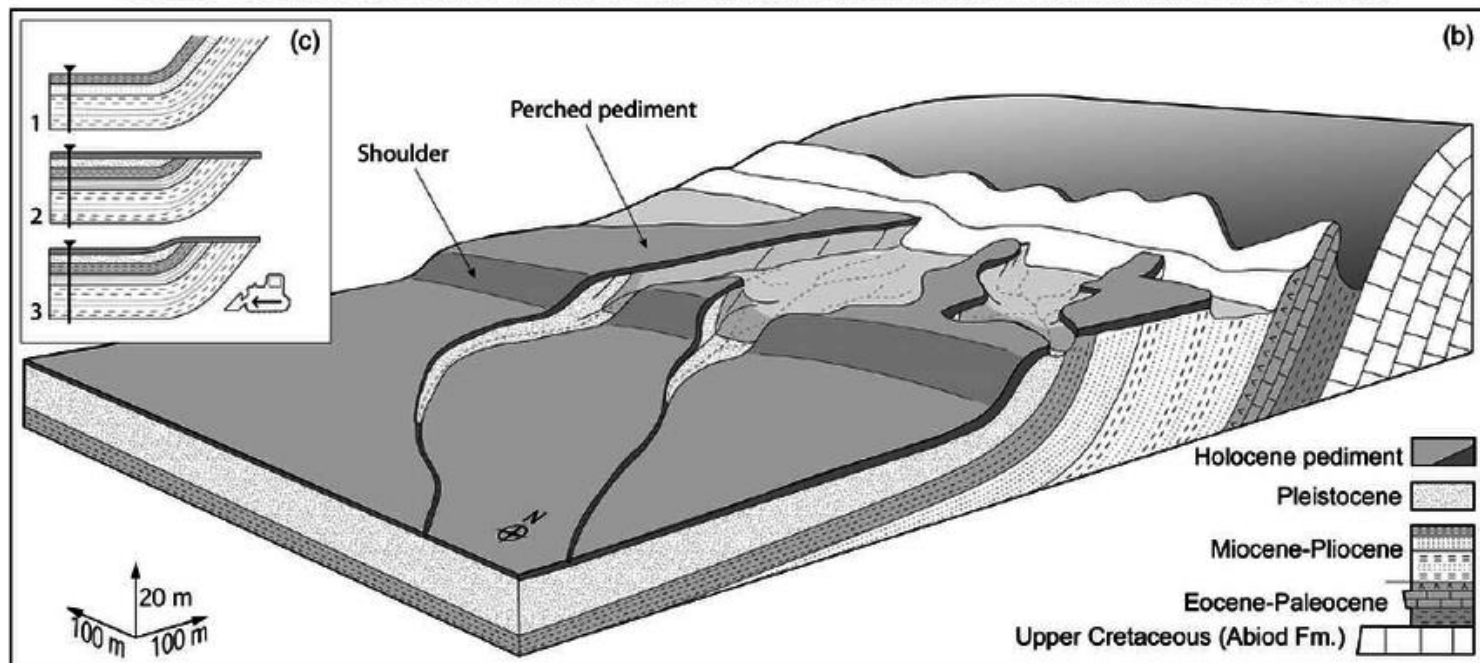
desert pavement,  
southwestern AZ

pediment, Mojave Desert, CA

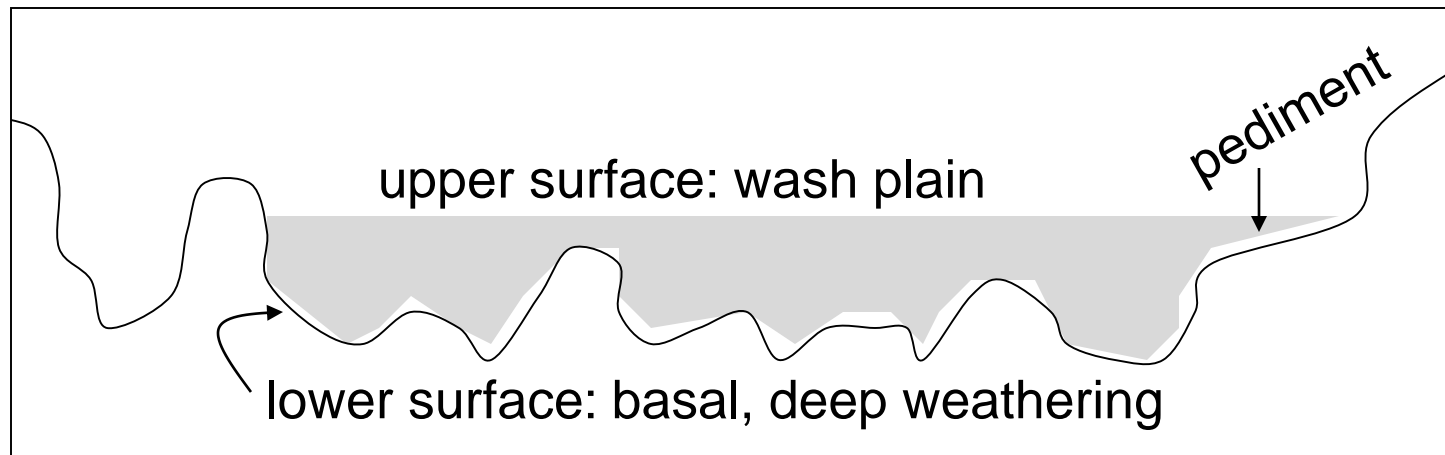




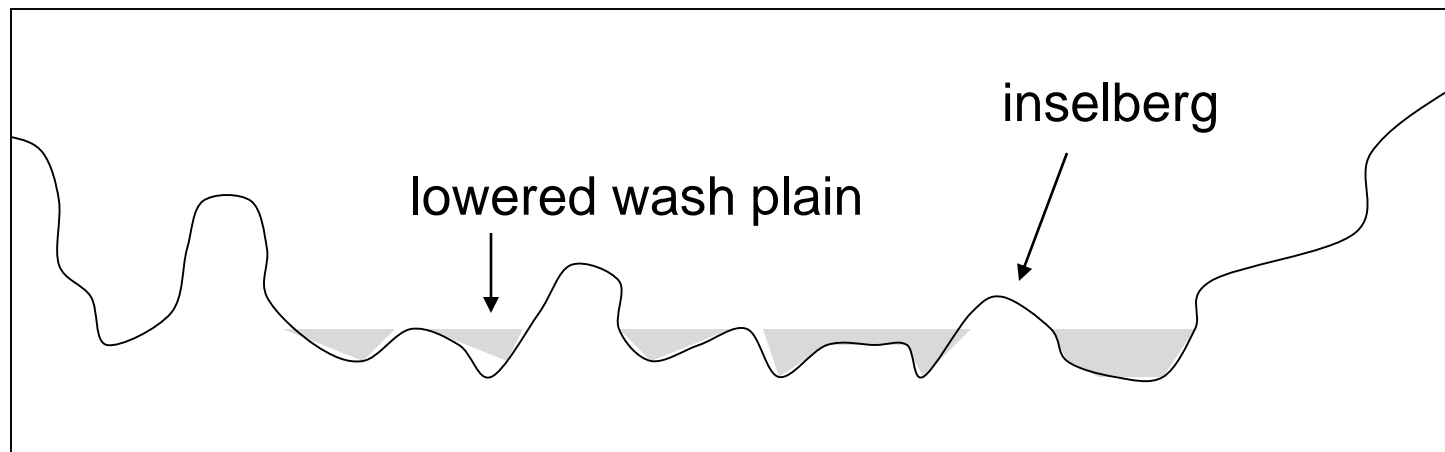
pediment,  
Jebel Alima,  
Tunisia



# “Double surface of leveling” hypothesis for tropical savannas (Büdel)



rejuvenation or climatic change





inselberg (from internet), Mozambique