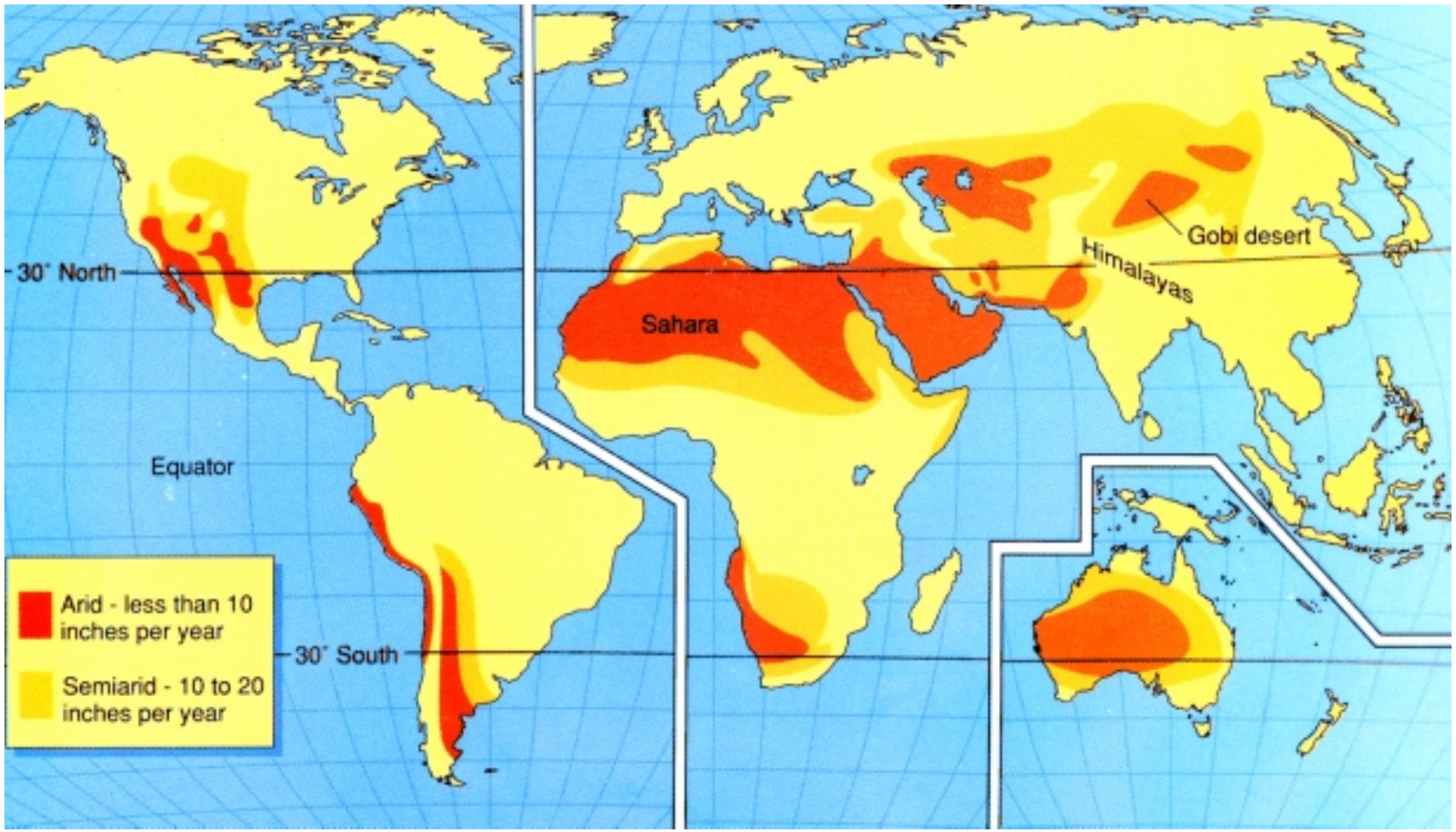
Deserts and Wind Action

Deserts by definition are arid. They receive less than 25 cm (10 inches) of precipitation a year and have enormous evaporation rates (commonly 15 to 20 times higher than precipitation rates).

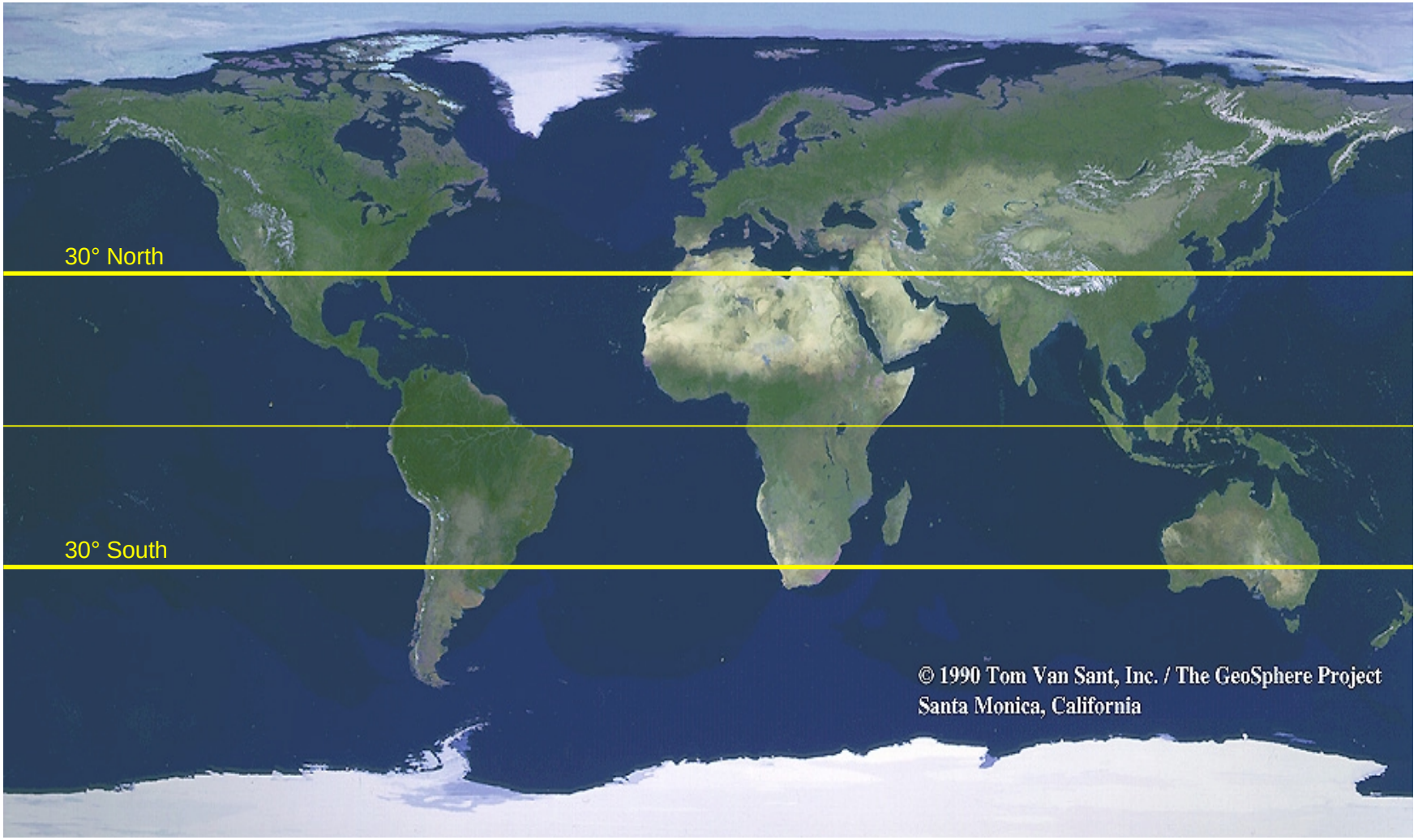
Deserts and Wind Action

Distribution of deserts:



Deserts and Wind Action

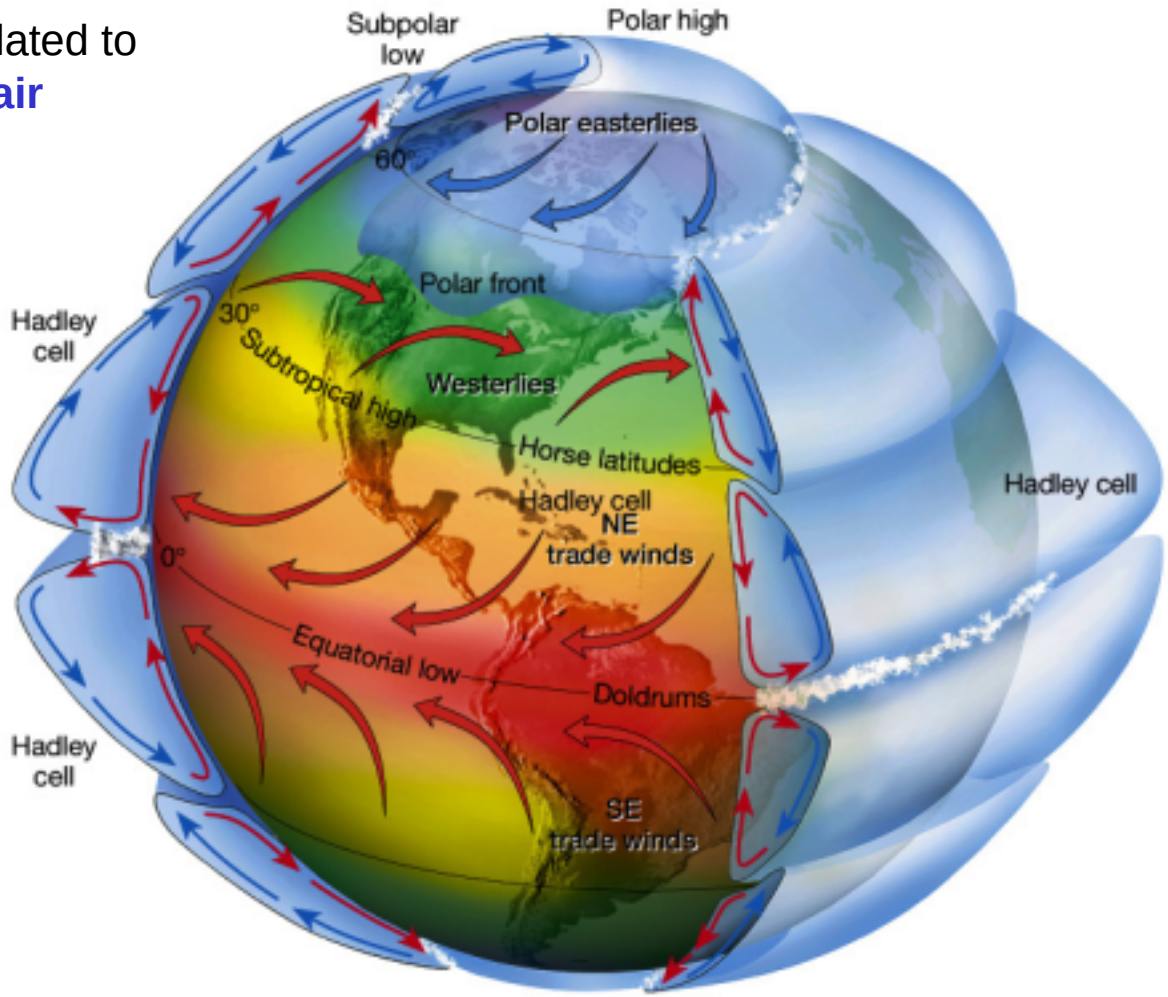
Distribution of deserts:



Deserts and Wind Action

Distribution of deserts:

- Location is related to **descending air**

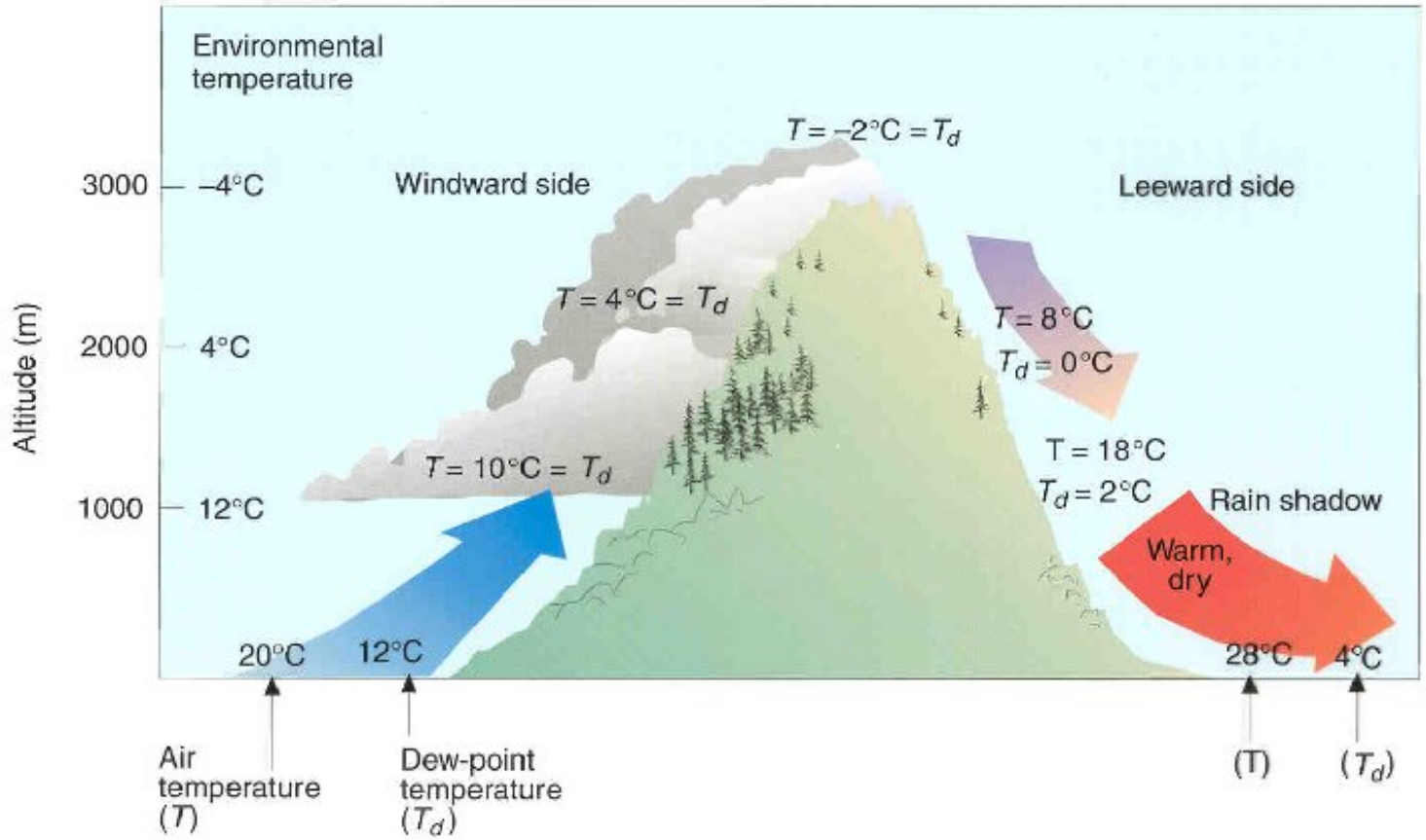


Deserts and Wind Action

Distribution of deserts:

- **Rain shadows** (orographic lifting)

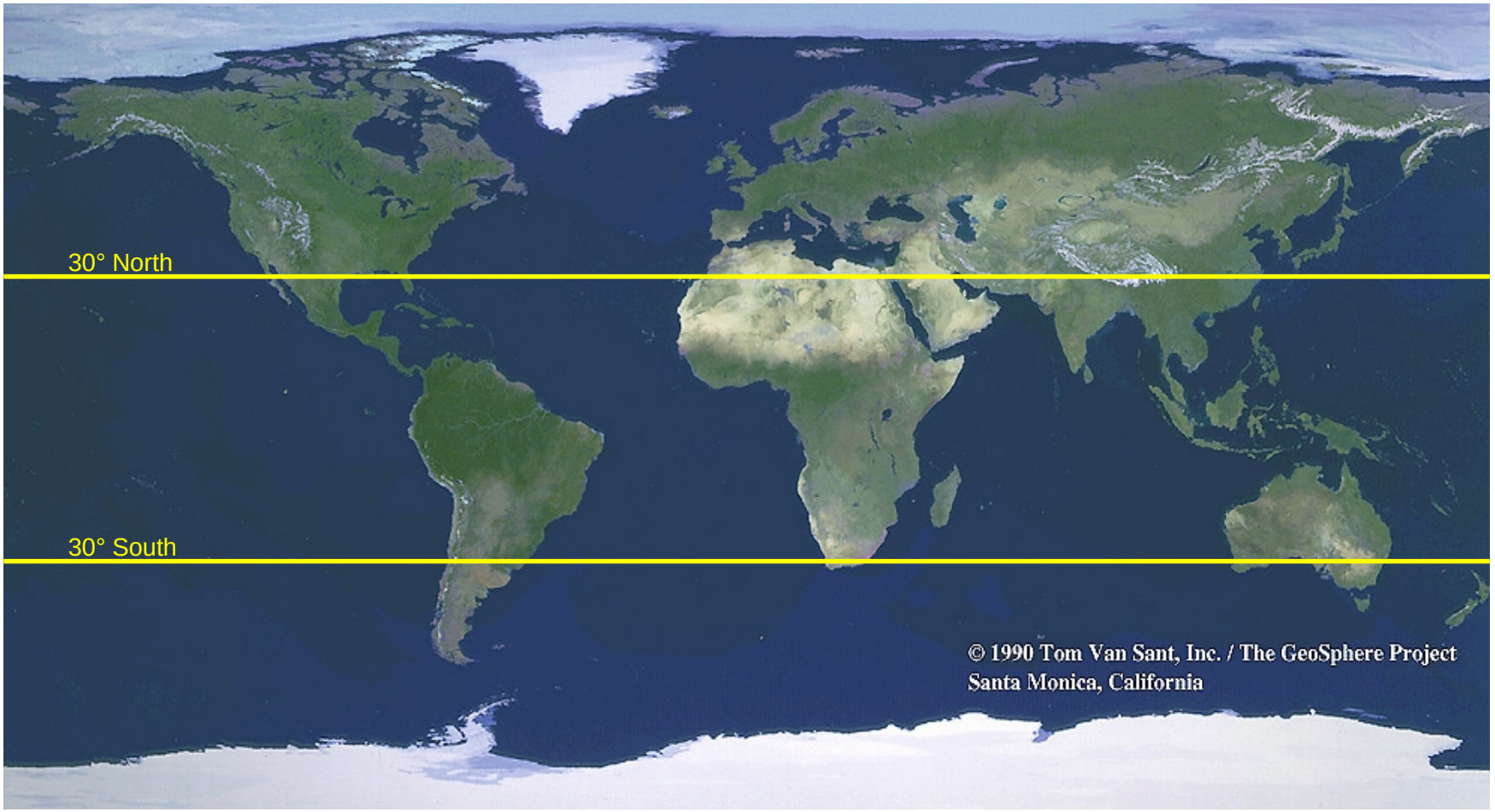
Orographic uplift, cloud development, and the formation of a rain shadow



Deserts and Wind Action

Distribution of deserts:

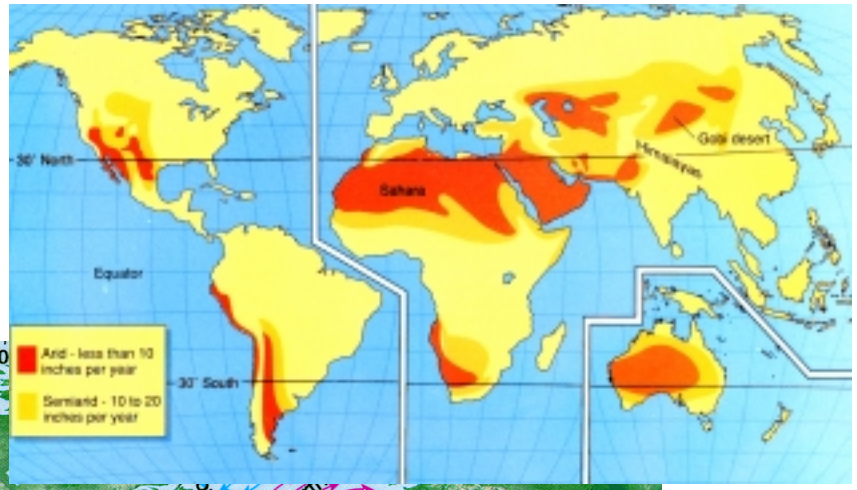
- **Great distances from the ocean**

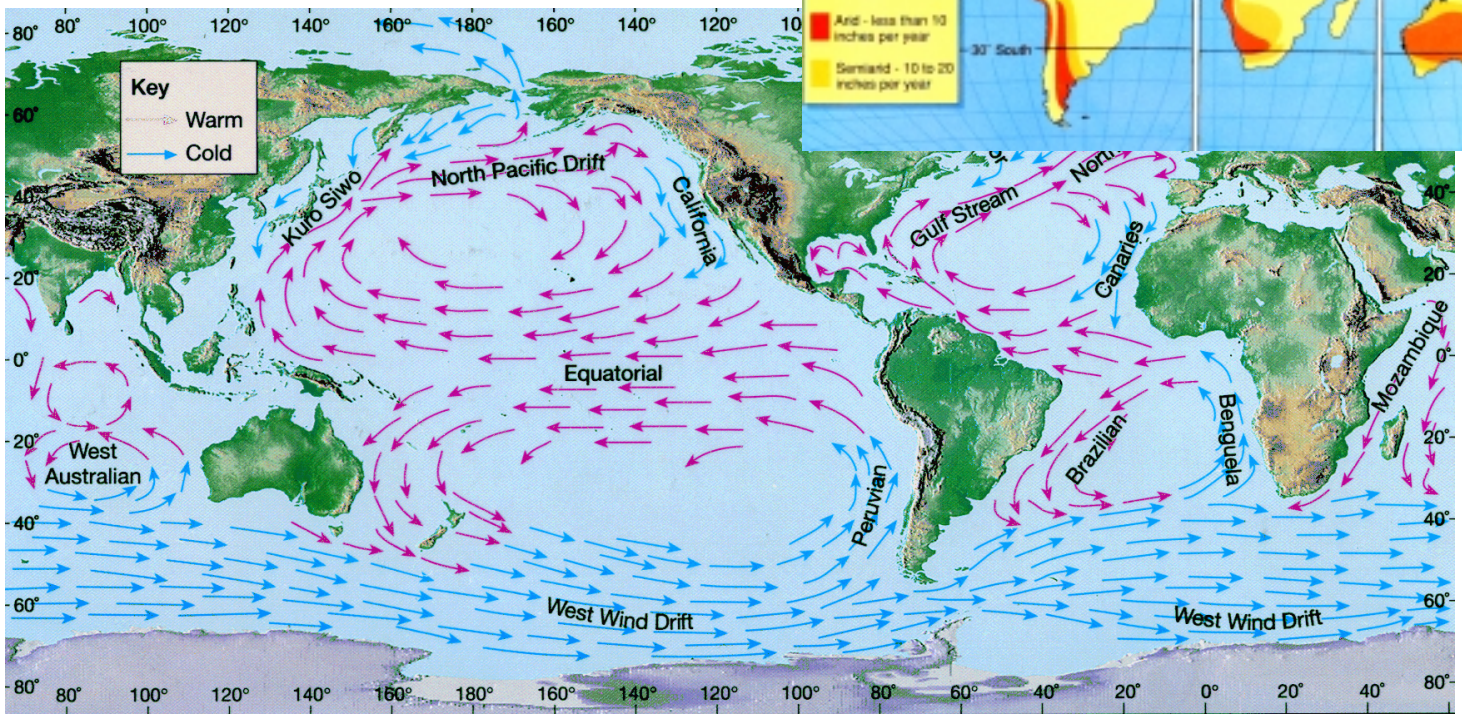


Deserts and Wind Action

Distribution of deserts:

- next to **cold ocean currents**

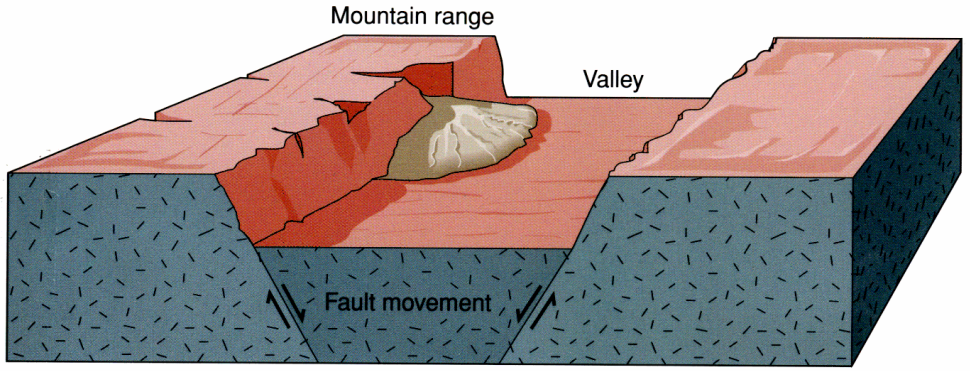




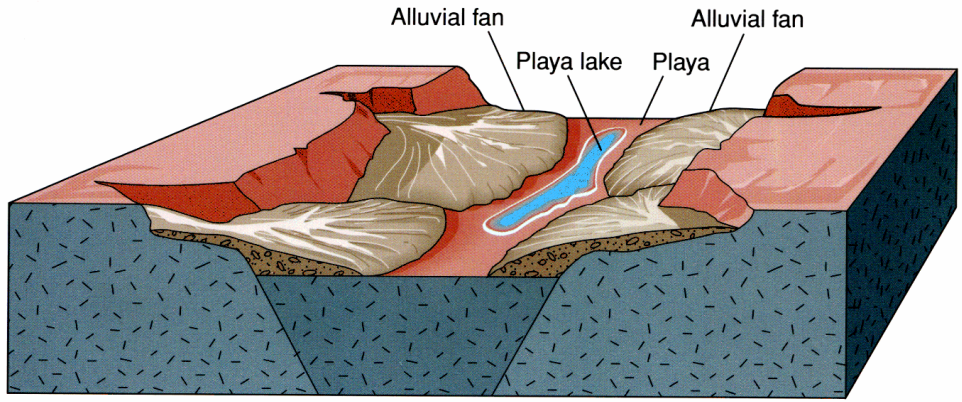
Deserts and Wind Action

Characteristics of deserts:

- Desert streams are intermittent (dry most of the year).
- Many deserts have internal drainage.
- Alluvial fans
- Soils



A

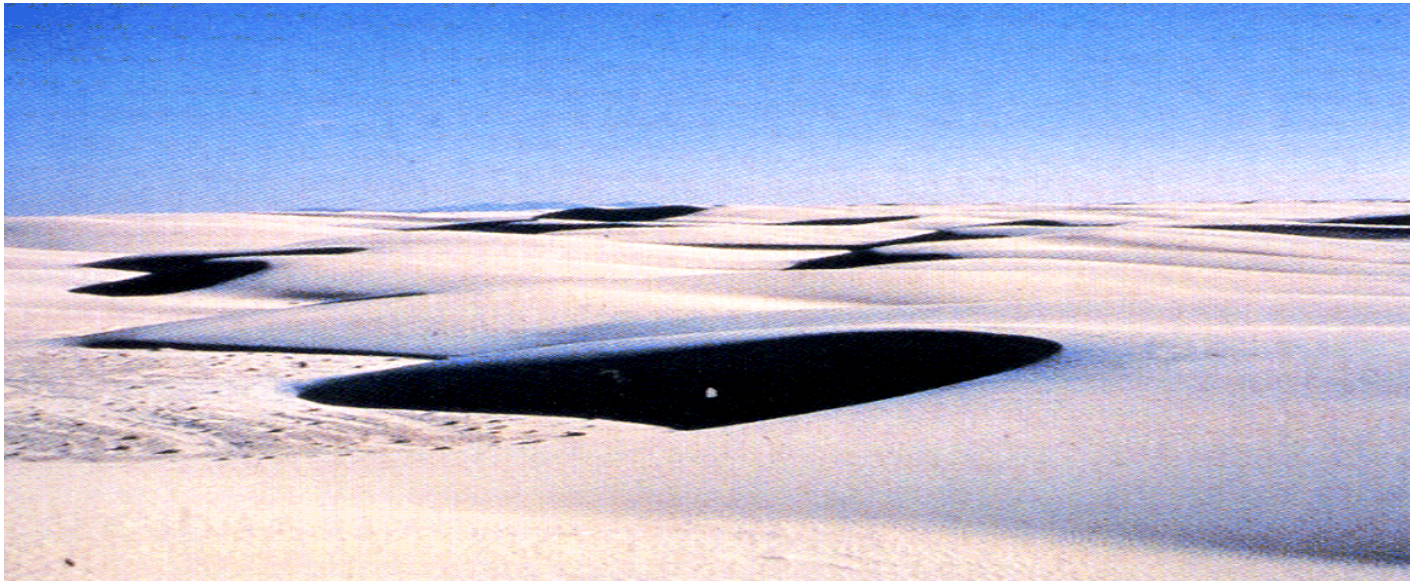


B

Deserts and Wind Action

Driving forces of desert features:

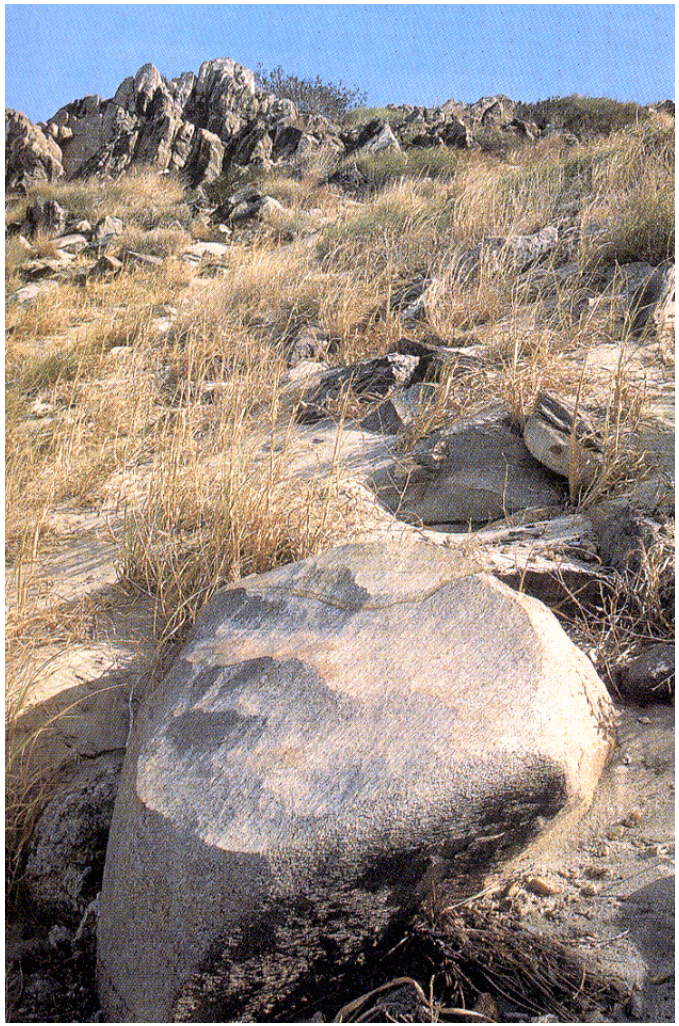
- **Wind direction**
- **Wind velocity**



Deserts and Wind Action

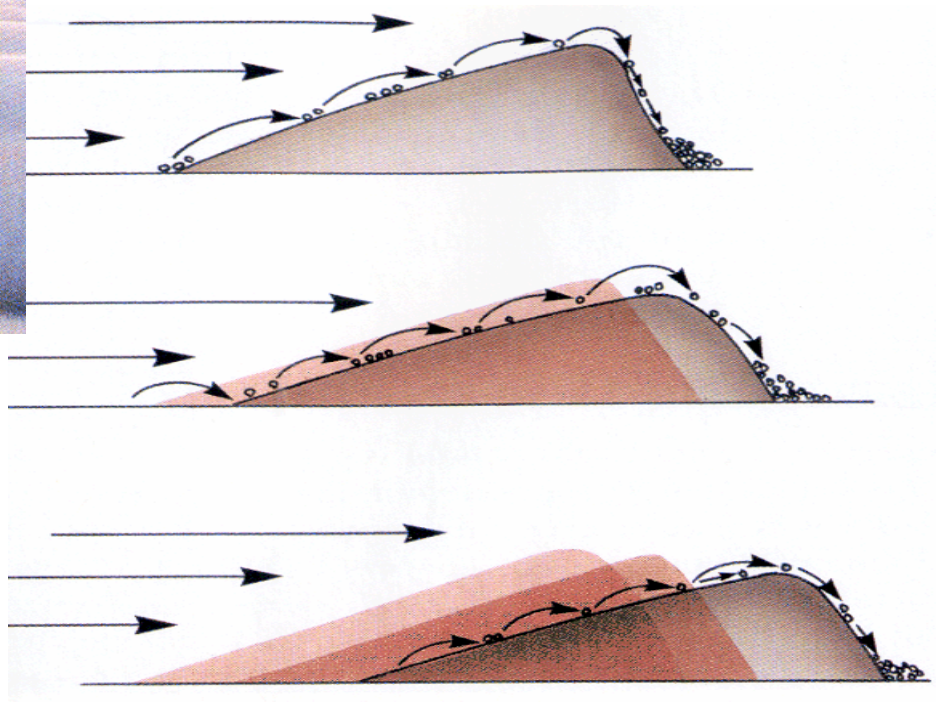
Driving forces of desert features:

- **Wind erosion**
  - Abrasion
  - Ventifacts
  - Deflation



Deserts and Wind Action

Wind deposition:



Deserts and Wind Action

Wind deposition:

- ***sand seas*** **-** ranging from tiny **ripples** to giant forms called **draa**
- ***sand sheets***

Zones of reduced energy leading to the formation of sand seas are produced in two ways:

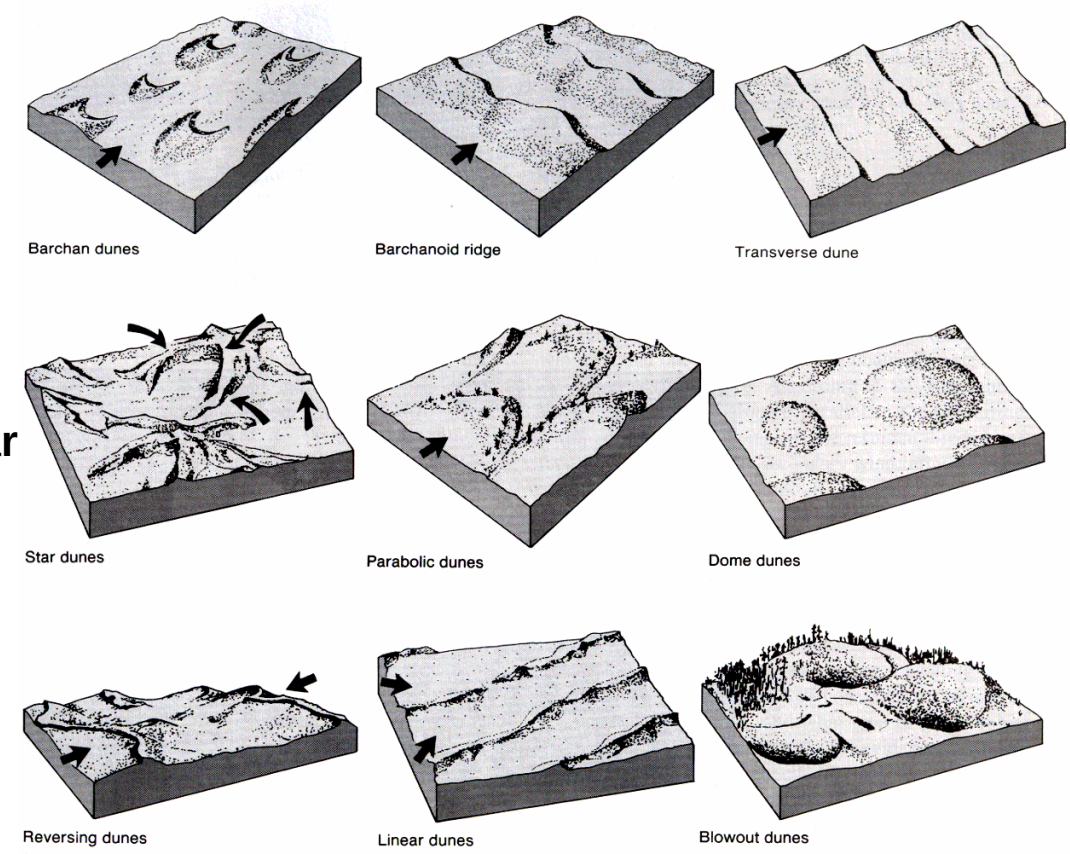
- topographic barriers – (Great Sand Dunes National Monument)
- large bodies of water serve as sand interceptors.

Wind deposition: Deserts and Wind Action

Dunes - attain a characteristic equilibrium profile that can be logically divided into three **components**, backslope, crest, and slip face.

Dune patterns include:

- **barchan**
- **transverse**
- **parabolic**
- **longitudinal or linear dunes**
- **Star dunes**



Wind deposition

Deserts and Wind Action

Loess is a wind-blown silt and clay.

Eolian images

Diversity and Distinctiveness of Desert Vegetation

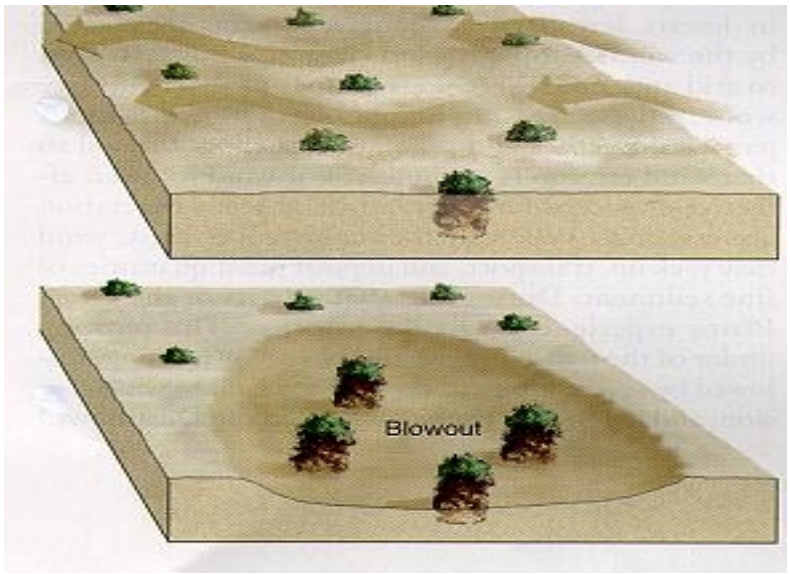

Dune
Advancement


Dune
Advancement

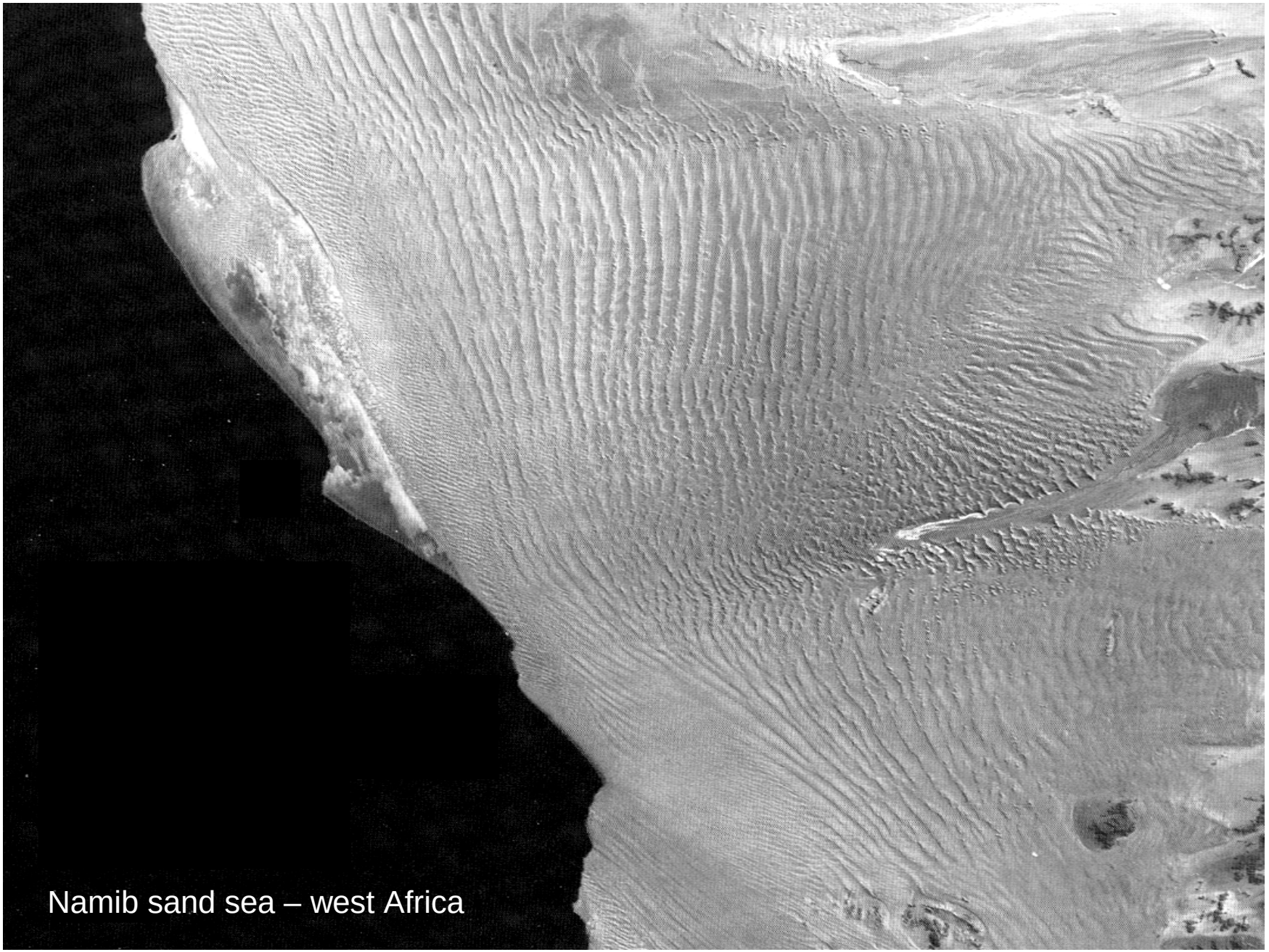

Dune
Advancement

Mass Wasting

Blowout



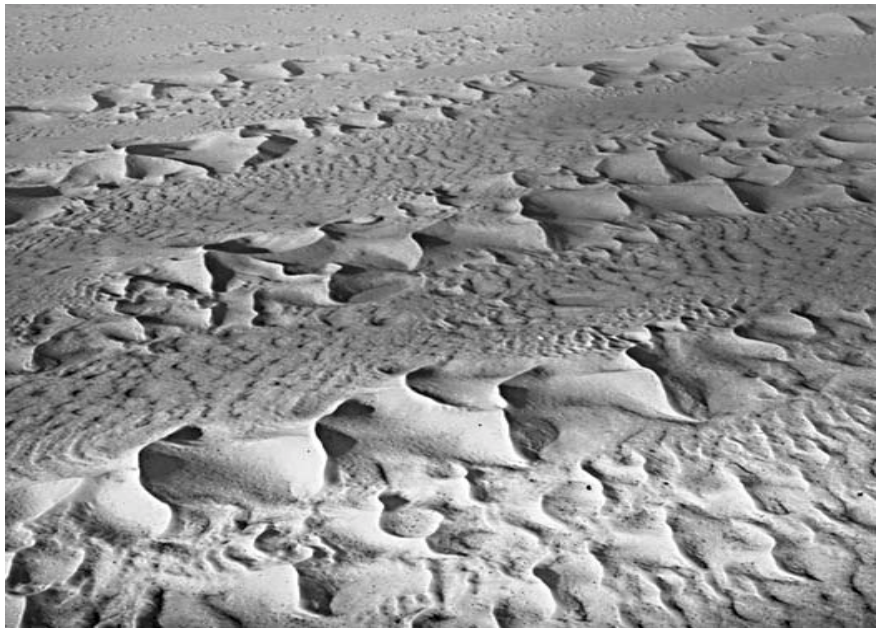
Finis


Namib sand sea – west Africa

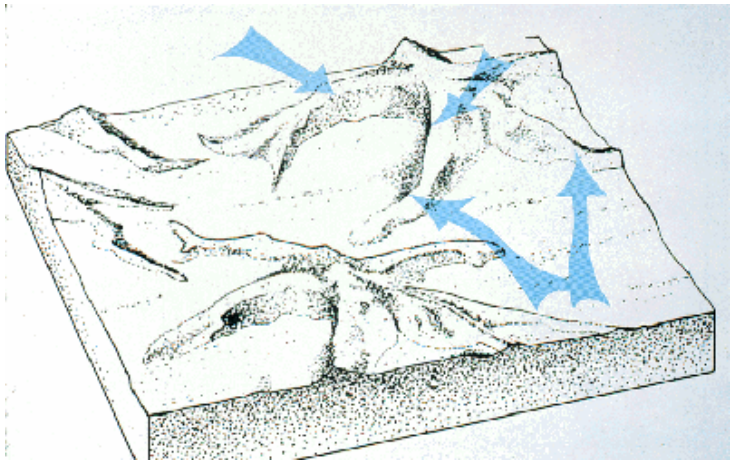
Tiny ripples – range in amplitude from 0.01 to 100 cm and may be spaced 20 m apart.

Dune types: Barchan dunes

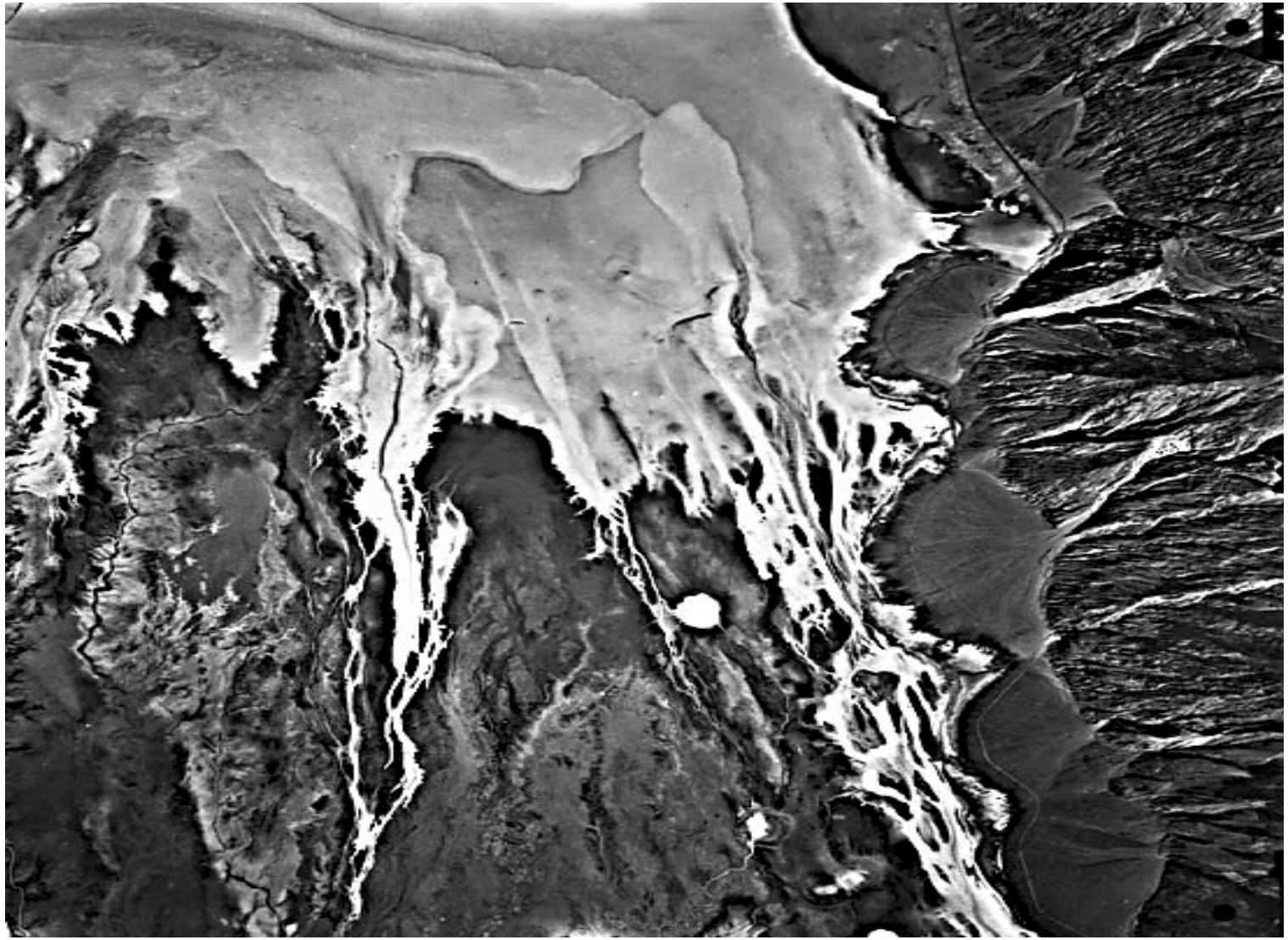
- Often formed where sand supply is limited.
- Usually formed where wind direction is unimodal.
- Often quite mobile.



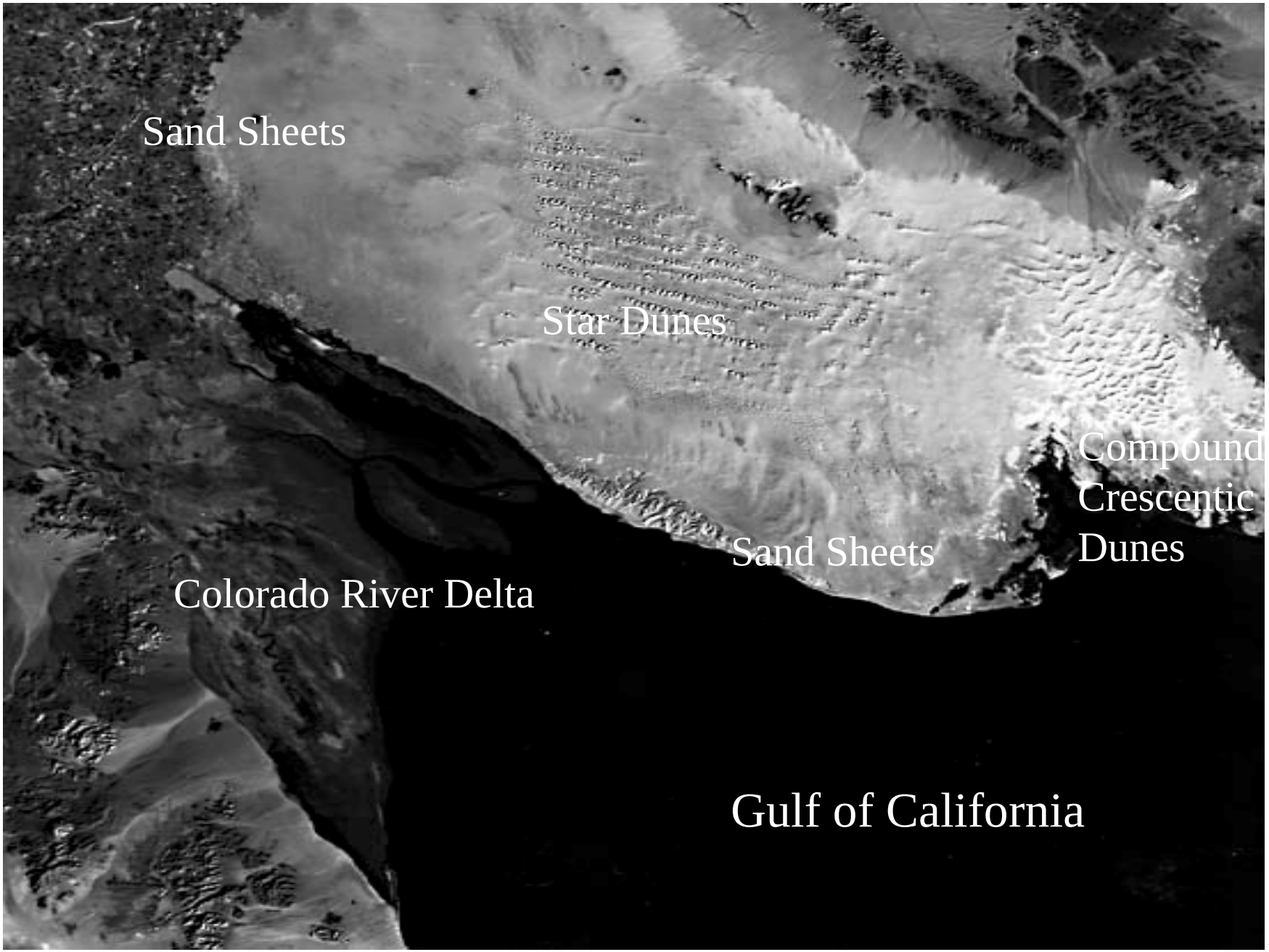
Star Dune



Alluvial Fan Deposits



Diversity and Distinctiveness of Desert Soils


Sand Sheets
Star Dunes
Compound
Crescentic
Dunes
Sand Sheets
Colorado River Delta
Gulf of California


Draa

Sand/Dune Movement