



# Wind

8.3

# I. Wind Erosion

- a. When air moves, it can pick up loose material and transport it to other places but it cannot move heavy sediments
- b. Wind can transport and deposit sediments over large areas

# A. Deflation and Abrasion

- a. Wind erodes Earth's surface by deflation and abrasion
  - When wind erodes by deflation it blows across loose sediment, removing small particles such as clay, silt and sand leaving coarse material behind
  - When the windblown sediments strike rock, they erode by abrasion

b. Abrasion and deflation occurs mostly in deserts, beaches and plowed fields

- In these areas there are few plants to anchor the sediments and nothing to hold the soil down

## B. Sand Storm

- a. Sand grains are too heavy for wind to lift high into the air so they stay about one-half meter from the ground
- b. In the sandy parts of deserts when wind blows with great force sand storms occur
  - These windblown sand grains form a low cloud



# West Texas – June 2002



# Sandstorm in Iraq





# C. Dust Storm

- a. When soil dries out it can be eroded by wind
- b. Soil particles weigh less than sand and a strong wind can pick them up and blow them high into the atmosphere
- c. Dust storms play an important part in soil erosion carrying the soil long distances



# Dust Storm



# Dust storm



Public Domain

**Texas 1935**

## II. Reducing Wind Erosion

- One of the best ways to slow or stop wind erosion is to plant vegetation

# A. Wind Breaks

- a. Farmers purposely plant trees along their fields to act as windbreaks to prevent soil erosion
  - As wind hits the trees, its energy or motion is reduced and the wind no longer has the energy to lift particles
- b. Tree belts reduce wind erosion and also capture snow and hold it on land, adding to the moisture of the soil



# Wind Break



The trees block the wind from picking up the dirt and stop wind from carrying dirt out of the field.

Stop  
Wind  
→



# B. Roots

- a. The best vegetation to plant to stop wind erosion is plants with fibrous root systems such as grasses
  - The roots hold soil in place

# III. Deposition by Wind

- Sediments blown away by wind are eventually deposited and these deposits develop into several types of landforms



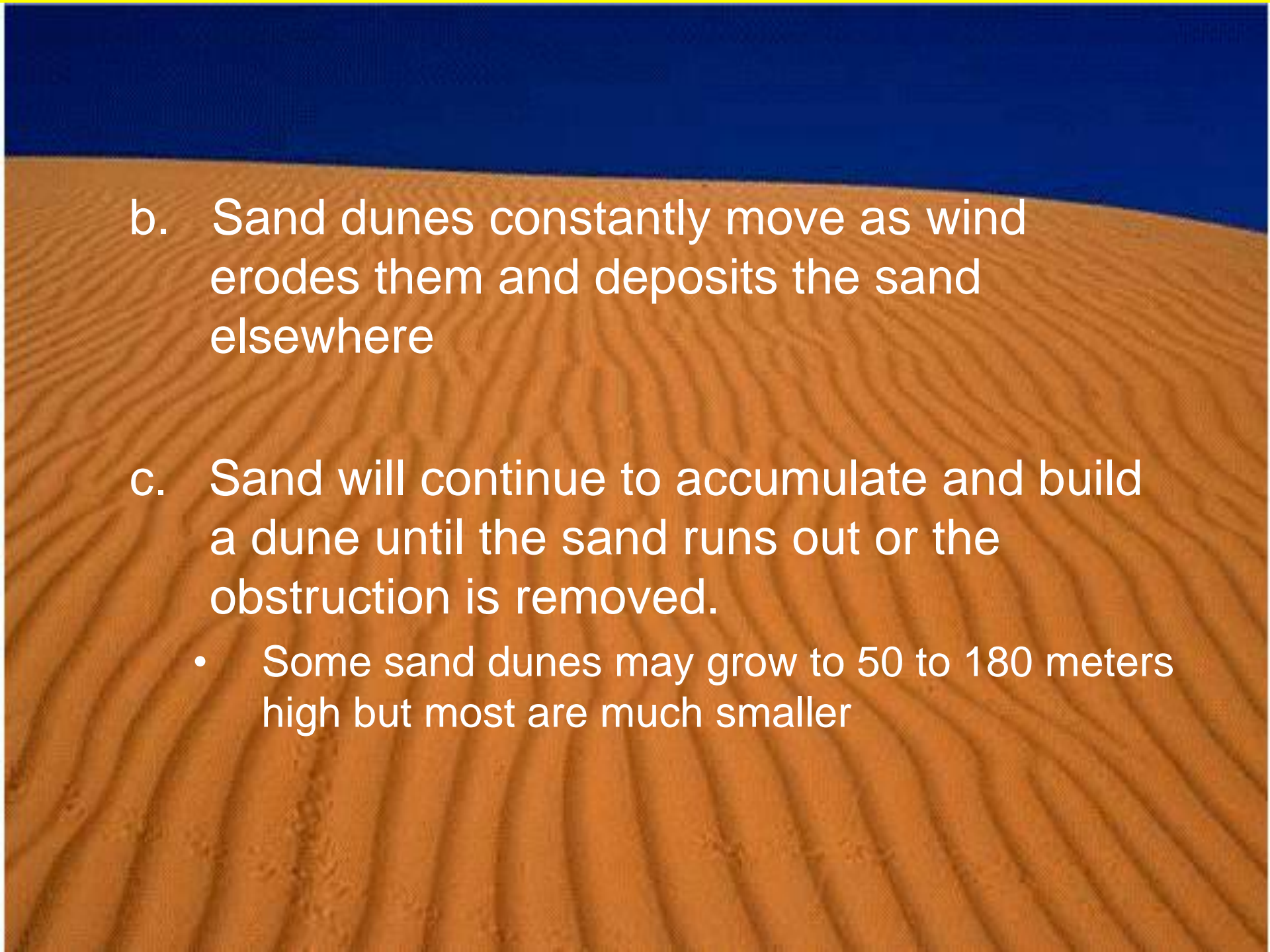
# A. Loess

- a. Large deposits of fine-grained wind blown sediments are known as Loess
- b. Strong winds carried the sediments and deposited them
- c. The particles became packed together creating a thick, buff-colored deposit lacking layers
- d. Loess is as fine as talcum powder (baby powder) and many farmlands of the Midwestern United States are on the fertile soils that have evolved from loess deposits

## B. Dunes

- a. When wind blows sediments against an obstacle such as a rock or a clump of vegetation the sediments settle behind the obstacle
  - Sediments build up and eventually a dune is formed
  - A *dune* is a mound of sand drifted by the wind



- 
- b. Sand dunes constantly move as wind erodes them and deposits the sand elsewhere
  - c. Sand will continue to accumulate and build a dune until the sand runs out or the obstruction is removed.
    - Some sand dunes may grow to 50 to 180 meters high but most are much smaller

# C. Dune Migration

- a. A sand dune has two sides and examining the shape of a dune tells you the direction the wind usually blows from





- b. Most dunes don't stay still they will migrate or move away from the wind
  
- c. Erosion and deposition are part of a cycle of change that constantly shapes and reshapes the land