What is the difference between

WEATHERING

and

EROSION?

I. What is weathering?

- **Weathering is physical and chemical processes that change the characteristics of rock on or near the earth's surface.**

TYPES OF WEATHERING

- ☞ **Mechanical**
- ☞ **Chemical**

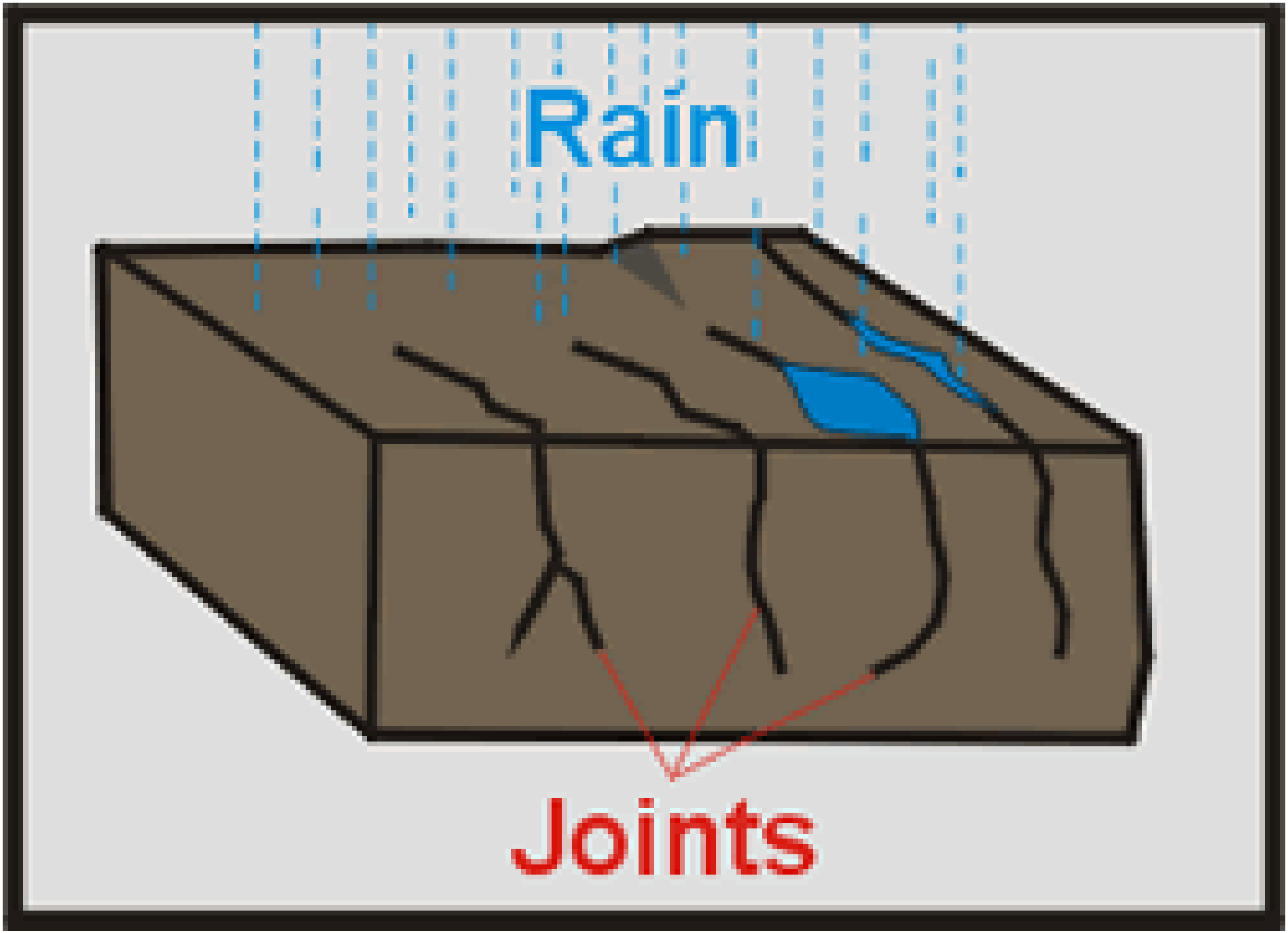
Effects of acid rain on limestone statues and buildings

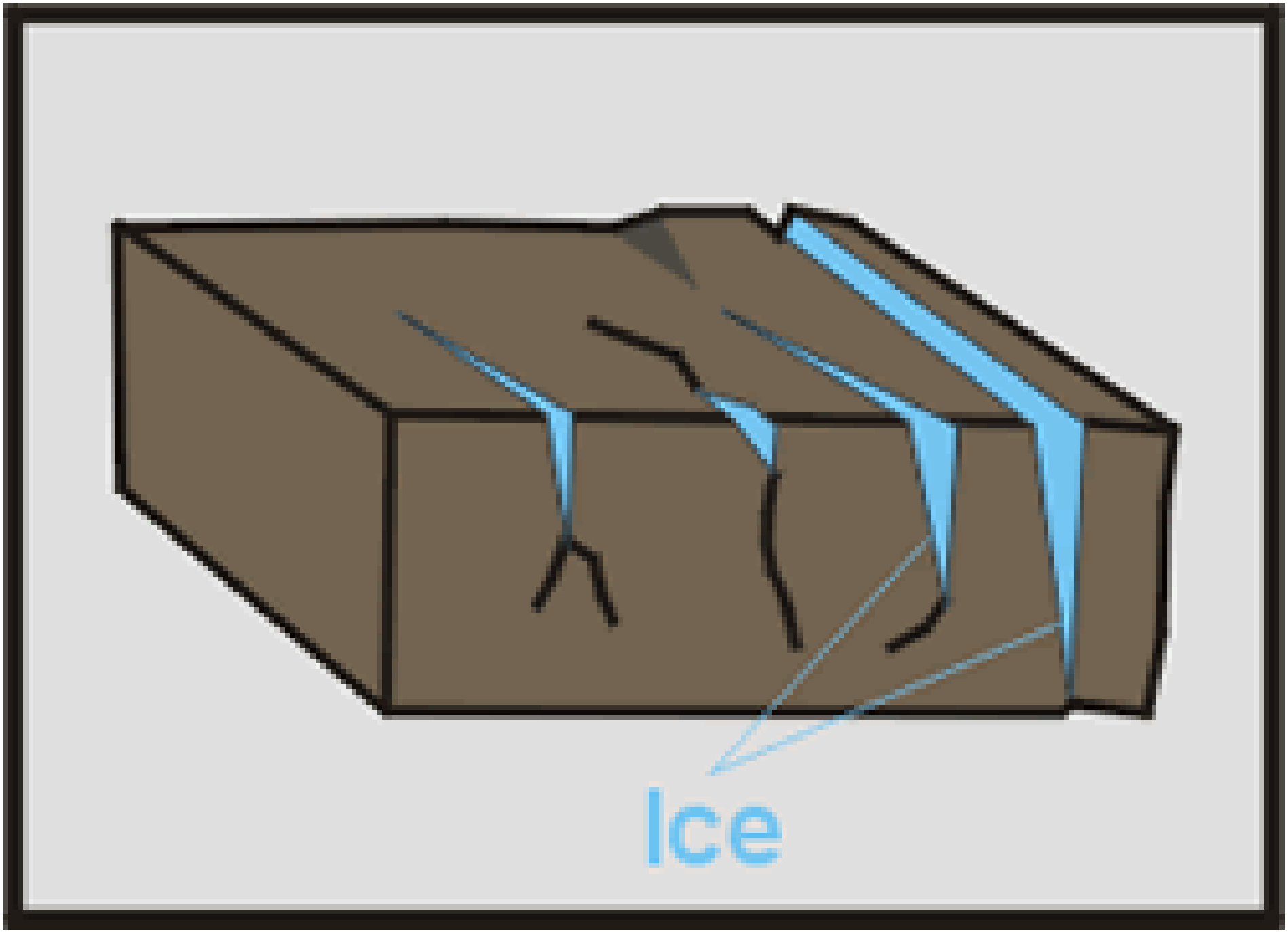
A. Mechanical Weathering

1. Breaks rocks down into smaller pieces.

2. Types of mechanical weathering: frost wedging, exfoliation, and thermal expansion.

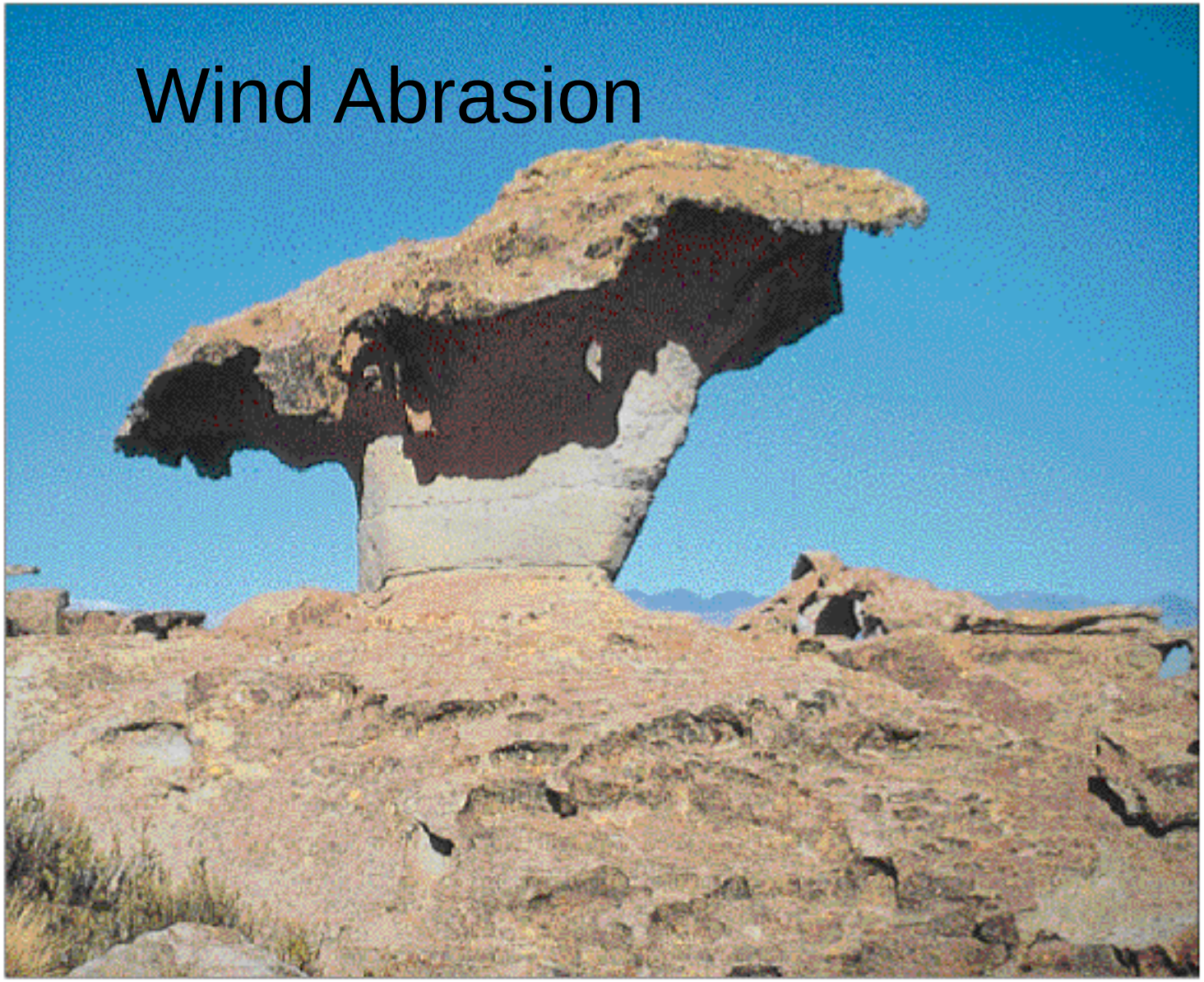
- **FROST WEDGING**


Rain
Joints


Ice

Fire shatters rock

Thompson and Turk: Earth Science and the Environment, 2/e
Figure 9.6



B. CHEMICAL WEATHERING

1. **Chemical weathering occurs when a rock is changed into a *new substance*.**

2. **A result of interaction between elements in the air or water and the minerals in the rock.**

Chemical Weathering
Acid dissolution

$$CO_2 + H_2O = H_2CO_3 = H^+ + HCO_3^-$$

$$CaCO_3 + H^+ = Ca^+ + HCO_3^-$$

II. Erosion

- **Movement of weathered material**

- **By wind, water, ice or gravity**

A. WATER EROSION

1. Erodes most often as running water in streams or rivers.

2. Water picks up loose material and moves it downstream.

B. GLACIAL EROSION

1. As a glacier moves, it grinds rock and cuts valleys into the land.

2. The glaciers carry away what it has broken off.

3. Glaciers move as a result of gravity.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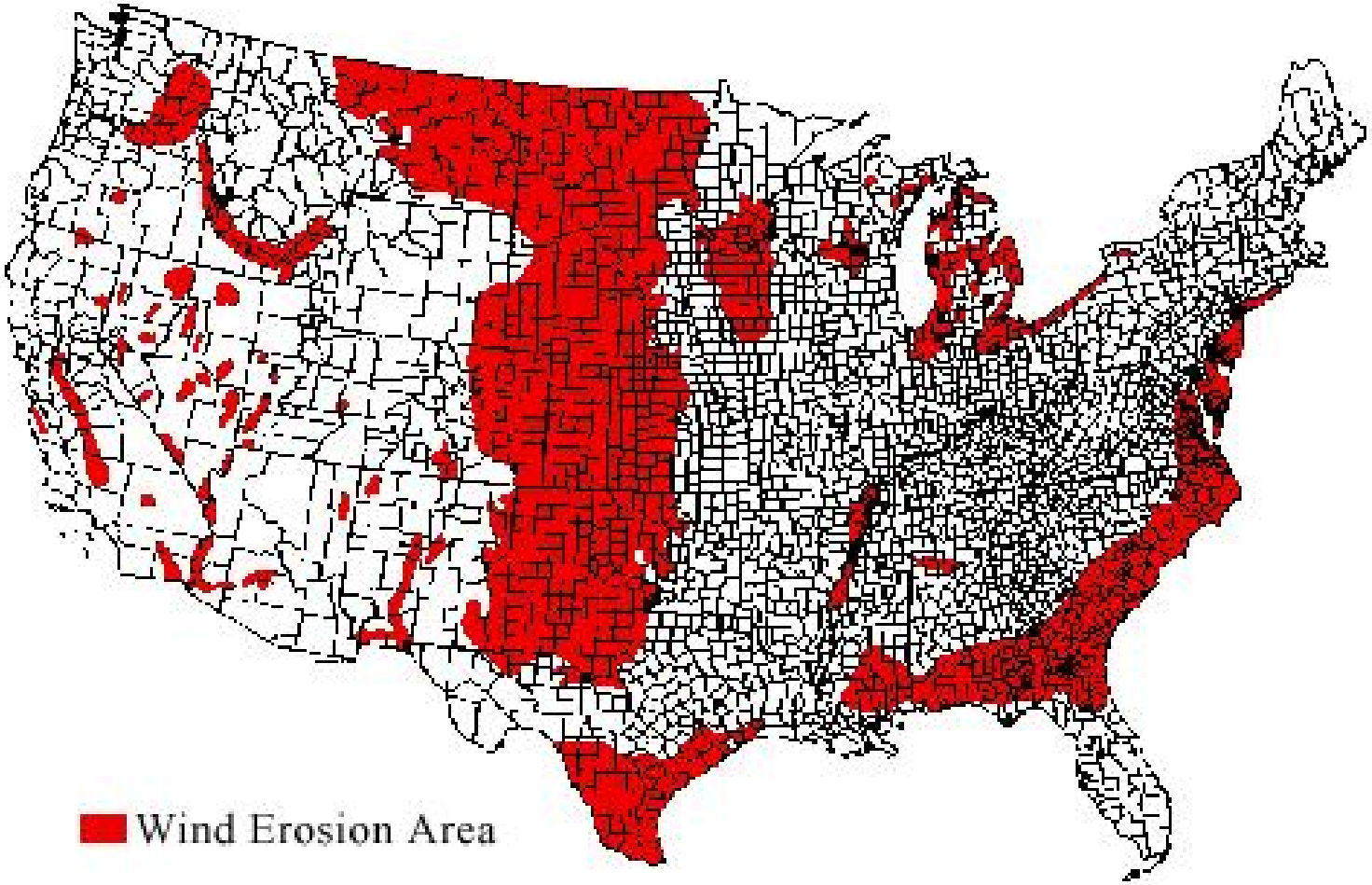
C. WIND EROSION

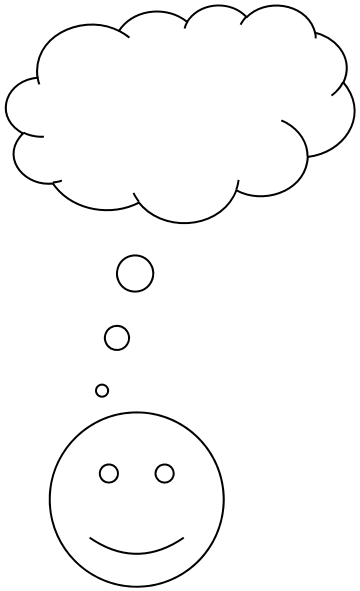
1. Carries away the weathered material.

2. The greater the speed of the wind, the larger the particles it can move.

- Wind erosion is a serious problem in many parts of the world. It is worse in **arid** and **semiarid** regions.



IN A NUTSHELL



1. **If a particle is _____, chemically or mechanically, but _____ _____, we call it weathering.**

2. Once the particle starts _____, we call it erosion