

❖ What is soil erosion?

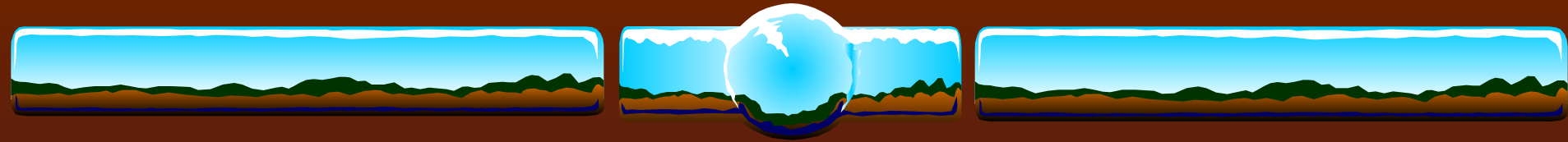
- ❖ I. *Soil erosion* is the process by which soil is moved. When soil is eroded, it may become pollution in the water or air. The land where it came from, loses fertility. Vegetation and other coverings help prevent soil erosion.



- ❖ There are two basic classes of erosion.
- ❖ **A. *Natural erosion*** occurs naturally and has made beneficial changes in the earth such as rounding off mountains and filling in valleys. The redepositing of soil forms new, highly fertile areas, such as the Mississippi Delta.
- ❖ Natural erosion is sometimes referred to as ***geologic erosion***. This means it has occurred on land not disturbed by humans.

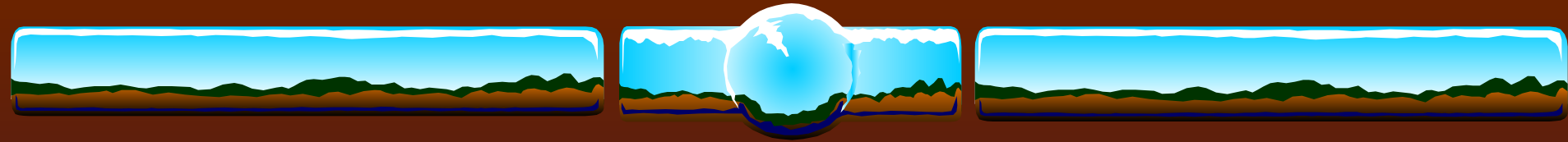


Mountains
worn down by
weathering
and erosion.

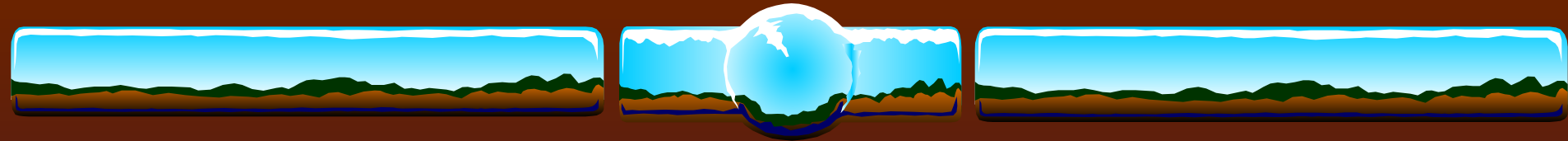


❖ **B.** *Accelerated erosion* removes topsoil at an excessive rate and usually results from human activity on the land.

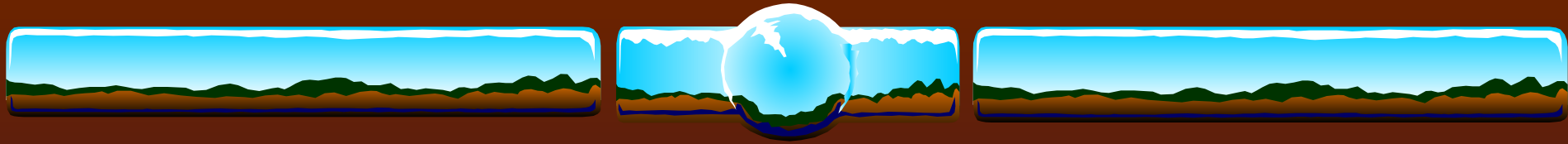




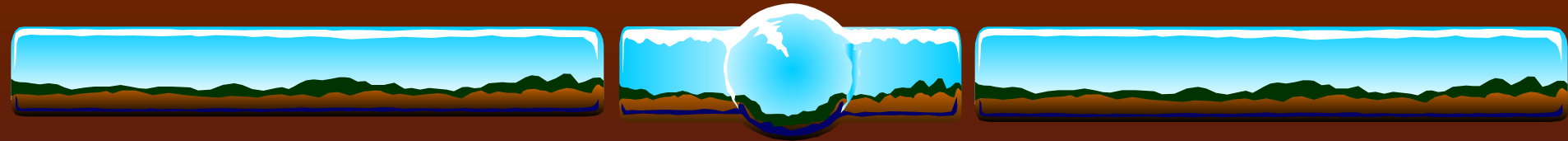
Objective 2: Identify the causes of soil erosion and steps in the erosion process.



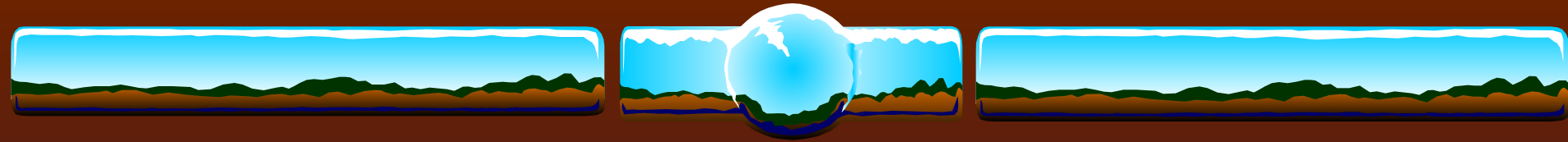
- ❖ What are the causes of soil erosion and steps in the erosion process?
- ❖ II. Erosion is caused by many different weather factors, such as wind, water, and glacial movement. When land is cleared of protective covering, it is much more susceptible to erosion.



- ❖ The erosion process involves three distinct steps.
 1. The first step is the loosening of soil particles.
 2. The second step is the moving of soil particles.
 3. The third, is the deposition of soil particles.

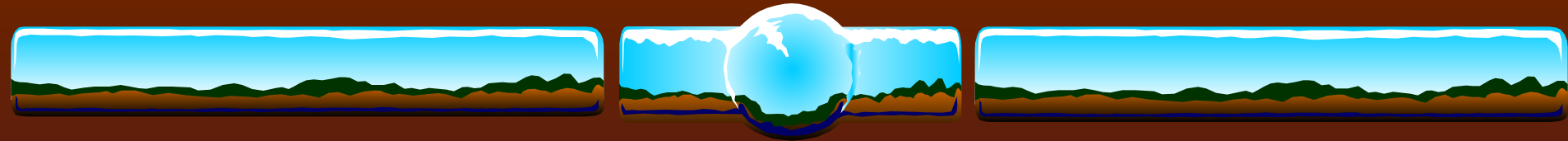


- ❖ There are four basic types of erosion.
- ❖ *A. Wind erosion* is the loss of soil due to the movement of wind over the land. It usually occurs in dry climates where the soil is loose. Wind erosion occurs on:
 - ❖ 1. newly-plowed fields.
 - ❖ 2. construction sites cleared by large equipment.
 - ❖ 3. land where vegetation has been grazed too short.



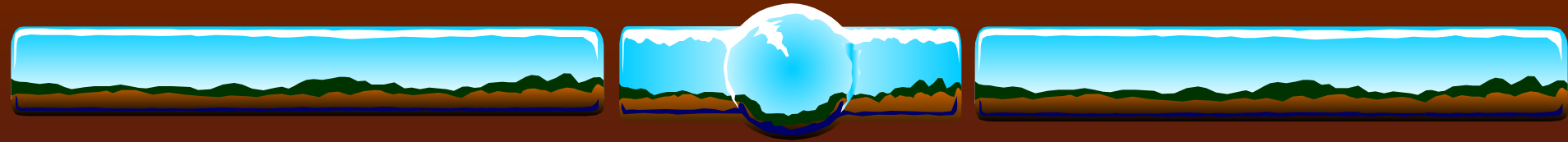
- ❖ **B. *Water erosion*** is the loss of soil due to water movement. It is the major cause of soil loss in North America. Water erosion occurs when excess rainfall creates runoff that carries soil away.



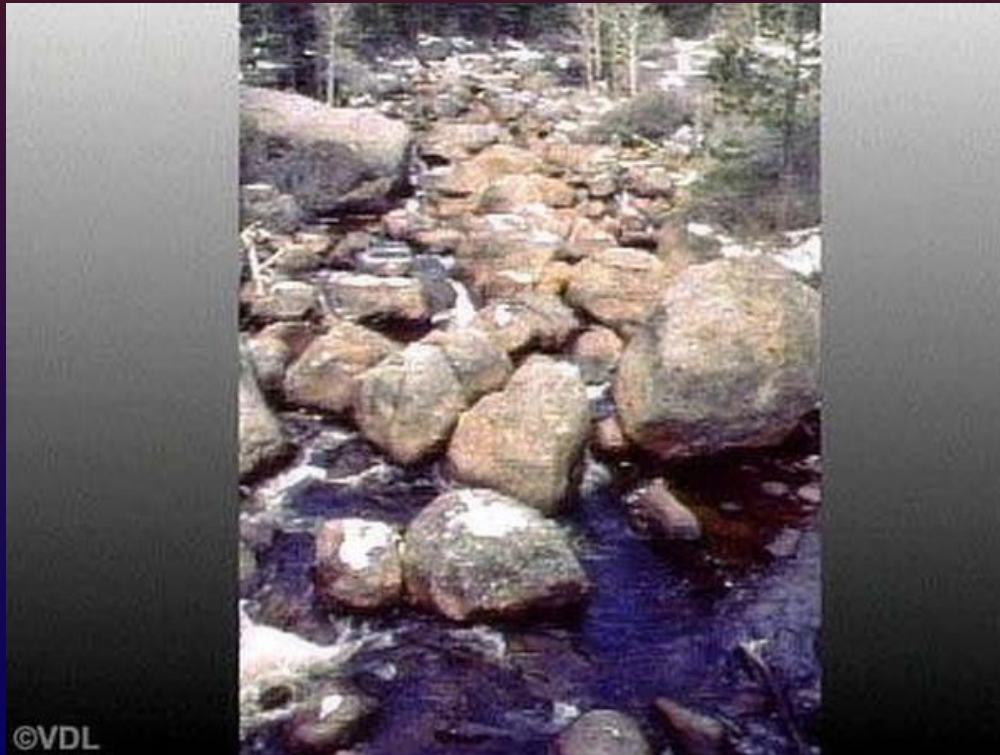


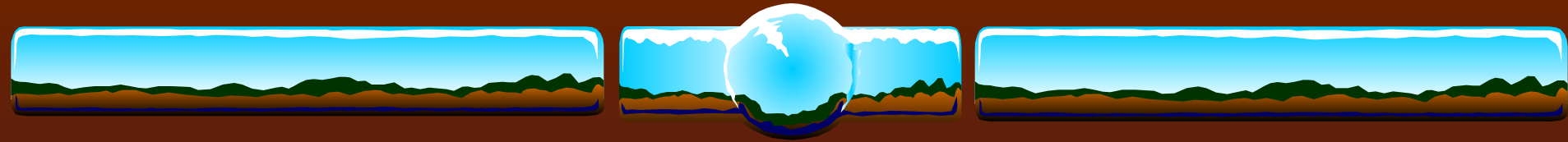
Examples to water erosion include:

- ❖ ***Runoff*** occurs when rain falls faster than it can be absorbed into the soil. Runoff water carries soil particles into streams and rivers. This causes water pollution and sediment.
- ❖ ***Sediment*** is the deposition of soil in the bottom of streams, riverbeds, ditches, etc.




- ❖ C. *Glacier erosion* occurs when the front edge of a glacier may push soil, rocks, fallen trees, and other materials. Soil erosion from glaciers is of minor importance except in areas where glaciers exist.





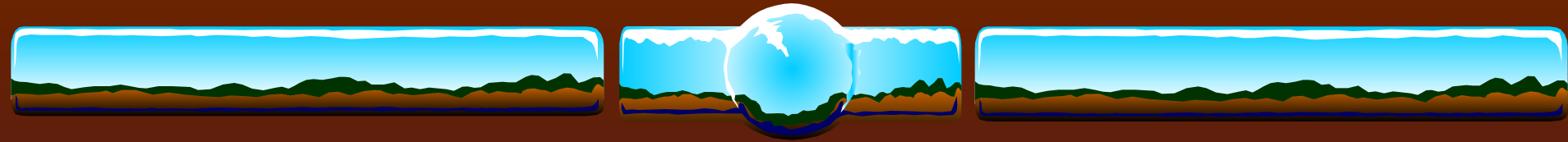
❖ **D.** *Land slippage* occurs on sloping land that is wet. Soil that is saturated with water, slips down the hillside or mountain slope. Land slippage is also known as mud slides or landslides. Banks along highways, streams, and ocean fronts are often subject to slides.



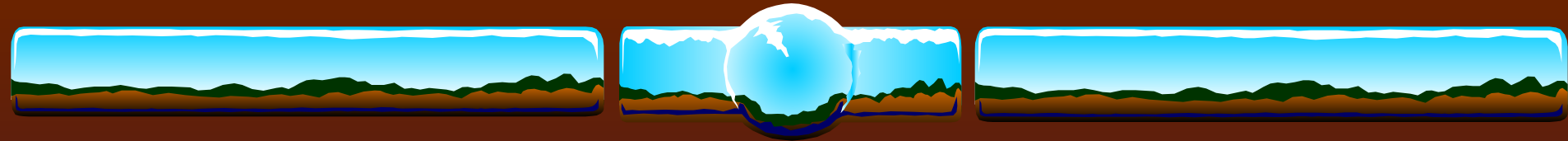


Objective 3: Explain the ways in which different types of wind erosion occur and the associated problems.

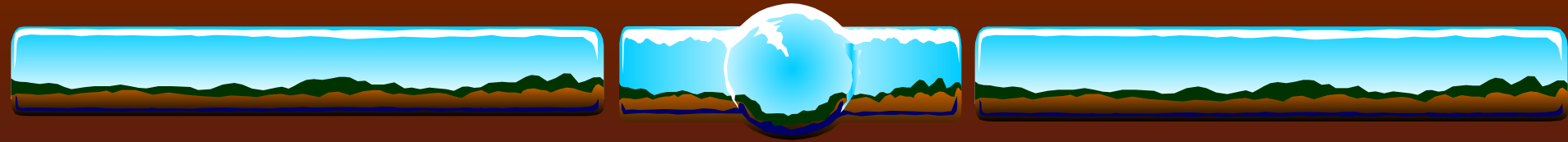
- ❖ *Anticipated Problem:* What are the ways that different types of wind erosion occurs and what problems are caused?



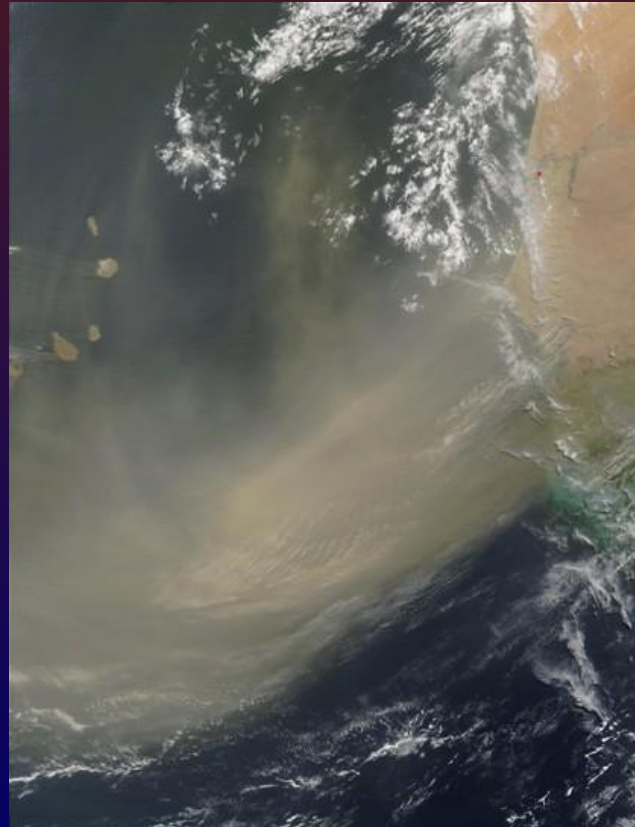
- ❖ III. Wind erosion causes air pollution, produces highway safety hazards, and fills drainage ditches. It occurs when persistent or frequent high-velocity winds and a dry, residue-free soil surface exist. Soil is moved by saltation, suspension, and surface creep.

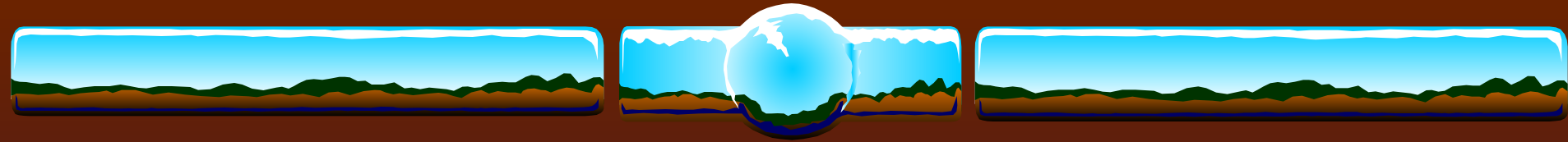


- ❖ **A. *Saltation*** occurs when the wind lifts medium-sized soil particles into the air. They are too heavy to remain in suspension, so they fall to the ground loosening other soil particles. This process repeats itself.
- ❖ Example: Laying on the beach on a windy day and the sand is blowing around.




❖ **B.** *Suspension* occurs when very small soil particles become airborne and enter the main airstream. They are carried in the same general direction as the wind. Because the soil particles are small, they remain in suspension.





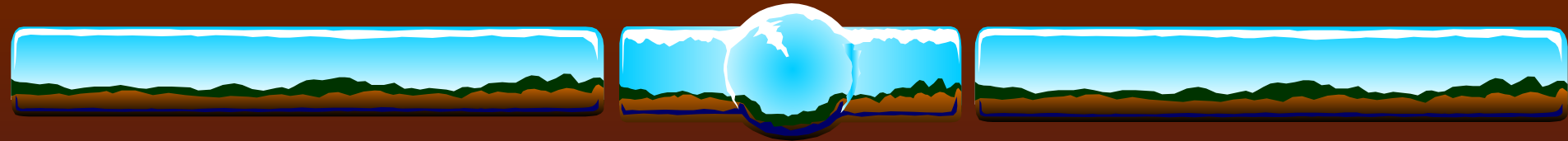
- ❖ C. *Surface creep* occurs as saltation takes place. The soil particles that are too heavy to be moved by saltation are moved along the surface by the impact of soil particles being displaced by saltation.

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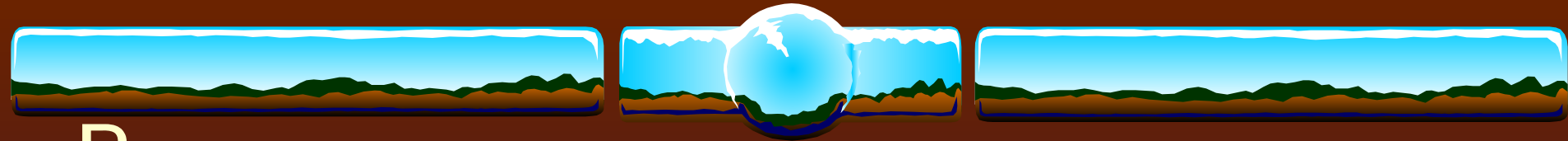
Objective 4: Distinguish between the different types of water erosion.

❖ *Anticipated Problem:* What are the different types of water erosion?


❖ **IV.** Three kinds of water erosion can occur. They are:



- ❖ **A. *Sheet erosion*** results when thin layers or sheets of soil are worn away. Sheet erosion can occur on nearly level land or on sloping land. If muddy water is moving off a field, sheet erosion is occurring. It may go unnoticed since no channels form. However, it may be just as problematic as erosion that is more apparent.



- ❖ **B. *Rill erosion*** usually occurs on sloping land where small channels are formed by running water. The signs of rill erosion can be masked by normal tillage practices.
- ❖ **C. *Gully erosion*** occurs when rills continue to wash away and become more severe. It is more likely on steeper slopes and cannot be smoothed by normal tillage practices.

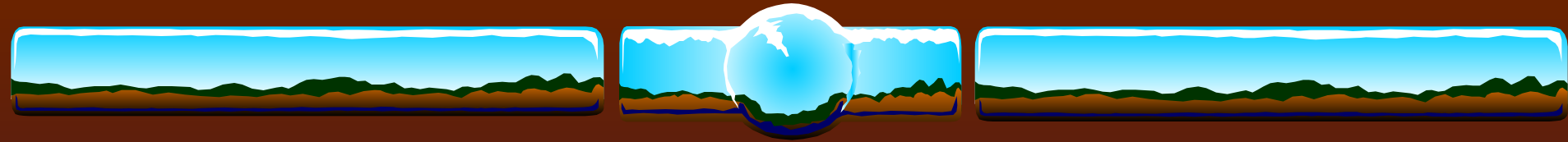


Objective 5: Identify urban management practices that will reduce soil erosion.

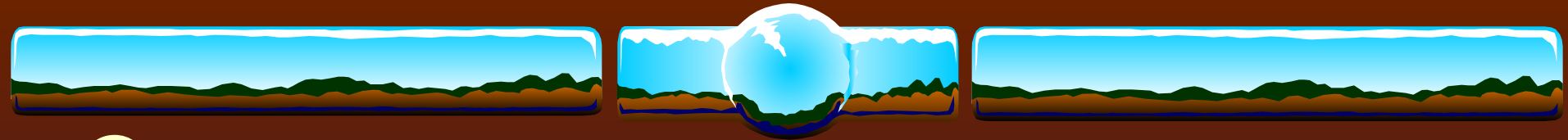
- ❖ *Anticipated Problem:* What are some management practices that can be implemented in urban areas to reduce soil erosion?
- ❖ V. In urban areas, the main concern is keeping the soil covered and controlling water runoff.



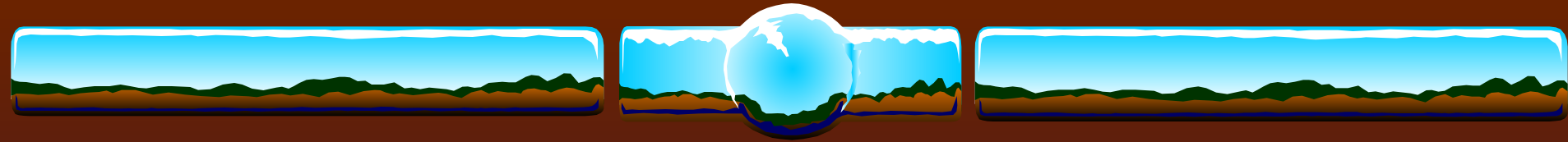
- ❖ This applies to construction sites, roads, parking lots, and recreational areas. Practices that help conserve soil in urban areas include:
- ❖ A. **Mulching** is placing a layer of straw, burlap, or other material on the top of soil to protect it from wind and water. Mulch helps hold water and reduce the impact of water flow.



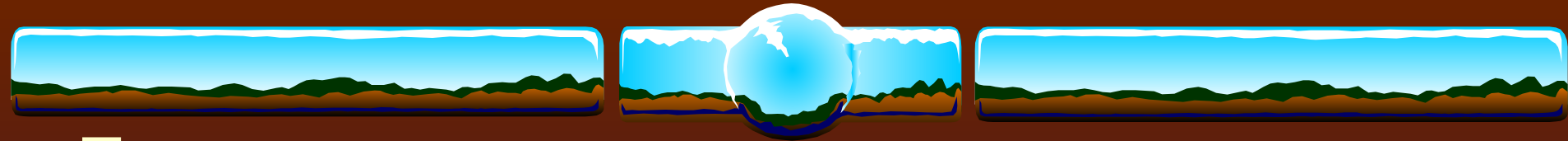
❖ **B.** *Silt fences* are placed at the bottoms of slopes to hold the soil yet allow the water to flow. This keeps sediment out of streams and lakes and prevents the loss of soil. Silt fences may be made out of bales of hay, plastic strips, or other materials.



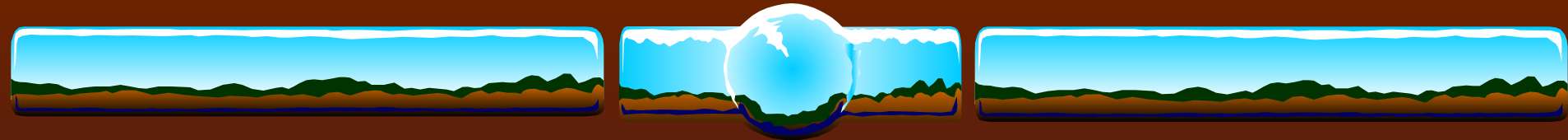
- ❖ **C. Cover crops**-Vegetation can be planted on excavated soil to hold it in place. Winter grass can be planted in the fall on new lawn areas to prevent erosion until the following spring when permanent sod can be established.
- ❖ **D. Building on the contour**-Streets, buildings, and other structures can be located on the contour of the land to slow water flow.



- ❖ **E. Stabilizing banks**-Creeks and roadsides often have banks that will quickly erode. Rip-rap, fabrics, straw, vegetation, and concrete are some materials used to stabilize banks.

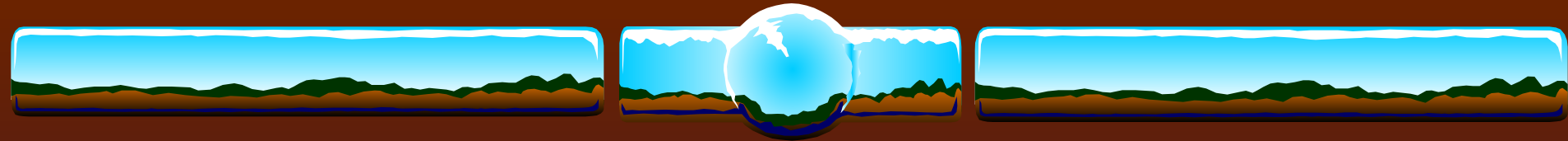


- ❖ **F.** Planting trees and shrubs-Trees and shrubs can be planted in areas where erosion is possible. The roots hold the soil. The limbs and leaves on the tree slow the impact of rain and fallen leaves cover the ground.
- ❖ **G.** Stormwater management-Curbs, ditches, and other structures may be installed to properly manage excess precipitation.

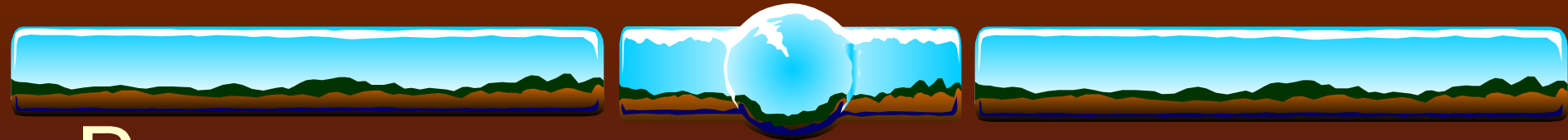


Objective 6: Identify management practices in agriculture that will minimize soil erosion.

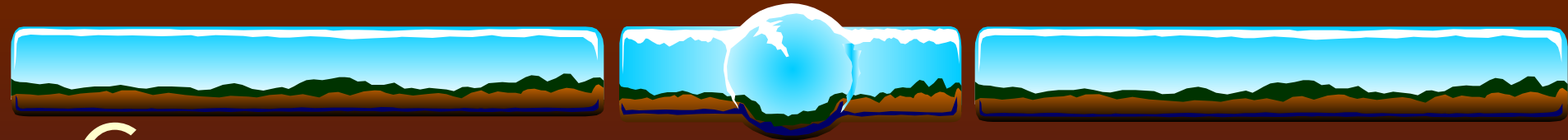
- ❖ *Anticipated Problem:* What management practices in agriculture will help minimize soil erosion?



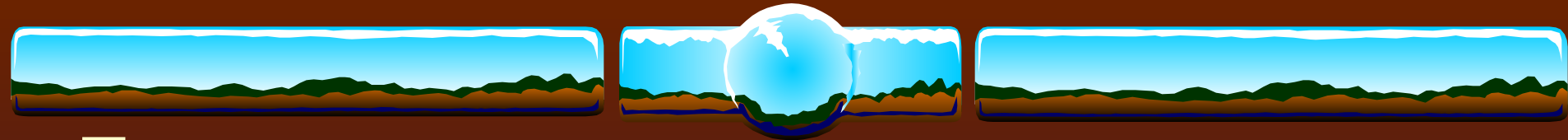
- ❖ **VI.** Agriculture utilizes the soil for growing crops. This creates loose soil that can be easily eroded. Several management practices can be implemented to reduce soil erosion.
- ❖ **A.** Plant on the contour-This involves planting around slopes rather than up and down them. This helps slow the flow of water and allows it to be absorbed rather than runoff.



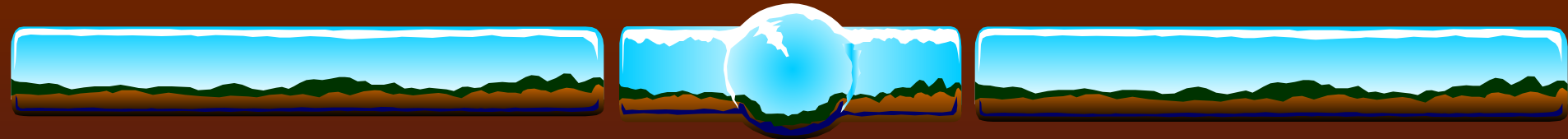
- ❖ **B.** Rotate crops-Planting different crops on land from one year to the next helps reduce soil erosion. It leaves residue on the surface to help hold the soil in place.



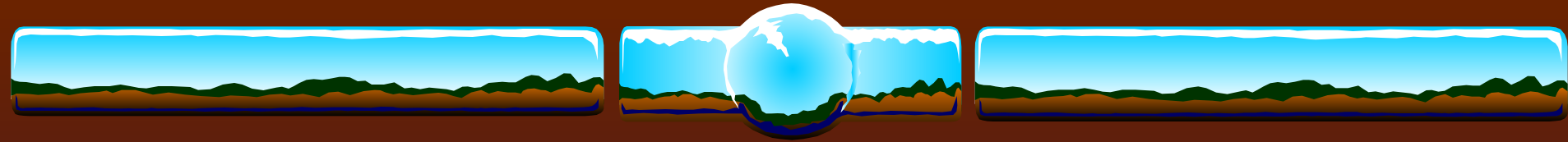
- ❖ **C.** Terraces-A ***terrace*** is a ridge or row of earth mounds placed across a slope. Terraces allow a gradual drop for the flow of water. This helps prevent rapid water flow and aids in holding soil in place.
- ❖ **D.** ***Grassed strips***-Small strips covered with grass may be left near plowed areas. This slows the flow of water and helps keeps gullies from forming.



- ❖ **E. *Diversion ditches***-Small ditches may be built across slopes to slow water movement and divert it into a safe outlet. They are similar to grassed waterways, but may be lined with riprap or other material.
- ❖ **F. *Strip cropping*** is planting alternating strips of crops on sloping land. The strips slow the flow of water and hold the topsoil in place.



- ❖ **G.** Vegetative covers-Fields may be planted in winter-cover crops after fall harvest. The cover crop adds fertility and protects the soil from erosion.
- ❖ **H.** *Conservation tillage* involves planting crops with little or no plowing. Crop residue from the previous year is left on the surface to protect the land.



- ❖ 1. **Windbreaks**-Rows of trees may be planted to slow blowing wind and help prevent wind erosion.