



STATE FOREST NOTES

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SOIL EROSION DEFINITIONS

These terms are used frequently to describe soil erosion. A definition for each of the terms is printed here to establish a common understanding and to provide a means of accurate communication between persons dealing with soil erosion and soil erosion control measures. Some *features* of soil erosion, as well as some *processes* of soil erosion are defined. While standard references in this subject area have been consulted to obtain definitions, many of the definitions have been modified when such modification was appropriate. Comments should be sent to the address listed above.

Soil as defined in:

engineering geology:

Any unconsolidated Earth material composed of discrete solid particles with gases or liquids between; such material can be excavated by earth-moving equipment without blasting.

geology:

All materials produced by weathering in place, no matter how deep they are or whether they are used by plants; such a soil may have been formed in the past and subsequently have been buried by natural geologic processes so that it is far below the present root zone.

silviculture and agriculture:

The soil profile; the weathering uppermost layers of the Earth's surface deposits in which plants anchor their roots and from which they derive the nutrients and water necessary for growth; has properties resulting from the overall effects of climate, relief, organisms, organic matter, parent material, and time.

Erosion:

The process by which soil and rock are detached and transported by running water, wind, ice, and gravity. The energy for erosion is obtained from either gravity or climate. Includes:

accelerated erosion:

Erosion at a greater rate than natural erosion, usually brought about by the influence of man's activities in disturbing or destroying the natural cover, and sharply reducing the resistance of the land surface and rate of infiltration of water. Accelerated erosion may be caused by deforestation, improper cultivation of soil, overgrazing of rangelands, burning and clearing natural vegetation, excavation for buildings and highways, urbanization of drainage areas, or strip mining.

channel erosion:

Erosion in which material is removed by water flowing in well-defined channels; erosion caused by channel flow. Cf: sheet erosion; rill erosion; gully erosion; stream bank erosion.

creep:

The slow, mostly plastic, and continuous downslope movement of superficial soil or rock debris, usually imperceptible except to observations of long duration, slower than a slow earthflow; less than 1 ft/10 years.

cut landslide:

Movement of masses of rock and soil as the result of man-made cuts, not necessarily limited to the cut.

detachment (soils):

Separation of transportable particles from a soil layer, usually by running water, raindrop impact, wind or gravity

dry ravel:

Downslope movement of sediment particles or small rocks on steeper slopes without flowing water. The particles are dislodged by a combination of gravity, changes in temperature and wetness, wind, and animals, including man.

energy dissipation:

Loss of kinetic energy as flowing water moves to a lower level; the energy represented by the head loss may be dissipated by detachment of soil and/or rock if the force attaching those particles to the substrate is exceeded by the frictional force of the water, or the energy can be dissipated without erosion, either in a man-made structure or by natural means.

fill landslide:

Movement of masses of rock and soil as the result of fill placed by man, not necessarily limited to the fill.

geologic erosion:

Syn: natural erosion.

gully erosion:

Erosion of soil or soft rock material by running water that forms distinct narrow channels that are 1 square foot or more in cross-section and that usually carry water only during and immediately after heavy rains or following the rapid melting of ice or snow.

harvested area landslide.

Movement of masses of rock and soil after the timber in an area has been harvested; movement that appears to have resulted from the removal of the trees.

landslide: (see chart)

The term "landslide" denotes downward and outward movement of slope-forming materials composed of natural rock, soils, artificial fills, or combinations thereof. Landslides move along surfaces of separation by falling, sliding, and flowing. Parts of a landslide may move upward while other parts may move downward. The event may occur with a speed of 100 ft/sec or as slow as 1 ft/5 yrs. Five types of landslides associated with timber harvesting can be identified: cut landslide, harvested area landslide, natural landslide, fill landslide, and stream bank erosion.

mass movement:

Syn: mass wasting.

TYPE OF MOVEMENT	TYPE OF MATERIAL			
	BEDROCK		SOILS	
<u>FALLS</u>	<u>ROCKFALL</u>		<u>SOILFALL</u>	
<u>FEW UNITS SLIDES</u>	ROTATIONAL <u>SLUMP</u>	PLANAR <u>BLOCK GLIDE</u>	PLANAR <u>BLOCK GLIDE</u>	ROTATIONAL <u>BLOCK SLUMP</u>
<u>MANY UNITS</u>		<u>ROCKSLIDE</u>	<u>DEBRIS SLIDE</u>	<u>FAILURE BY LATERAL SPREADING</u>
<u>DRY FLOWS</u>	ALL UNCONSOLIDATED			
	ROCK FRAGMENTS <u>ROCK FRAGMENT FLOW</u>	SAND OR SILT <u>SAND RUM</u>	MIXED <u>LOESS FLOW</u>	MOSTLY PLASTIC
<u>WET</u>			<u>RAPID EARTHFLOW</u>	<u>DEBRIS AVALANCHE</u>
	<u>SAND OR SILT FLOW</u>		<u>DEBRIS FLOW</u>	<u>SLOW EARTHFLOW</u>
<u>COMPLEX</u>	COMBINATIONS OF MATERIALS OR TYPE OF MOVEMENT			

Classification of landslides. (Committee on Landslide Investigations, 1958.)

mass wasting:

Movement of soil or rock on slopes by gravitational forces and not directly by running water, usually involving movement of a portion of the land surface. It includes slow displacement such as creep, and rapid movements such as earthflows, rockslides, avalanches, and falls: Cf: landslide.

natural erosion:

Erosion of rocks and soil under natural environmental conditions, undisturbed by human activity. It includes erosion by running water, rain, wind, ice, waves, gravity, and other geologic agents. Cf: accelerated erosion.

natural landslide:

Movement of masses of rock and soil in areas as yet undisturbed by man.

rill erosion:

The development of a channel or channels with less than 1 square foot cross-section, initiated by numerous irregularities in the ground surface and resulting in the uneven removal of surface soil by running water that is concentrated in streamlets of sufficient volume and velocity to generate cutting power. It *may* be an intermediate process between sheet erosion and gully erosion — a rill may become a gully or it may be buried by subsequent deposition of transported sediments.

sheet erosion:

Erosion in which thin layers of surface material are gradually removed from sloping land by storm run-off in minute, numerous, and localized pulses of running water flowing overland rather than by streams flowing in well-defined channels.

splash erosion:

The dislodgment and movement of soil particles under the impact of falling raindrops.

stream bank erosion:

Erosion in which soil or rock on or composing the banks of the stream is undercut by water flowing in the stream and is removed by the flowing water; soil and rock deposited in streams by landslides is removed by this process.

transportation:

The actual movement, shifting, or carrying away by natural agents (such as flowing water, ice, wind, or gravity) of sediments, soil or loose, broken, or weathered material, either as solid particles or in solution, from one place to another on or near the Earth's surface, e.g. the conveyance of soil, mud, sand, and dissolved salts by a stream, the drifting of sand along a seashore under the influence of currents.

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