

Introduction to Landscape Analysis

I. Introduction

A. Geomorphology: The study of surface landforms, processes and the historical evolution of continental landscapes.

B. Landscape Elements

1. Landforms – topographic shape and form of the landscape
2. Material – Earth materials that underlie and comprise the landforms
3. Process- physical processes of erosion or deposition that create the landforms
4. Age – the time in the past at which the processes primarily created the landforms

II. Landform

A. Topographic shapes at the Earth's surface: hills, valleys, slopes, flats

Examples: river valley, volcanic mountain, cinder cone

III. Material

A. Bedrock: igneous, sedimentary, metamorphic

B. Regolith: unconsolidated material = "sediment" = sand, silt, clay, gravel; poorly sorted, well sorted,

IV. Processes

A. Categories

Constructional = Deposition e.g. sand dune

Destructional = Erosion e.g. river valley

B. Landforming Agents

Wind = "Eolian"

Water = rivers = "Fluvial"

Ice = glaciers

Gravity = mass wasting

Tectonics and Volcanism

C. Deposit Types Related to Process

Alluvium = river deposits

Colluvium = mass wasting deposits

Till and Outwash = glacial deposits

V. Age /Time (Landscape Evolution and Rates of Change)

A. Landscape Evolution: concept of progressive change of landforms in response to surface processes operating over a period of time.

1. Landforms/landscapes will display characteristic features at successive stages of development.

a. Provides an avenue for relative dating of landforms on the basis of developmental stage

(1) If rates of process/change are known, ages of landforms and landscapes can be determined through deductive reasoning

B. Time is an essential ingredient in any geologic process

1. In terms of geomorphic process, variable levels of time are required for desired products of change

a. e.g. time scale variation between slow steady-state soil creep vs. instantaneous slope failure

C. Geologic Time Periods Related to Landscape Development

Quaternary Period: 10,000 to 1.8 million years ago

Pleistocene Epoch: 1.8 m.y. – 10,000 years ago

Holocene Epoch: <10,000 years ago

D. Cyclicity and Time: Geologic processes are by nature cyclic and repetitive over time (e.g. flooding, earthquakes, eruptions)