

Notes WEATHERING AND EROSION

Weathering – the wearing down of rock material into finer particles

Mechanical Weathering – physical changing of the rock

Frost action – ice freezing , ice expands and breaks the rock, thaws, refills

Abrasion – wearing down of the rock by scouring of smaller materials, sand, pebbles

Wetting and drying – the alternating of expanding

Foliation – the cracking of rocks in long thin sheets over a dome are rock area

Jointing- cracks created by the cooling of rocks that get acted upon by frost action and break the rock into large chunks

--the climate must be cool to cold (water must freeze) and thaw and wet/humid

Chemical weathering – the rock changes from one composition to another

Oxidation – reacts with oxygen to form clay

Hydrolysis – reacts with water to form clay

Acid – carbonates dissolve, carbonic acid

--climate must be warm and wet – chemicals, enzymes only work when warm, work very slowly when cold

Rates of Weathering

Very hard rocks are resistant to weathering, metamorphic (in general), or those rocks with a silica base, igneous rocks

Very soft rocks are not resistant to weathering, break apart easily, water gets into cracks easily: shale, rocks “glued” together by cement that is reactive to acid

Soils can be classified as:

Parent material – bedrock of the area that is being breaking down

Residual soil – created by weathering and remains in the same place

Transported soils – soils brought in from a different area – parent material is not local, brought in by water motion, glaciers, wind

Soil Profile

Soil Horizons Topsoil – humus- dark made of soil and organic matter

Subsoil – made mostly of clay infiltrated through lighter color

Broken down bedrock/parent material – weathered from rock underneath

Bedrock/Parent material – rock underneath

Mass movement

Creeping –slow, unnoticeable motion down a slope, soil is usually semi-dry

Talus – the pile of rock, rubble at the bottom of a slope

Mudslide-water aids the the “liquidification” of the slope

Landslide

Pg146 Review 1-17; P147 I&A 1, 3; Critical Thinking all

WATER BUDGET

Water cycle – discuss briefly

Evapotranspiration – visual set up with container w/ dirt, water, lit lamp, plant - pour water through the system. Discuss evaporation and transpiration

Define:

Precipitation – water being “added” to the ground system

E_p – the maximum amount of water that could evap. W/ extreme climate for the area

E_a – actual amount of water that evap for the month using real weather and temp for that point in time

S_t – the amount of water in the ground “ground water” rises and lowers according to evaporation and E_p

S – when storage is full and P surpasses E_p , shows itself as surface water and runoff

D – when storage is empty and P is under E_p requirements. Dry conditions

Discuss – wet conditions characteristics, discuss dry condition characteristics

Do 2 exmple of water budgets – step by step for all.

Porosity – amount of water soil or rock can hold, dependent on pore space –

Shape – round has a lot of space between

Flat angular fit tightly together

Sorting – well sorted material has a lot of space, not sorted has little space between

Cement – amount of cement used to glue a rock together

Permeability / impermeable – rate at water passes through a rock or soil

Increases w/ grain size. The bigger the grains the faster water pours through

Water Table

Zone of saturation

Zone of aeration

Capillary fringe

Discuss regular well

Hillside spring

Aquifer

Artesian well

Geyers, hot springs – briefly discuss Old Faithful, Saratoga Springs

Minerals in the water – show a teapot with built up gunk – discuss how to get rid of built of minerals in appliances and equipment

Caverns – Limestone being dissolved and deposited by running water, carbonic acid
Carlsbad Caverns , NM, Howe Caverns, NY show slides.

P166 Review 1-15 Multiple Choice - answers only

Interpret & Apply 3, 5, 7

C.T.A 1-6

EROSION AND DEPOSITION OF MATERIALS – Chapter 10

Running Water – mechanical weathering/erosion abrasion, chemical

Materials are carried in three ways

Solution – dissolved materials ie calcite, limestone salt -Koolaid solution

Suspension – muddy water, sand , silt, clay – Glass of stirred muddy water

Bed load – large cobbles, pebbles

Carrying Power and Load – discuss different particles with their sizes and ESRT chart

V- shaped valleys, canyons, widening creating canyons, gullies, gorges, chasms

Baselevel

Pothole, very large potholes are called plunge pools

Undermining

Flood Plain,

Meanders

Oxbows, oxbow lakes

Deltas – fan shaped deposits at the mouth, change is carrying load, distributaries

Alluvial Fans – at a mountain base where debris falls in a fan shape, semiarid regions

Pg 188 Review 1-21

CT 1-4

Flash floods – upriver major thunderstorm occurs and water washes through the drainage area, narrow valley of a young mountain stream

Dams breaking

Preventing floods – natural vegetation encouraged – particularly marsh and swamp areas to remain and left, less concrete, trees, grass

Stream Divides and River systems

P188 Review and
I/A #3, 5 CT 1-4

GLACIERS- a very large (1-2 miles thick) ice block that moves across an area
Alpine glaciers & Valley glaciers – move downhill through 2 mountains/ranges
Continental ice sheet moves across a wide expanse of land
More snow precipitates than evaporates giving build up over time 1-2"/year

As snow accumulates the ice moves kind of like gelatin, very slowly over several years.
Warm based glaciers – have a thin layer of water on the bottom, some volcanoes are actually under the glaciers – causing a river underneath
Cold based glaciers – actually frozen to the bedrock – pull on the rock **plucking**
The middle moves fastest compared to the bottom and the sides. Ice will crack over large drops of steep hill sides due to gravity - **crevasses**

Snow changes by being partially melted due to friction and pressure and compaction into dense, heavy ice very little air – blue ice

U- shaped valleys

Hanging valleys

Cirque valley

horns

Erratics- rocks and boulders carried by the ice get rounded and scraped and abraded. They get dropped into the land helter-skelter

Striations – long N/S scratches made by the glacier

Moraines – lateral, medial, terminal

Drumlins, made from unsorted till, run in N/S fields good source of gravel for building

Kettle/ lakes

Reasons for glaciers: