

Glaciers

Glaciers: large masses of ice on land

Types: (1) **Valley** (alpine); form in mountain heights and flow downhill;

(2) **Continental**: covers nearly entire land surface; flows very slowly; cross-section looks like a convex lens;

Ice caps: masses of ice at poles; Arctic ice cap (not a glacier); Antarctic ice cap (continental glacier)

Glaciers need low temperature and enough moisture

Glacial budget = **accumulation** (snowfall) minus **ablation** (melting, iceberg calving, sublimation, wind erosion)

Glacial flow: dry glaciers—plastic flow; wet glaciers—basal slip

Crevasses form in upper parts of glaciers due to brittle cracking

Glacial landscapes

tremendous erosion power grinds and plucks from base and sides of moving glacier;

Rock flour: fine powder (may be blown and form loess deposits)

Striations: grooving of pavement rocks

Roche moutonnee: small glacial bedrock hills

Cirque: headwall area of valley glacier

Arete: divides between valley glaciers

U-shaped valley: characteristic cross-section carved by glaciers

hanging valleys: tributary valleys left high above main valley floor

Fjords: steep valley entering ocean, base below sea level

Glacial sedimentary landforms:

drift: general term for all material of glacial origin

till: poorly sorted sediment left by melting ice

erratics: large boulders left in till

outwash: drift sorted and redeposited by outwash streams, leads to loess

moraine: accumulation of material carried by ice:

end moraine: ice front deposits; **terminal moraine** (farthest advance)

lateral moraine: deposits on side of glacial valley

medial moraine: lateral moraines of joining glaciers

drumlins: large, streamlined hills of rock

kames: small hills of sand and gravel near edge of ice

varve: seasonally alternating layers of coarse and fine glacial sediment (fine-winter; coarse-summer)

eskers: sinuous ridges (meltwater streams flowing in tunnels beneath glacier)

kettles: melting of individual ice blocks during glacial retreat

Causes of glaciation: combination of continental drift and Milankovitch cycles