

Medium- and large-scale erosional forms GES-441

Medium Scale

Whalebacks - smoothed on all sides, no plucked face, all abrasion, high pressure

Rock drumlins – smoothed on all sides, no plucked face, steeper upglacier side, high pressure

Roche moutonnee - abraded upglacier side, plucked downglacier side; high pressure on stoss (upglacier) side, cavity on downglacier (lee) side.



Roche moutonnee near Bar Harbor, Maine. Ice flow was from left to right.



Roche moutonnee. Note abraded slope to right and plucked face on left. Ice flow was from right to left. From Andersen and Borns, Ice Age World.

Crag and Tail - resistant rock protects softer rock just down glacier. Softer rock is streamlined in tail



Crag and tail. Ice flow from left to right.

Grooves - elongated features formed by glacial abrasion and/or meltwater, can be influenced by rock structure
Meltwater channels - subglacial - N-channels - can flow up and down
lateral, proglacial

Large Scale

Areal scouring - landscape where every feature has been affected by glacial erosion - warm-based ice



Areal scouring in Yosemite National Park.

Troughs - deep linear features, often the sites of **selective linear erosion** and channelled flow, commonly U-shaped, when submerged – **fjords**



U-shaped glacial valley – Yosemite Valley.



Fjord. Photo from G. Denton.

Hanging valleys - tributary troughs cut at slower rates than main trough

Cirque - alpine landform, bowl-shaped depression carved into mountain



Cirque on Mt. Katahdin, Maine. From G. Denton.

Arete - ridge between two cirques

Horn - remnant of mountain peak surrounded by cirques



The Matterhorn (Switzerland). From G. Denton.

Giant stoss and lee - asymmetrical hills, steeper on downglacier (plucked) side

Tunnel valleys - broad, long valleys commonly on shelf, may end abruptly, origin uncertain

Scabland topography (from outburst flood)

1) scabland complex - waterfalls, potholes, fluvial incision

- 2) streamlined residual hills
- 3) scour marks
- 4) giant bars and current ripples