

Summer School in Glaciology, Fairbanks/McCarthy, 2010

**Lecture outline: Glacial geomorphology**

Glaciers are efficient erosional agents

How do we know? How do we measure erosion?

Sediment discharge

Sediment volumes

Cosmogenic radionuclide concentrations in deglaciated terrain

Compilations

Processes. Key: All require sliding at the bed

Abrasion

Hallet's  $u^2$  rule

Quarrying

The role of water pressure and its variation in time

Key erosional features and how they have been modeled

Small scale. Roche moutonee, striations...

U shaped valleys. Harbor. Modeling strategy...

Longitudinal profiles. MacGregor

Hanging valleys

Steps and flats in valleys

Fjords

Overdeepenings, sills. Kessler

The role of ice drainage capture, topographic steering

The essence: glacial valleys simply explained

Ice discharge as a proxy for erosion

The roles of rock type

Duhnforth results from Yosemite

Fractures count

The Teflon peaks hypothesis

How you get really big mountains

Hard rock, lacking fractures...role of granites... Denali, Manaslu, Trango...

Avalanches both remove erosional agent and supply it to glacier below

Peaks can go high and potentially turn polar, further reducing erosion

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