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

References
Anderson, R.S., Teflon peaks: the evolution of high relief in glaciated mountain ranges. AGU Fall meeting 2005.


