

Glacial Geomorphology – Lecture outline and references
Michael G. Loso, Alaska Pacific University
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1. Erosion

- a. Erosion mechanisms -**
 - i. Abrasion** (Hallet, 1979)
 - ii. Quarrying** (Iverson, 1991; Hallet, 1996)
 - iii. Solution** (Hallet, 1976; Anderson, 2005)
- b. Erosion effectiveness**
 - i. Compared to rivers** (Hallet and others, 1996; Koppes and Montgomery, 2009)
 - ii. By glacier type and location**
 - 1. Glacier size and thickness**
 - 2. Bed condition / temperature**
 - 3. Location under glacier** (Anderson and others, 2006)
 - iii. By subglacial condition**
 - 1. Bedrock / sediment**
 - 2. Rock hardness** (Hallet, 1979)
 - 3. Water pressure** (Bartholomaeus and others, 2008)
- c. How do we measure?**
 - i. Sediment yield** (Church and Ryder, 1972; Loso and others, 2004)
 - ii. Cosmogenic radionuclides** (Briner and others, 2006)
 - iii. Thermochronometry** (Spotila and others, 2004)
- d. Large-scale landforms of glacial erosion**
 - i. Cross-valley profiles** (Harbor, 1992)
 - ii. Longitudinal profiles** (MacGregor and others, 2000; Anderson and others, 2006)
 - iii. Mountain ranges**
 - 1. Glacier buzzsaw** (Brozovic and others, 1997)
 - 2. Fjords** (Kessler and others, 2008)
 - 3. Isostasy** (Molnar and England, 1990; Larsen and others, 2005)

2. Sediment deposition and landforms

- a. Glacial sediment types** (Evans and Benn, 2014)
 - i. Till**
 - 1. Subglacial** (Evans and others, 2006)
 - 2. Supraglacial** (Boulton, 1978)
 - ii. Outwash**
 - iii. Loess** (Wiles and others, 2003; Muhs and others, 2004)
 - iv. Glaciolacustrine/varves** (Loso and others, 2006)
- b. Glacial landforms**
 - i. Moraines**
 - 1. Terminal / lateral** (Benn and Evans, 2014)
 - 2. Medial** (Anderson, 2000)

3. Trimlines and fosses

- ii. **Eskers** (Shreve, 1985; Huddart and others, 1999)
- iii. **Drumlins** (Benn and Evans, 2014)
- iv. **Kames, Outwash, Kettles** (Benn and Evans, 2014)
- v. **Glacial Lakes** (Bennett and others, 2002)
- vi. **Tidewater shoals** (Boulton and others, 1996)

3. Local glacier history/morphology

- a. **Alaskan/Wrangells/Kennicott glacier timeline** (Viereck, 1967; Wiles and others, 2002; Diedrich and Loso, 2012)
- b. **Outburst floods** (Bretz, 1969; Ferrians, 1989; Wiedmer and others, 2010)

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