

L'incision glaciaire



Extension des glaciers en Europe pendant les 2 dernières glaciations

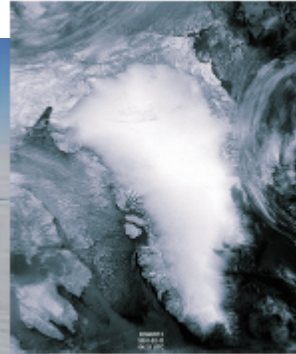
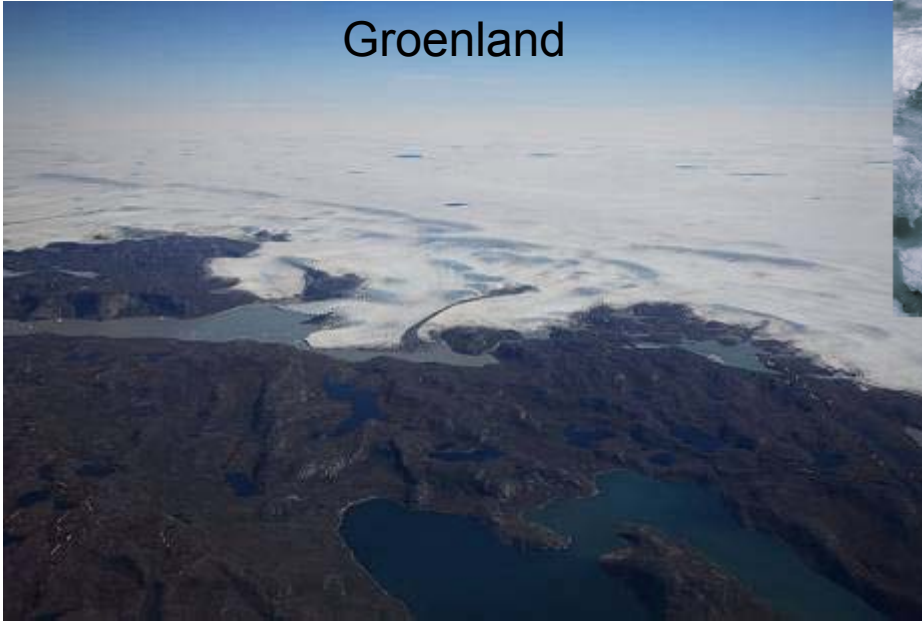
Calendrier du Quaternaire

Âges B.P.	Chronologie	Glaciations	Âges B.P.	Divisions Stratigraphiques	Chronologie
1 000	HOLOCENE	Post-Glaciaire	2 700	Subatlantique	HOLOCENE
10 000			PLEISTOCENE SUP.	WÜRM	
	8 000	Atlantique			
	9 000	Boréal			
10 300			10 700	Dryas III = Dryas récent	
50 000			11 700	Alleröd	
80 000		Intergl. Riss/Würm	12 200	Dryas II	
100 000			13 200	Bölling	
120 000			15 000	Dryas I = Dryas ancien	
200 000	PLEISTOCENE MOY.	RISS			
300 000			Int. M/R		
350 000					
400 000		MINDEL			
500 000					
600 000		Int. G/M			
700 000					
800 000	PLEISTOCENE INF.	GÜNZ			
900 000					
1 000 000					
1 100 000					
1 200 000					
1 300 000					
1 400 000		Interglaciaire Donau/Günz			
1 500 000					
1 600 000					
1 700 000					
1 800 000	TERTIAIRE				

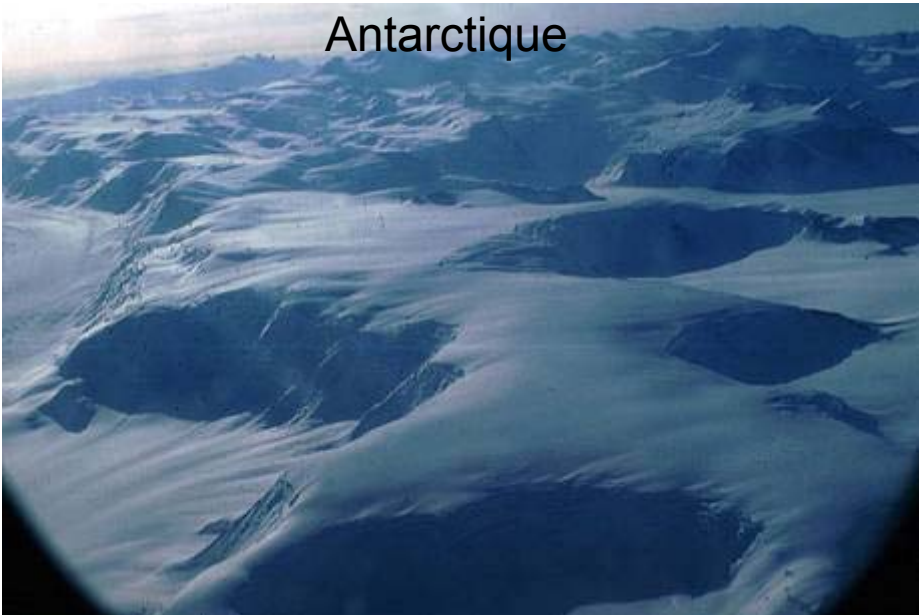


Inlandsis

Groenland



Antarctique



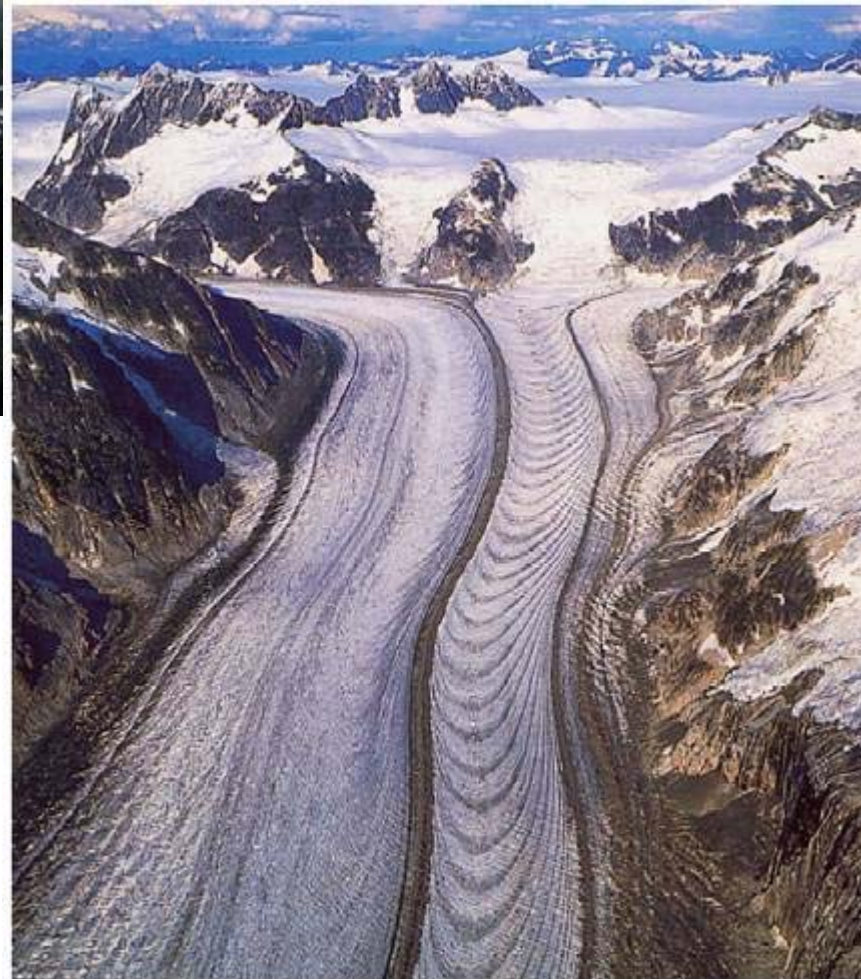
Calottes locales



Vatnajokull, Islande



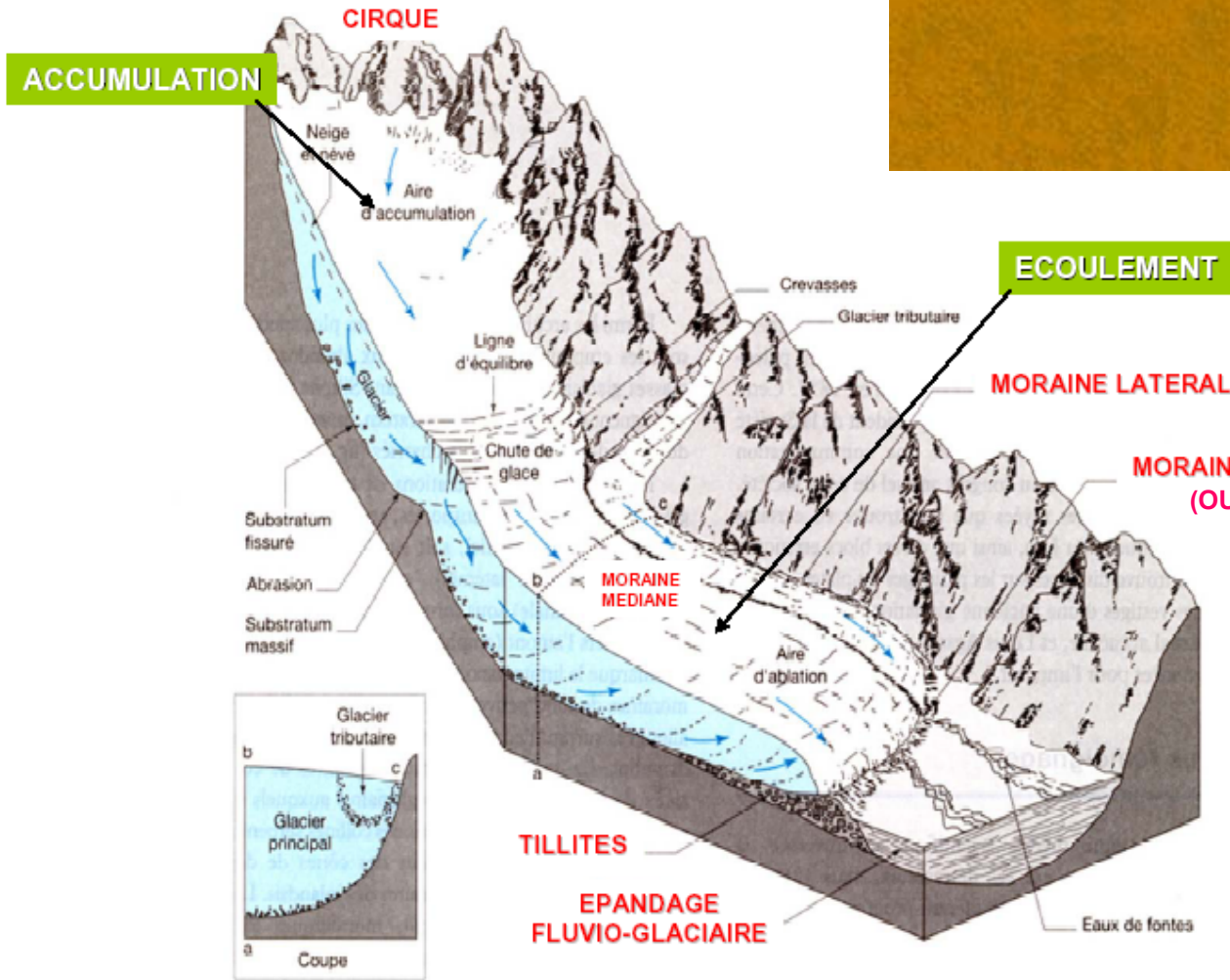
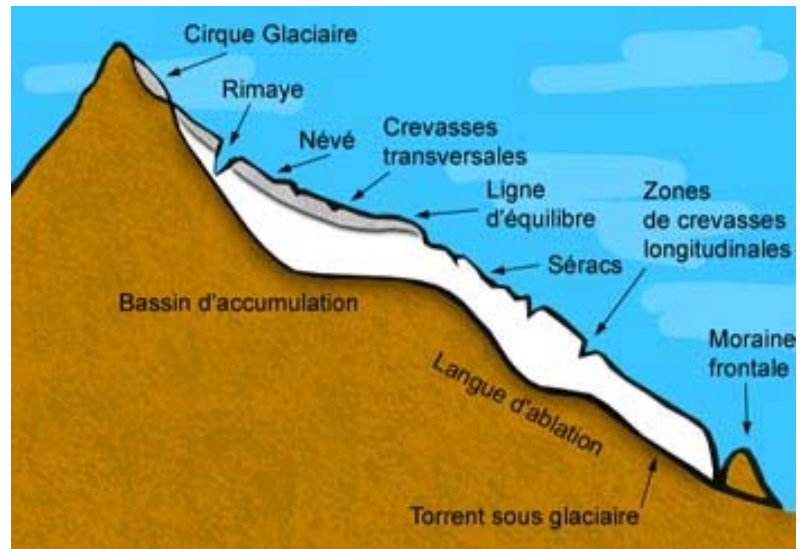
Glaciers de vallée



Glaciers de piémont



Alaska

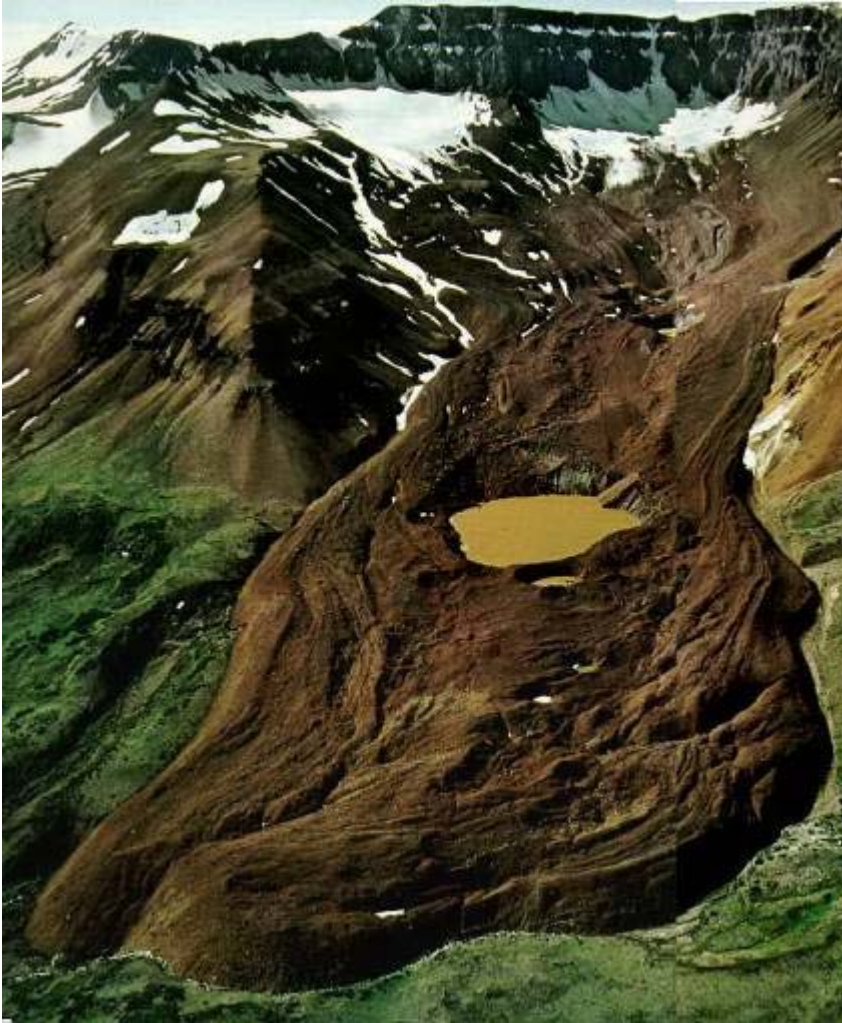




R. Brix

Glacier Schlatenkees, Autriche

Glaciers rocheux



Morphologie après retrait du glacier

Le glacier du Rhône (Suisse)

1850



Aujourd'hui



Cirques glaciaires



SE

NW

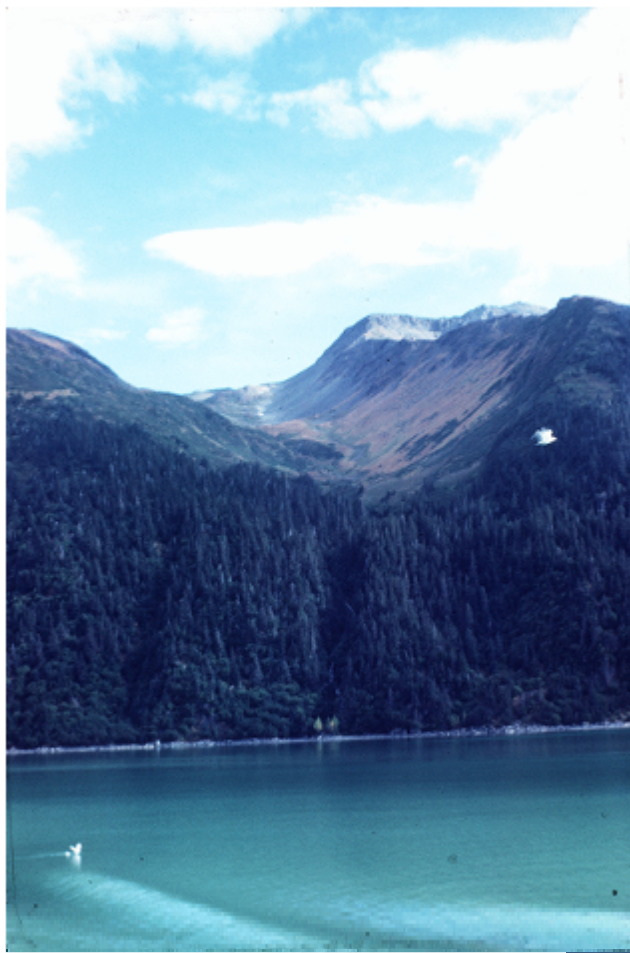
moraine



Vallées en auge



**Vallées suspendues,
gradins de confluence et
gorges de raccordement**



Lacs de surcreusement (Ombilics et verrous)



Alpes du Sud





Stries et roches moutonnées









Dépôts

Moraines de fond, latérales, et frontales





Alpes

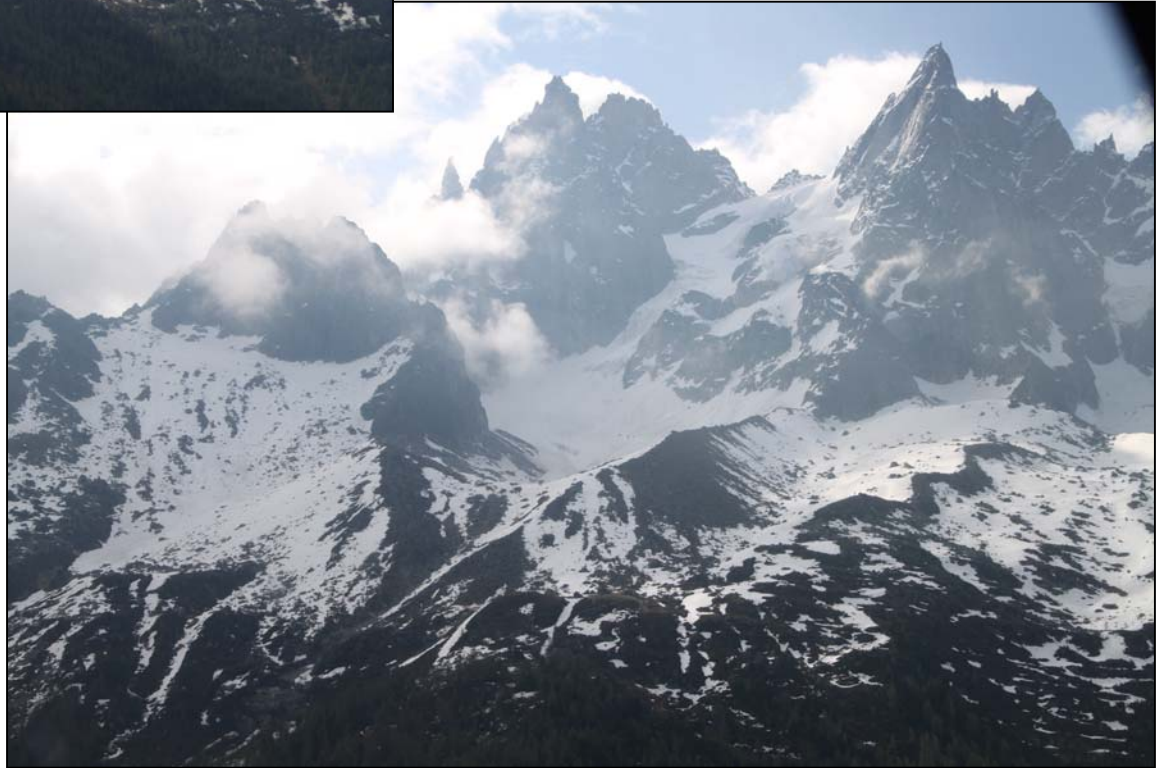


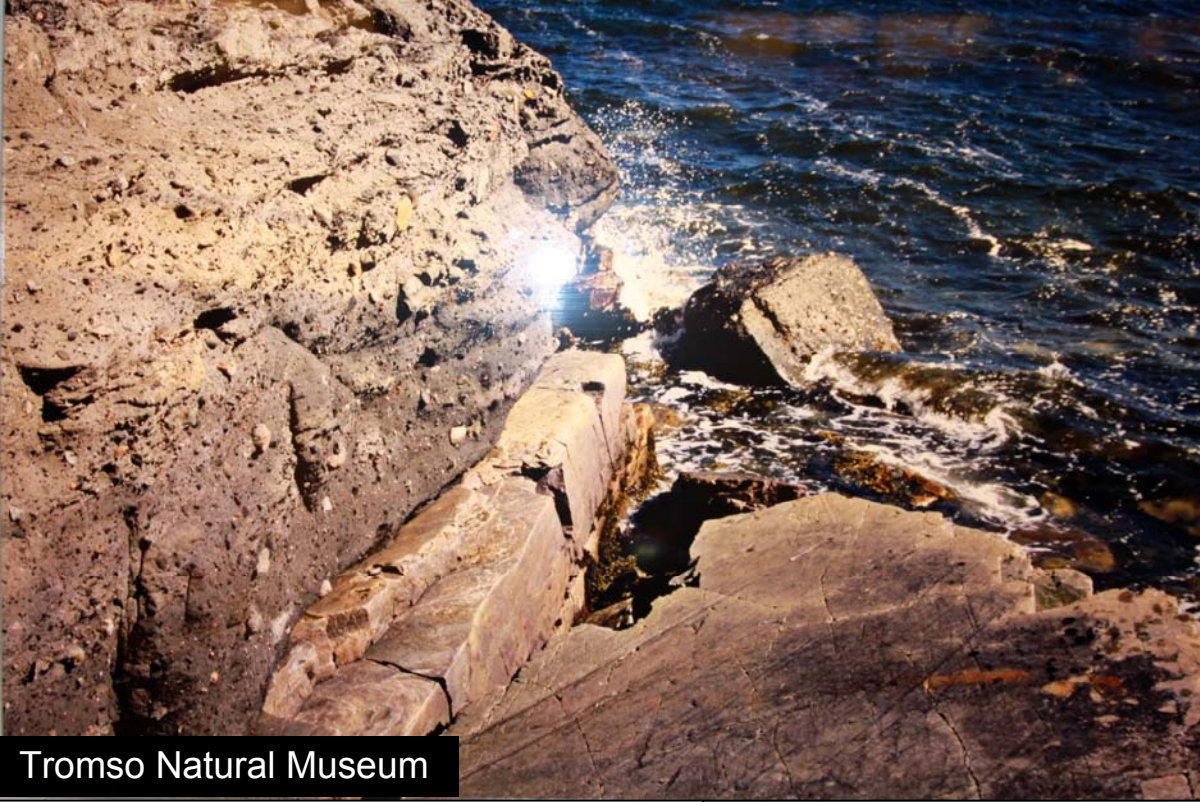
Mongolie



Islande

Université de Liège





Tromsø Natural Museum

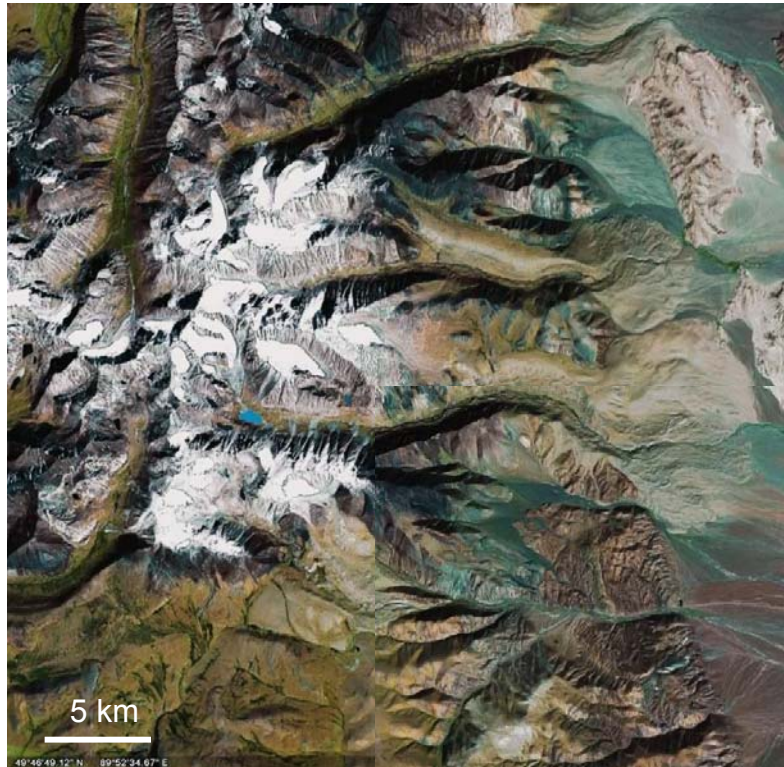




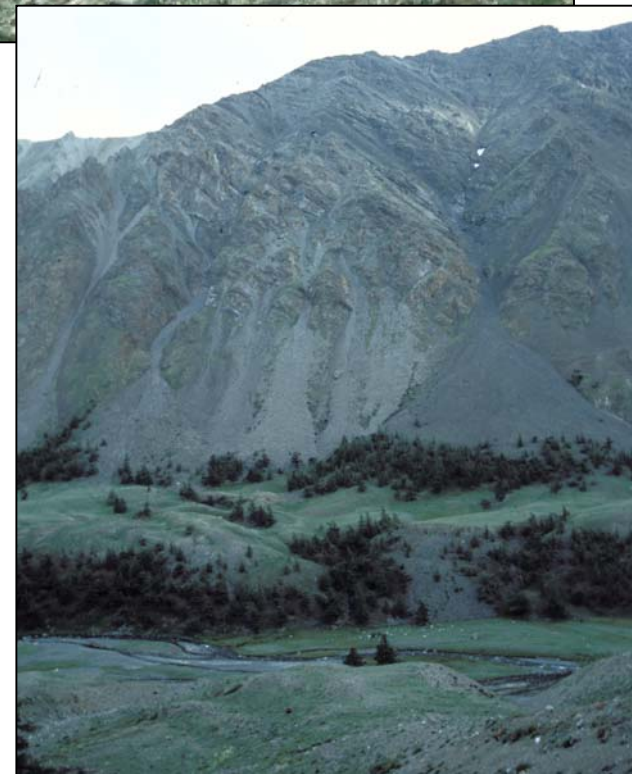
Photo: S. Arzhannikov



Glaciaire vs fluviatile : Morphologies des dépôts



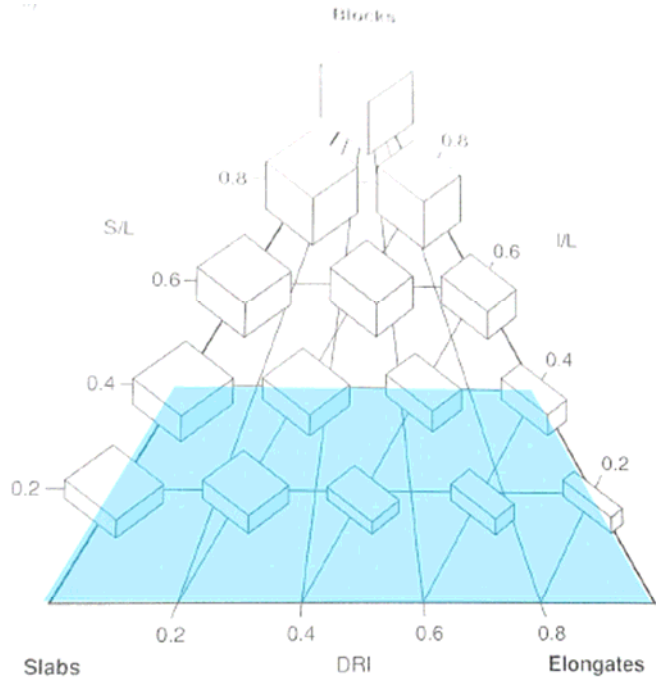
Altay,
Russie-Mongolie



Fjords de Norvège



Glaciaire vs fluviatile : Morphologies des sédiments



Forme de la + petite « boîte » qui contient le galet

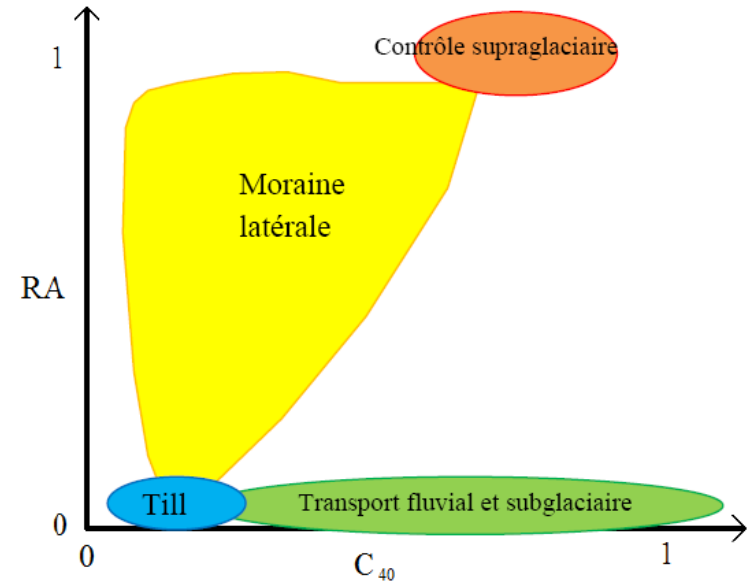
Dimensions donnés par 3 axes:
 S = Short
 I = Intermediate
 L = Long

C_{40} = % galets avec $S/L < 0,4$

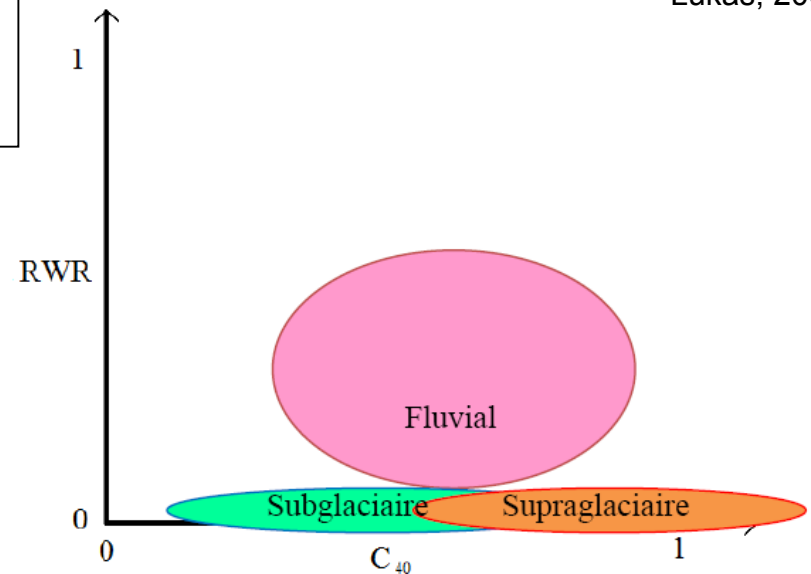
Class	Description
Very Angular (VA)	Edges and faces unworn ; sharp, delicate protuberances
Angular (A)	Edges and faces unworn
Sub Angular (SA)	Faces unworn, edges worn
Sub Rounded (SR)	Edges and faces worn but clearly distinguishable
Rounded (R)	Edges and faces worn and barely distinguishable
Well Rounded (WR)	No edges or faces distinguishable

$$RA = VA + A$$

$$RWR = R + WR$$



Lukas, 2009



Lacs de barrage morainique

Maggiore

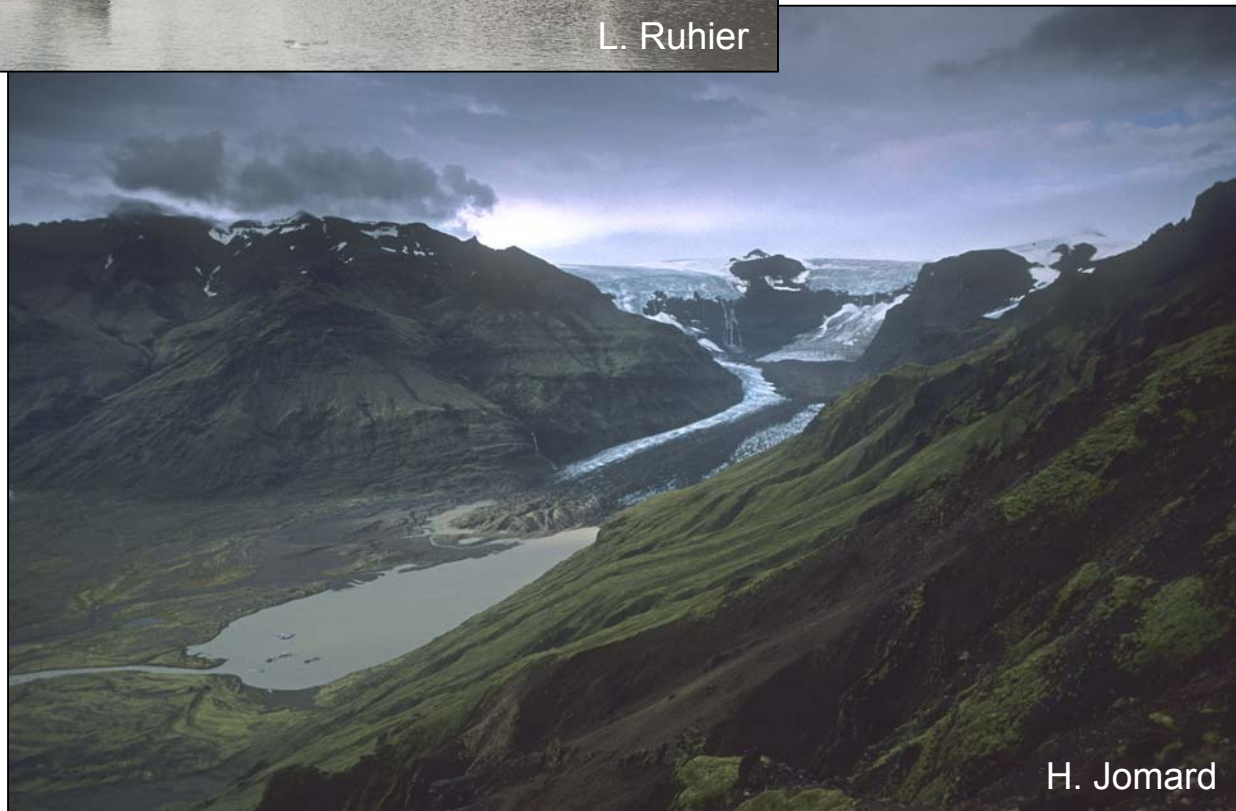


Garda



10 km

Dropstones



Épandages fluvio-glaciaires (Sandur)



Terrasses de kame



C. Beaudevin

Vallée de Miage

Pigne d'Arolla, Suisse



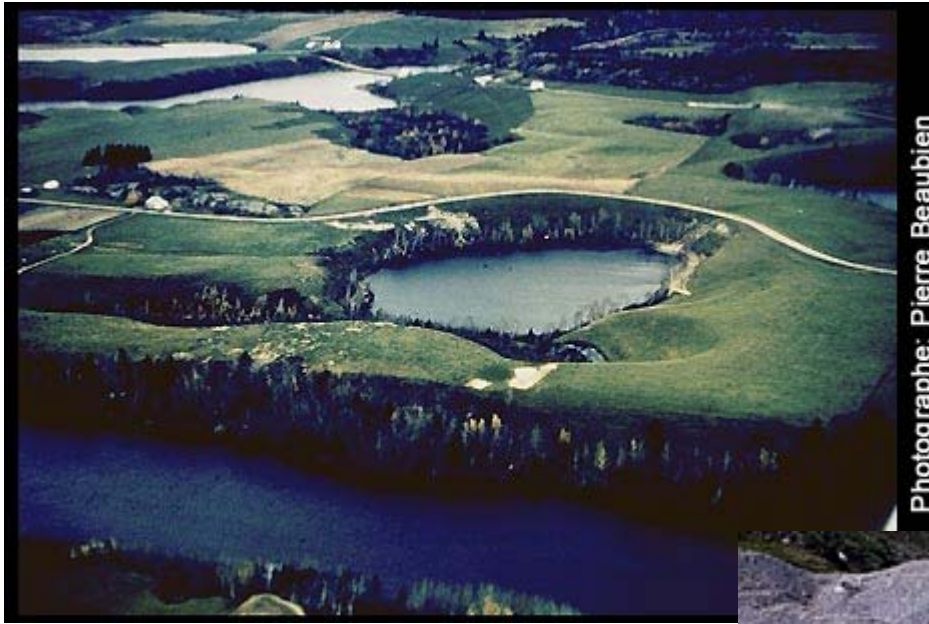
J. Parker

Tasman glacier, N. Zélande



M. Hambrey

Kettles



Photographe: Pierre Beaubien

Tasman glacier, Nouvelle Zélande

Hébertville, Québec



Cincinnati University

Blocs erratiques





Environnements périglaciaires

Les loess : dépôts éoliens sableux à granulométrie très fine (2-50 microns)



W. Huff

Matunaska Valley, Alaska

Saxonie-Anhalt,
Allemagne



N. Neuheiser, UFZ



Luochuan, Chine

D. D. Rousseau

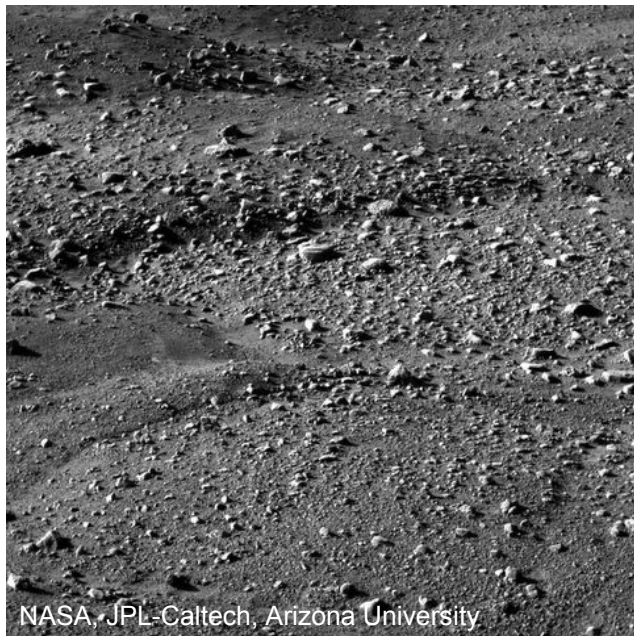
Sols polygonaux



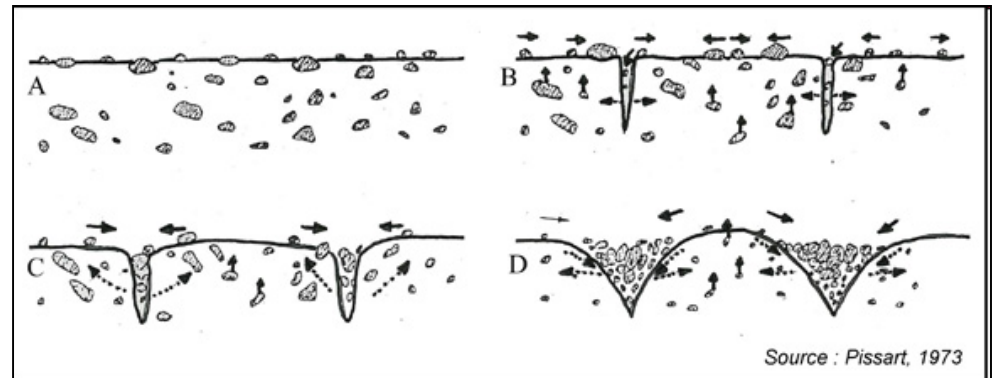
Vallon de Réchy, Suisse



Vallée des Lacs de Chambeyron



Mars



Cryoturbation

