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Glacial Geomorphology

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Types of Glaciers (Classification of Ice Masses)

1. Thermal Classification

1.1. Temperate / warm glacier (İlman buzullar)

1.2. Cold glacier (Soğuk buzullar)

1.3. Polythermal glacier (Politermal)

2. Morphological Classification

2.1. Unconstrained by Topography

2.1.1. Ice sheet (Örtü buzulları)

2.1.2. Ice cap (Buz şapkaları)

2.1.3. Ice stream (Buz nehirleri)

2.1.4. Outlet glacier (Outlet/Çıkış buzulu)

2.1.5. Ice shelf (Buz şelfi)

2.2. Constrained by Topography

2.2.1. Icefield (Küçük örtü buzulu)

2.2.2. Valley glacier (Vadi buzulu)

2.2.3. Cirque glacier (Sirk buzulu)

2.2.4. Piedmont glacier (Piedmont buzulu)

2.2.5 Hanging glacier (Asılı buzul / niş)

Types of Glaciers (Unconstrained by Topography)

Ice sheets and **polar ice caps** are continental-scale glacier masses

They cover vast areas, often enveloping the entire underlying topography.

The Antarctic and Greenland ice sheets are in this category.

These glaciers largely conceal the bedrock beneath them, with their central regions typically dome-shaped.

Ice masses covering less than 50,000 km² are called Ice sheets.

Ice masses covering less than 50,000 km² are called ice caps.

Types of Glaciers (Unconstrained by Topography)

Ice sheets

Nunataks



Types of Glaciers (Unconstrained by Topography)

Ice caps are dome-shaped ice masses and exhibit radial flow.

Mýrdalsjökull ice cap, Katla volcano.



<https://icelandmag.is/article/see-how-ice-cap-myrdalsjokull-glacier-has-changed-28-years>

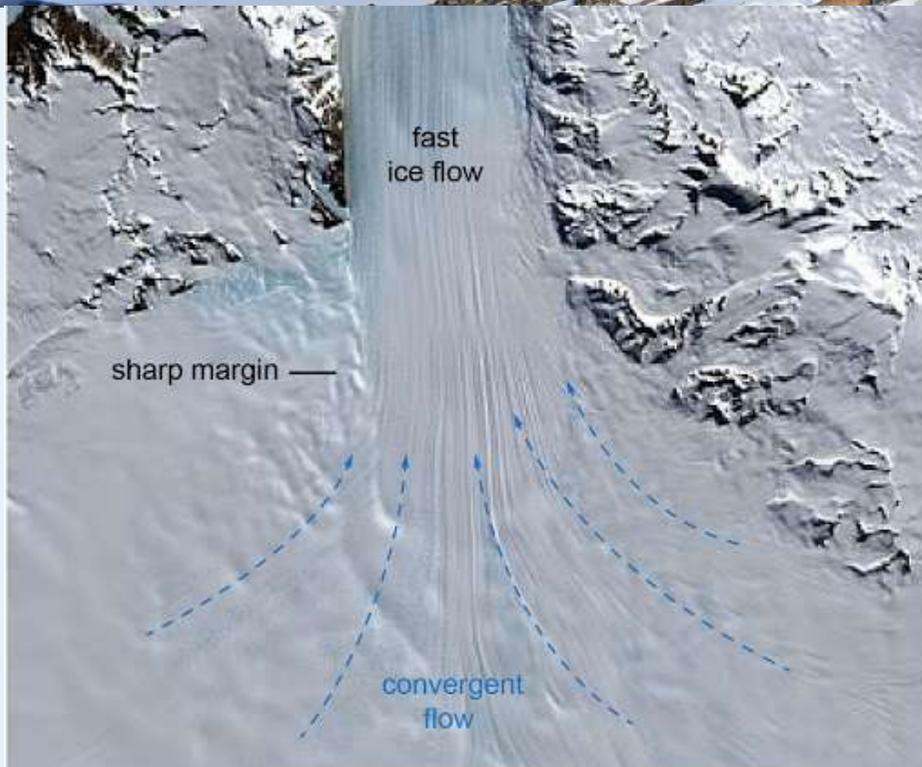
<https://icelandmonitor.mbl.is/news/tag/18766/katla/>

Types of Glaciers (Unconstrained by Topography)

Ice Streams



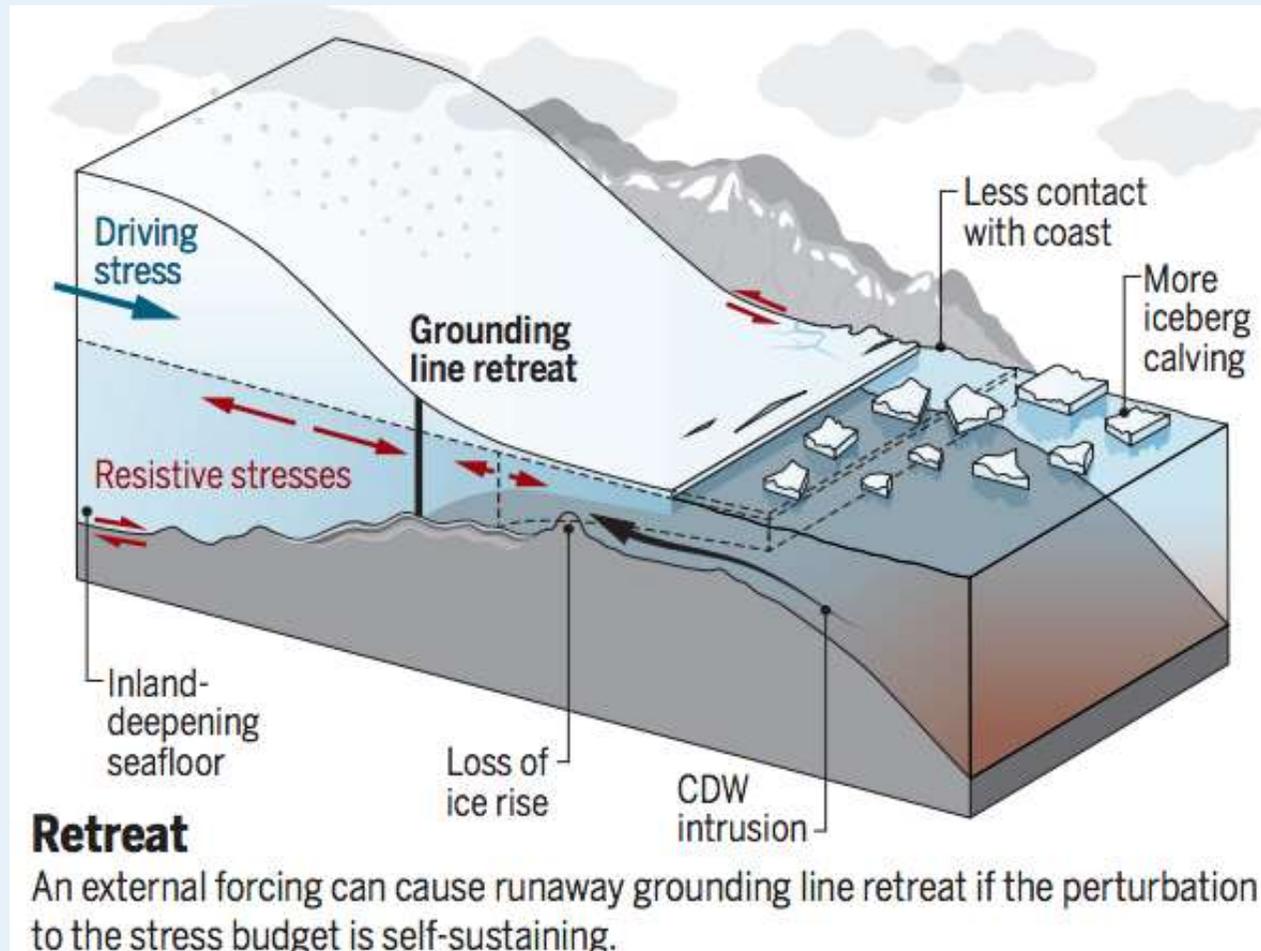
- These are zones where fast ice flow occurs within continental glaciers.
- They are surrounded by very slow-moving glaciers.
- Ice streams facilitate the drainage of ice sheets by continuously transporting ice accumulated in the inner regions of the ice sheets towards the sea, leading to a steady ice flow.
- Ice streams are large structures typically characterized by a convergence zone at their origin, which feeds a main channel that can be tens of kilometers wide and hundreds of kilometers long.
- Due to this central convergence and the increasing basal sliding speed, ice streams create a depression axis on the surface of the ice sheet. This causes surface slopes to be lower than those of the surrounding ice dome.



Types of Glaciers (Unconstrained by Topography)

Ice shelves

Ice shelves are extensions of the ice sheets floating in the sea and ocean. Ice shelves, which lose mass in the form of icebergs calving, are responsible for the mass loss of the ice sheets.



<https://www.carbonbrief.org/guest-post-collapse-west-antarctic-ice-sheet-inevitable/>

Types of Glaciers (Constrained by Topography)

Icefield

Icefields are glaciers that partially cover mountain ranges but do not have ice domes as in ice sheets and ice caps. Therefore, the landscape of the bedrock topography they cover may be reflected in the glacier surface landscape, and ice flows are affected by the underlying topography. In addition, peaks and ridges belonging to the bedrock topography may rise in and around the glacier. Alaska and Patagonia glaciers are examples of this group.



https://en.wikipedia.org/wiki/Ice_field

Types of Glaciers (Constrained by Topography)

Valley glacier / Mountain glacier



Types of Glaciers (Constrained by Topography)

Valley glacier / Mountain glacier



Types of Glaciers (Constrained by Topography)

Valley glacier / Mountain glacier



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Valley glacier / Mountain glacier



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Valley glacier / Mountain glacier



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Valley glacier / Mountain glacier



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Valley glacier / Mountain glacier



Types of Glaciers (Constrained by Topography)

Valley glacier / Mountain glacier



Types of Glaciers (Constrained by Topography)

Cirque glacier



Types of Glaciers (Constrained by Topography)



Niche / hanging glacier

<https://youtu.be/htgkyCyzUG0>



Types of Glaciers (Constrained by Topography)

Niche / hanging glacier



Jungfrau

Types of Glaciers (Constrained by Topography)



Mönch

Types of Glaciers (Constrained by Topography)

Piedmont glacier



<https://www.swisseduc.ch/glaciers/glossary/piedmont-glacier-en.html>

Types of Glaciers

(Debris-covered glacier)



Types of Glaciers

(Debris-covered glacier)



Types of Glaciers

(Debris-covered glacier)

