

Glaciers [UPSC Geography Notes GS1]

Glaciers are a bulk of ice moving under its own weight. It is an important geographical term for students preparing for the [IAS Exam](#) or any other Government Exam.

Geography is a significant part of the General Studies Paper-1 in the [UPSC Syllabus](#). Students [choosing their Optional Subject](#) as Geography for UPSC Mains Exam can also find this article useful.

What is a Glacier?

Glaciers are a bulk of ice moving under its own weight. It forms in areas where the amassing of snow goes beyond its ablation over many years.

- They are generally seen in the snow-fields.
- This largest freshwater basin covers around 10 percent of the land surface of the Earth.
- According to the topography and the location of the glacier, it can be categorized as Mountain Glacier (Alpine Glaciers) or Continental Glacier (Ice Sheets).
- The Continental Glacier moves outward in all directions whereas the Mountain Glacier moves from a higher to a lower altitude.

Types of Glaciers

Glaciers can be distinguished in two major categories based on its type:

Alpine Glaciers	Ice Sheets
• Alpine glaciers are formed on the mountainsides and they usually move downwards through the valleys. • There are times when an alpine glacier also deepens the valleys by pushing away the dirt, soil, and other materials. • These glaciers are found in high mountains.	• Ice sheets form broad domes and usually spread out in all directions. • When the ice sheets spread, they cover all the areas such as valleys, plains, and mountains with a thick blanket of ice. • The continental glaciers are the largest ice sheets and cover most of Antarctica and islands of Greenland.

Glacial Landforms

Glaciers have played a prominent role in the shaping of landscapes in the mid and high latitudes of alpine environments. The major landforms made by glaciers are:

1. [Glacial Erosional Landforms](#)
2. [Glacial Depositional Landforms](#)

Glacial Erosional Landforms	Glacial Depositional Landforms
The major erosional landforms made by glaciers are: • Cirque • Horns and Serrated Ridges	The major depositional landforms made by glaciers are: • Esker • Outwash plains

- Glacial Valleys/Troughs

- Drumlins

Glaciers in India

Glaciers in India relevant to UPSC can be listed as follows:

Name	State	Mountain Range
Batura Glacier	Jammu & Kashmir	Karakoram Mountain Range
Khurdopin Glacier	Jammu & Kashmir	Karakoram Mountain Range
Hispar Glacier	Jammu & Kashmir	Karakoram Mountain Range
Biafo Glacier	Jammu & Kashmir	Karakoram Mountain Range
Baltoro Glacier	Jammu & Kashmir	Karakoram Mountain Range
Chogolungma glacier	Jammu & Kashmir	Karakoram Mountain Range
Diamir Glacier	Jammu & Kashmir	Karakoram Mountain Range
Siachen Glacier	Jammu & Kashmir	Karakoram Mountain Range
Gangotri Glacier	Uttarkashi, Uttarakhand	Himalayas
Milam Glacier	Uttarakhand	Trishul peak of Pithoragarh
Pindari glacier	Nanda Devi, Uttarakhand	Upper reaches of the Kumaon Himalayas
Zemu Glacier	Sikkim	Eastern Himalaya Located on Kanchenjunga peak

Gangotri Glacier

This is an important glacier in India.

- Largest Glacier in Uttarakhand.
- Source of the Ganges. (River Bhagirathi)
- The Gangotri glacier originates at the northern slope of Chaukhamba range of peaks in Garhwal Himalayas.
- Gangotri is not a single valley glacier, but a combination of several other glaciers.

Carbon Deposits on Gangotri

- The Wadia Institute of Himalayan Geology is an Autonomous Institute administered by the Department of Science and Technology.
- They have the **Chirbasa** station at a height of 3,600 m and **Bhojbasa** station at a height of 3,800 m.
- They conduct research on the amount of carbon deposits on the important glaciers of the Himalayas. Gangotri being the source of the Ganges, is one of the most important Glaciers in the country.
- According to recent data from the research, the concentration of Black Carbon present on the Gangotri Glacier has doubled when compared to the results of the past few years.
- Primary reason for this is the agricultural burning and the forest fires in the nearby regions.

Students can note this point as an important prelims fact for the UPSC Prelims under the segment [UPSC Environment and Ecology](#).

