

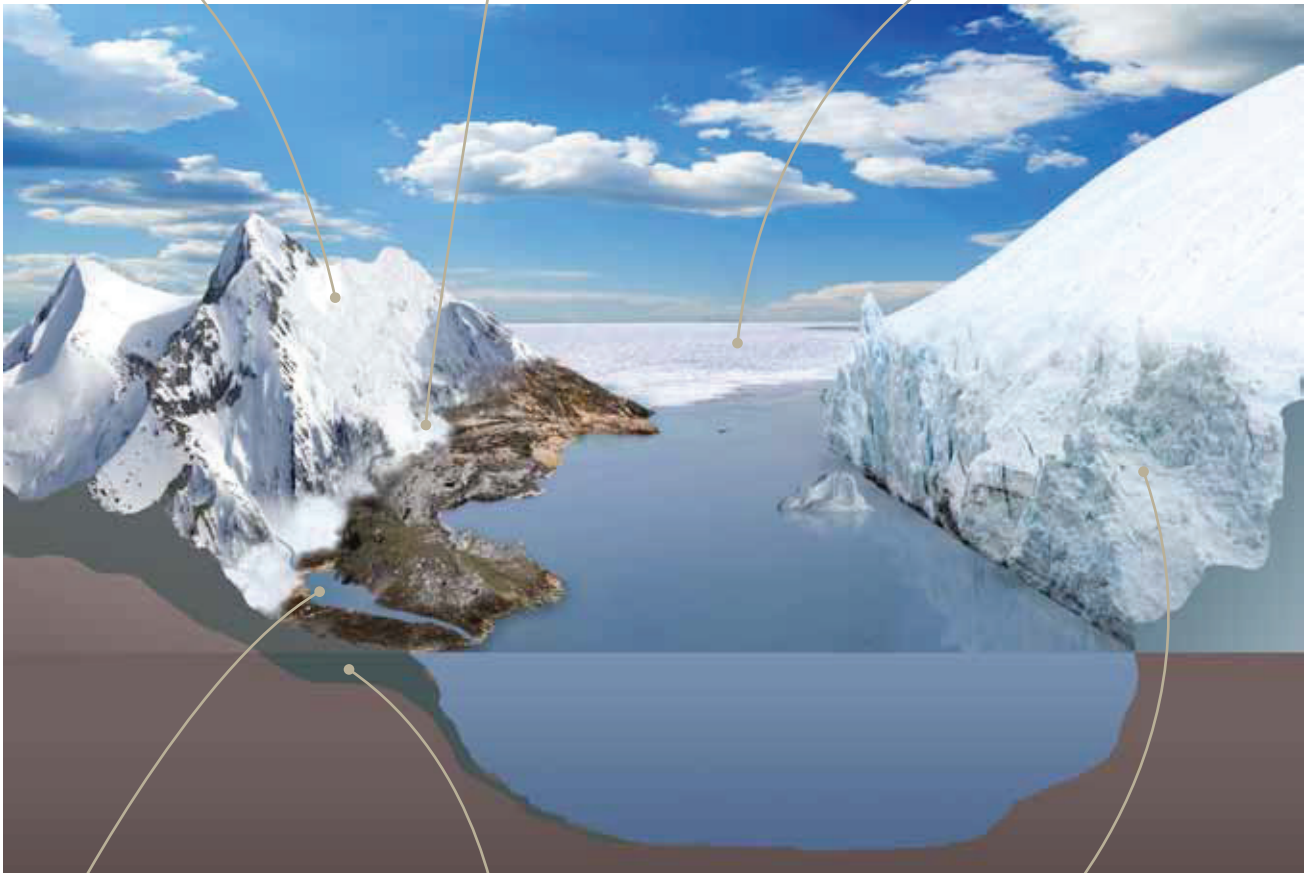
# Arctic Monitoring and Assessment Programme

Arctic Climate Issues 2011

Glaciers and ice caps hold frozen freshwater from snowfall, stored on land through millennia. These bodies of ice have diminished throughout the Arctic. This creates faster meltwater flows into rivers and lakes, and more freshwater entering the ocean, leading to global sea-level rise.

Snow accumulates on the surface, mainly during winter, as a snowpack. It stores water temporarily and so affects lake levels and patterns of river flow. The duration of snow cover is decreasing all over the Arctic, with snow melt occurring faster and earlier in the spring.

Sea ice is the ice that forms on the surface of the ocean when the temperature drops well below freezing. Sea-ice extent in the Arctic Ocean at the end of summer has been at or near record low levels nearly every year since 2001. The decline in summer sea-ice extent has accelerated during the past ten years. Reduced ice cover significantly changes the environment of the Arctic Ocean.



Lakes and rivers form a complex network of freshwater flows and stores, interwoven into the Arctic landscape. The length of time they are ice-covered has decreased. This change affects the dynamics of water flow and the conditions in the waterbodies themselves. The amount of rain and snowfall has increased slightly, and so has the amount of water flowing out of large Arctic rivers into the northern seas.

Permafrost is soil, rock, sediment or other earth material that stays frozen for two years or more. It forms an impermeable layer below the surface, preventing water from draining away and leading to high water levels and wet conditions in many areas. Permafrost has warmed, and in some areas has begun to thaw.

The Greenland Ice Sheet is a massive ice body up to 3050 metres thick. It is the largest bulk of freshwater ice in the northern hemisphere and holds close to 3 million km<sup>3</sup> of ice. The rate of ice loss at the edges of the ice sheet has increased since 2000 and the ice sheet is now shrinking.