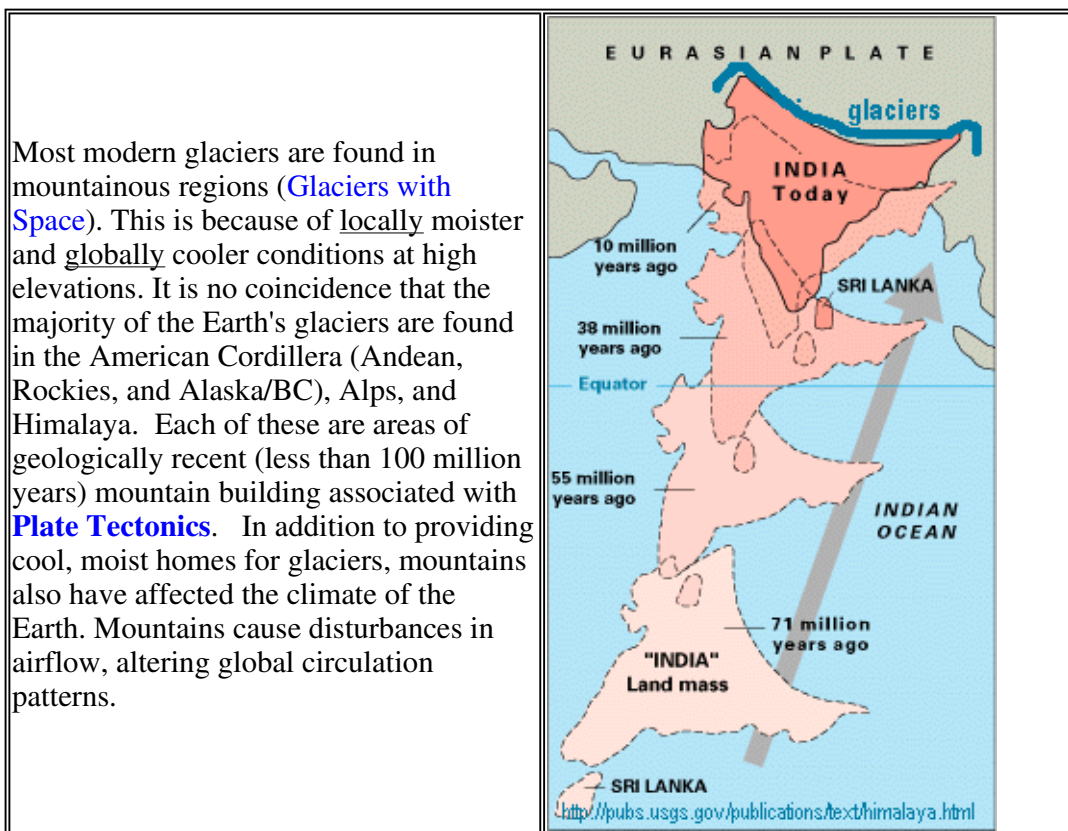


# *Plate Tectonics and Glacier Formation*

Glaciers can only form when: 1) global climate is sufficiently cool, and 2) local climates are both cold and moist enough to support glaciers by virtue of a) high mountains or b) polar continents.

## *Mountain Building*



## *Plate Mobility*

Evidence of past glaciation in locations such as southern Africa, Australia, and India, long confounded scientists. Plate tectonic theory solved this problem. As the Earth's tectonic plates migrate at a rate of 1-16 cm per year, the continents move in and out of polar areas. In the adjacent

image we see the continents clustered in the southern hemisphere. This continent cluster, known as Pangaea, created a large land mass at high southern latitudes, allowing for a great glacial extent about 300 million years ago. Note that such current glaciated areas as Alaska, and Scandinavia were then located near the Equator and devoid of any glaciation. Today we would not find glaciers in southern Africa, India, or Australia.

Plate motion can also redirect ocean currents, as by the closing of the Isthmus of Panama about 5 million years ago. that barrier deflected the Gulf Stream to the NE, helping initiate glaciation of iceland, Geenland, and the rest of the Northern Hemisphere.

**(To view a 1 Mb animation from Cal-Berkeley of plate movement, assembling and destroying Pangea, please click [here](#). To view reconstructions by Chris Scotese of former continental positions across time, especially glacial periods such as the Last ice Age, Late Carboniferous, and late Precambrian, click [here](#).)**

[Image of Pangaea not yet acquired]



Geologic Time and Glacial  
Cycles

Up to Glaciers With Time



On to Milankovitch Cycles

