behind to mark its former presence, including glacial lakes and eskers.

Just as we were able to make sense of the type of rocks in an area by knowing the geologic history of the region, we are able to make sense of the topography of the Northeast based on the rocks and structures resulting from past geologic events.

see Glaciers, p.60, for more on the scouring and deposits of glaciers.

Topography of the Inland Basin

Region 1

The Inland Basin has three main topographic divisions: the ***Allegheny*** Plateau, the Adirondacks and the Lowlands *(Figure 5.1)*. The existence of the basin itself is due to the downward buckling of the crust at the onset of the Taconic and Acadian mountain-building events. What makes the Inland Basin distinct from the other regions of the Northeast are the structure and nature of the sedimentary rocks that fill the basin. Unlike the Appalachian/Piedmont region or the complexly deformed Exotic Terrane region, the surface rocks of the Inland Basin have been gently tilted and folded, and were far enough removed from the mountain-building events to have escaped being metamorphosed. The exception to this pattern is the ***Adirondack region***, where uplift independent of the Paleozoic mountain-building events raised bedrock metamorphosed during the late Precambrian to the surface as erosion removed the overlying Inland Basin sedimentary layers.

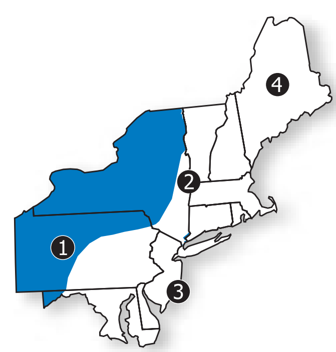
***'Allegheny'** refers to the plateau or front; 'Alleghanian' refers to the mountain-building event.*

see Rocks, p.32 for more on the rocks of the ***Adirondack region***.

Figure 5.1: Generalized topographic divisions of the Inland Basin.

Allegheny Plateau

The Allegheny Plateau dominates much of the Inland Basin region, extending from the southern tier of New York through Pennsylvania and Maryland to Alabama *(Figure 5.1)*. The layers of rock within the plateau have been only gently folded and tilted slightly to the south during the final mountain-building event during the Permian. A drive through the Allegheny Plateau region reveals a landscape contrary to the common concept of a plateau as an



elevated flat-topped region. The Allegheny Plateau was probably flat, but since its uplift 400 million years ago it has been deeply dissected by streams, making the area quite hilly and in some places even mountainous in appearance. The Plateau is bounded on the eastern side by the Allegheny Front, a scarp separating it from the Appalachian Mountains.

The Shawangunks, or 'Gunks' as they are locally known, are famed for being the best rock climbing spot in the Eastern United States.

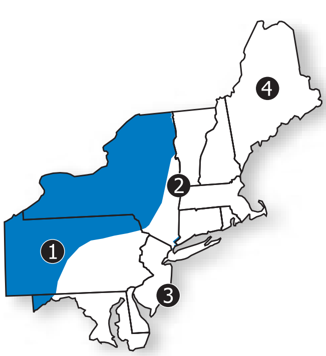
The scarp includes the white cliffs of the ***Shawangunk*** Ridge that extend southwest from the Hudson River into New Jersey and Pennsylvania, where it is known as Kittatinny Mountain. The Catskill ***Mountains*** form the eastern boundary of the Allegheny Front in New York. They are often called one-sided mountains because there is a steep scarp on the eastern side, but the west side has a gentle slope that grades more gradually into the surrounding provinces. The layers of rocks forming the Catskills are the Devonian sedimentary beds of the Catskill Delta, created during the Acadian mountain-building event as sediment eroded from the Acadian highlands. The mountains are thus unusual, as the rocks are flat lying and the relief over the area comes from deep erosion of the flat-lying layers. The elevation in the Catskills is much higher than other parts of the Allegheny Plateau because of the thicker sequences of sediments deposited on the eastern side of the Catskill Delta (closer to the Acadian highlands) and erosional differences by glaciers during the last ice age.

The Catskills are not considered by some to be technically ***'mountains'*** *because of the underlying layers of rock lack deformation.*

The highest point in the Catskills is over 914 m above sea level.

The Paleozoic sedimentary rock layers of the basin, tilted just a few degrees to the south, form many of the east-west ridges that stretch across New York. These gentle ridges are called cuestas, formed from the more resistant layers of tilted rocks, while the softer surrounding rocks have eroded away *(Figure 5.2)*. The tilting most likely occurred during the Permian ***Alleghanian*** mountain-building event, the final crunch on the east coast of North America.

see Geologic History, p. 14, for more on the **Alleghanian** *event.*



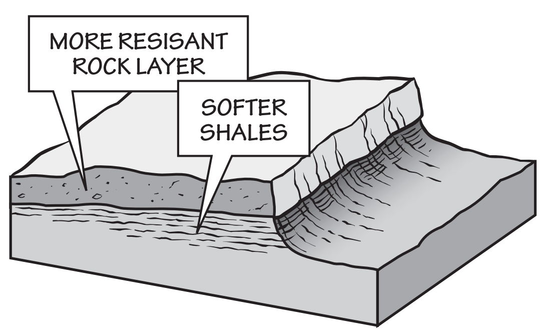


Figure 5.2: A cuesta ridge is formed from a resistant layer of gently tilted rock. Figure by J. Houghton.

The different looks of different mountains

A mountain may be formed from any rock type and a variety of underlying structures. The type of mountain that we see today all depends on the amount of erosion, the resistance of the rock, the structure of the rock layers and the events occurring in geologic history that formed the mountains. There is a wide variety of mountains throughout the Northeast that formed in diverse geologic situations relating to the geologic history of the region (Figure 5.3).

Mountains	Location	Origin
The Catskills	New York	erosion of flat-lying rock layers
Kittatinny Mountain/ (Shawangunks)	PA, NJ, NY	hogback/cuesta formed from resistant conglomerate
Green Mountains	Vermont	resistant Precambrian gneiss
White Mountains	New Hampshire	igneous intrusions
Mt. Katahdin	Maine	exposed volcano magma chamber
Taconics	NY, VT, MA, CT	slices of resistant metamorphosed Cambrian rocks, stacked on top of each other and moved west
Bolton Range	Connecticut	resistant Ordovician volcanic rocks originating from Taconic volcanic islands
Adirondacks	New York	Precambrian resistant rock, uplifted during the Tertiary

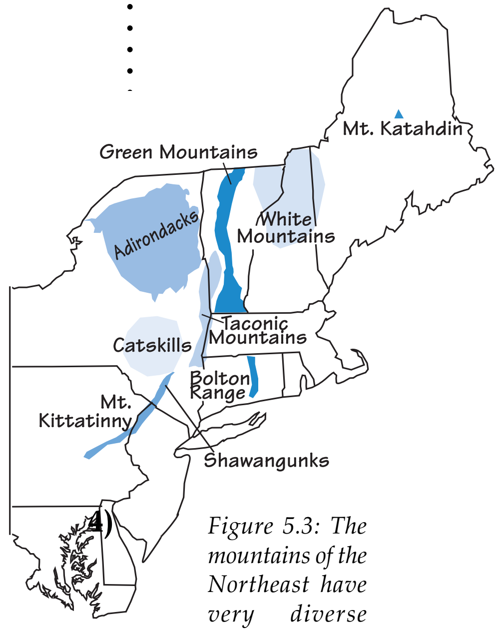


Figure 5.3: The mountains of the Northeast have very diverse origins.

Adirondacks

The Adirondacks loom high over the surrounding lowlands *(Figure 5.4)*. Uplifted during the late Mesozoic and Tertiary, much of this mass of crystalline metamorphic Precambrian rock is extremely ***resistant*** to erosion. The surrounding lowland rocks are considerably less resistant and are made of much younger sedimentary rocks. Both the relatively recent uplift of the area and the resistant metamorphic rocks contributed to the height of the Adirondacks. Additional scouring by glaciers during the ice age helped to carve the Adirondack peaks.

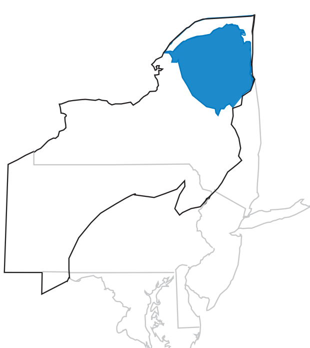


Figure 5.4: The Adirondack region of the Inland Basin.

Not all Precambrian metamorphic rock is extremely **resistant** *or uniformly resistant to erosion. Precambrian schists, for example, are not as resistant as harder sedimentary rock found in other parts of the Inland Basin.*

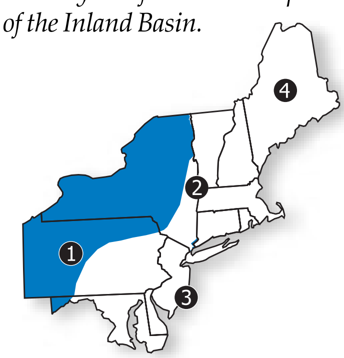


Figure 5.5: The Lowlands of the Inland Basin.

see Glaciers, p.67, for glacial features of the ***lowland*** *areas.*

Lowlands

The Lowlands of the Inland Basin surround the Adirondack region on all sides, including the Erie, Ontario, St. Lawrence and Mohawk Valley lowlands *(Figure 5.5)*. Many of the topographic features of the Lowlands region were formed during the most recent Ice Age. The Lowlands preserve remnants of large glacial lakes scoured by glaciers and filled with glacial meltwater as the continental ice sheet advanced and retreated over the Northeast. The region of Lake Ontario was formerly occupied by a series of glacial lakes, including Glacial Lake Iroquois. The Tug Hill Plateau, which is actually a part of the Allegheny Plateau has been isolated through erosion by meltwater escaping through the present Mohawk Valley from former Lake Iroquois. As the glacial lakes shrunk, or altogether disappeared, characteristic glacial lake deposits were left behind: sand, silt and clay, and other evidence of ancient shorelines. Many striking glacial features are evident within the ***Lowlands***, including thousands of drumlins in the Ontario Lowlands.