Physiographic Provinces of New Jersey

New Jersey's landscape has formed during more than a billion years of geologic processes such as mountain building, erosion and deposition. This history has given the State distinctive landforms that are divided into four regions (Salisbury, 1898, p. 5), known as physiographic provinces. Beginning in the northwest and proceeding southeast, these regions are called the Valley and Ridge, Highlands, Piedmont, and Coastal Plain Provinces. The first three are grouped with the larger classification known as the Appalachian Highland, the last with the Atlantic Slope. Both are major physiographic divisions of the United States.

The Valley and Ridge Province, with an area of approximately 536 square miles (about one-fifteenth of the State), occupies a major portion of Sussex and Warren Counties. This province, up to 17 miles wide, is characterized by steep-sided, linear ridges and broad valleys. It is underlain by folded and faulted Paleozoic sedimentary rocks of Cambrian to Middle Devonian age (540 to 374 million years old) and minor amount of earliest Silurian-aged igneous rocks.

The Kittatinny Valley, which forms the eastern segment, is the southernmost portion of the Hudson-Champlain Valley (Fenneman 1938, p. 203). Kittatinny Mountain, a broad even-crested ridge ranging from 1,600 to 1,800 feet in elevation, separates the upper Delaware River Valley above the Delaware Water Gap from the Kittatinny Valley. High Point, near the northern end of Kittatinny Mountain, is the highest point in New Jersey at 1,803 feet.

Valley floor elevations range from approximately 400 to 600 feet in the Kittatinny Valley and 300 to 600 feet in the upper Delaware River Valley. Two major sub-valleys, paralleling the main Kittatinny Valley, and numerous tributaries create a highly dissected topography. Karst features are found in areas underlain by limestone and dolomite.

The southeast boundary with the Highlands Province is placed where Cambrian and Ordovician sedimentary rocks are in contact with Precambrian (Proterozoic) crystalline rocks. Generally, this boundary is an unconformity, but in places a fault defines it. Starting at the border of New Jersey and New York, the physiographic province boundary follows the contact south along the western slope of Pochuck Mountain. It continues along the western side of the Highlands around Jenny Jump Mountain, and then continues southwest at the foot of Scotts and Marble Mountains to the Delaware River.

The Highlands Province occupies an area of approximately 980 square miles, about one-eighth of the State. It lies within the southeastern portions of Sussex and Warren Counties, as well as major portions of Hunterdon, Morris, and Passaic and small parts of Bergen and Somerset. This mountainous belt is about 10 miles wide at the Delaware River and 25 miles wide near the New York border. In general its rugged topography consists of a series of discontinuous rounded ridges separated by deep narrow valleys. Although contiguous with the Reading Prong in Pennsylvania and the Hudson Highlands in New York, the use of the term "Highlands" (Rogers, 1840) for this region of New Jersey takes precedence.
By far the largest physiographic province in New Jersey is the **Coastal Plain**. With an area of 4,667 square miles occupying about three-fifths of the state, it includes all of Atlantic, Burlington, Camden, Cape May, Cumberland, Gloucester, Monmouth, Ocean, and Salem Counties and parts of Mercer and Middlesex. The unconsolidated deposits of the Coastal Plain dip gently to the southeast and range in age from the upper Lower Cretaceous to the Miocene (90 to 10 million years old). A broad trough follows the Piedmont boundary from the Raritan Bay to Trenton. Near Monmouth Junction, where the trough floor forms a saddle it reaches an elevation of about 80 feet. East of this depression is the drainage divide between the Delaware River and the Atlantic Ocean. The maximum elevation of the Coastal Plain, located at Crawford Hill, is 391 feet. The streams that flow northwest to the Delaware have narrow valleys, are shorter and have a steeper gradients than the streams that flow southeast. The Highlands of Navesink at 266 feet above sea level is the highest point directly on the coast.

**Physiographic Provinces and Counties of New Jersey.**

The Highlands is mainly underlain by highly metamorphosed igneous and sedimentary rocks of Middle Proterozoic age (1.2 billion to about 900 million years old). There are also small areas of Late Proterozoic age metasedimentary rocks and diabase dikes. Many of the elongate northeast trending valleys within the Highlands are underlain by sedimentary rocks similar to those in the Valley and Ridge Province. Middle Paleozoic sandstone and quartzite form some of the higher ridges in the Highlands and Bearfort Mountain is the highest among these at 1,496 feet. In New Jersey, these younger sedimentary rocks are included as part of the Highlands.

At 1,496 feet above sea level, Wawayanda Mountain is the highest point in the Highlands. The maximum elevation of the peaks decreases both toward the southeastern border and southwest to the Delaware River. Ramapo Mountain (1,171 feet) is the highest point on the southeast side of the Highlands while the maximum elevation near the Delaware River is less than 800 feet. The valleys range from less than 400 to over 800 feet above sea level with the lowest elevations located near the Delaware River.

The boundary with the Piedmont Province is placed at the contact between the rock units of the Piedmont and the unconsolidated Cretaceous sediments. It is essentially a line from Carteret through Princeton Junction to Trenton. This boundary line is known as the Fall Line because it is marked by a series of waterfalls and rapids all along the East Coast. The Sand Hills are erosional remnants of Coastal Plain sediments that lie within the Piedmont.

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**References**


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