



## THE SMOKY SMOKIES

The Great Smoky Mountains National Park recently received the dubious recognition as the most polluted national park. Three agencies—the National Parks Conservation Association, Appalachian Voices and Our Children’s Earth—joined together to assess air quality in the Smokies based on standards set by the Environmental Protection Agency.

“Ozone levels in the Smokies violated federal health standards more than 175 times since 1998, threatening the health of hikers and damaging 30 species of plants,” according to the study (Associated Press, Sept. 25). Sulfur dioxides released by coal-fired electrical generators in Tennessee and Alabama, as well as in the Midwest, are blamed for acid rain and acid fog in the Smokies.

The Smokies, however, are a relatively small portion of the Appalachian Mountains affected by this same air quality problem. Although the study only dealt with the Smokies, the entire Appalachian Mountain region is undergoing similar environmental stresses from pollutants carried by the westerly winds.

Although the name Great Smoky Mountains is recognized by most Americans, this mountain range covers only 900 square miles (2,331 sq. km.) and occupies parts of only two counties each in North Carolina and Tennessee.

The Smokies were named for a bluish haze that often shrouds the slopes. This haze was actually very moist air combined with naturally occurring hydrocarbons produced by trees. In the last half of the 20th century, however, anthropogenic (human produced) hydrocarbons added to the naturally blue haze, reducing visibility even more.

The Great Smoky Mountains National Park is the country’s most visited, averaging more than nine million visitors annually. However, visitors often confuse the Appalachians, the Appalachian Mountains, the Blue Ridge and the Smokies. The Appalachians are comprised of all of the mountain, hill and plateau regions from Eastern Canada to Alabama. The Appalachian Mountains are the highest part of the Appalachians, stretching from southern Pennsylvania to North Georgia. The Blue Ridge and the Smokies are simply parts of the Appalachian Mountains, with the Blue Ridge occupying the eastern edge of the mountain range and running their entire length. In fact, technically there is no such thing as the Blue Ridge Mountains.

The Smokies, on the other hand, are a distinct, but small subset of mountains located on the western side of the Appalachian Mountains.

The Appalachian uplift occurred when the North American tectonic plate collided with Africa and Europe about 280 million years ago. This mountain building episode was a complicated, multi-phased process

whereby the Smokies were shoved north-westward to perhaps two or three times their present elevations. Erosion then lowered the mountains and even cut through the overthrust materials to expose limestone on the floors of isolated mountain coves. Coves called Cades, Wear and Tuckaleechee are unique geologic, biologic and cultural phenomena on the Smokies’ landscape.

The Smokies have some of the highest peaks east of the Mississippi. Clingman’s Dome is the second highest mountain east of the Mississippi at 6,643 feet (2,037 m.), just 41 feet (12.5 m) shorter than Mt. Mitchell, North Carolina’s highest. The Smokies contain a total of 16 peaks over 6,000 feet (2,839 m), as well as a 35-mile (56- km) length of mountain crest over 5,000 feet (1,524 km).

Today the Smokies are densely covered with mature trees, representing one of the most diverse middle latitude forests in the world. More than 200 tree species are represented in distinctive mountain vegetation zones. These zones correspond to temperature bands around the mountain slopes and to aspect, or directions slopes face.

Only 76 years ago—prior to the establishment of The Great Smoky Mountain National Park—the Smokies were a ravaged landscape, largely denuded of old-growth timber. The creation of the National Park in 1926 ultimately protected 520,269 acres (210,553 ha.), or about 90 percent of the Smokies. Since that time, the forests have been allowed to regenerate naturally.

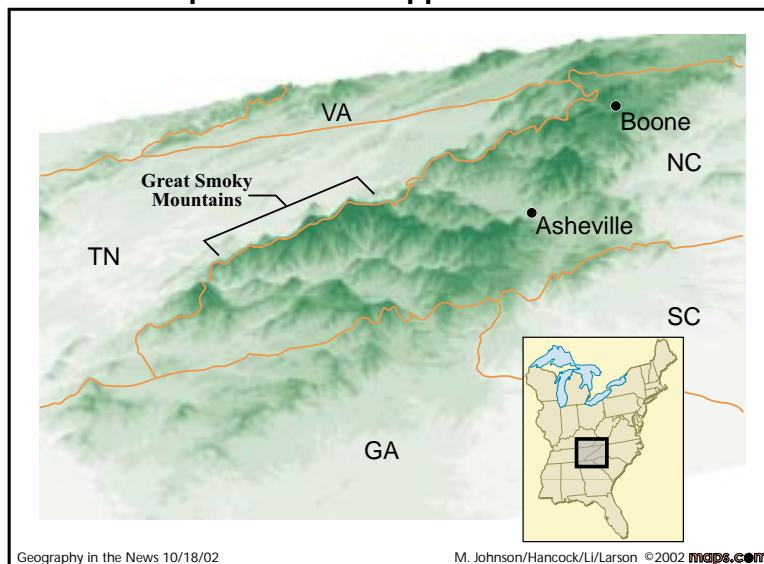
During the past 50 years, however, atmospheric pollutants have stressed the park’s vegetation at the highest elevations. Ozone, acid rain and acid fog have made trees, such as the Fraser fir and red spruce, susceptible to insect infestations.

The skeletal remains of many of these trees stand on slopes above 4,500 feet (1,372 m.), as witnesses to air quality decline in the park and elsewhere across the Appalachian Mountains.

And that is Geography in the News. October 18, 2002. #646.

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### 3-D Perspective of the Appalachian Mountains



that folded, fractured and shoved the rocks of the Appalachian Mountains northward. Because there were multiple uplifts during perhaps 20 million years or more, the geology of the Appalachians is very complex. The erosion that has followed may have removed as much as 30,000 feet (9,144 m.) of rock from parts of the Appalachians.

The Smokies formed during a latter portion of the Appalachian orogeny, or mountain-building episode. The rocks in this portion of the Appalachian Mountains were thrust over existing sedimentary rocks. This overthrusting created a stacking effect,