

Great Smoky Mountains

National Park 1934

International Biosphere Reserve; UNESCO World Heritage Site

I. Human History

- A. Sacred home of Cherokee Indians - one of the most culturally advanced on the continent
 - 1. 1838 forcibly removed to Oklahoma - Trail of Tears
- B. European settlement
 - 1. Late 1700s – 1900s
 - a. lived off wildlife and land, used timber for buildings and fences
 - b. areas that had once been forest became fields and pastures
 - 2. arrival of lumbering in early 1900s changed agricultural pattern of life
 - a. self-sufficient economy replaced by dependence on manufactured items
 - b. logging boom towns sprang up overnight (cut primeval forests)
- C. Great Smoky Mountain National Park 1934
 - 1. saved the 20% of primeval forest that remained within park boundaries
 - 2. ~1,200 land-owners had to leave their land once the park was established
 - a. left behind farm buildings, mills, schools, and churches
 - 1.) >70 of these structures have since been preserved
 - a.) largest collection of historic log buildings in the East
 - 3. money to buy land raised by individuals, private groups, and school children; Laura Spellman Rockefeller Memorial Fund donated \$5 million

II. Geologic History

A. Precambrian 1.1 BYA

- 1. Basement rocks – **Grenville Orogeny** (super continent Rodinia)) igneous & metamorphics

B. Precambrian - 800 – 545 MYA

- 1. Deposition on continental shelf (south of equator) of Iapetus Ocean
 - a. along ancient margin of North American continent as supercontinent broke apart
 - b. 50,000 ' of clay, silt, sand, gravel, and minor amounts of calcium carbonate
 - 1.) reflect changes in environments of deposition over time
 - a.) varying depths of water, ocean currents, types of sediments
 - 2.) cemented/lithified into 9 mi of rock; deformed & metamorphosed
 - c. **Ocoee Supergroup** – metasedimentary rocks (sandstone, siltstone, conglomerate), slightly metamorphosed slate and schists
 - 1.) subdivided into smaller divisions of differing rock types reflecting range of climatic and topographic conditions

C. Paleozoic 545 – 360 MYA

1. sedimentary - compacted/cemented sand, silt, & clay deposited in ancient shallow marine continental margin in what is now Appalachian region
 - a. **Chilhowee Group** – quartz sandstone
 - b. **Knox Group** – carbonates
2. two minor orogenies from microcontinents
 - a. **Taconic Orogeny** in Southern Appalachians – brought Ocoee Supergroup to North American margin – Greenbriar Fault
 - b. **Acadian Orogeny** – to east but caused compression and renewed thrust faulting and some granitic intrusions

D. Paleozoic 310 – 245 MYA

1. eastern edge of North American plate collides with African plate becoming part of a "supercontinent" known as Pangaea
2. **Allegheny Orogeny** - uplifted Appalachian mountains - Newfoundland to Alabama
3. African plate gradually pushed against edge of the North American plate
 - a. original horizontal layers were bent or folded and broken by faults
 - b. **Great Smoky & Gatlinburg thrust faults:** older, deeply buried rocks were pushed northwestward, up and over younger rocks
4. Pangaea broke apart & North American and African plates moved to present position
5. intense erosion from ice, wind, and water
 - a. mountain valleys were carved
 - b. sediment transported to Atlantic & Gulf of Mexico by rivers & streams
 - c. rock most resistant to erosion formed highest peaks
 - 1.) metasandstone on top of Clingmans Dome and Mt Le Conte
 - 2.) igneous rocks, dikes, quartz veins and pegmatite at Clingman's Dome
 - 3.) waterfalls formed where downcutting streams encountered ledges of resistant metasandstone, erodes more slowly than adjacent slate or metasiltstone
6. unmetamorphosed limestone and dolomite (Knox Group) found on floor of Cades Cove, below the Great Smoky fault

E. Cenozoic

1. Colder & wetter climate of Pleistocene ice age - glaciers did not reach this far south
 - a. lowered timberline: remnants of spruce-fir forests are in higher peaks and ridges
 - b. intense frost wedging and increased erosion & downcutting
 - c. geologists estimate that the mountains are being eroded ~2"/ky
 - d. great diversity in plant and animal life