

Geological History of North Carolina

December 5, 2014

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Where are We?



Our tour guide today is Waldo.



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Back in Time...

- North Carolina became a colony on May 20, 1775
- And then a state a few years later... April 12, 1776
- But the landmass underneath NC that accounts for its existence actually began forming **1,700** million years ago and hasn't taken much of a breather since



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How many regions are in NC?

- North Carolina is typically divided into 3 main regions:

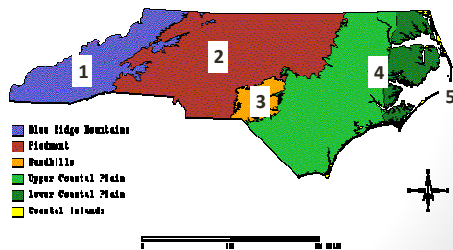


- But this can vary up to five or even more

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5 Regions in NC:

1. Blue Ridge Mountains
2. Piedmont
3. Sandhills
4. Upper & Lower Coastal Plain
5. Coastal Islands



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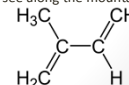
Mountains

- Blue Ridge Mts. are a subdivision of a larger range called the Appalachian Mts
- The Blue Ridge mountains began to form around 400 million years ago!

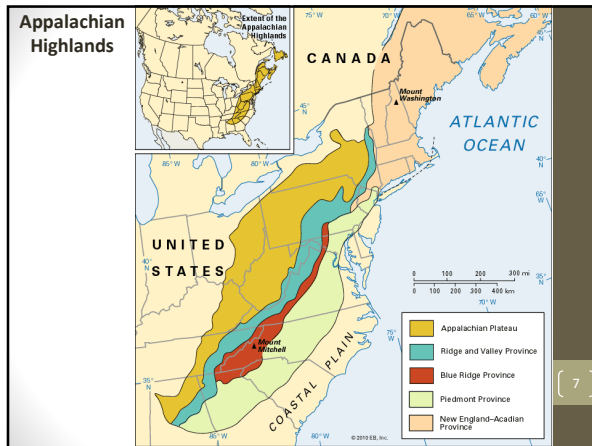


Blue?

Trees that reside along the mountainsides are responsible for this. Trees release a substance called isoprene into the air that causes the blue haze you see along the mountains.



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Piedmont

- Piedmont is an area less steep than mountains, but more unlevel than a flat plain. Also called foothills.
- In North Carolina the Piedmont region is directly between the more mountainous west, and the flat, coastal east.
- The Piedmont region consists of gently rolling countryside, small mountain ranges that have over time become severely eroded, and hills.

Durham is located in the Piedmont

Coastal Plain

- Coastal plain is flatter land that borders the Atlantic Ocean.

Challenge!
Draw a simple topographical map of NC showing the change in elevation in the three main regions (Mountains, Piedmont, Coastal Plain)

So what accounts for all these regions and their distinct features?

Converging Plates!

Converging Plates

- When two plates collide the one with higher density (oceanic) subducts under the other
- However, what if they are both continental plates?

Erosion

- Piedmont areas generally form at the bases of mountains.
- They are the result of a combination of the same forces that form mountains
- Over time due to erosion, the landscape gets worn down and creates more rolling hills

Challenge!
Why do you think the coastal plain region is flatter than the Piedmont region?

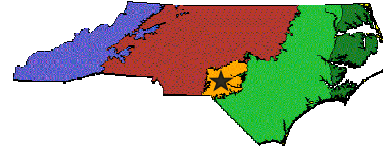
Answer:

- Over time, the combination of chemical and physical influences exerted by the tides can strip land into a much flatter formation.
- This is evident when you look at the Coastal Plain, and its much flatter landscape, combined with its sandy soil.

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Sandhills

- The sandhills are the area of highest elevation in the Coastal Plain
- Ancient remnants of sand dunes left behind as proof that the coastline used to be farther inland
- The great seas/lower land of the past left this geologic landmark divisor that now generally separates the Coastal Plain from the Piedmont region



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Dunes

- Sandhills today...
Pinehurst Golf Resort
- Current famous dunes still on coast line...
Kitty Hawk
(Wright brothers – the first airplane flight in 1903)



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Fall Line

- Fall Line is the border line between the Coastal Plain and Piedmont
- On one side is softer, sedimentary rock. On the other is harder rougher mountain like rock.



Challenge!
Which region has the harder mountain like rock– Coastal Plain or Piedmont?

Piedmont

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- Rivers flowing to the sea reach the fall line and form water falls, hence the name
- When European settlers arrived to NC, they could travel up the rivers by boat as far inland as the falls, but then had to find other transportation
- Trading posts emerged which grew into cities
- Interstate 95 follows the fall line along much of the east coast

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Barrier Islands

- Barrier islands are long narrow sandy islands that protect the mainland from storms
- North Carolina's built in defense in the outer banks



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Geological Timeline

- bya = billion years ago
- mya = million years ago

- 4.5 bya = Earth Formed
- 4000 mya = Stable crust with oceans formed
- 1700 mya = Land to form NC started to form
- 1300 mya = 1st mountains in NC formed, called Grenville Mountains. They eroded away
- 750 mya = North America and Europe/Africa start to move toward each other
- 344 mya = Appalachian Mts. form. Streams from mountains carry sand and sediment filling the sea

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- 320 mya = North America & Europe/Africa collide, creating Pangea. This is the end of building the Appalachian Mountains. The Piedmont and Coastal Plain regions move up.
- 250 mya = Pangea breaks apart. NC at this time is near the equator
- 200 mya = When the tectonics plates were moving the Coastal Plains sunk, causing the difference between the Piedmont and Coastal Region. The Appalachian Mts. start to erode creating the Piedmont.

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- 65.5 mya = All of the Coastal Plains are above sea level
- 55.8 mya = The Coastal Plains start to sink again, the ocean comes up to where the modern Piedmont would be then recede again
- 33.9 mya = The ocean rises as far as modern day New Bern
- 23.0 mya = The ocean retreats completely from the modern day Coastal Plains
- 5.3 mya = The Blue Ridge Mts. and Piedmont look as they do today; shallow seas cover the Coastal Plains then recede.

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- 1.8 mya = Sandhills form. Streams bring sediment to the Coastal Plains. The ocean rises then recedes again. Fall line forms.
- 1.7 mya = The Ice Age begins and sea levels fall
- 18,000 ya = Glaciers recede, and barrier islands form

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