

I. Crustal Provinces of North American Continent

A. North America

1. The surface of NA is variable
 - mountains, plains etc.
2. This implies a diverse nature to the continental crust
 - a. this diversity can be divided into provinces
 - b. These provinces are regions of the crust that formed during distinct events in NA history.
3. Provinces are defined based on
 - a. age of rocks that compose them
 - b. Types of Rocks
 - c. Nature of the events that shaped the province

B. A quick history of North America beginning ~500 million years (Ma) ago

Note: Most of Earth's history and much of NA history occurred before 500 Ma

1. Baltica Approaches Laurentia (~490 Ma)
 - a. Taconic Orogeny
 - b. Beginning of Appalachian Mountain building
2. Laurentia collides with Baltica and Avalonia (~425 Ma)
 - a. Acadian Orogeny
 - b. Collision begins in the North (northeast NA and Greenland)
 - c. Northern Caledonides of British Islands form
 - d. Resulting continent is called Euroamerica
3. Western Euroamerica involved in repeated collisions (later in class)
 - a. ~370 Ma
 - b. This begins shaping western North America and continues to Cretaceous (~65 Ma)
4. Euroamerica collides with Gondwana (Forming Pangaea!) ~320 Ma
 - a. Alleghanian and Ouachita Orogenies
 - b. Completes the building of Appalachian mountains
5. Pangaea breaks apart (~250 Ma) into Continents we know today

II. The provinces from East to West

A. Coastal Plain

1. East to southeast coast of NA
2. Flat lying sediment
 - a. deposited since opening of Atlantic (rifting of Pangaea)
 - b. Most in past 100 Ma, when sea level was higher than today.
 - c. Sediments burry older continental rocks

B. Appalachian Mountains (include Ouachita Mts.)

1. From northeast to southeast NA
2. Mountains built over a long history of continental collisions
 - a. Beginning 490 Ma ago with Taconic orogeny, continuing through Acadian, Alleghanian and Ouachita Orogenies.
 - b. ending ~280 Ma when Africa collided with Euramerica
3. Note: The Appalacian Mountains were once greater than the Himalayans. They have since been eroded away.

C. Continental Interior

1. Midwest to Northern Plains to Texas
2. Mostly flat lying sedimentary rocks
 - a. Most are older than 280 Ma
 - b. Deposited during times when the oceans flooded the mid-continent
 - c. These sedimentary rocks are 10s of km thick and overlie 'basement'
3. Basement rocks
 - a. These are very old (>1 billion years or Ga)
 - b. Formed during early history of Laurentian continent
 - c. Basement is exposed in some parts of Interior
 - e.g. southern Missouri, Upper Peninsula MI, northern WI and MN

D. North American Cordillera

1. Western ~1/3 of NA
 - a. Continues north into Canada – Alaska
 - b. Continues south through Mexico and begins again in western South America
2. The Cordillera (Cordillera is old term from geosyncline hypothesis referring to string of islands within the geosyncline)
 - a. very wide belt of mountain chains
 - b. Most < 150 Ma old
 - c. Active mountain building continues today
3. Some regions you should know:
 - a. Rocky Mountains = easternmost mountains in NA Cord.
 - b. Colorado Plateau: high plateau covering northern AZ, eastern UT and southwest CO
 - c. Basin and Range:
 - i. A region of alternating elongate mountain ridges and intervening low flat basins
 - ii. Covers NV, much of UT, south central OR and NW AZ
 - iii. Created by stretching and breaking of NA crust

Note: this region is sometimes erroneously referred to as ‘the Great Basin’. The Great Basin is, in fact, the Great Valley of California that lies between the Sierra Nevada and Coastal Range
- d. Sierra Nevada Mountains: elongate chain of mountains on the eastern boundary of CA
4. The Cordillera formed by orogenesis and rifting
 - i. Orogenesis = mountain building from convergent-margin tectonism
 - ii. Rifting formed the Basin and Range