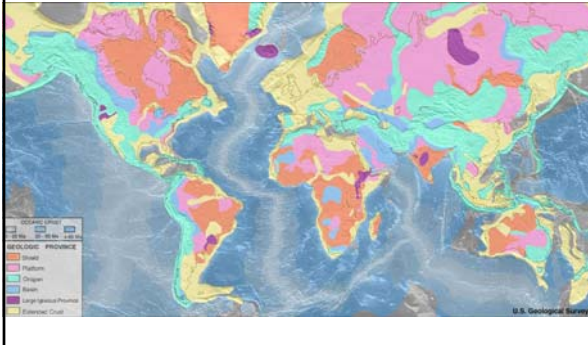


Formation of the North American continent



Geologic Time Scale

Era	System & Period	Series & Epoch	Some Distinctive Features	Years Before Present
CENOZOIC	Quaternary	Recent	Modern man	11,000
		Pleistocene	Early man, northern glaciation	1.2 to 2 million
	Tertiary	Pliocene	Large canyons	2.5 to 1 million
		Miocene	First abundant grazing mammals, large running mammals	25 to 2 million
		Oligocene	Large running mammals, many modern types of mammals, first placental mammals	58 to 2 million
MESOZOIC	Cretaceous	Palaeocene	First flowering plants, climate of dinosaurs and ammonites, followed by Cretaceous-tertiary extinction	65 to 2 million
		Neocene	First dinosaurs, abundant cyclopes and conifers	135 to 5 million
	Jurassic		First birds, first mammals dinosaurs and ammonites abundant	180 to 5 million
	Triassic		First dinosaurs, abundant cyclopes and conifers	230 to 10 million
	PALEOZOIC	Permian		Extinction of most kinds of marine animals, including trilobites. Southern glaciation
Carboniferous			Permian	Great coal forests, conifers, first reptiles
Devonian		Mississippian	Sharks and amphibians abundant. Large and numerous scale trees and seed ferns	345 to 10 million
			First amphibians, ammonites, fishes abundant	405 to 10 million
Silurian			First terrestrial plants and animals	425 to 10 million
Ordovician			First fishes, water-breathing dinosaurs	500 to 10 million
Precambrian	Cambrian		First abundant record of marine life, trilobites dominant	600 to 10 million
			Fossils extremely rare, consisting of primitive aquatic plants. Evidence of glaciation. Oldest dated algae, over 2,800 million years, oldest dated microbe 4,500 million years	

western Plateaus forms, Basin and Range province forms, volcanism

Pangea breaks apart, western US orogenies, continental sea

Pangea forms, Orogenies that form the Appalachian province

•Laurentia forms, Grenvillian orogeny

Terminology

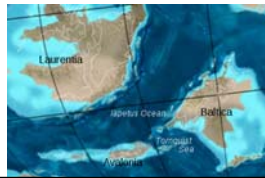
- **Craton:** stable interior portion of a continent characteristically composed of ancient crystalline rock
 - Craton is generally from the Precambrian era
- **Basement rock:** oldest rock, foundation of continent, not sediment
- **Shield:** exposed part of the craton
- **Orogenies:** mountain-building events
- **Terranes:** fragment from another plate lying or attached to another plate

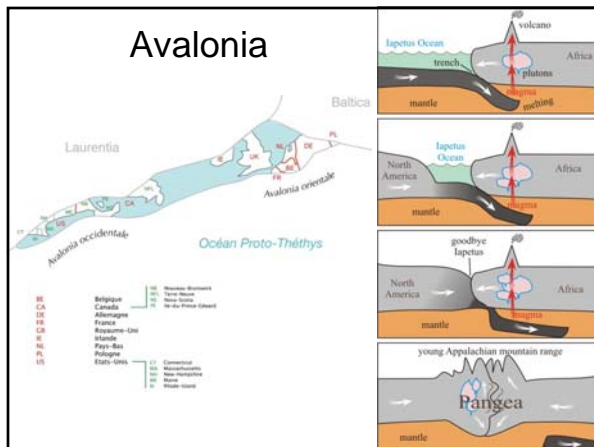
Old rock: Precambrian

- South America and Africa were assembled around 0.7 Ga
- Assembly of Eurasia began at 0.3 Ga
- Most of the North American craton has been coherent since 1.7 Ga.
- North American craton (Laurentia) included Greenland and northwest Scotland until their partial separation in the Late Cretaceous.

Forming Pangea

- Laurentia surrounded by 3 oceans (important one: Iapetus, split into 2 parts)
- Avalonia was a volcanic arc continent on another plate (Gondwana)
- As western Iapetus closed, Avalonia was wedged onto Laurentia





Mesozoic: Jurassic 170myo

- Shallow inland sea
- Eastern continental edge
- Western continental edge



Mesozoic: Late Jurassic 150 myo

- Shallow inland sea
- No Alaska
- Not much of OR, WA, CA
- Coastal plain not there



Mesozoic: Cretaceous 140myo

- Florida
- Gulf opening
- Coastal margins
- Western edge



Mesozoic: Cretaceous 115 myo

- Inland sea
- High sea levels
- Laramide orogeny
- Wedging of western edge
- Warm period



Mesozoic: Cretaceous 100 myo

- Western edge accreted on to continent
- Northern edge of continent
- Warm period



Mesozoic: Cretaceous 85 myo

- Midcontinental seaway
- High sea level
- Northern boundary
- Warm period



Mesozoic: Cretaceous 75 myo

- Expansion of seaway
- Warm period



Cenozoic: Paleocene 50 myo

- Coast Mountains
- Rocky mountains
- Coastlines
- Western trench
- Warm period



Cenozoic: Miocene 8 myo

- Alaskan mountains
- Southern coastal submersion
- Warm period



Cenozoic: Pliocene 3 myo

- Aleutian arc
- Ca sea
- Basin and Range mountains formed
- Gulf of CA opens



Cenozoic: Quaternary 0.126 myo

- Ice ages
- Map does not show full extent



Cenozoic: Quaternary-Present

- Great Lakes and Hudson Bay
- Sea level