

Rivers and Streams

Chapter 14: River Systems

Rivers are of great Importance

- Past
 - Transportation
 - Food – Irrigation, Fishing
 - Communication
 - Drinking Water
- Present
 - Transportation
 - Energy
 - Drinking Water
 - Food - Irrigation
- Future
 - ???



River Headwaters

- Lakes
- Springs
- Glaciers
- Mountains
- Confluence of multiple streams



At Source of Mississippi River Lake Itasca (2552 miles from Gulf of Mexico, 1475ft above sea Level)

The Niobrara River

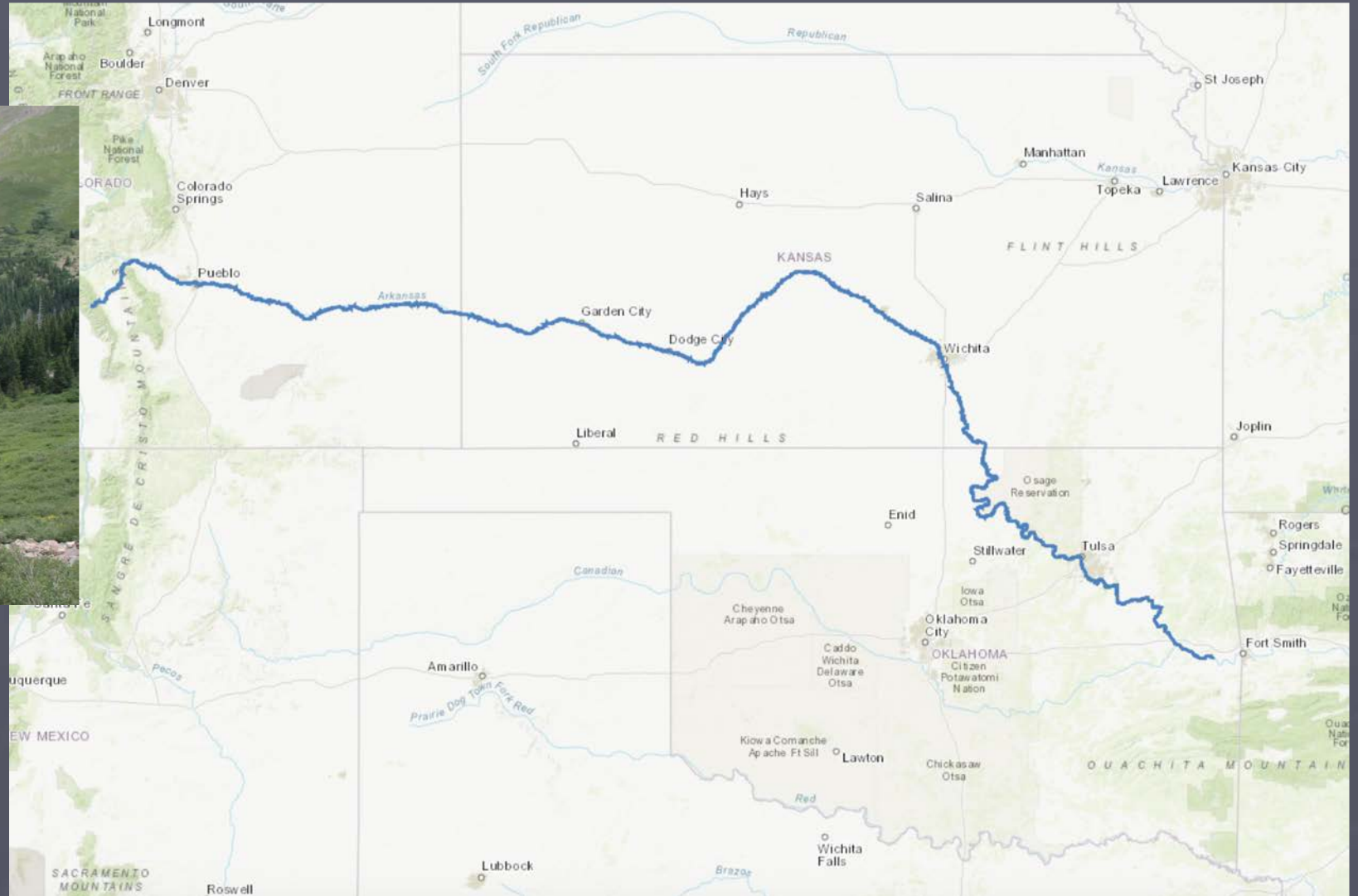


At Agate Fossil Beds National Monument (about 50 miles from source)



At confluence with Missouri River (About 335 miles from source)

Horseshoe Lake to Arkansas River

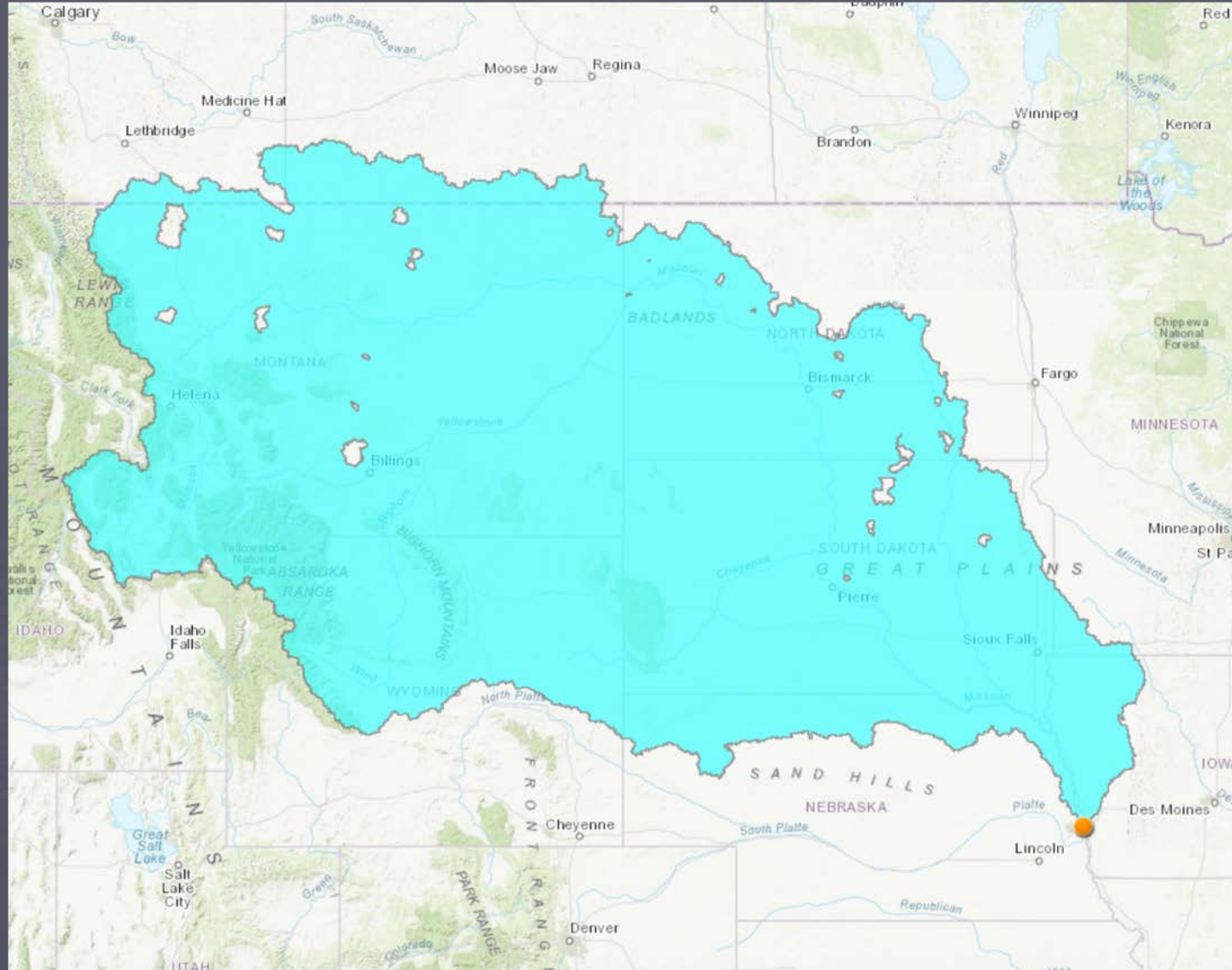


12,000 feet to
445ft in 1000
miles

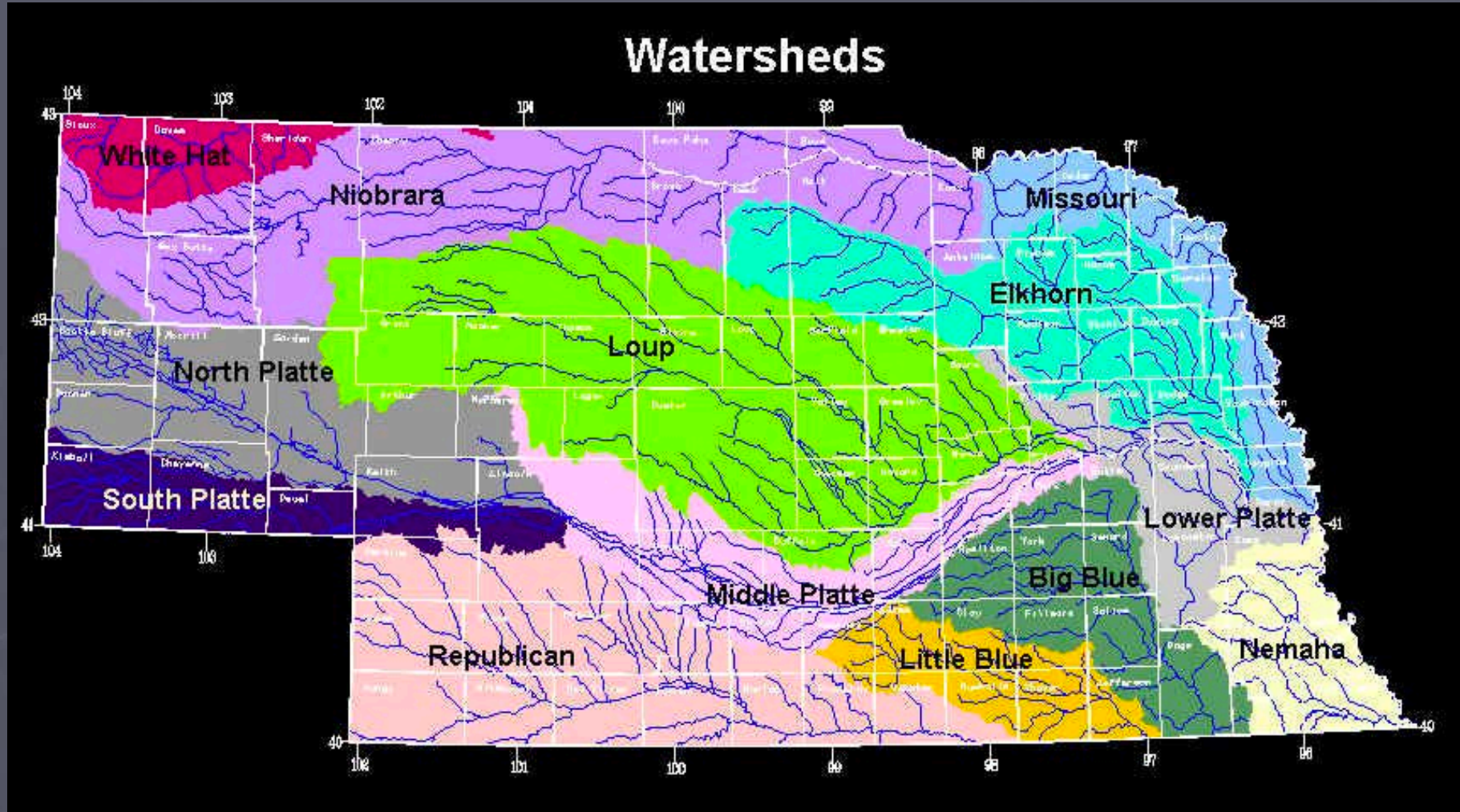
Drainage Basins (Watershed)

- Systems of streams and rivers that connect into each other creating a network of water volume, sediment, and runoff that eventually flow into main channel

Missouri River Drainage Basin to Omaha



Nebraska's Drainage Basins



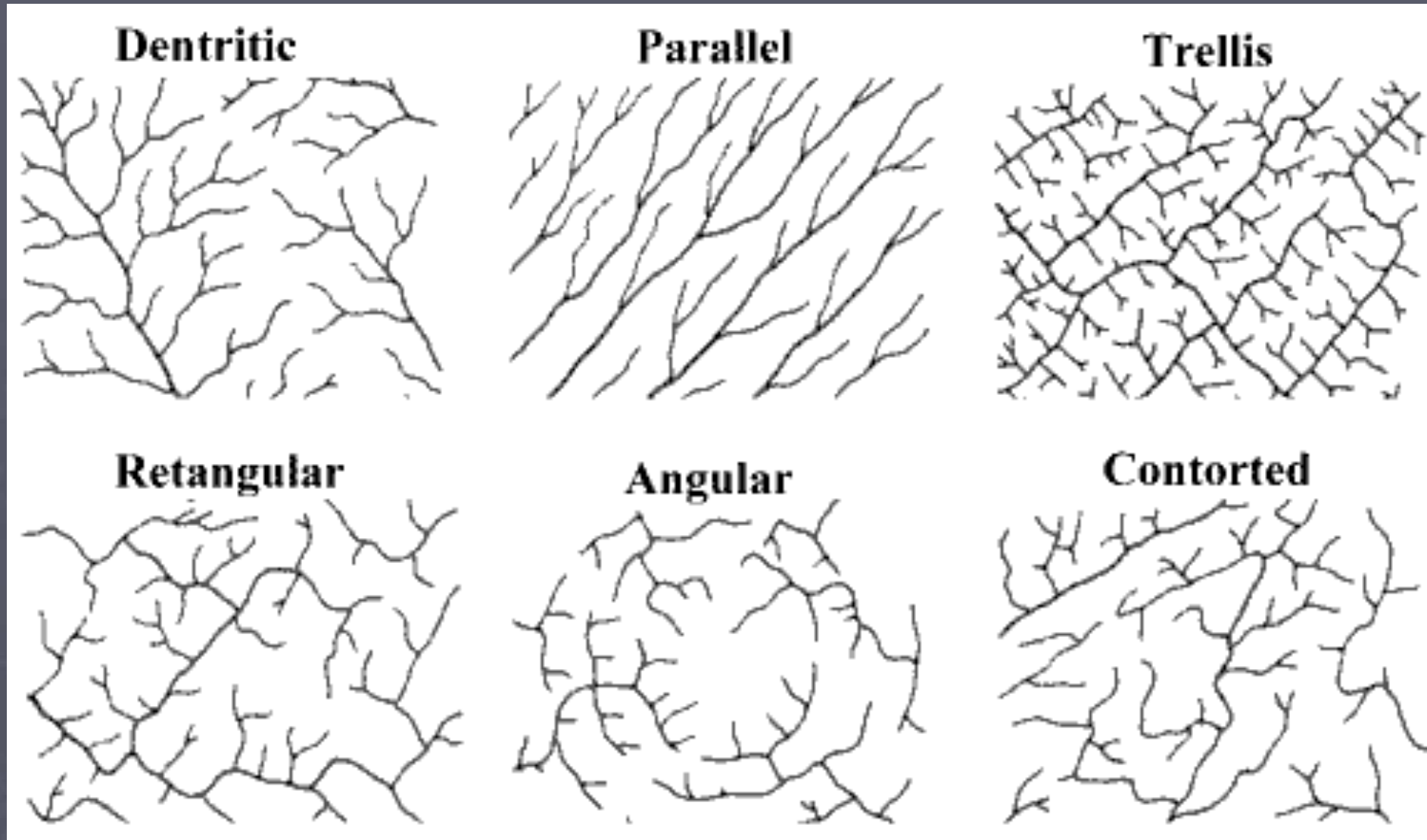
Mississippi River Drainage Basin



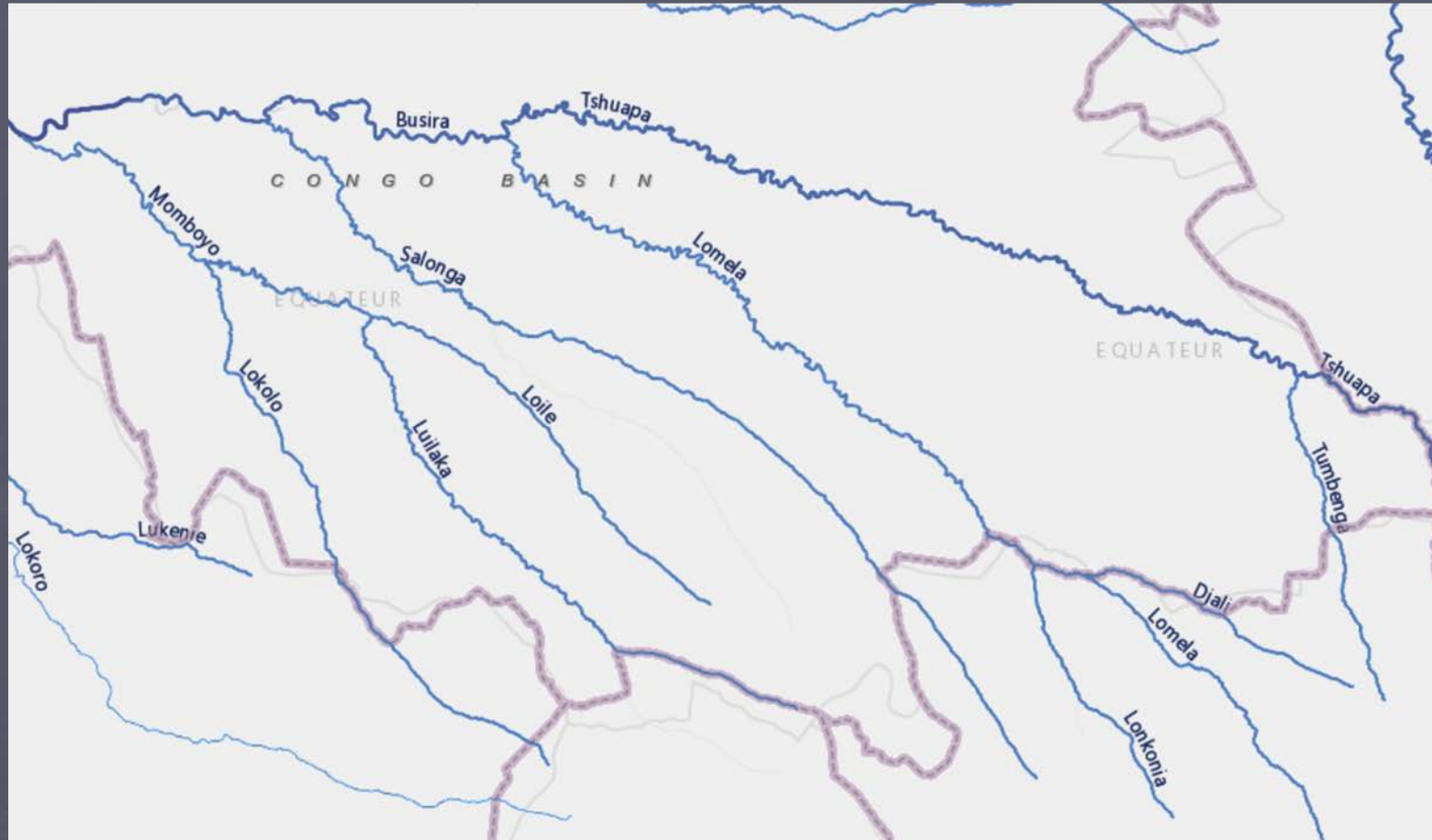
Drainage Patterns

- Shape of streams dependent upon a number of factors
 - Topography
 - Frequency of precipitation
 - Seasonal? Consistent? Rare?
 - Geology
 - Human-Environment Interactions

Drainage Basins Patterns



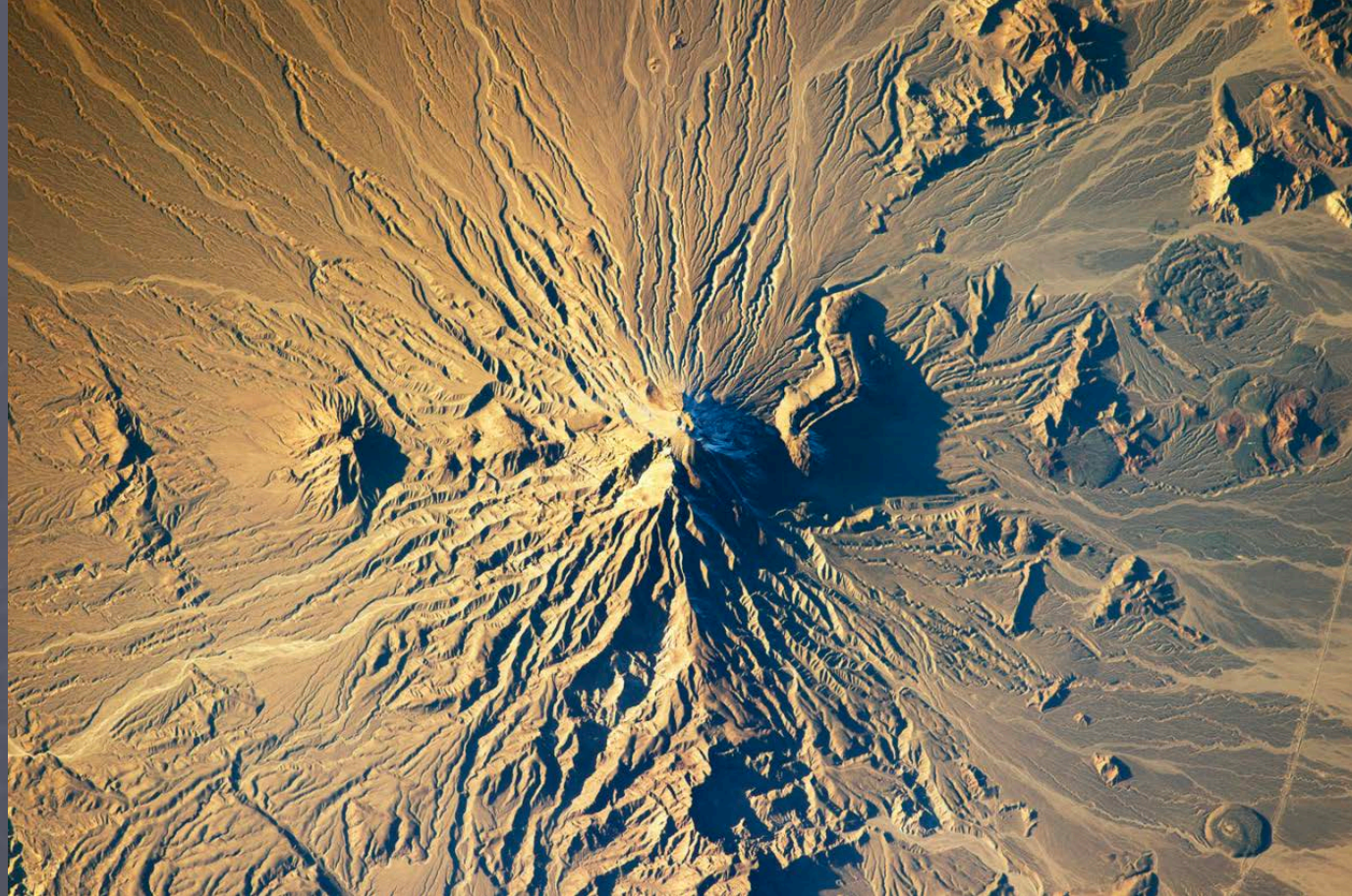
Case Study: Ruki River (Democratic Republic of the Congo)



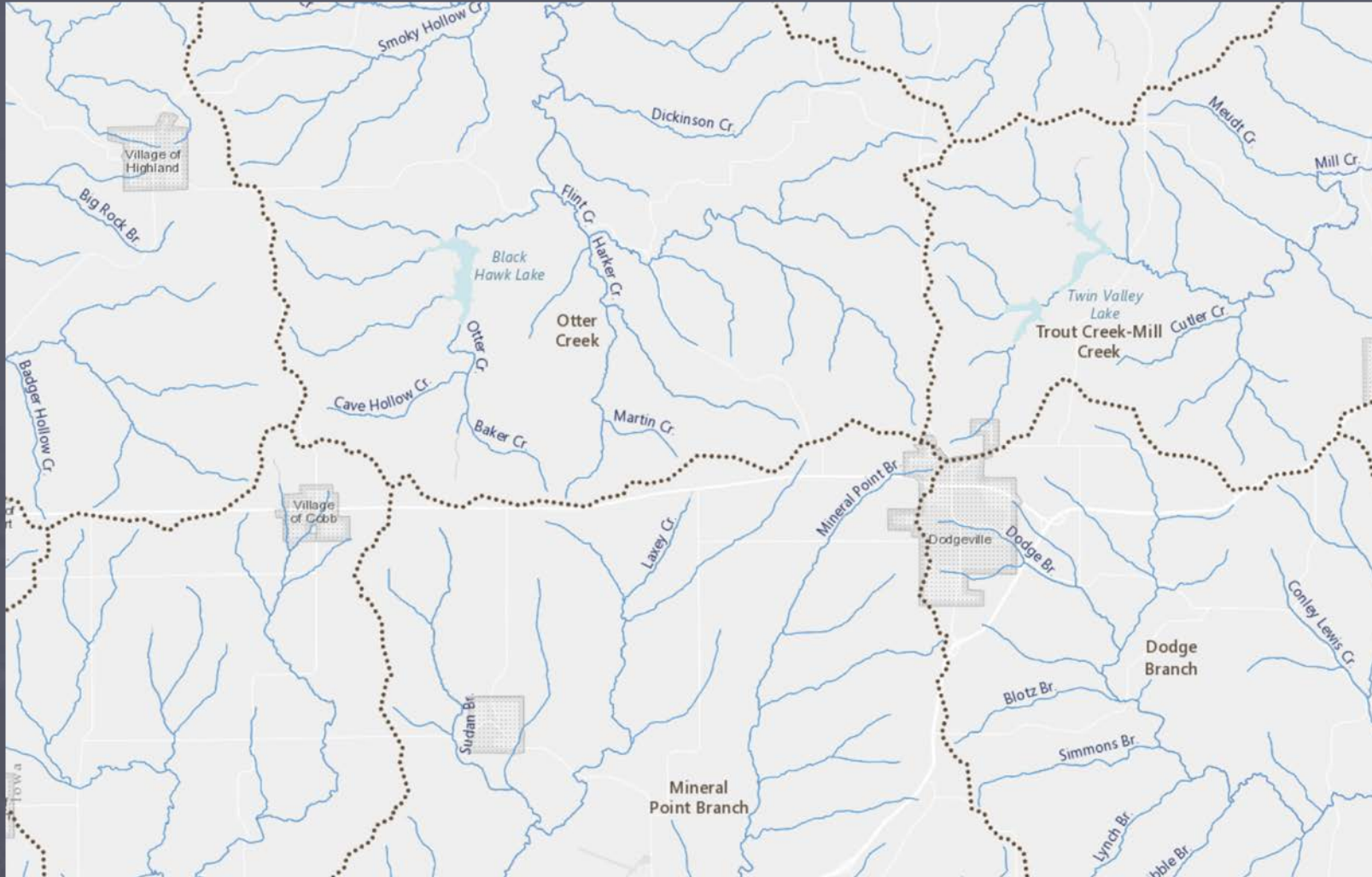
Case Study: Mauna Koa (Hawaii)



Case Study: Bazman Volcano, Iran

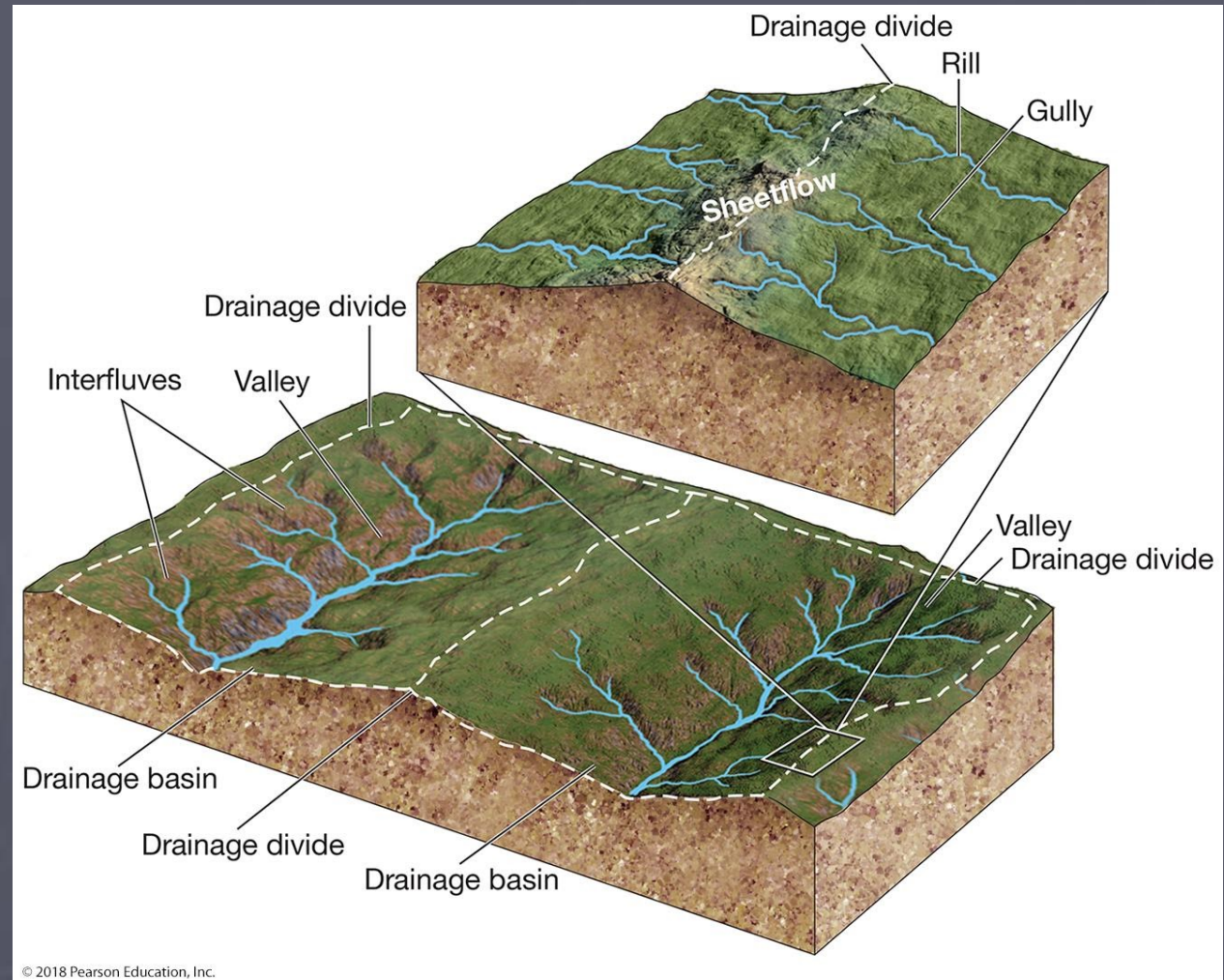


Case Study (Dodgeville, Wisconsin)



Drainage Divides

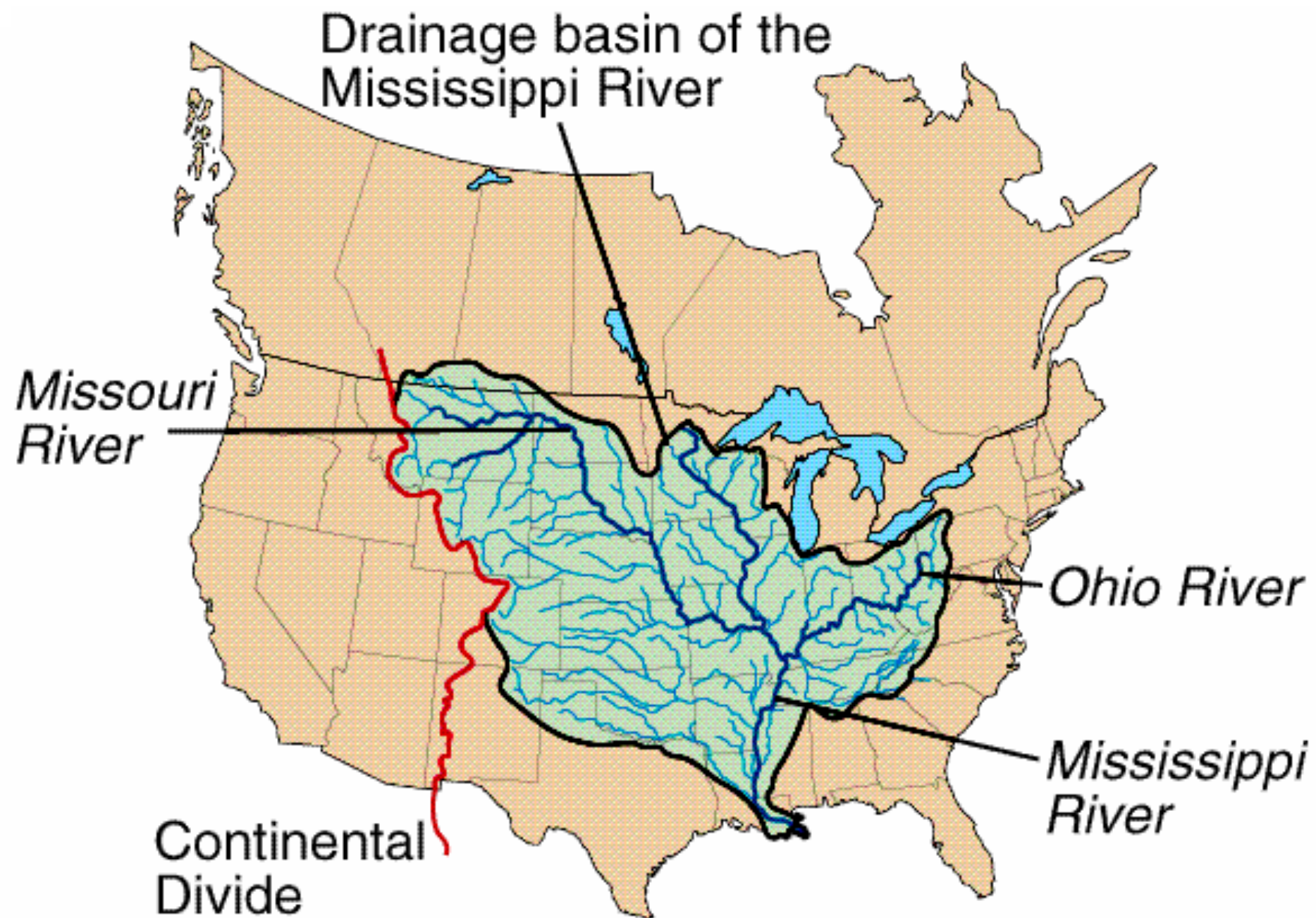
- Changes in elevation determine direction of water
 - Over time water carves out unique landscape features



Continental Divides

- Water always travels along path of least resistance
 - Highest elevation to lowest elevation.
- Continental divides are separations in the direction rivers/creeks travel

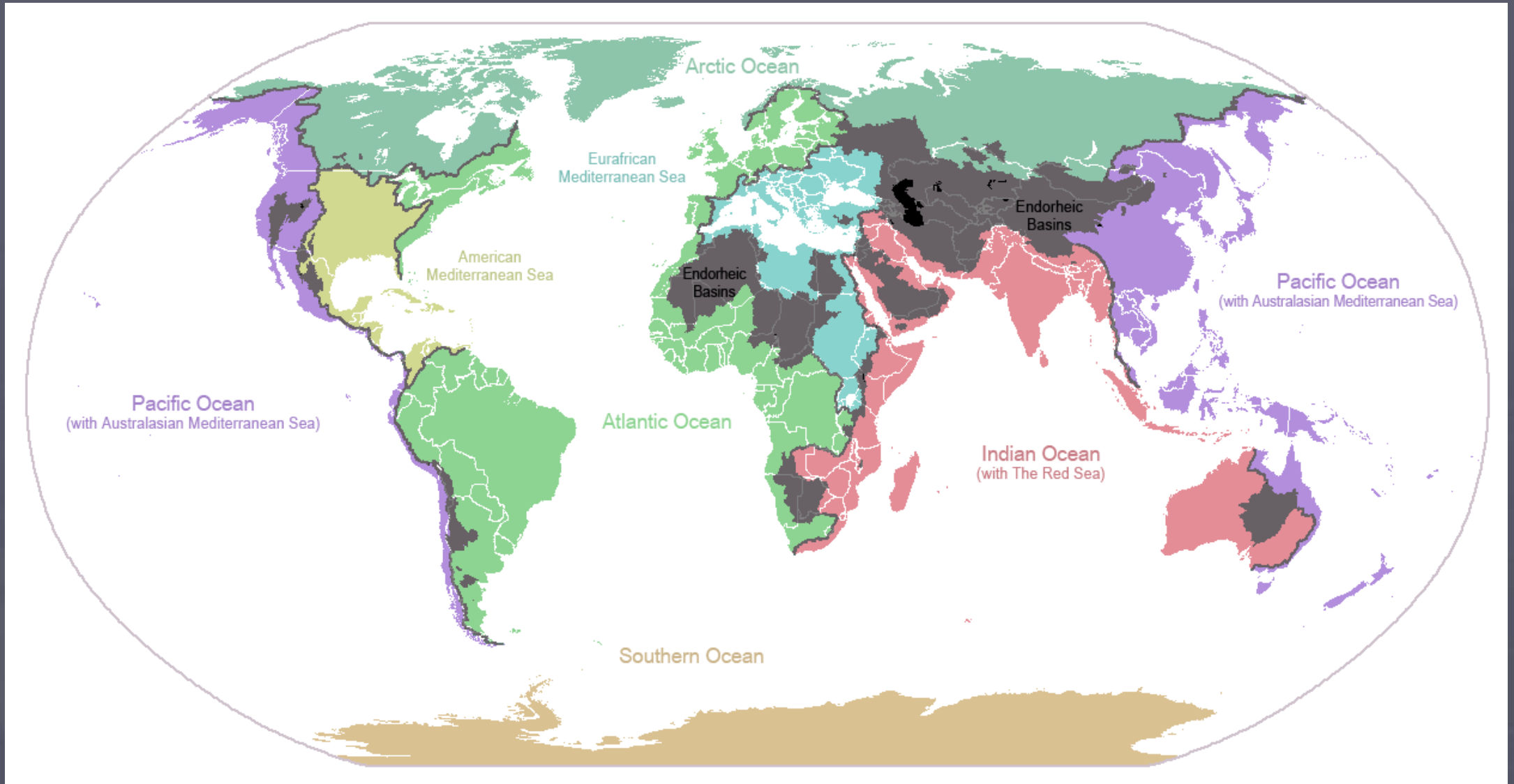




Internal Drainage

- Depending upon physical geography not all streams will end up in ocean/sea
 - Endorheic – Systems of lakes/rivers where water does not ultimately end in the ocean

Endorheic Basins



Case Study: Great Basin (Western USA)



Stream Discharge

- volume of water flowing past a certain location in a given unit of time
 - Measured ($Q = \text{channel width} \times \text{depth} \times \text{velocity}$)
 - Communicated as volume and speed (m^3/s)

River	Country	Average Discharge at Mouth (Thousands of cubic feet per second)
Amazon	Brazil	7,500
Congo	Congo	1,400
Yangtze	China	770
Brahmaputra	Bangladesh	700
Ganges	India	660
Yenisey	Russia	614
Mississippi	USA	611
Orinoco	Venezuela	600
Lena	Russia	547
Parana	Argentina	526

Missouri River in Chamberlain, SD

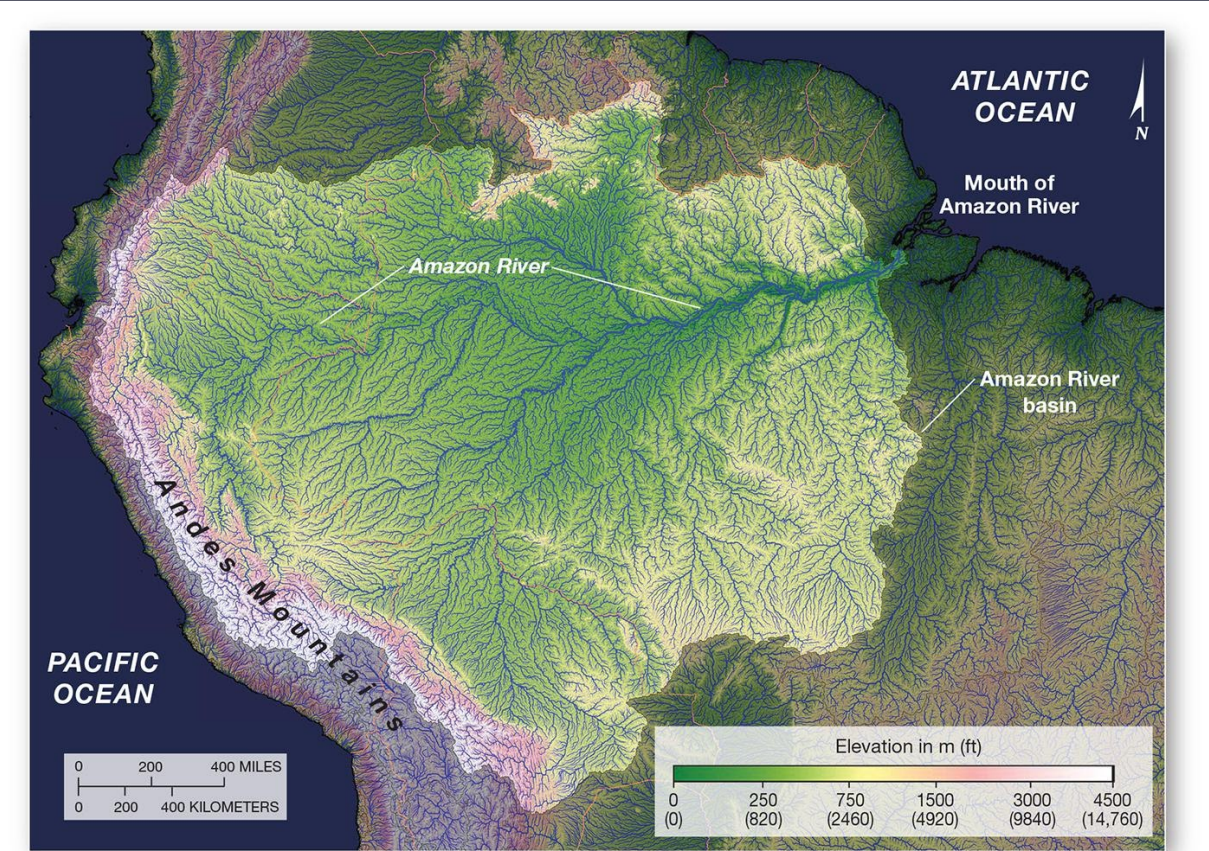
The Muddy Mo



The Platte River at Platte River State Park (A Prairie River)



Amazon River Drainage Basin



Nile River Drainage Basin



Flood Plains and Braided Channels

- Flood Plains – Areas adjacent to streams/rivers that experience frequent periods of flooding resulting in increased deposition
- Braided Channels/Streams – Rivers or streams with high amounts of deposition leading to the creation of a network of interconnected streams

Case Study: Skogar (Iceland)



Case Study: Missouri River Flood Plain (Iowa)



River Deltas and stream Deposition

- Deltas - Areas where rivers discharge
 - Often will divide into separate distributaries (like veins)
- Most large rivers end in seas or oceans
 - Creating river estuaries where sea water and freshwater mix
 - Brackish water
- Gradual buildup due to alluvial (Sediment)

Case Study: Mississippi River (Louisiana)

River Delta – Gulf of Mexico (at sea level)



Case Study: Nile River Delta (Egypt)



Case Study: Okavango River (Botswana)

