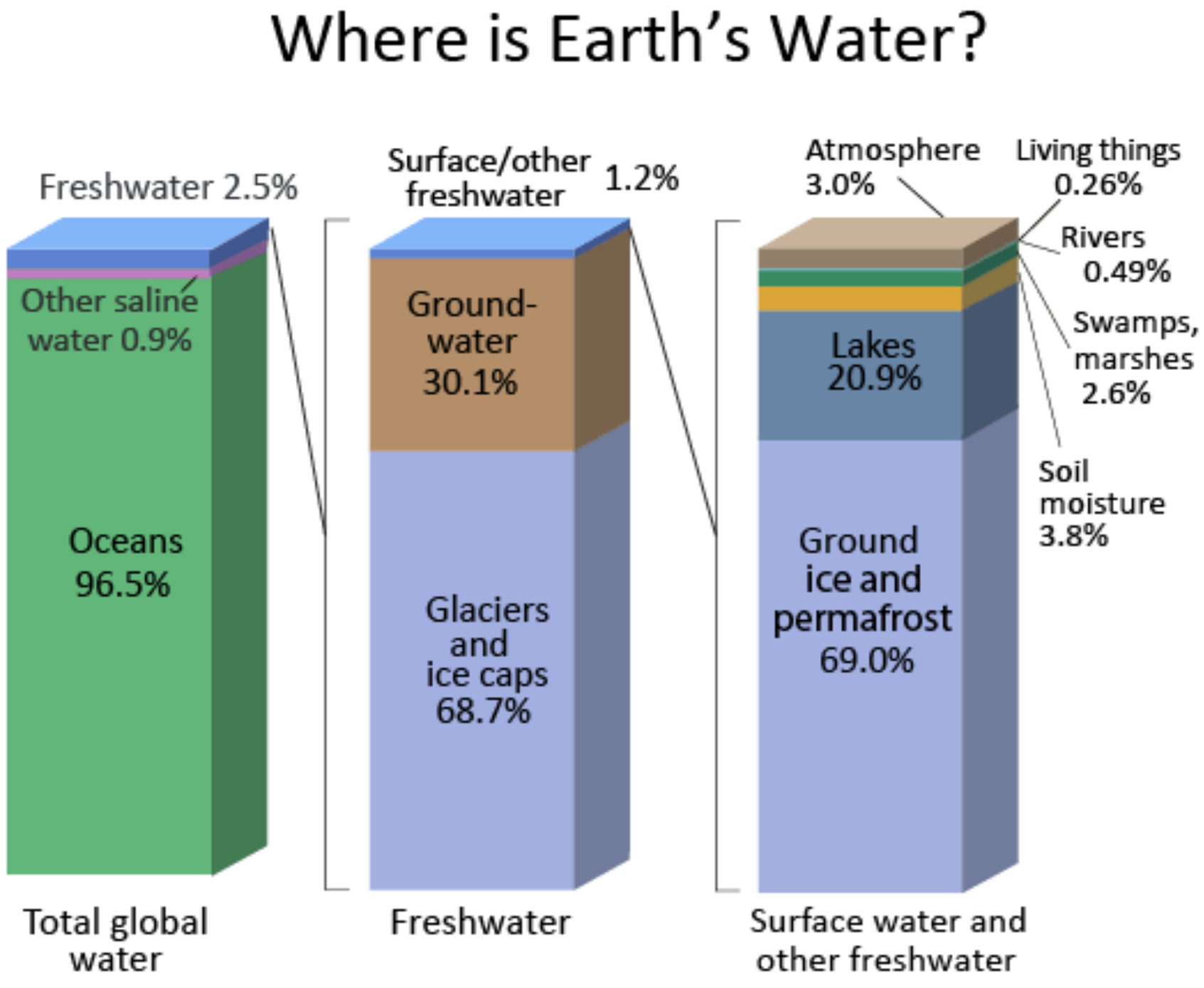
UNIT 4 SG 2

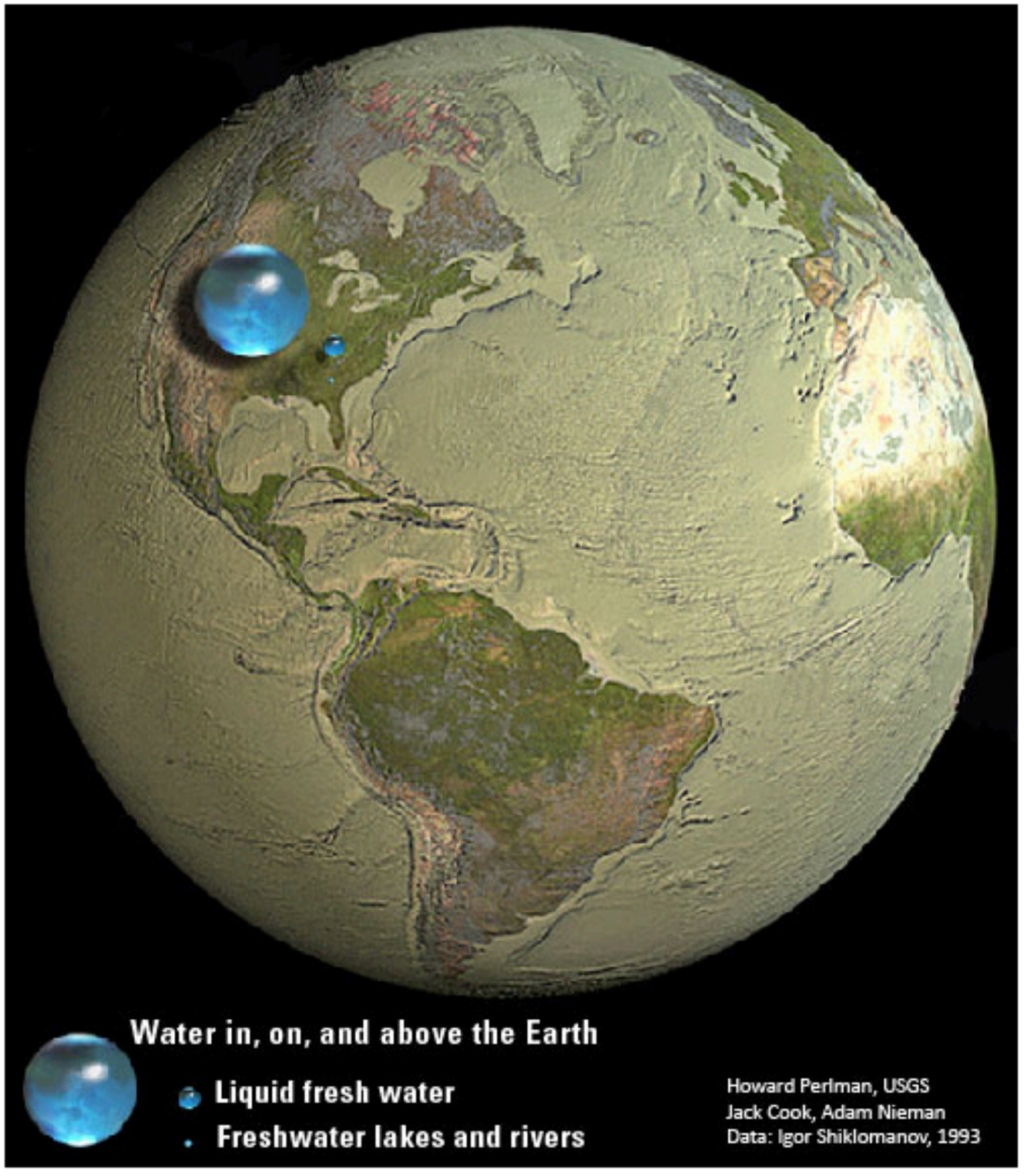
Resource Management - Water

I. WATER

- A. Only about 2.5% of the water on earth is “freshwater.”
  - 1. 68.7% of freshwater can be found in the world glaciers and ice caps. 30.1% is groundwater, & 1.2% is surface water.
    - a. Our drinking water comes mainly from groundwater and surface water, however, 70% of surface water is frozen in the ground as ground ice and permafrost.

Distribution of Earth's Water

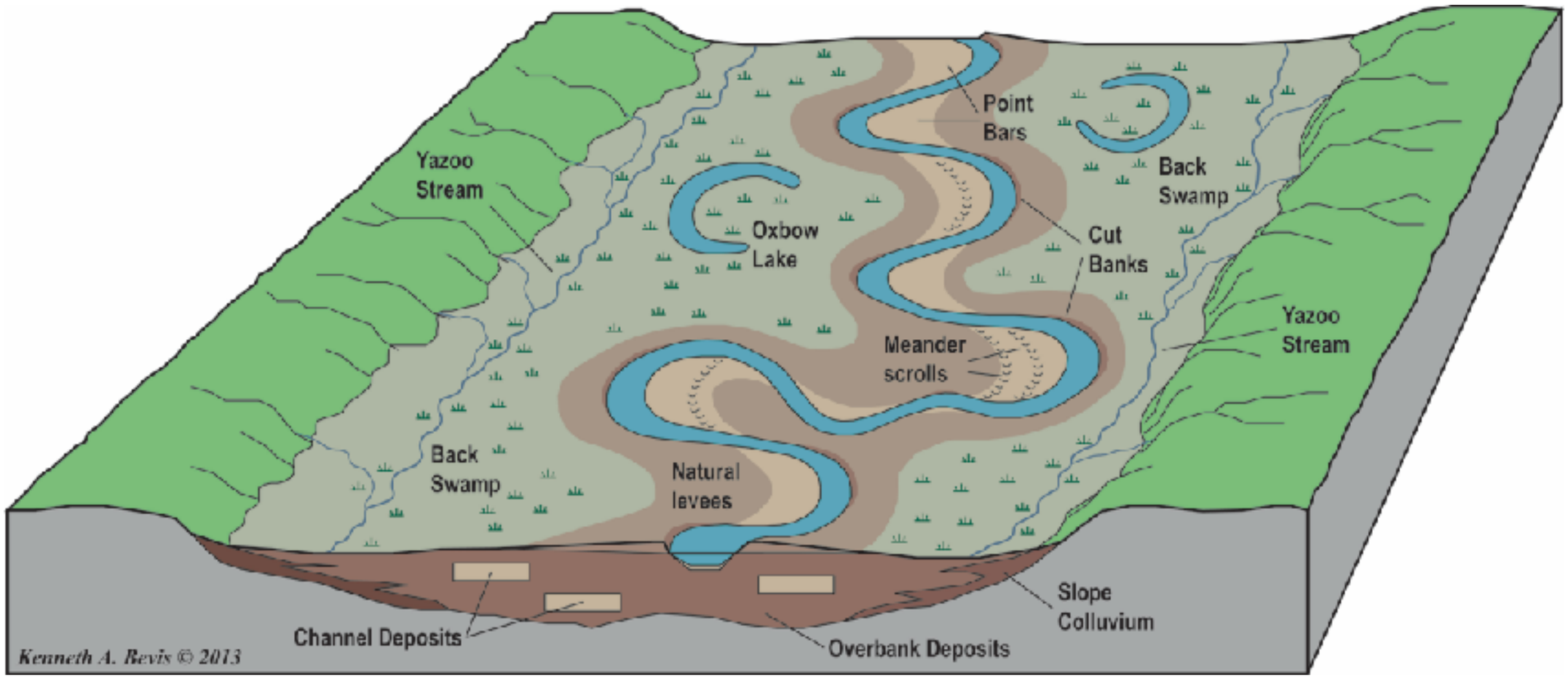




Earth's freshwater

Spheres showing:
(1) All water (sphere over western U.S., 860 miles in diameter)
(2) Fresh liquid water in the ground, lakes, swamps, and rivers (sphere over Kentucky, 169.5 miles in diameter), and
(3) Fresh-water lakes and rivers (sphere over Georgia, 34.9 miles in diameter).

- B. Rivers & lakes are critical sources of freshwater and are often the locations for human settlement including cities, industry and agriculture.
  - 1. River floodplains provide fertile soil for agriculture.
  - 2. Lakes and rivers provide habitats for fish which provide food for humans.
  - 3. Rivers can also be used to generate electricity through hydropower.


Yazoo
Stream
Oxbow
Lake
Point
Bars
Back
Swamp
Cut
Banks
Meander
scrolls
Yazoo
Stream
Back
Swamp
Natural
levees
Slope
Colluvium
Channel Deposits
Overbank Deposits
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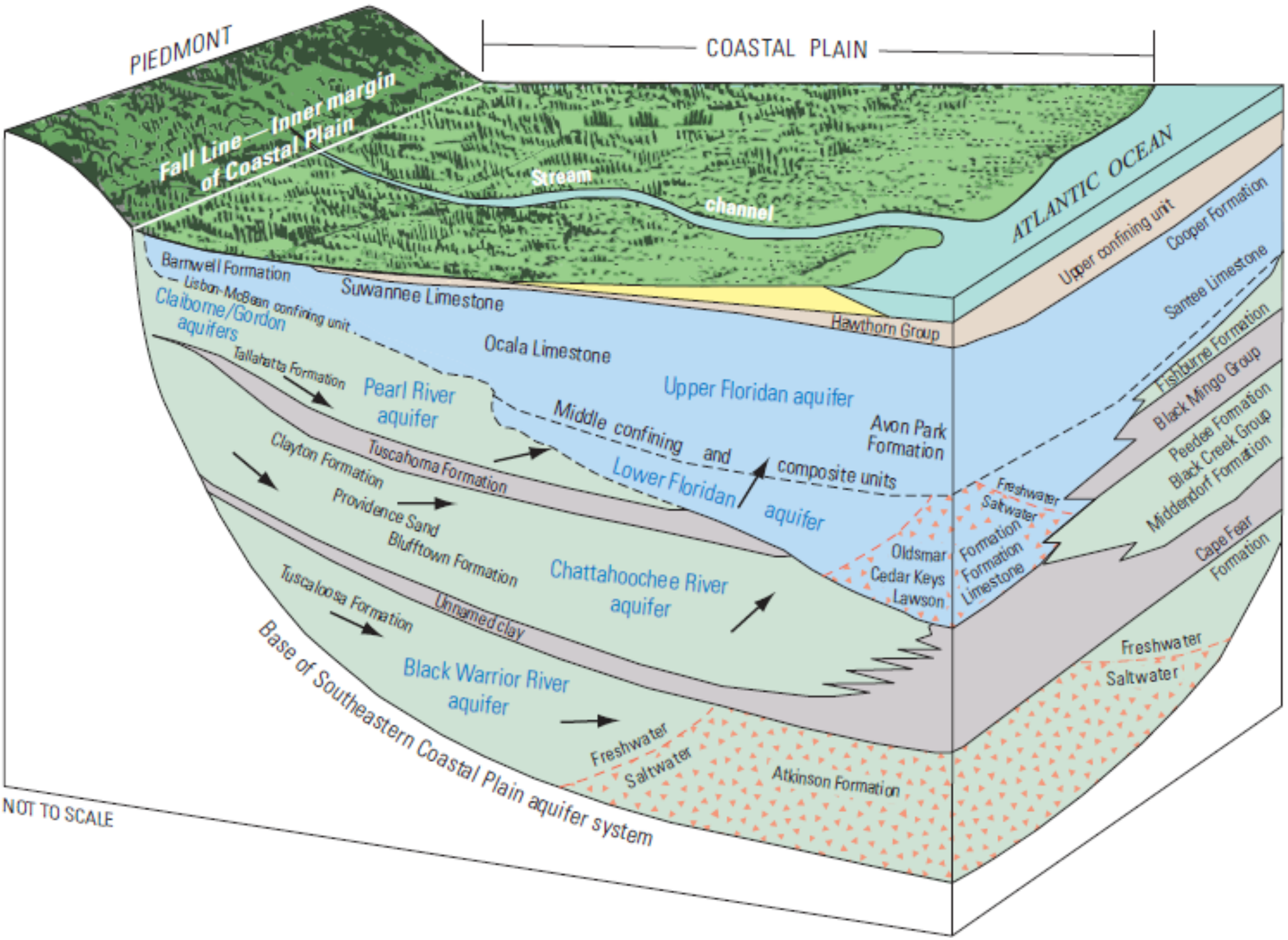
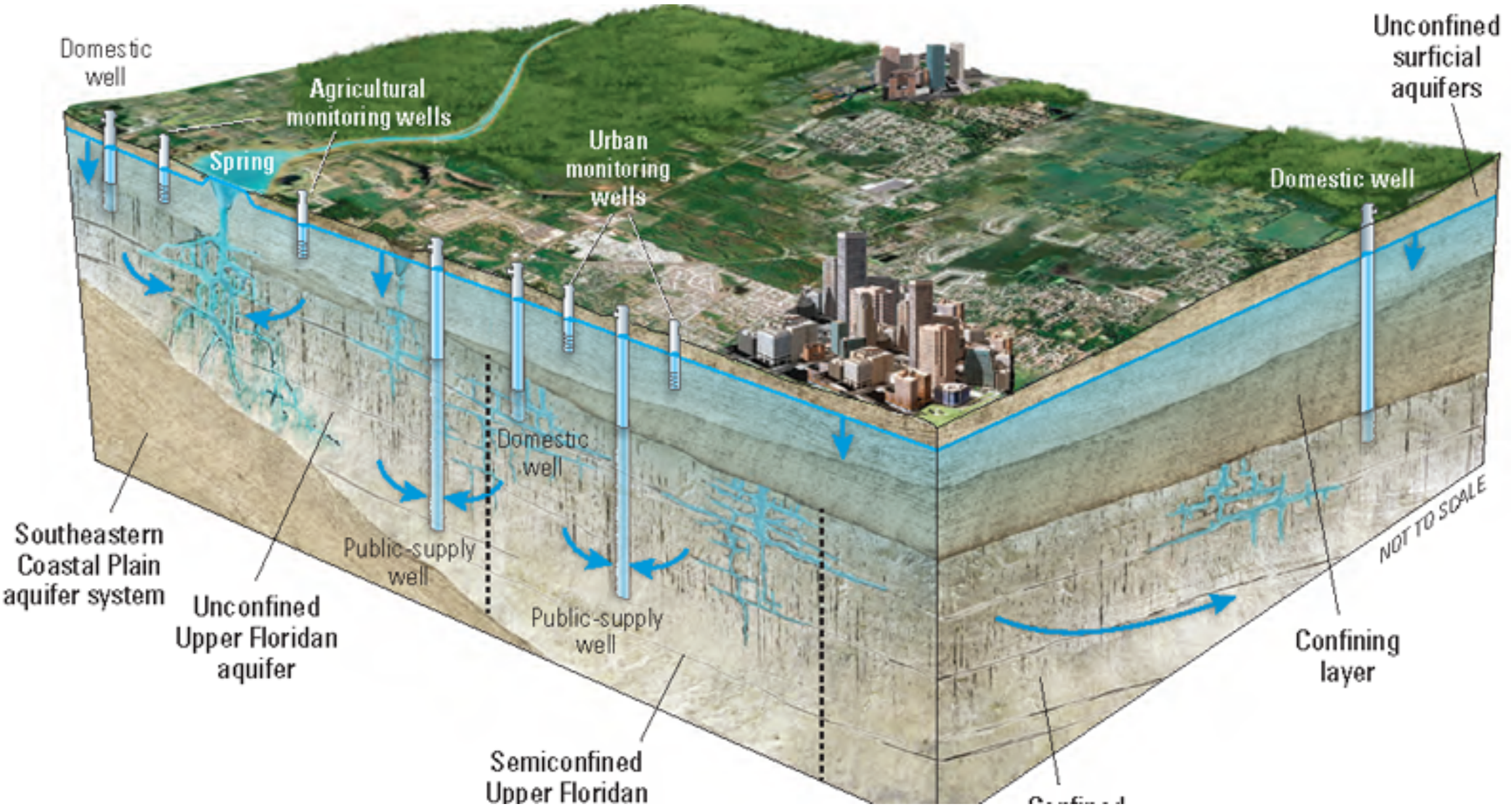
(a) Satellite photos (before and during) show the extent of flooding during the 1993 Mississippi River flood.

(b) Great Falls, Montana, was submerged by floodwaters in 1975.

(c) In 2007, contaminated floodwaters spread disease in Indonesia.

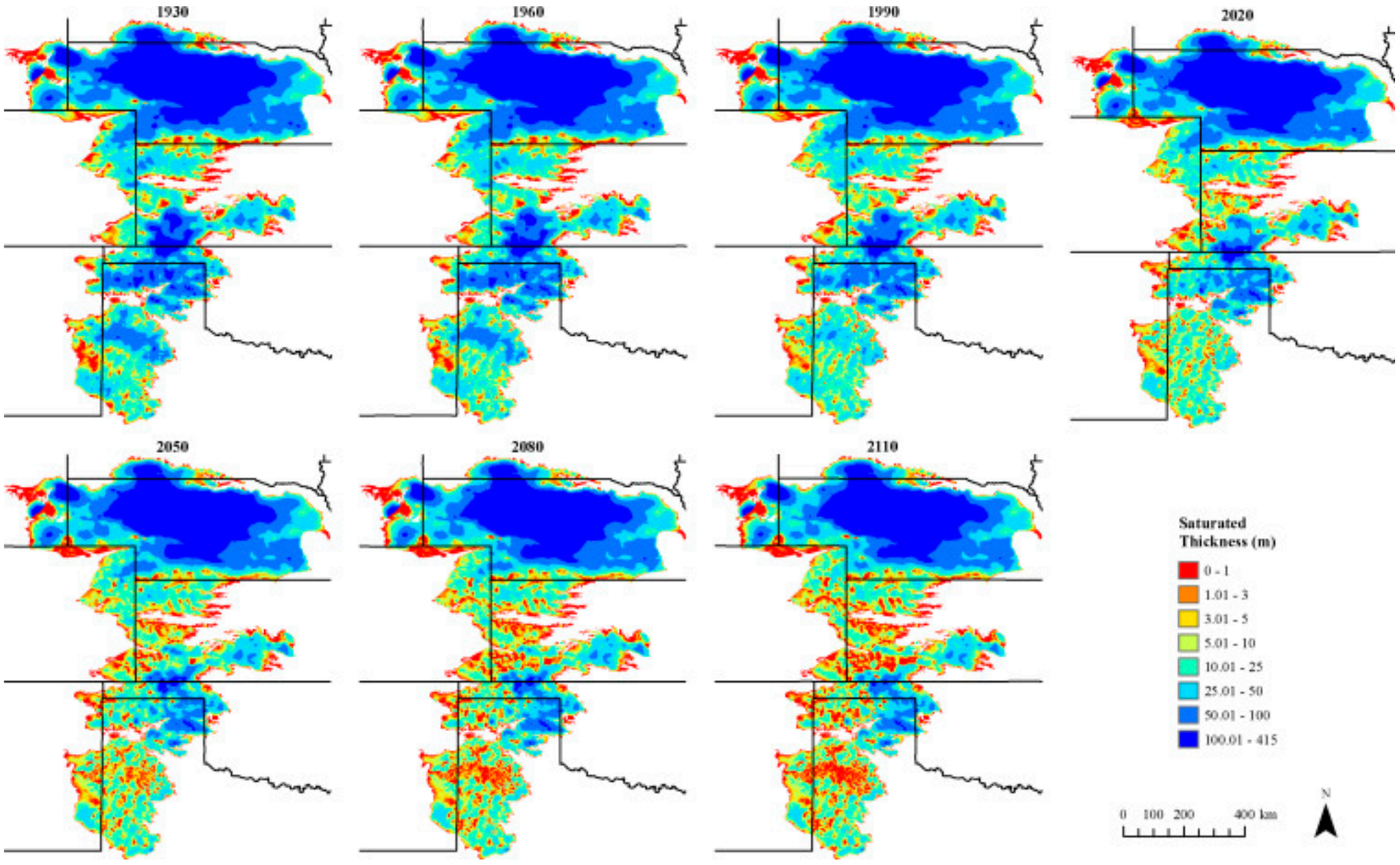
- C. Another major source of water for human settlements are aquifers. Aquifers are porous layers of rock that trap groundwater.



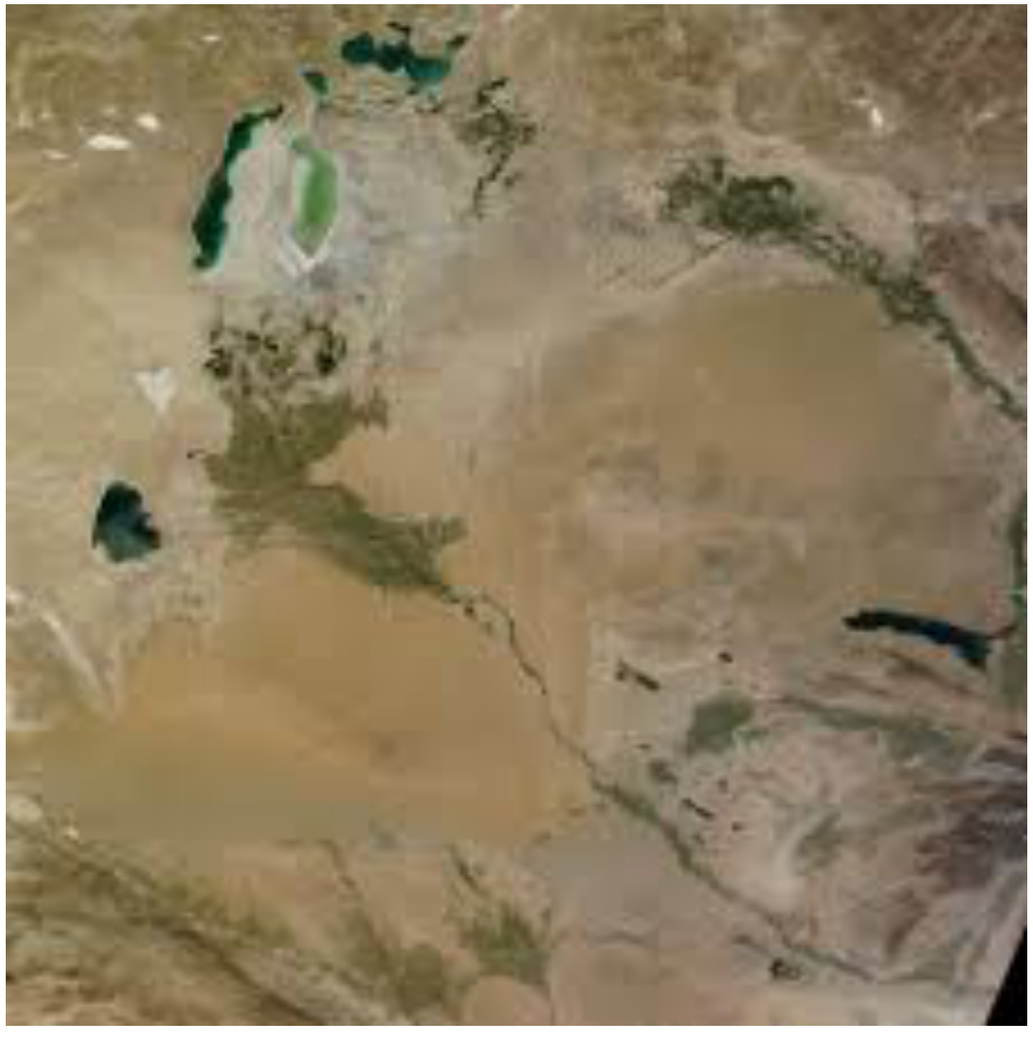

Domestic well
Agricultural monitoring wells
Spring
Urban monitoring wells
Unconfined surficial aquifers
Domestic well
Domestic well
Public-supply well
Public-supply well
Southeastern Coastal Plain aquifer system
Unconfined Upper Floridan aquifer
Semiconfined Upper Floridan
Confining layer
NOT TO SCALE

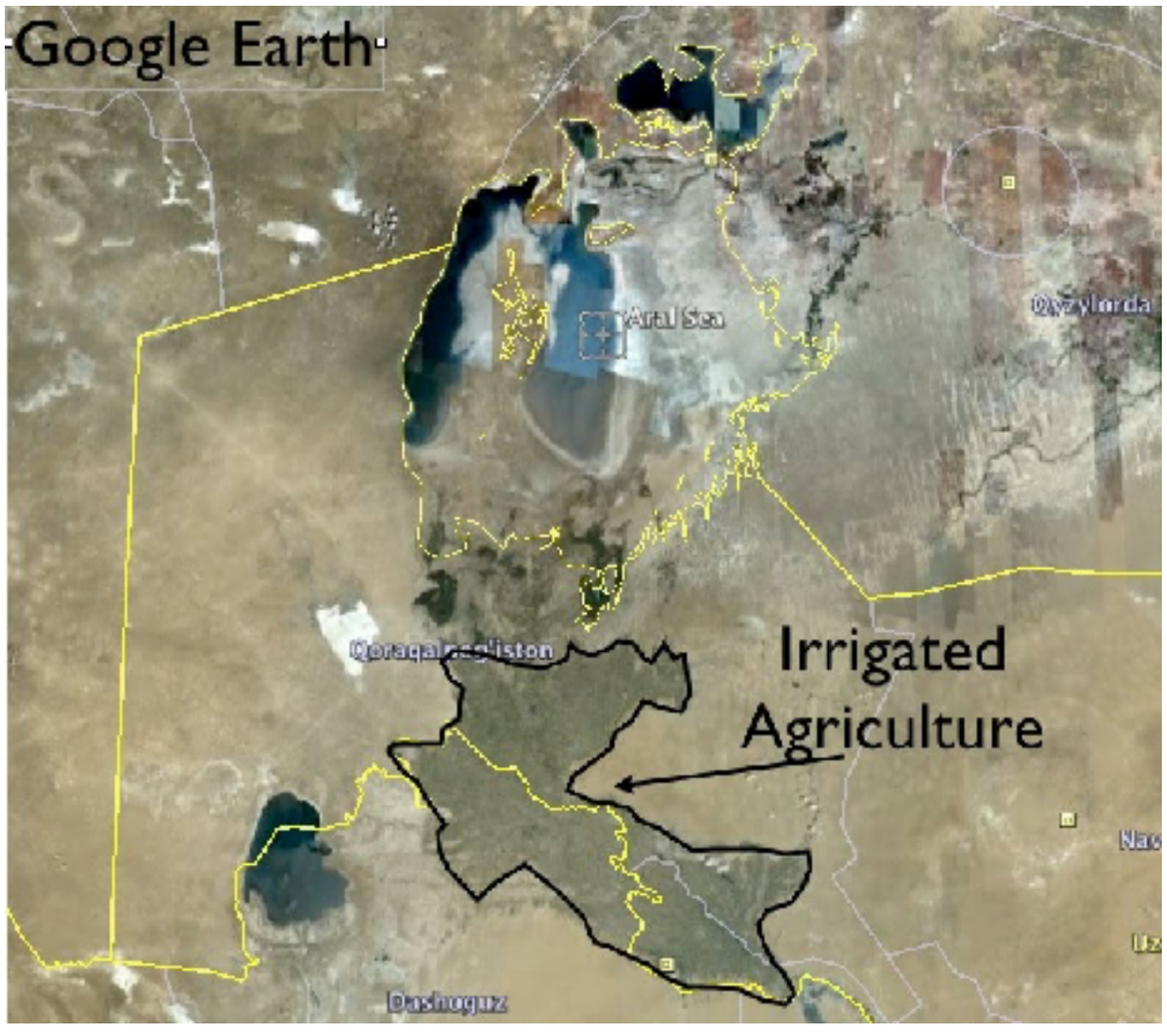
- D. Human consumption of water happens faster in many lakes and aquifers because they cannot be recharged fast enough to keep up.

Ogallala Aquifer

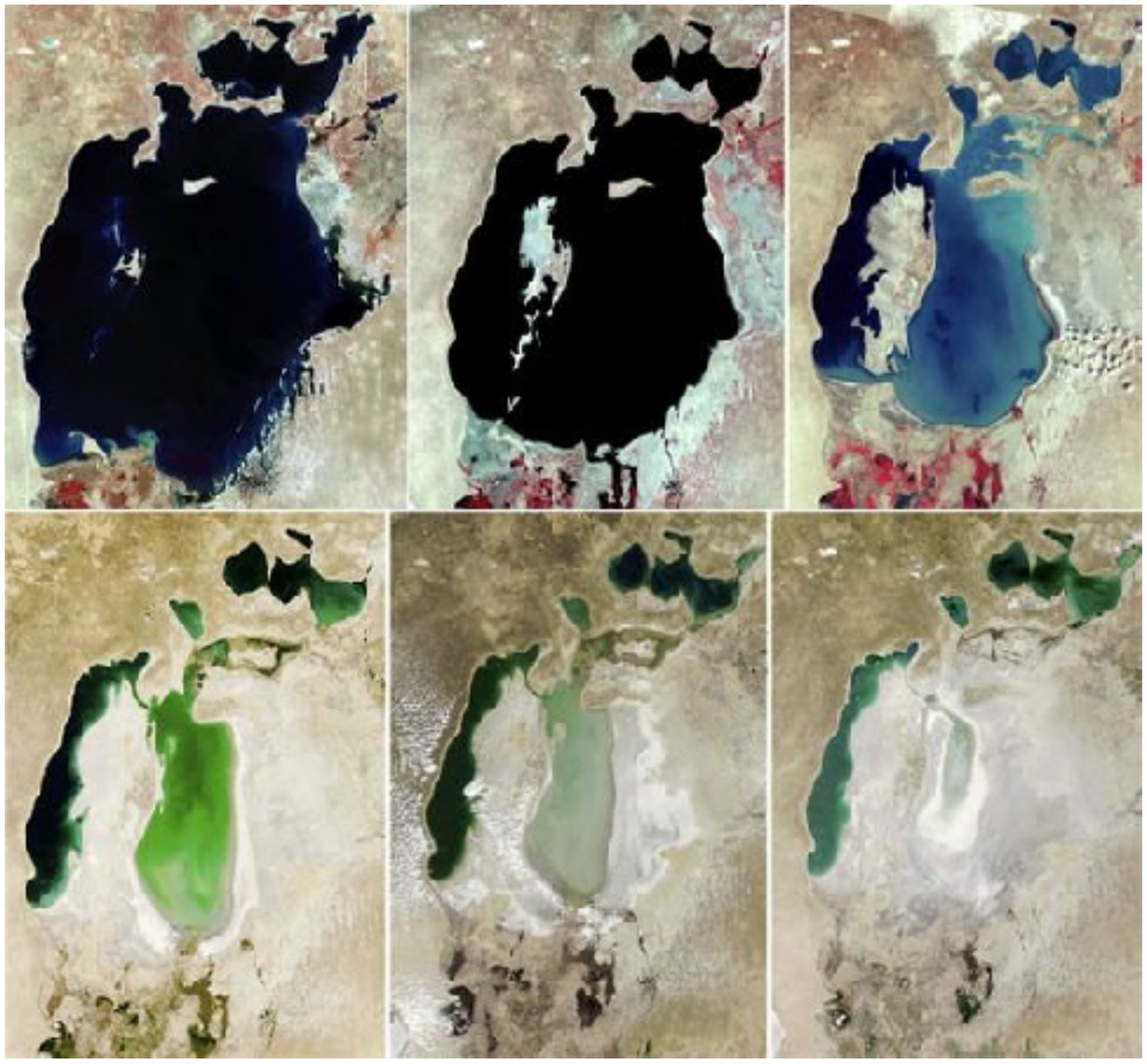


➤ 1. Agriculture is the main source of human water consumption.

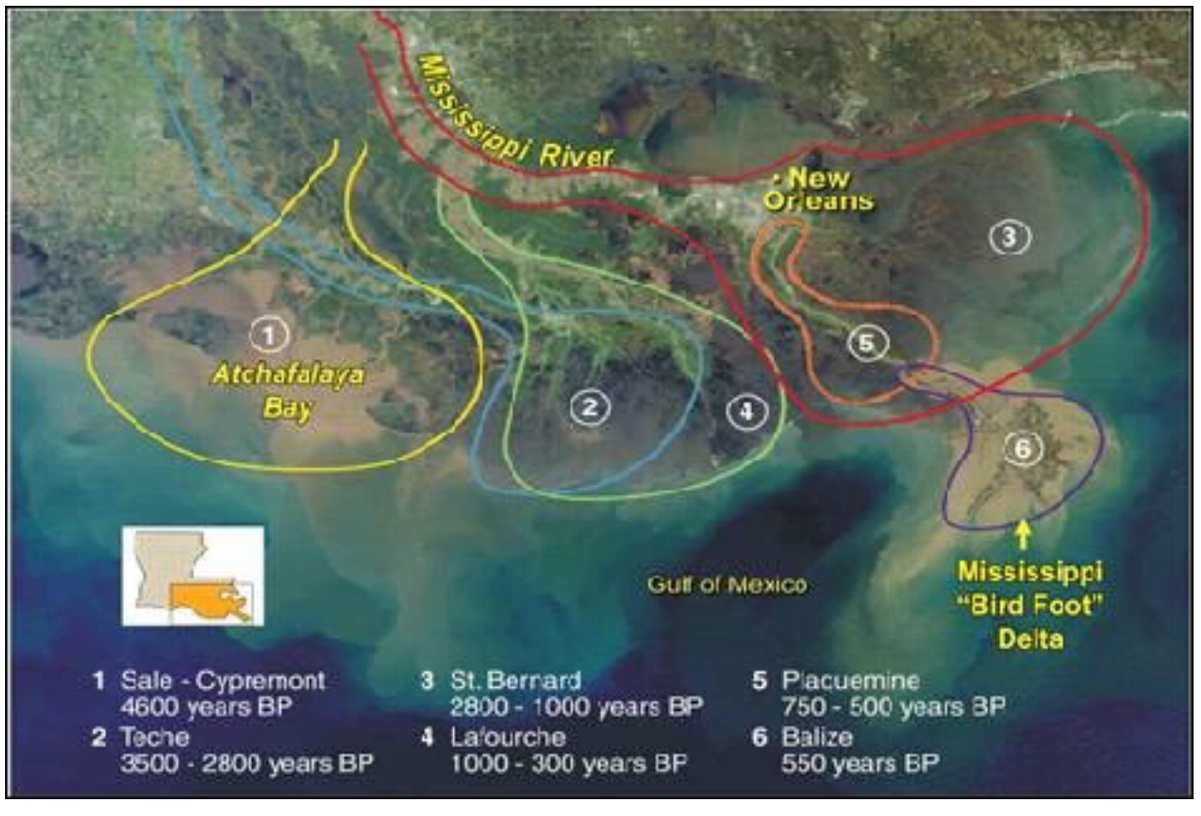




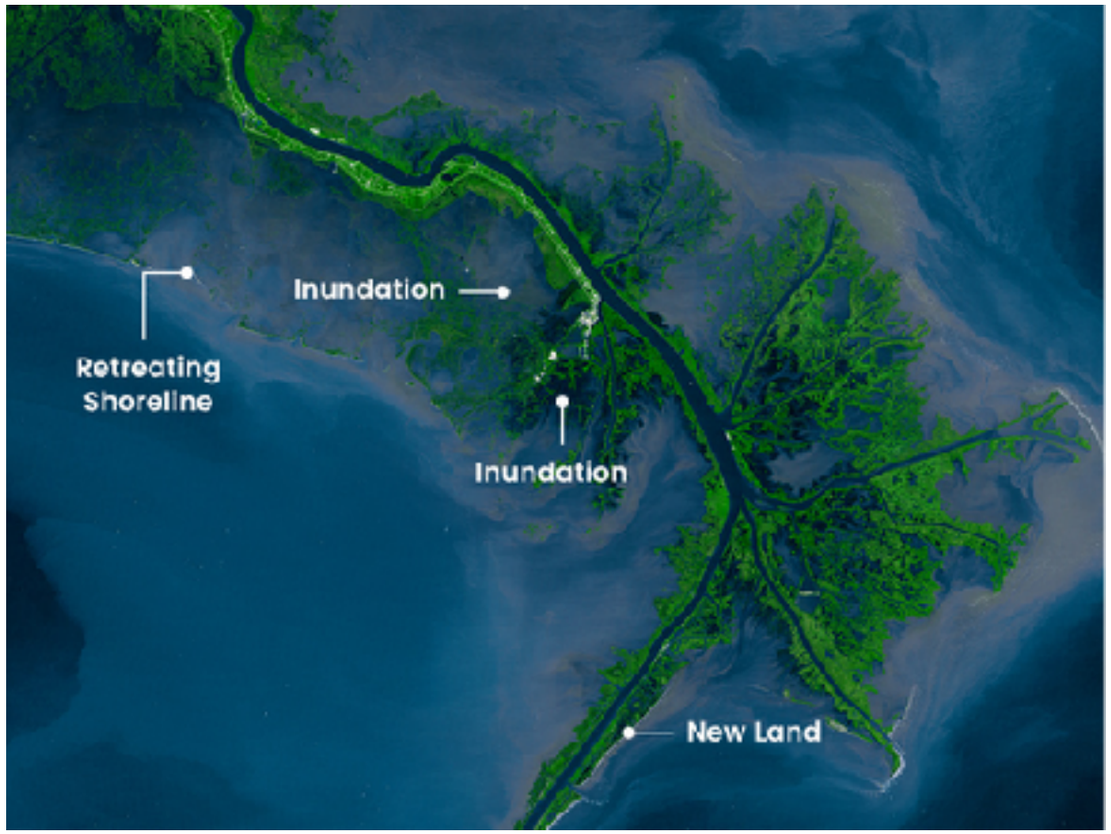
The Aral Sea



- E. Humans can alter the availability of water by building levees, canals, dikes, polders, aqueducts, & dams.
  - 1. The Mississippi River has been extensively engineered to control its course and to prevent the flooding of its flood plain.
  - 2. Rivers also change their course and the Mississippi River delta has shifted several times in the past. Then river is being managed to keep that from happening again where it comes close to the Atchafalaya River.



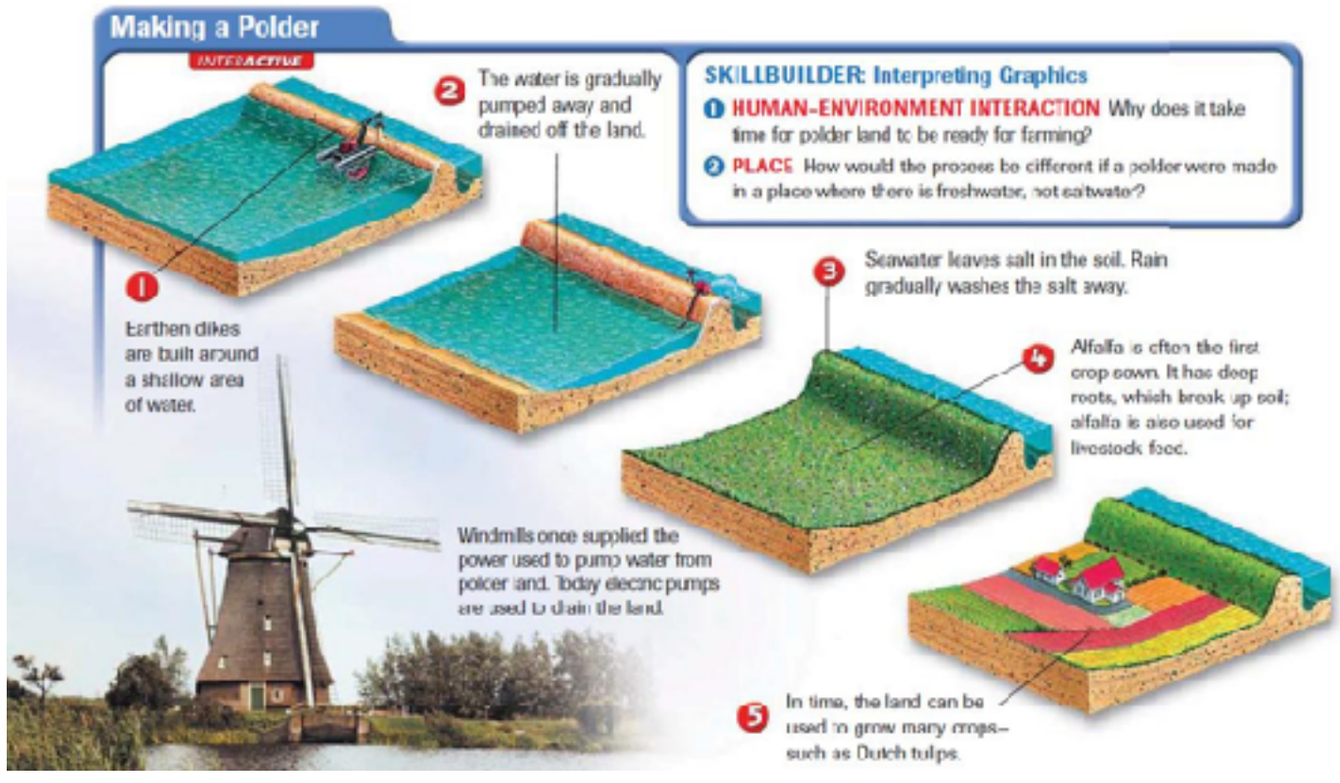
➤ 3. Levees can be used to direct the flow of rivers and keep them from overflowing.



Lake Pontchartrain Levee

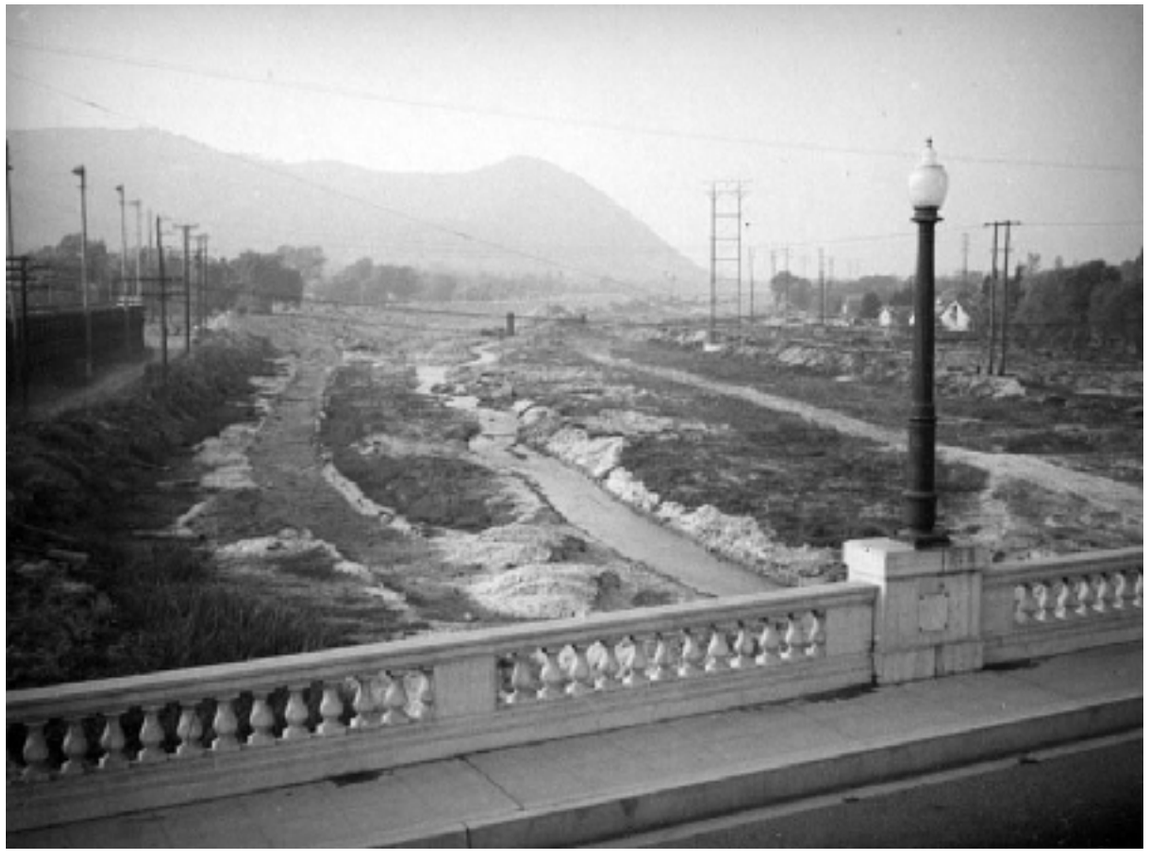
➤ 4. Canals can be built to connect rivers and lakes for flood overflow and shipping channels.

- 5. Dikes and polders are used extensively in the Netherlands to create new farmland. Dikes hold back the land, the polder is the reclaimed land used for crops.

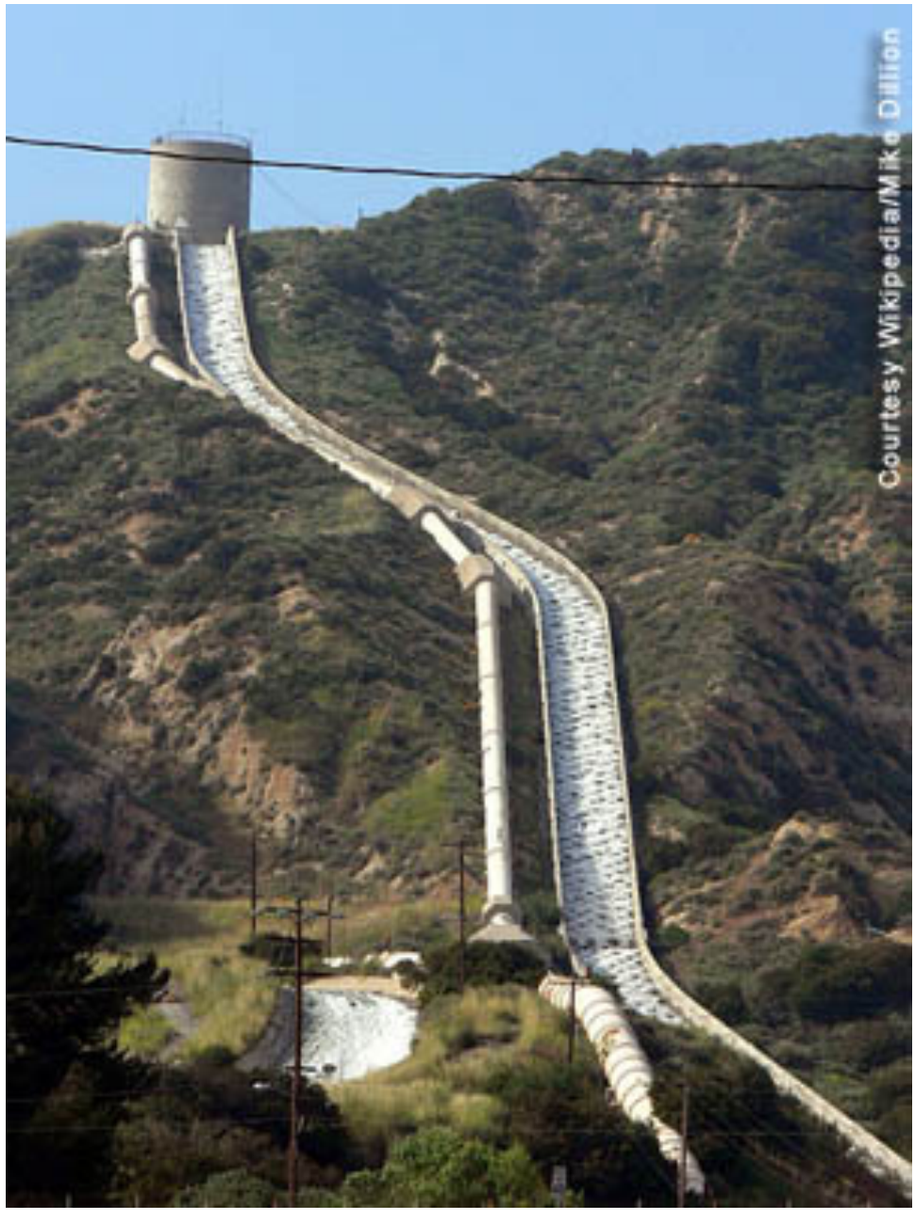


- 6. Aqueducts are used to bring water from higher elevations to lower elevations in places where water is scarce. They can extend over hundreds of miles.

The Los Angeles River circa 1937



Los Angeles River Today


Courtesy Wikipedia/Mike Dillion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