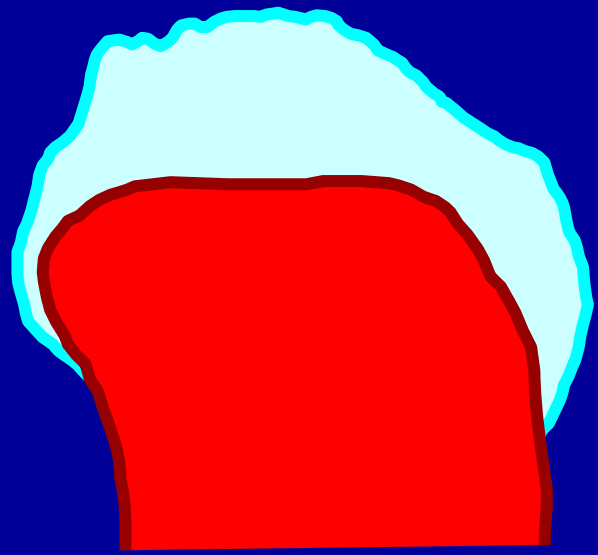
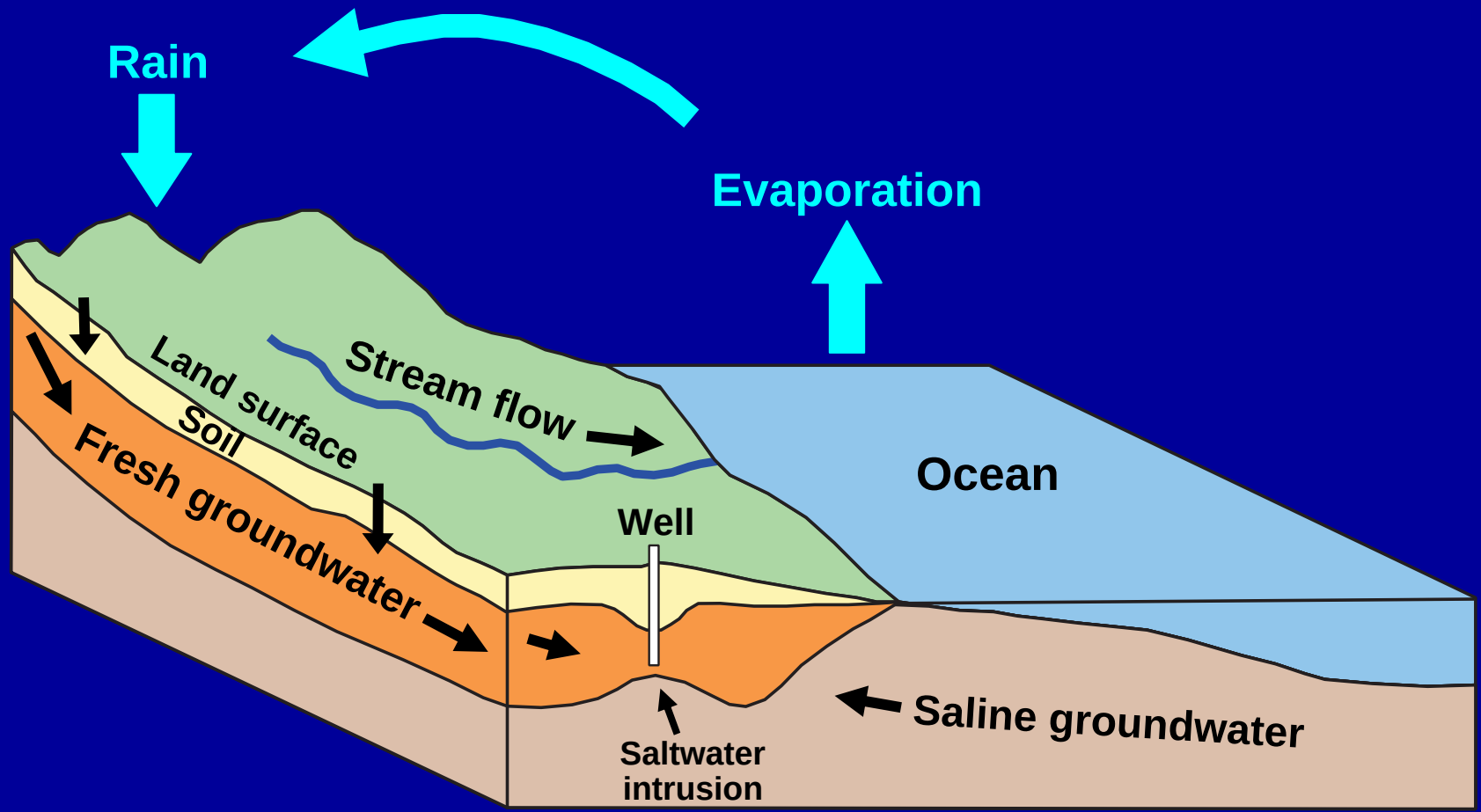
# SALT DOMES AND WATER QUALITY IN THE GULF COAST AQUIFER



**H. Scott Hamlin**
**Bureau of Economic Geology**
**The University of Texas at Austin**
**November 2008**

# GROUNDWATER FLOW IN COASTAL AREAS
# THE HYDROLOGIC CYCLE

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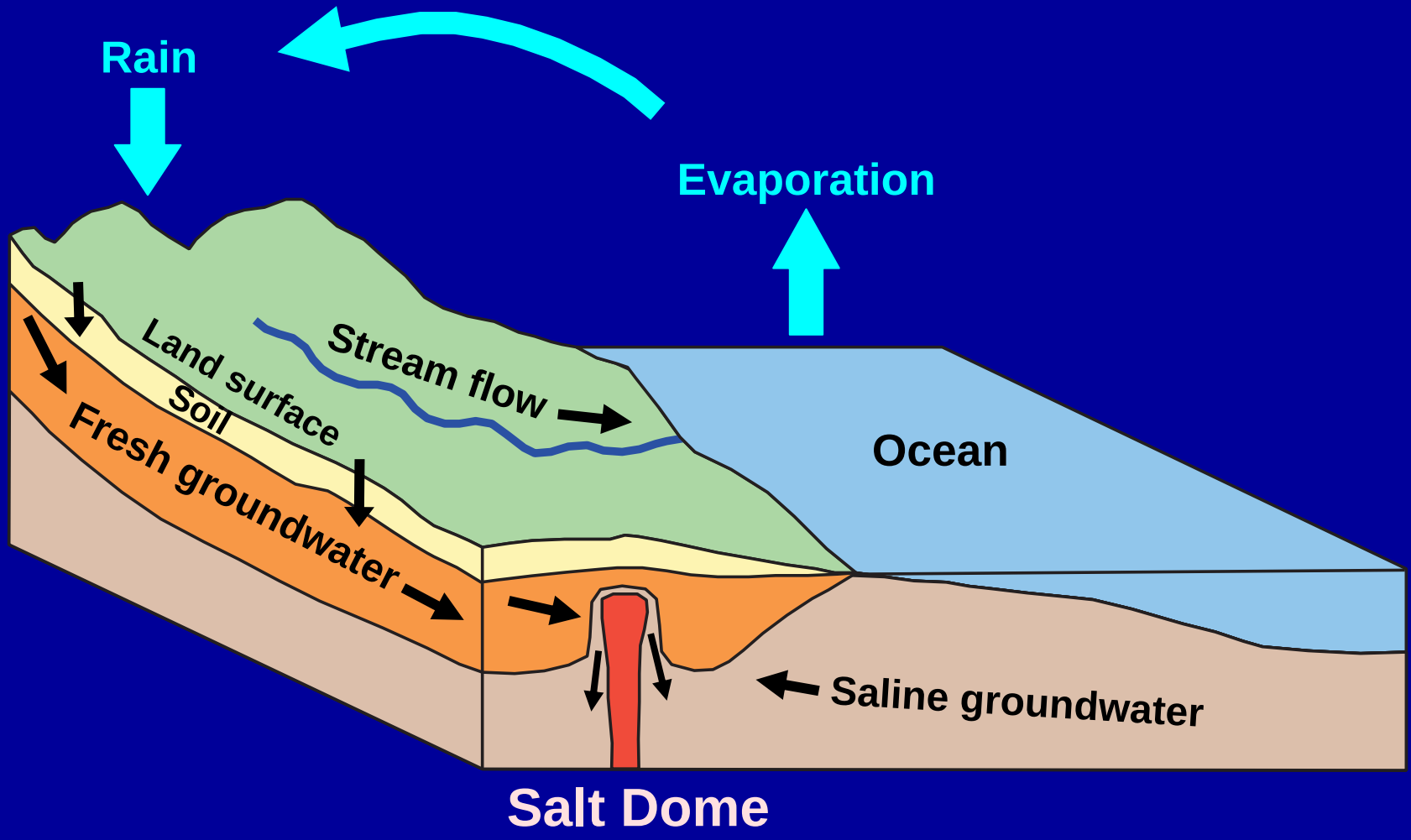
# THE HYDROLOGIC CYCLE

## WITH SALT DOME

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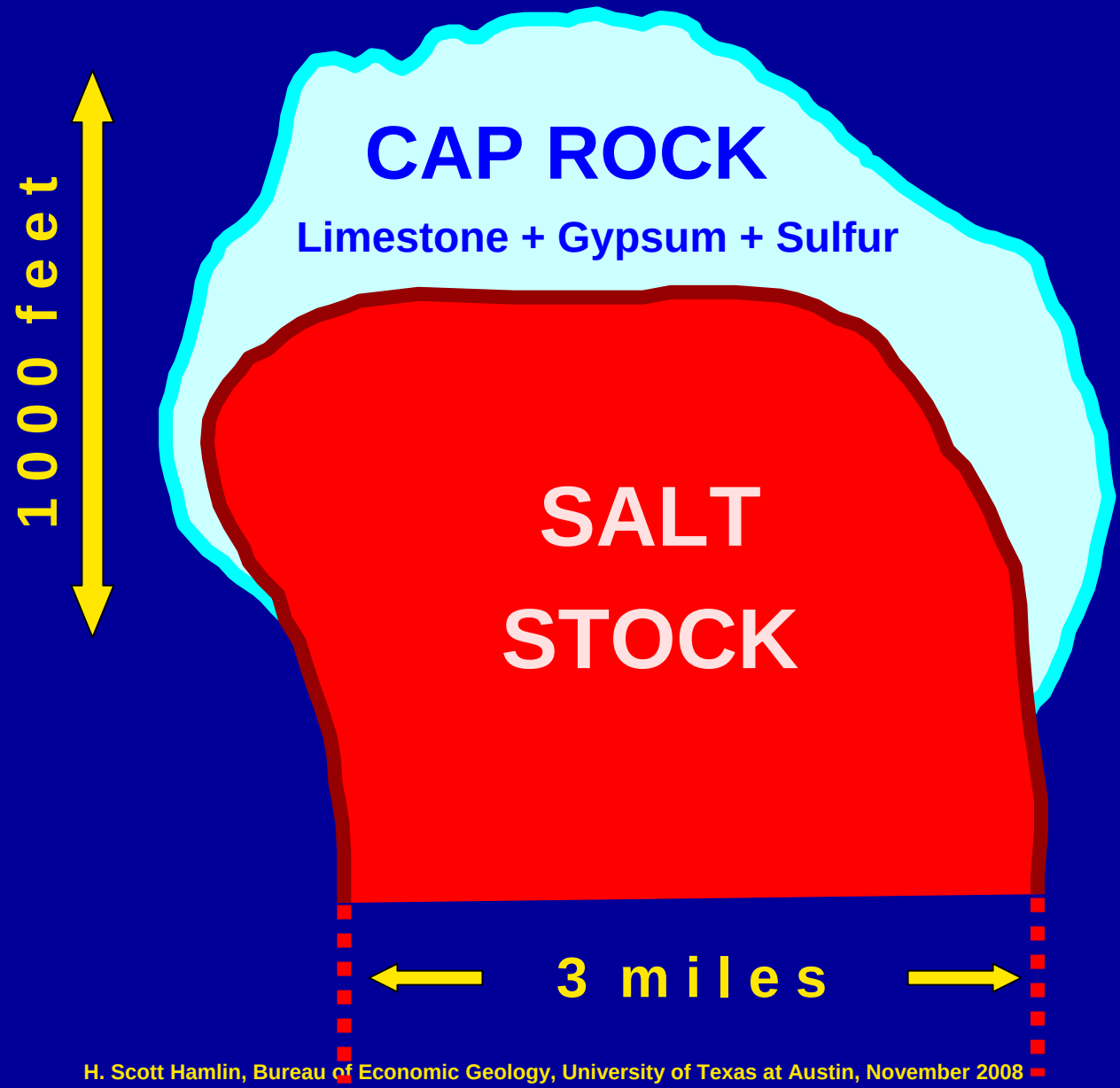
# SALT DOMES…

- Composed of sodium chloride = table salt
- Common within the Gulf Coast aquifer
- Natural resources are extensively exploited
- Are actively dissolving

# SALT DOME CROSS SECTION

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# INSIDE A SALT DOME

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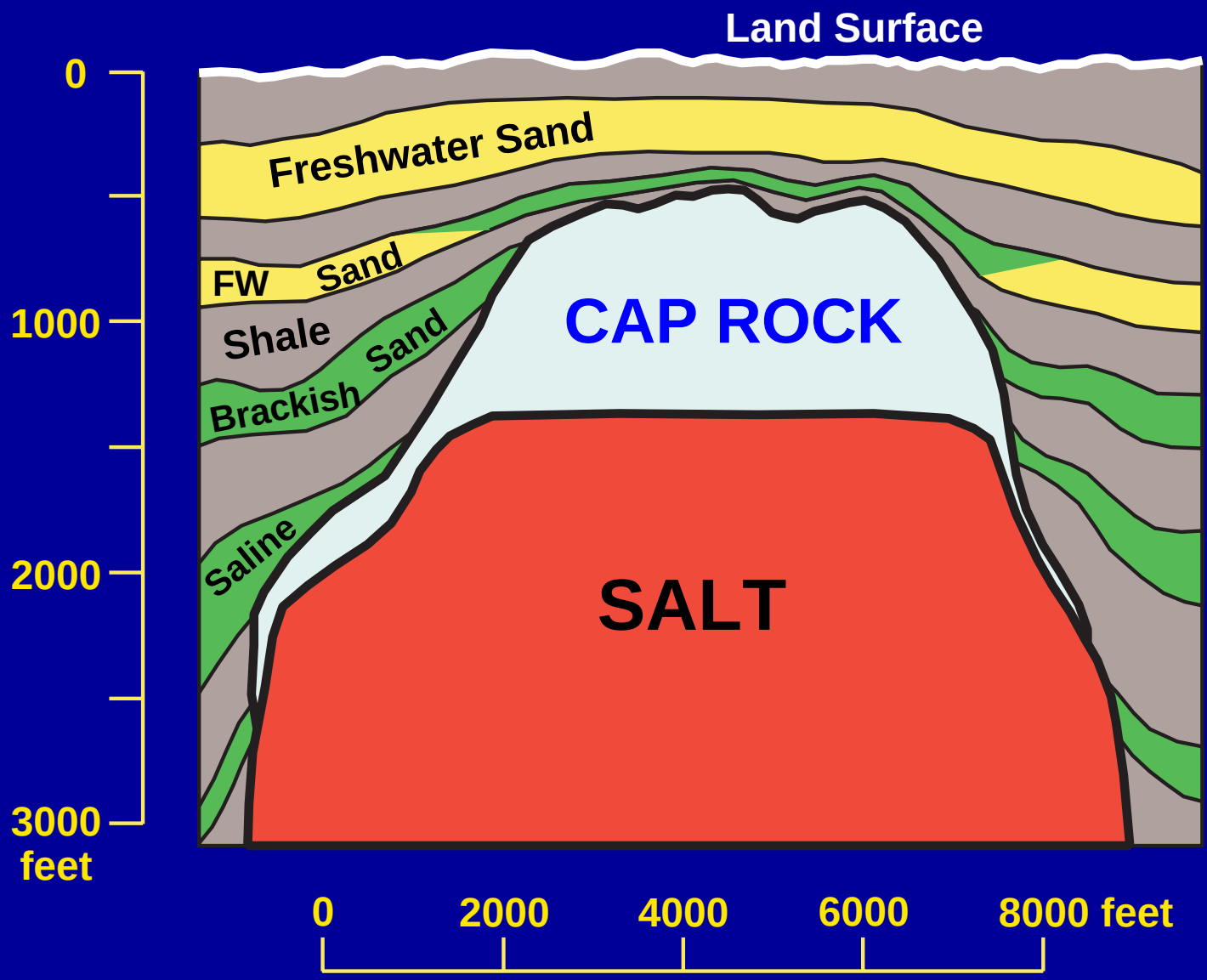
# SALT DOME AND AQUIFER CROSS SECTION

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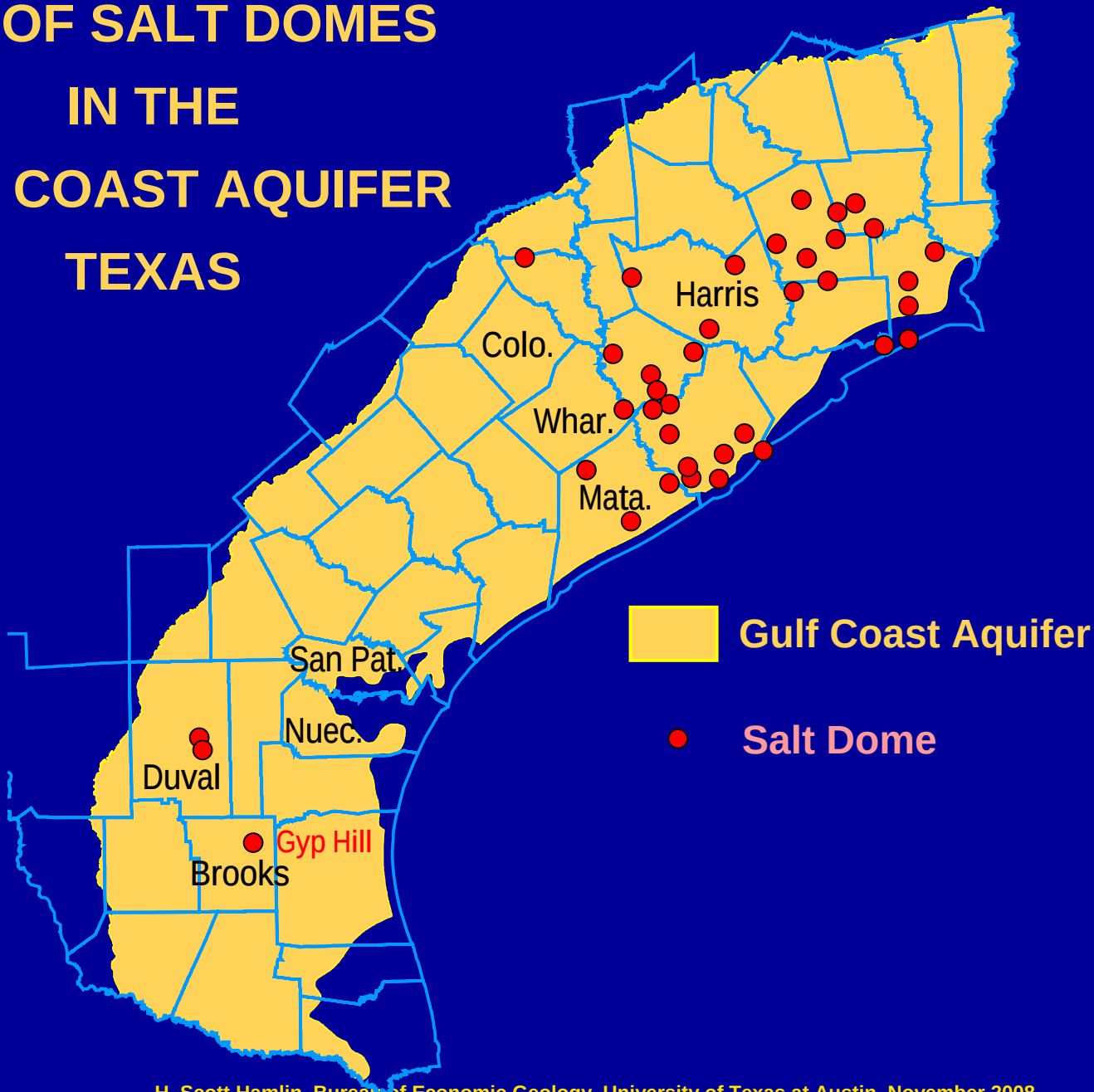
# MAP OF SALT DOMES IN THE GULF COAST AQUIFER TEXAS

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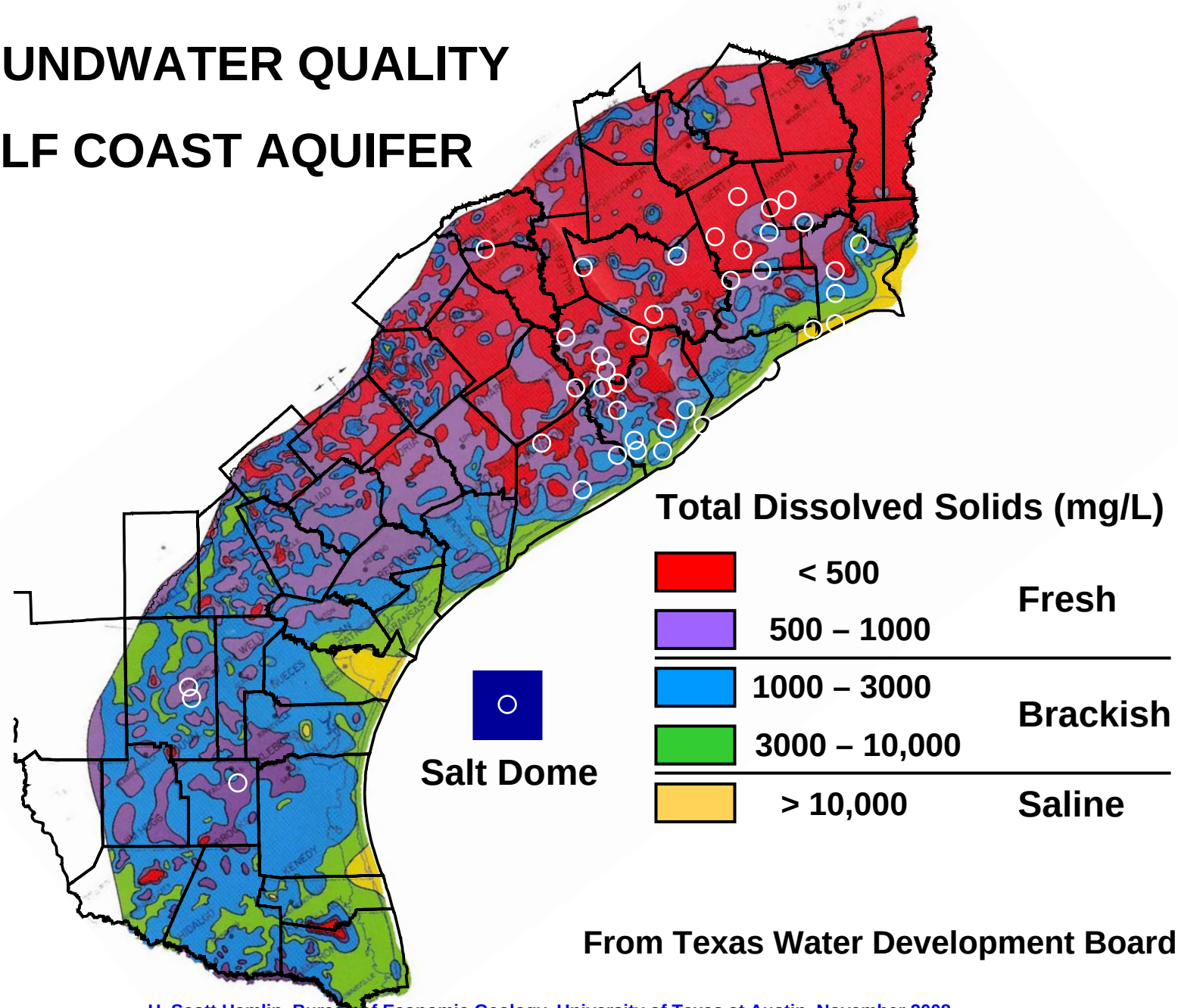
# GROUNDWATER QUALITY

# GULF COAST AQUIFER




From Texas Water Development Board

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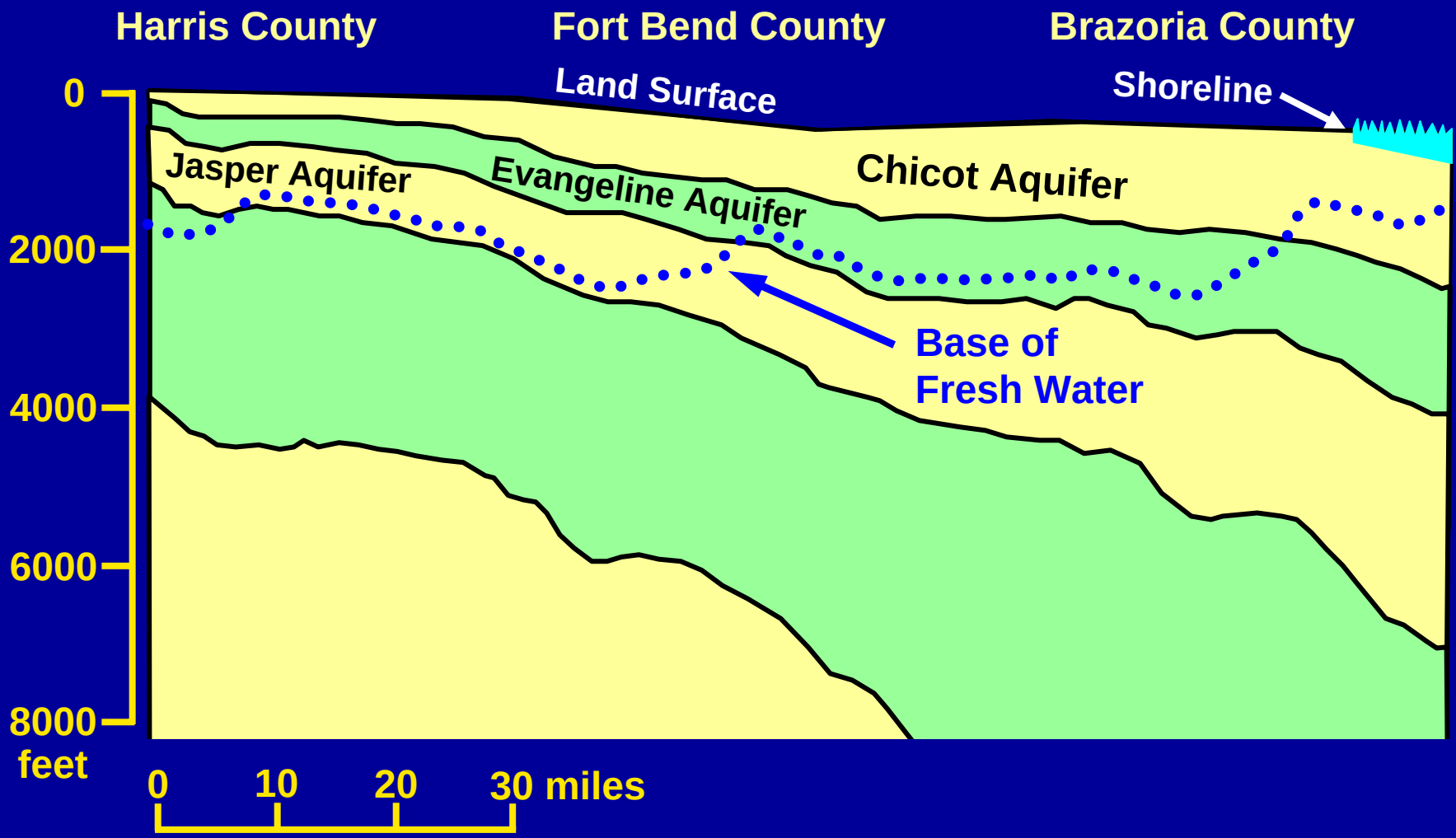
# GULF COAST CROSS SECTION

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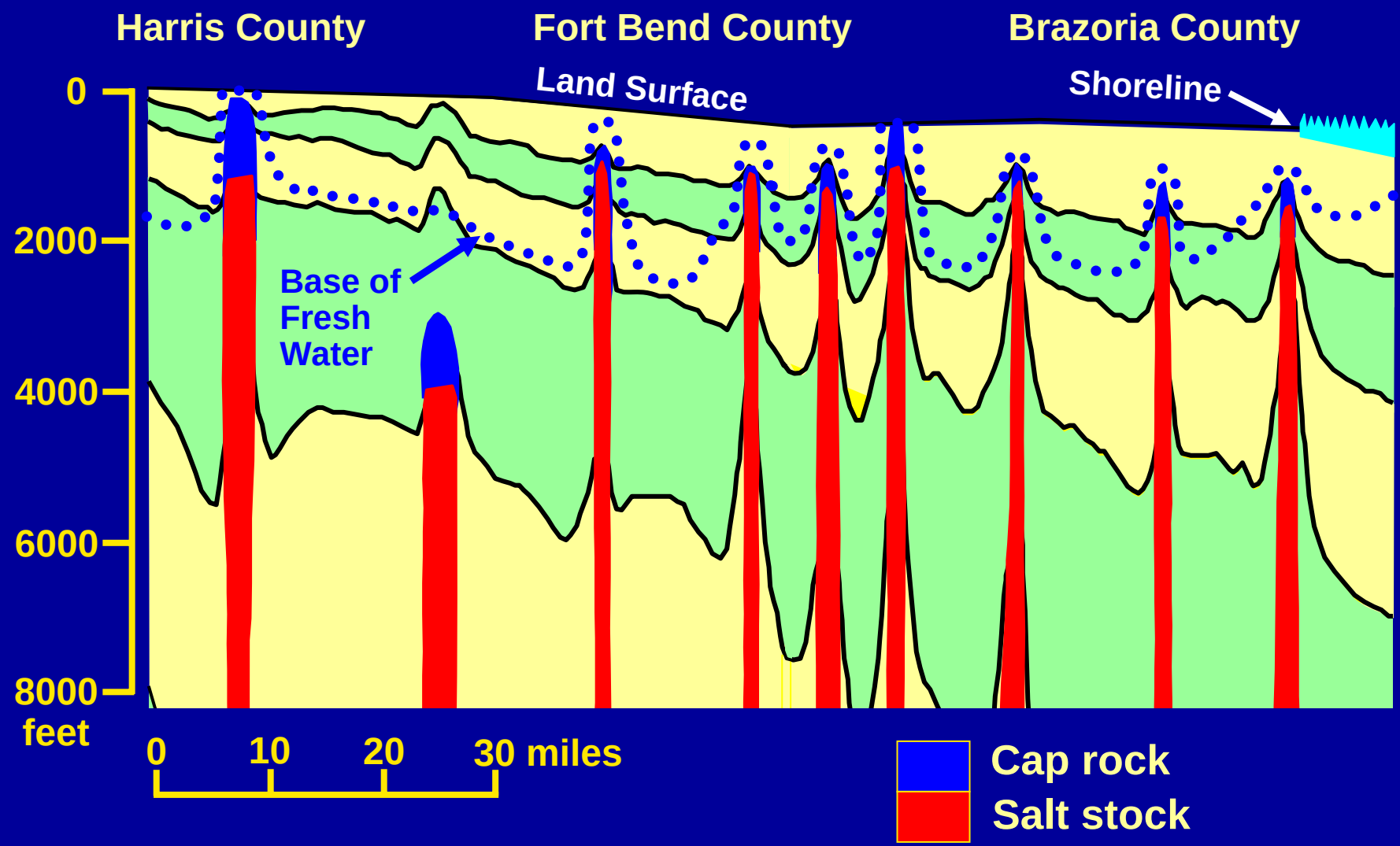
# GULF COAST CROSS SECTION WITH SALT DOMES

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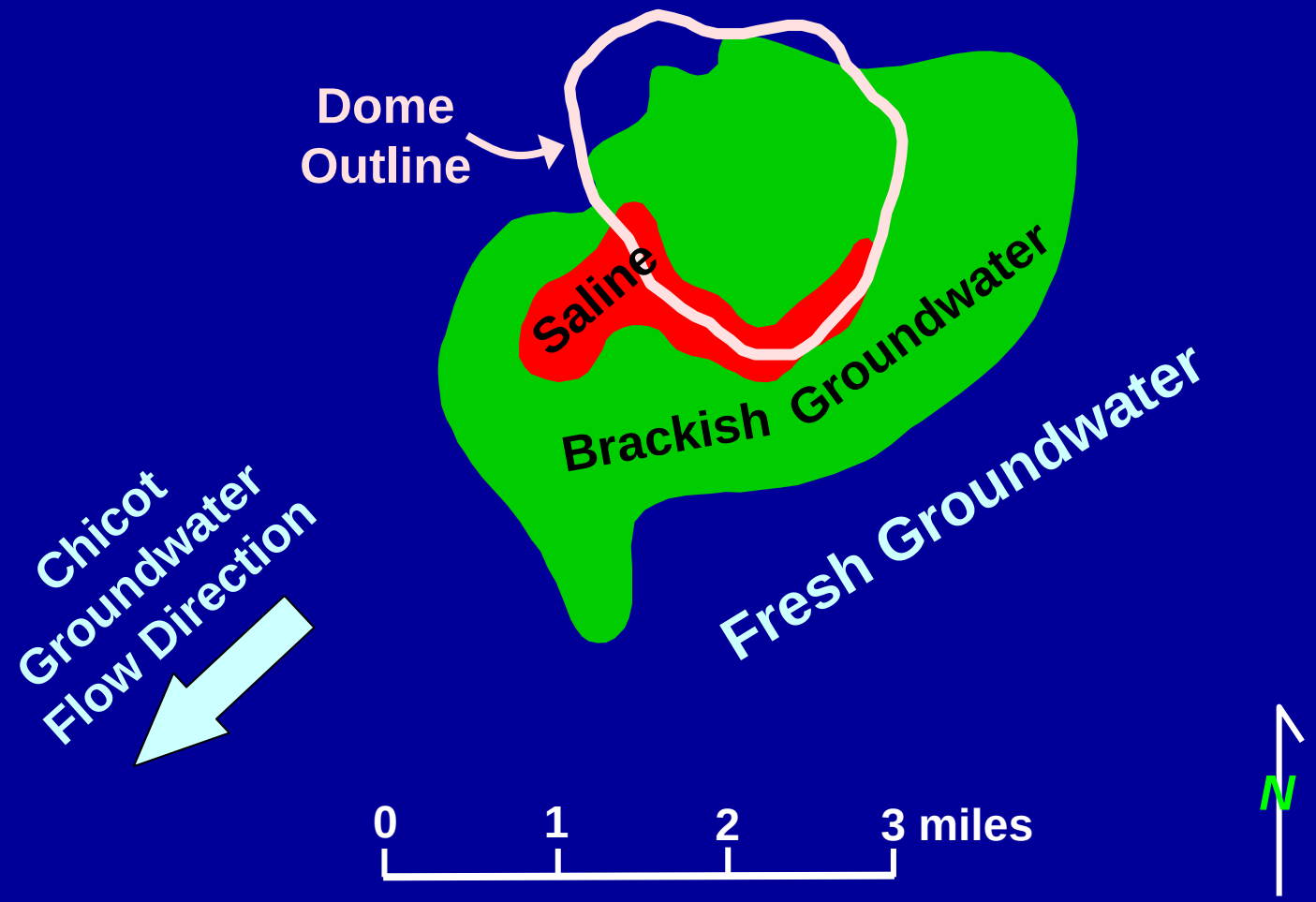
# GROUNDWATER SALINITY MAP
# CHICOT AQUIFER, BARBERS HILL SALT DOME

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# SALT DOME NATURAL RESOURCES

**Oil and gas production = 38 domes (all of them)**

**Mining of salt and/or sulfur = 21 domes**

**Petroleum storage caverns = 15 domes**

**Brine disposal in cap rock = 12 domes**

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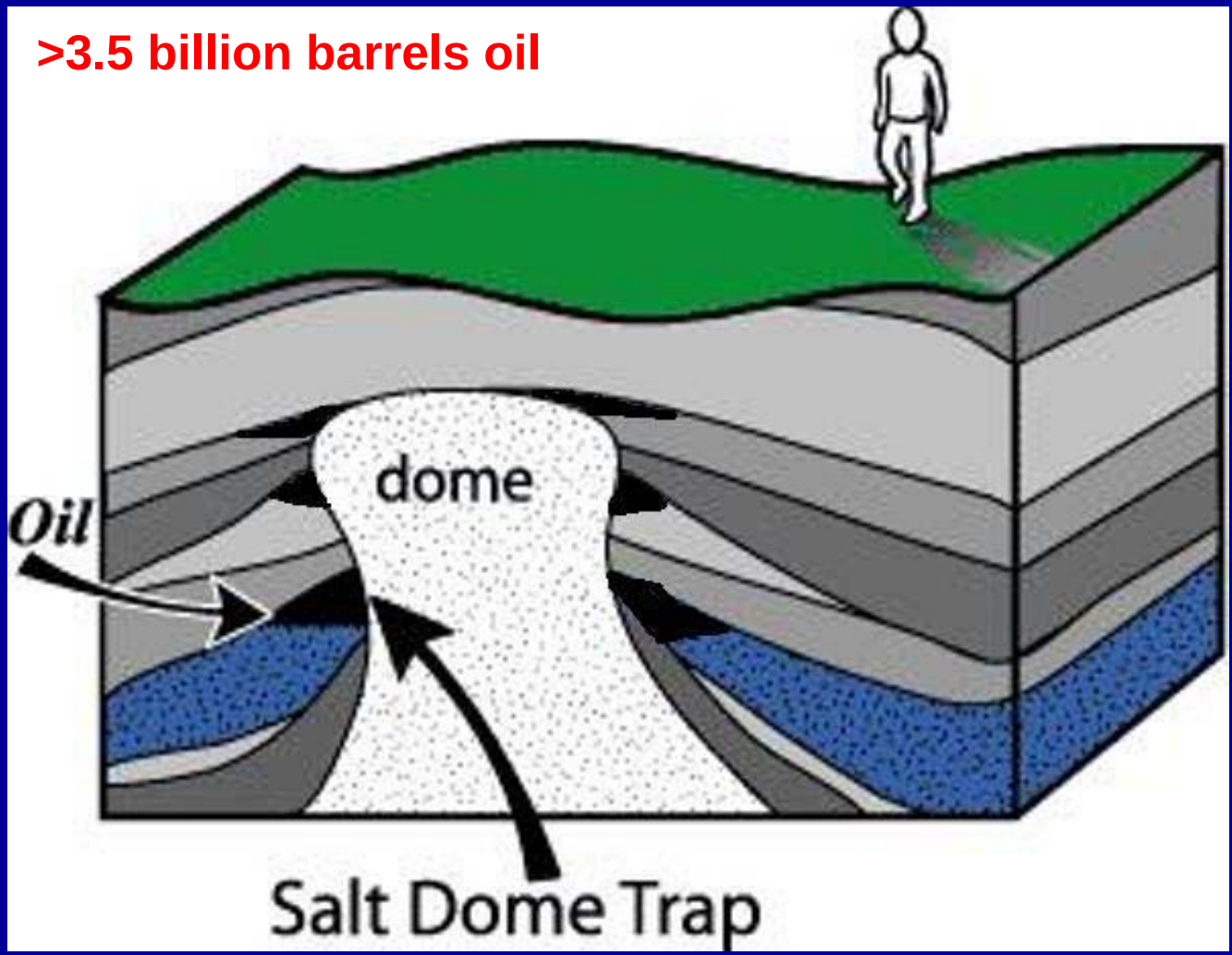
# SALT DOME OIL FIELD

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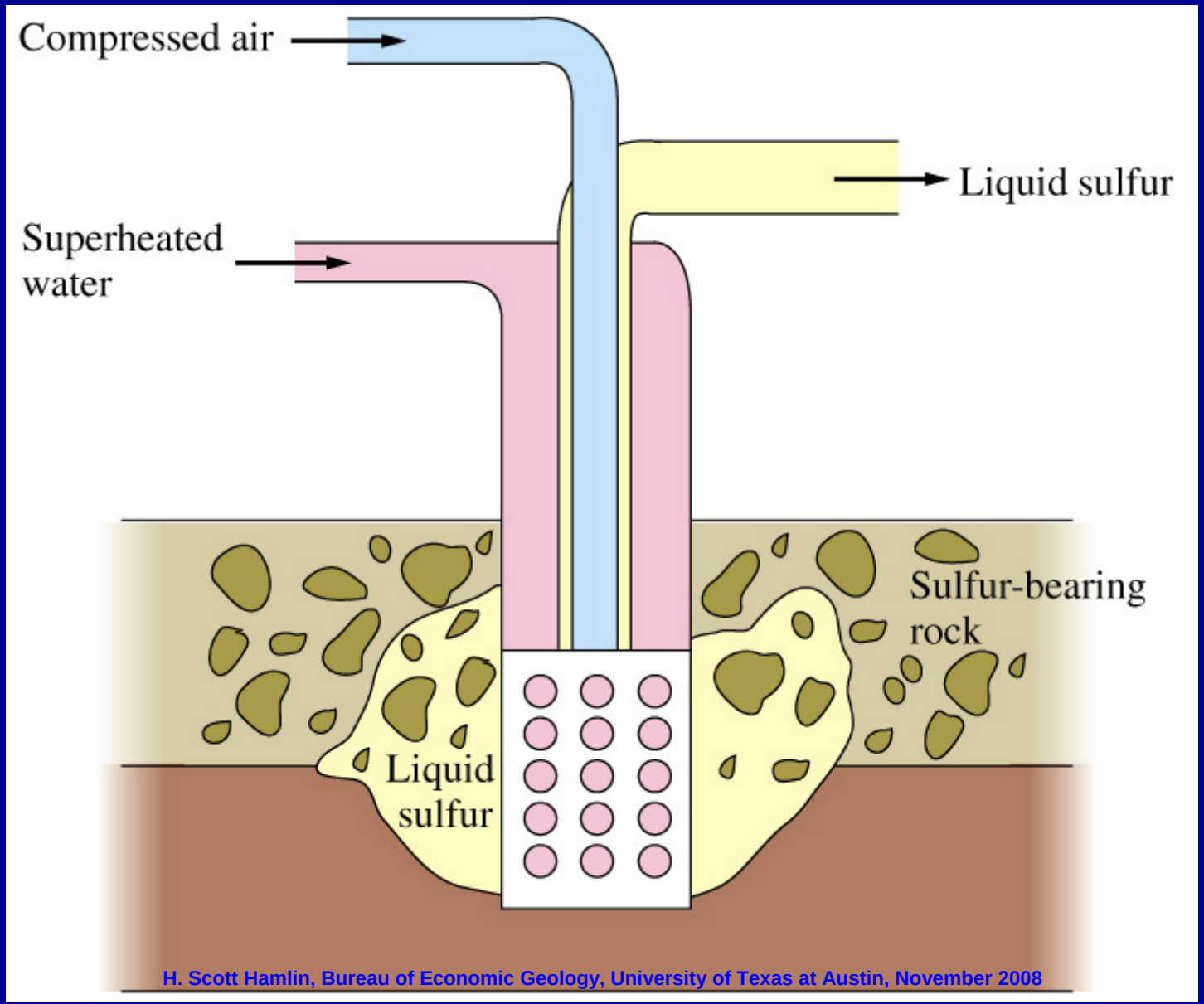
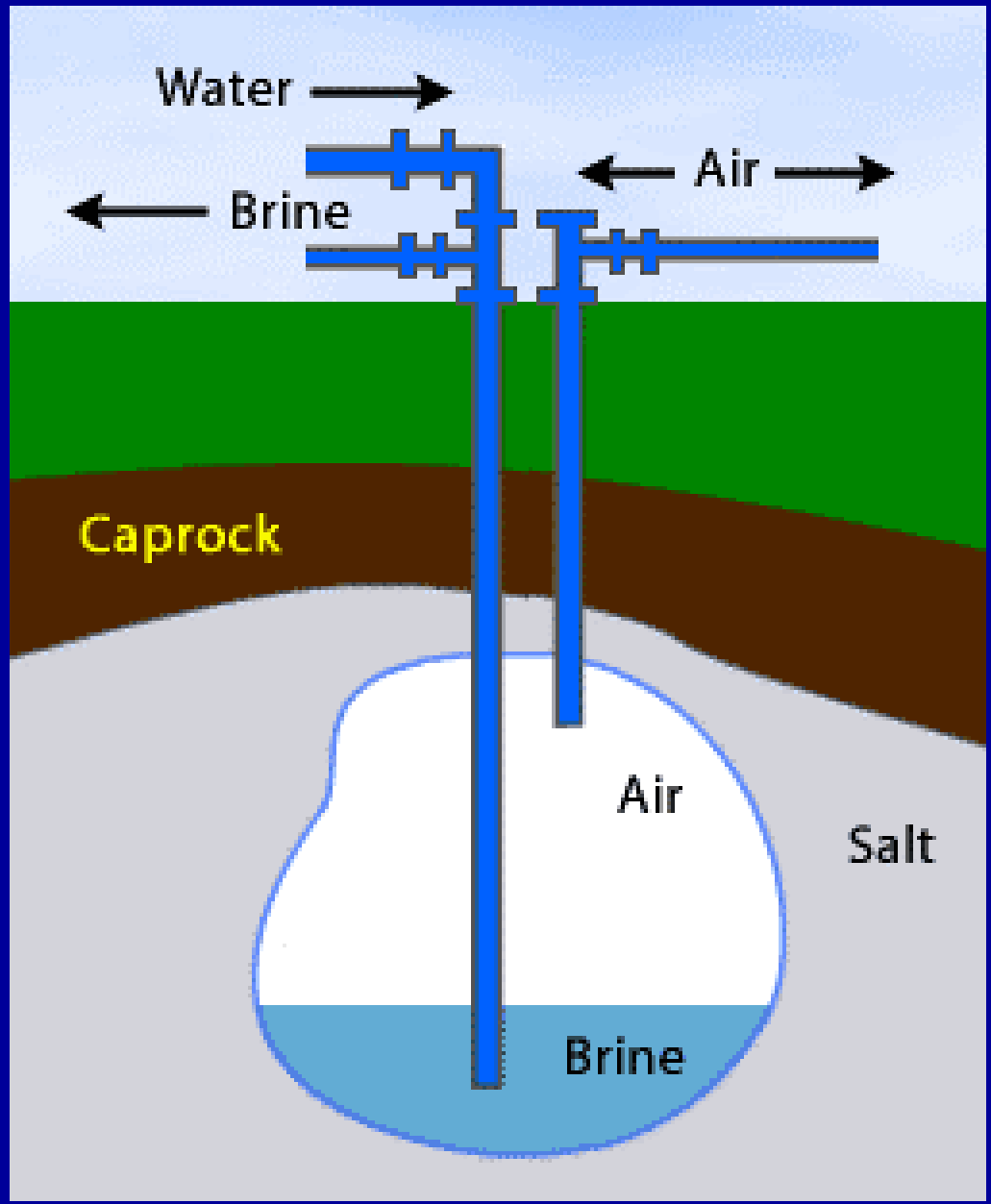
# CAP ROCK SULFUR PRODUCTION



# SOLUTION MINING AND STORAGE CAVERN CONSTRUCTION

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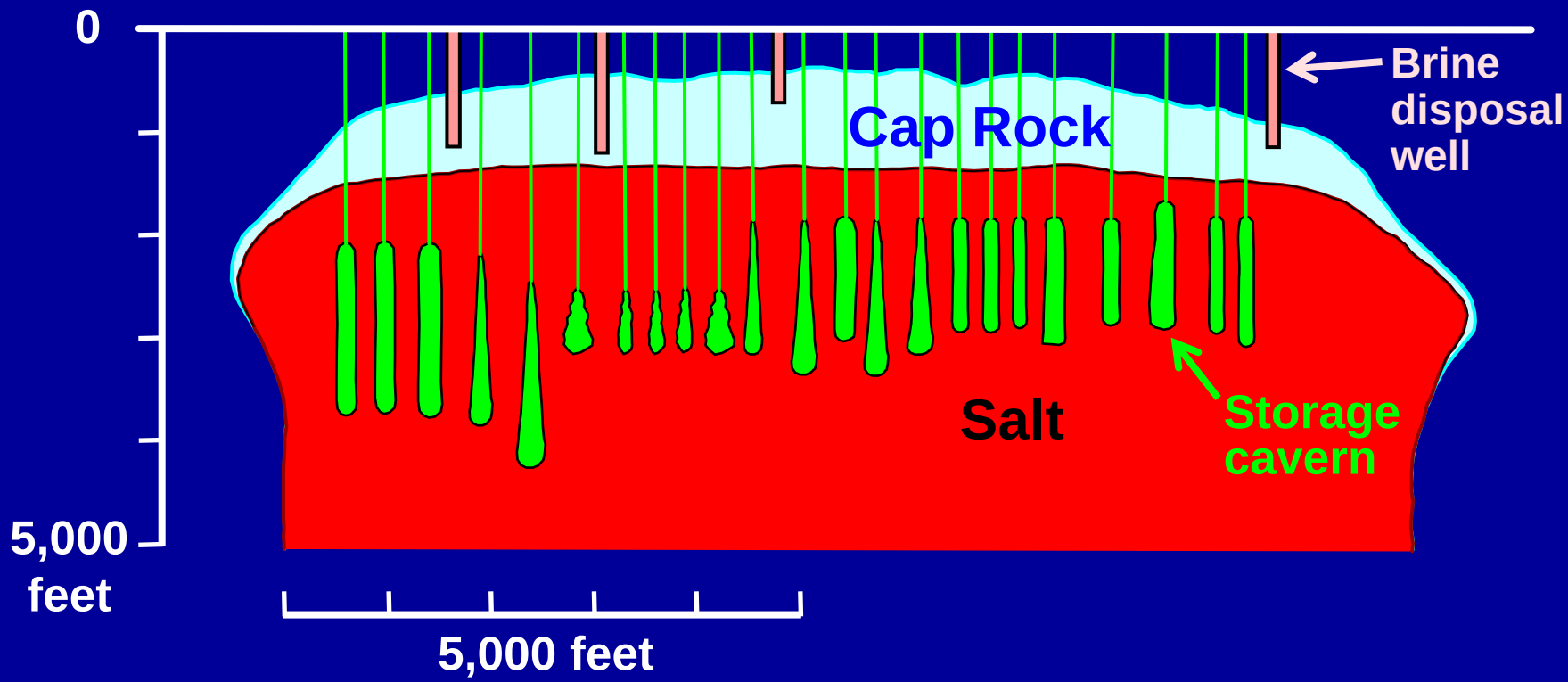
# BARBERS HILL SALT DOME, CHAMBERS COUNTY

## CROSS SECTION SHOWING STORAGE CAVERNS AND BRINE DISPOSAL WELLS

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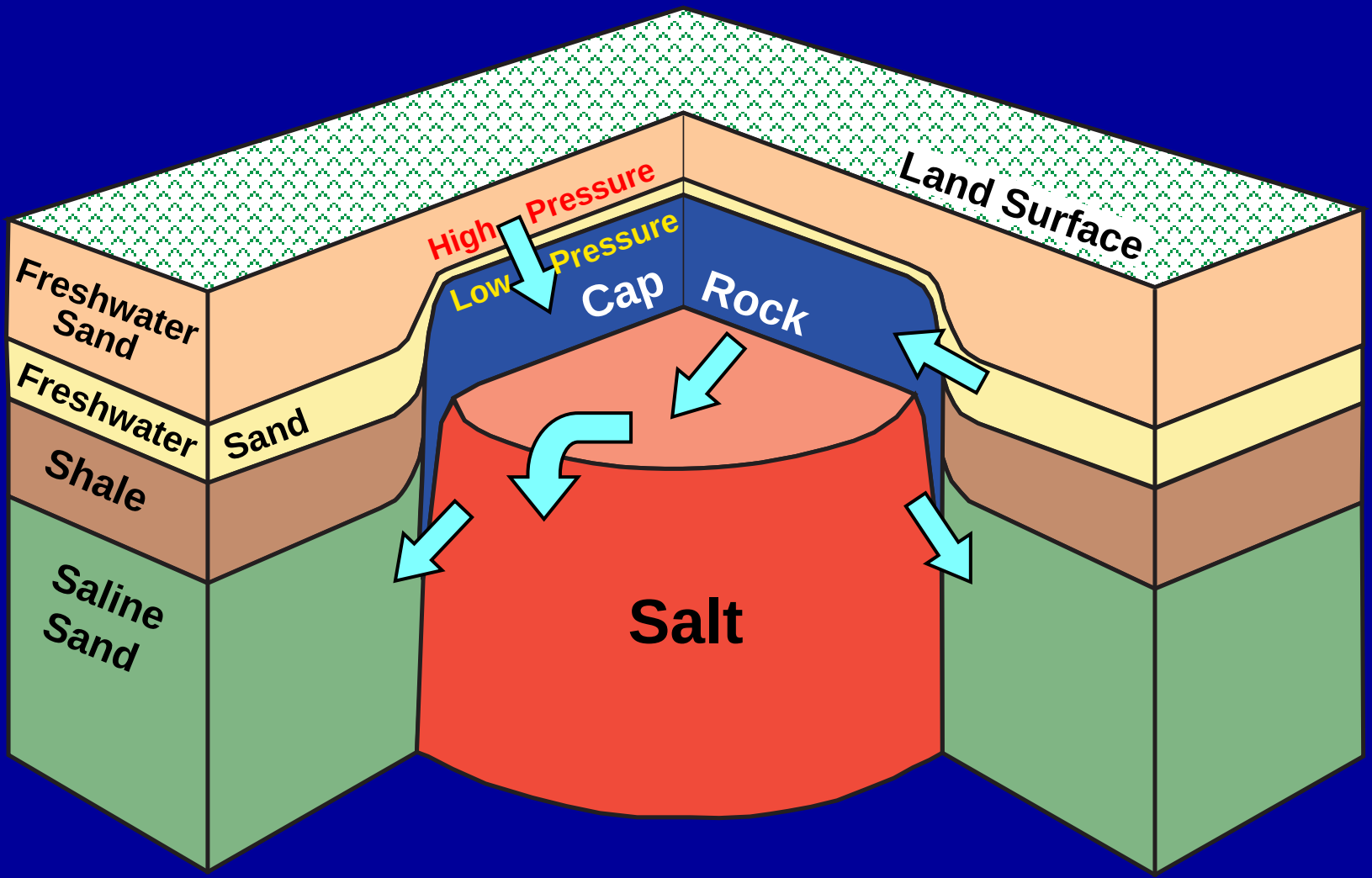
# 3D MODEL OF SALT DOME
# BEFORE BRINE DISPOSAL IN CAP ROCK

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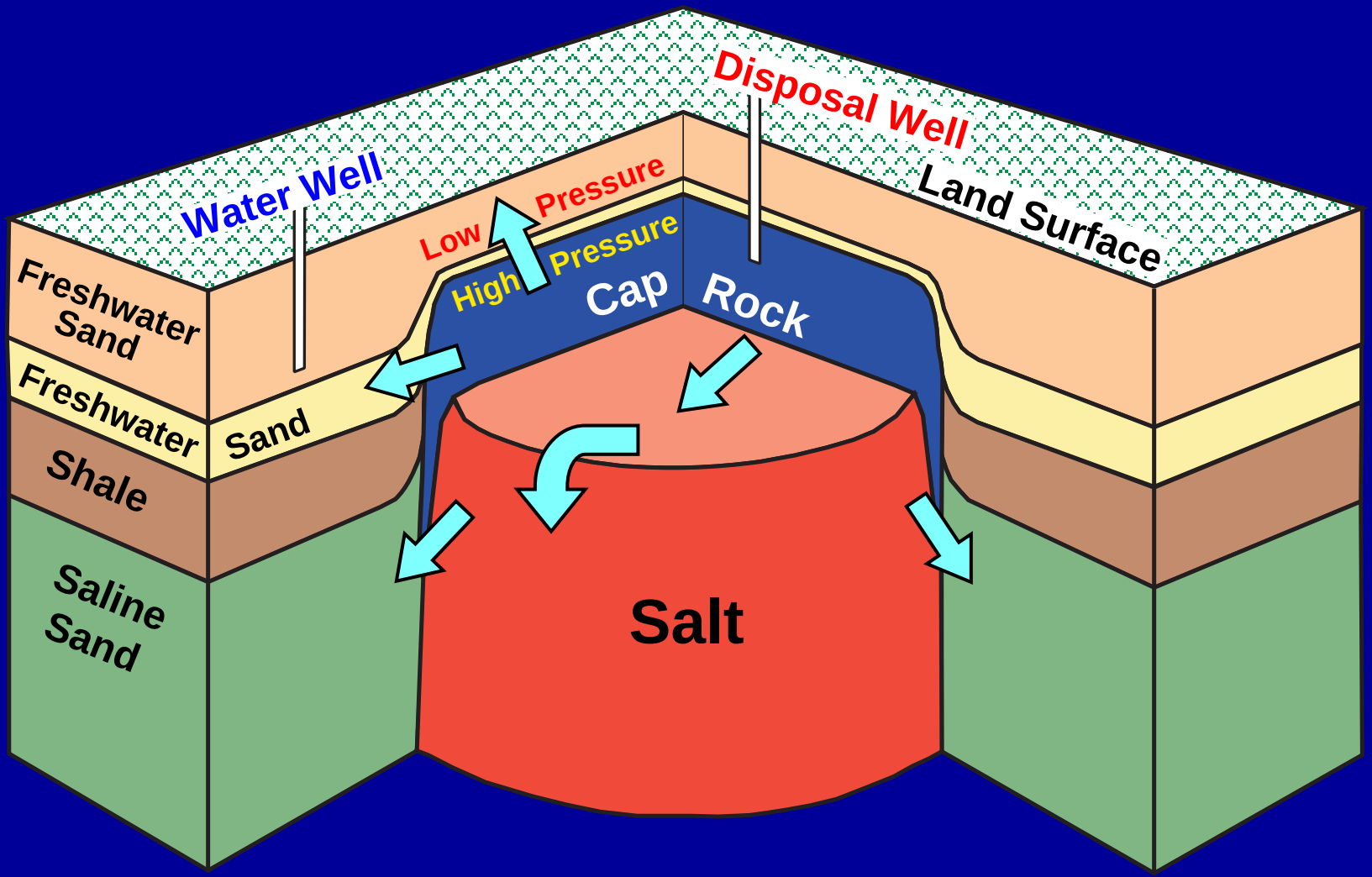
# 3D MODEL OF SALT DOME
# AFTER BRINE DISPOSAL IN CAP ROCK

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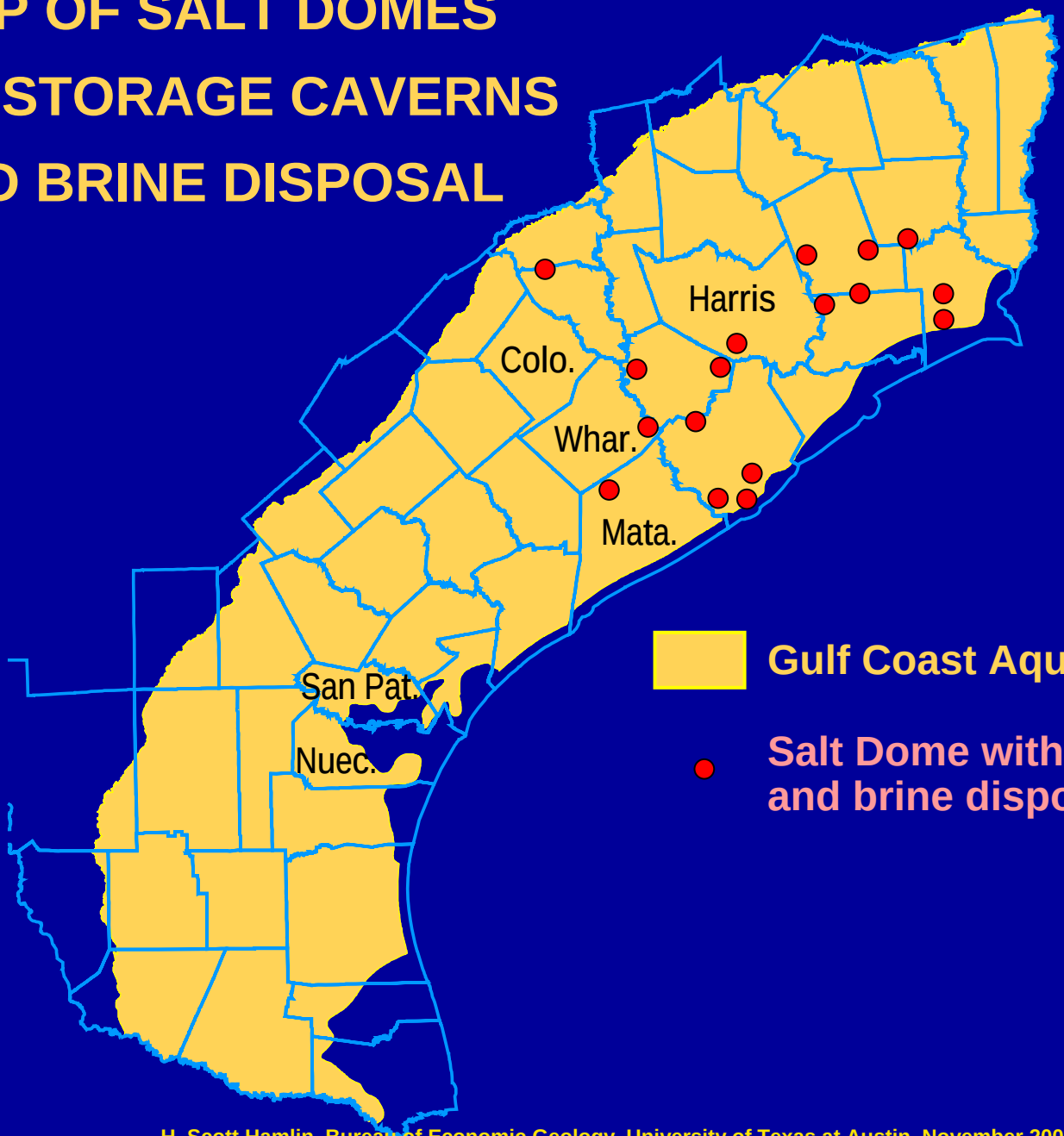
# MAP OF SALT DOMES WITH STORAGE CAVERNS AND BRINE DISPOSAL




Gulf Coast Aquifer

Salt Dome with caverns and brine disposal

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# SALT DOMES AND WATER QUALITY IN THE GULF COAST AQUIFER

- **Most salt domes are located along the upper Texas Coast**
- **The affects of salt domes are local**
- **Resource development increases potential for aquifer contamination**

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