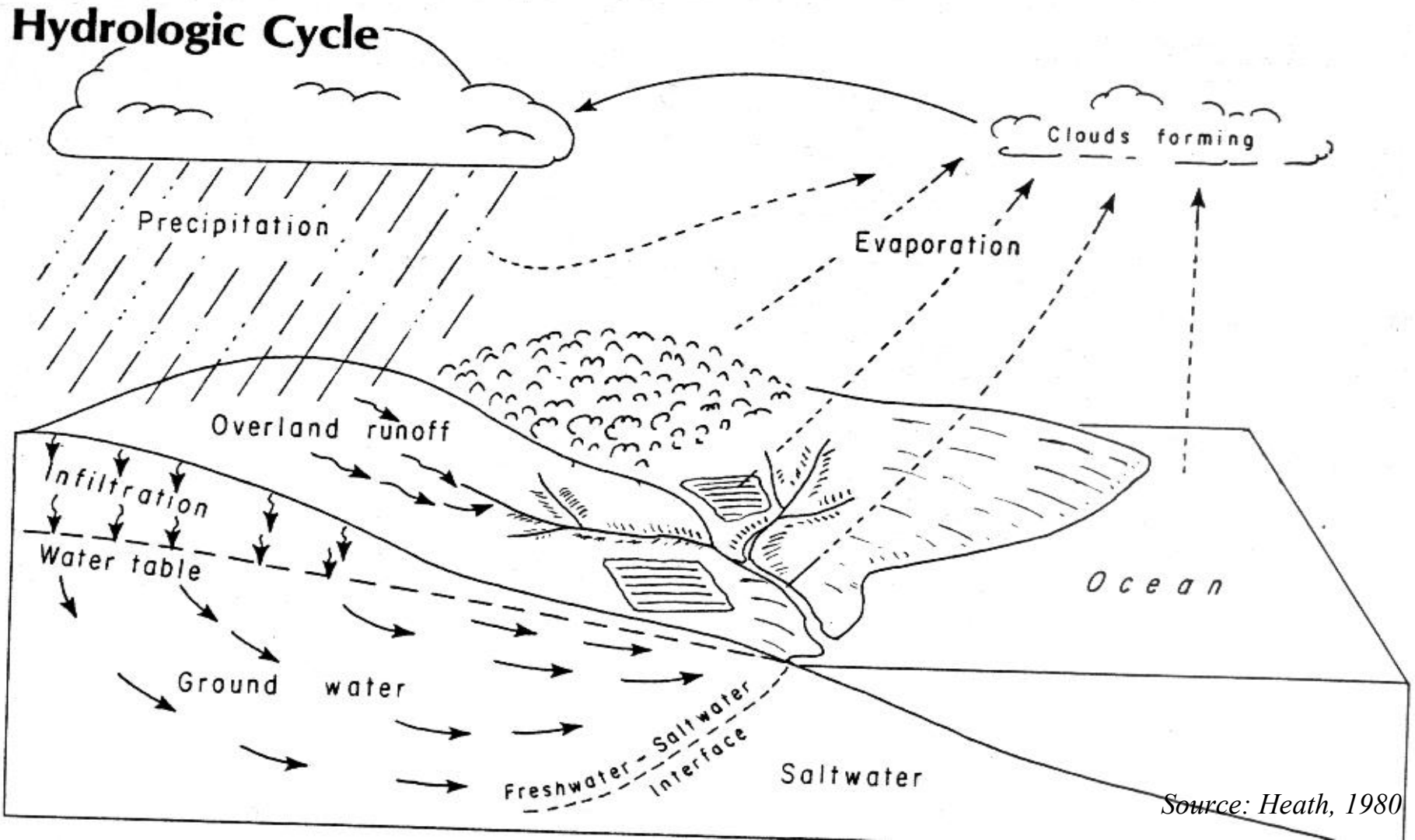
Hydrogeology & Geology of Orange County

– Presented by Rick Bolich

NCDENR – Division of Water Quality

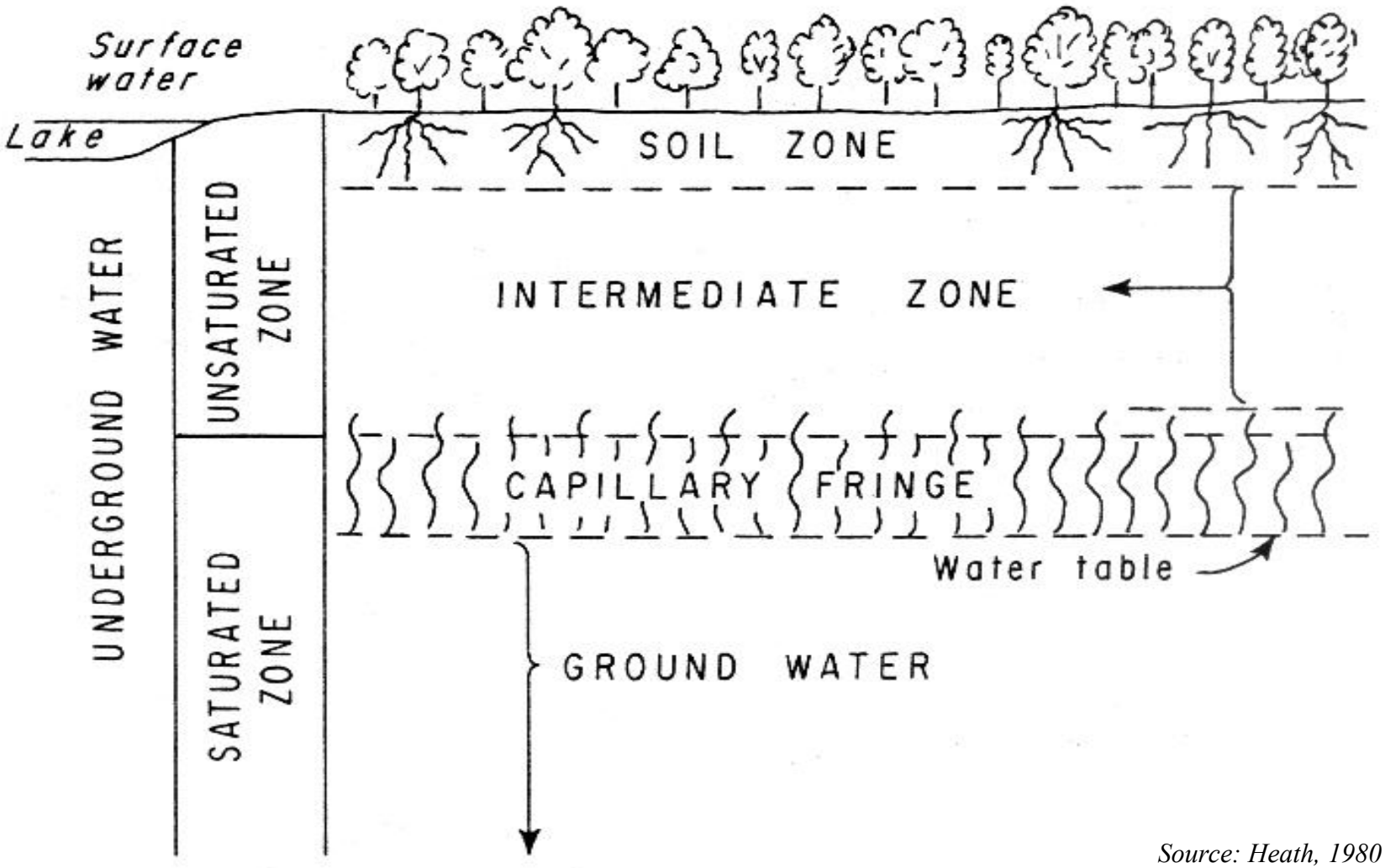
Aquifer Protection Section

How Does Groundwater Form?



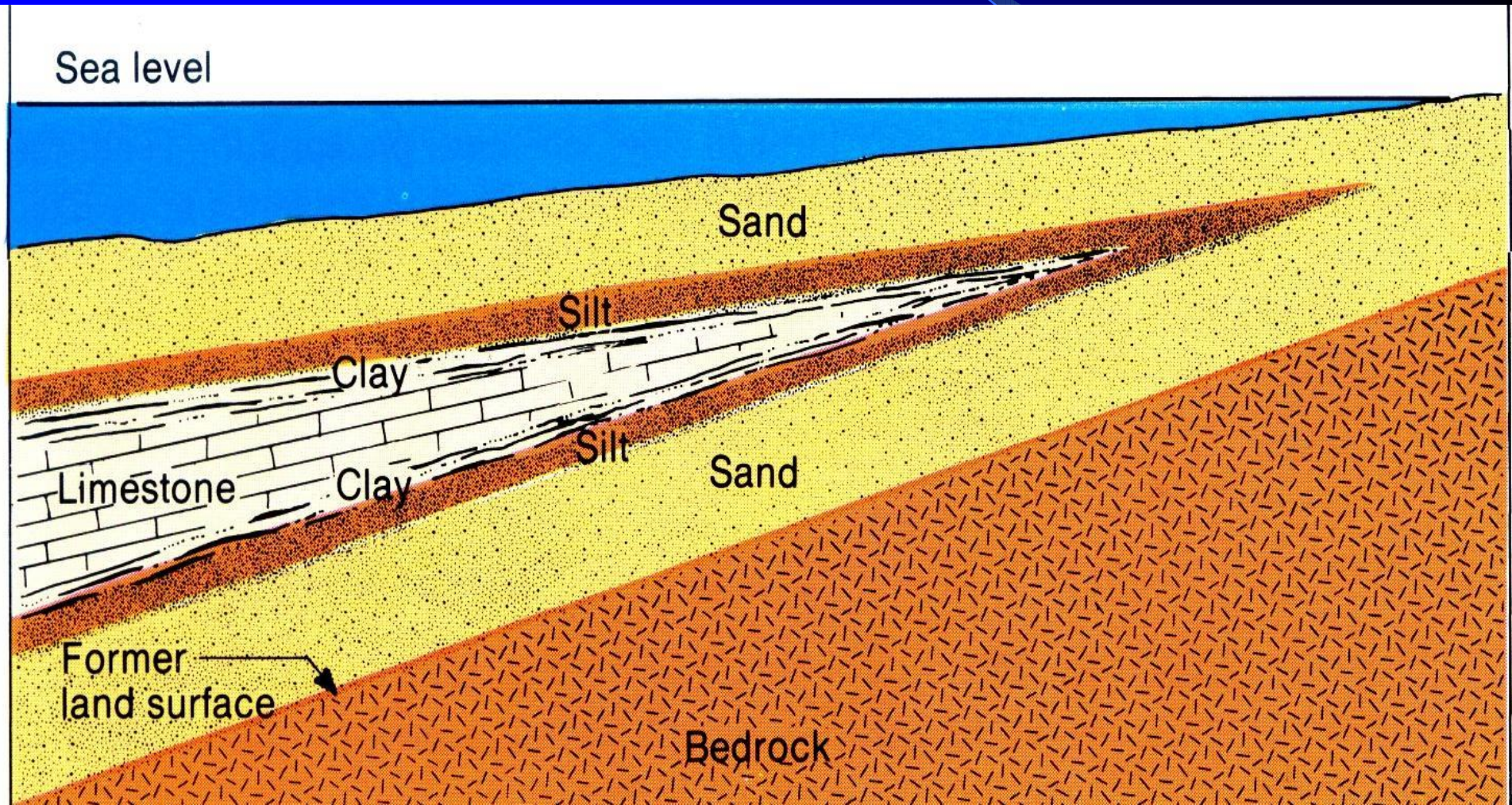
Source: Heath, 1980

Occurrence of Groundwater



Source: Heath, 1980

Groundwater in the Coastal Plain



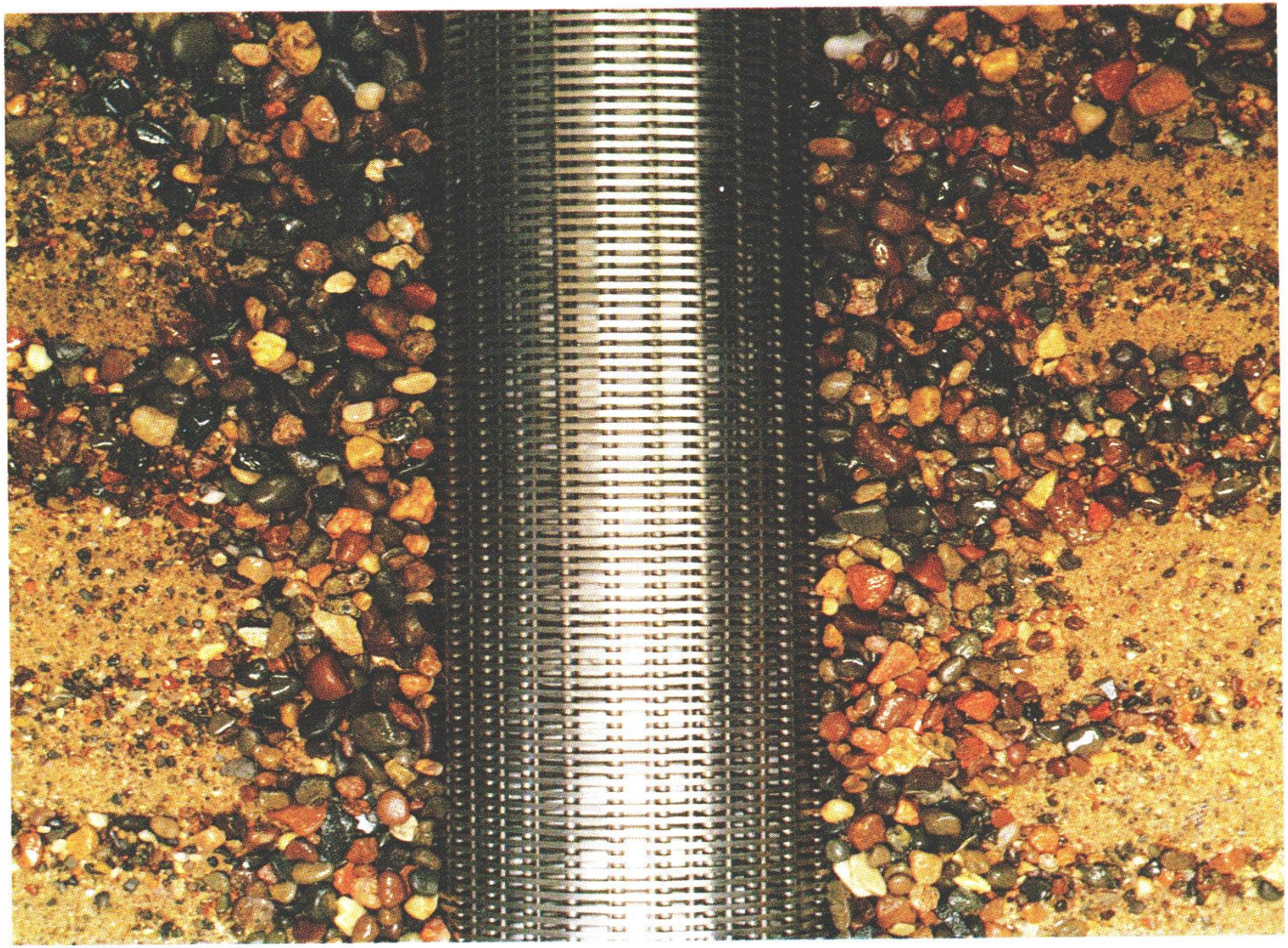
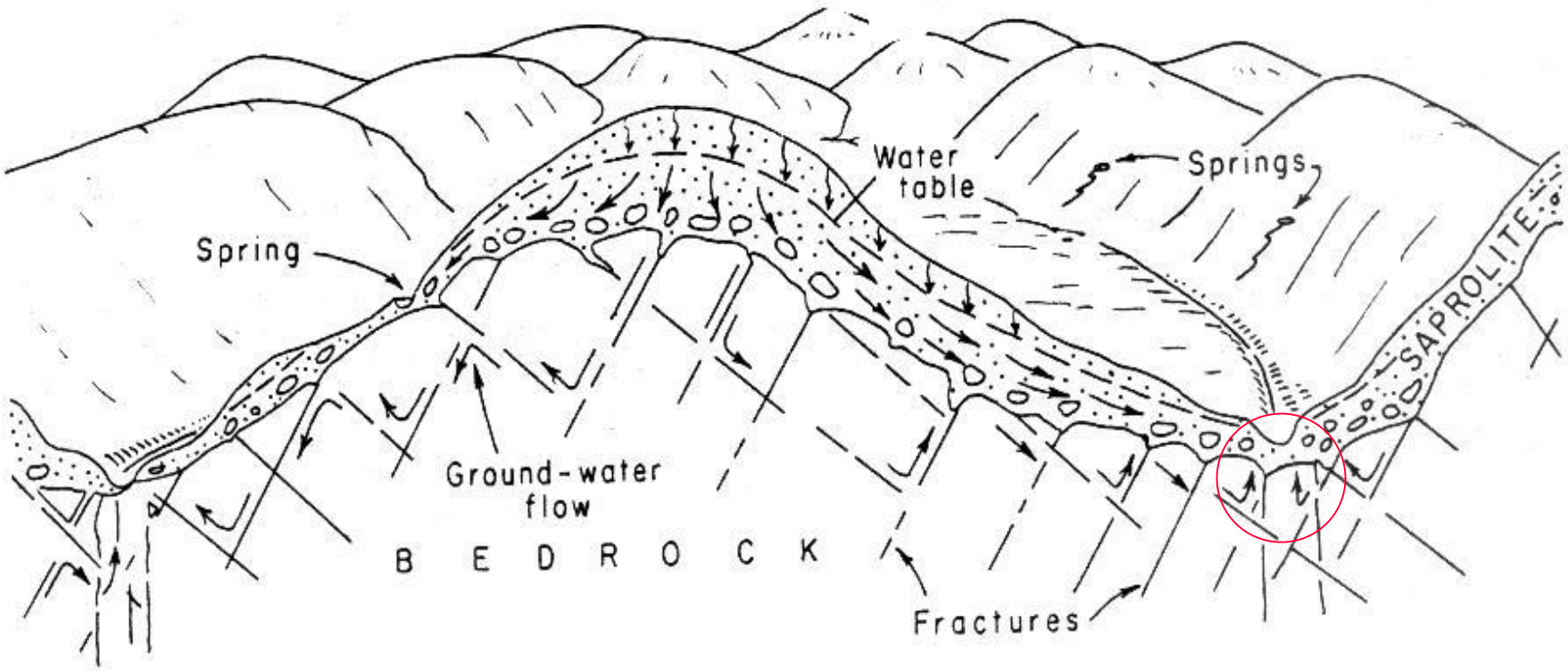


Figure 15.3. Natural development removes most particles near the well screen that are smaller than the slot openings, thereby increasing porosity and hydraulic conductivity in a zone surrounding the screen.

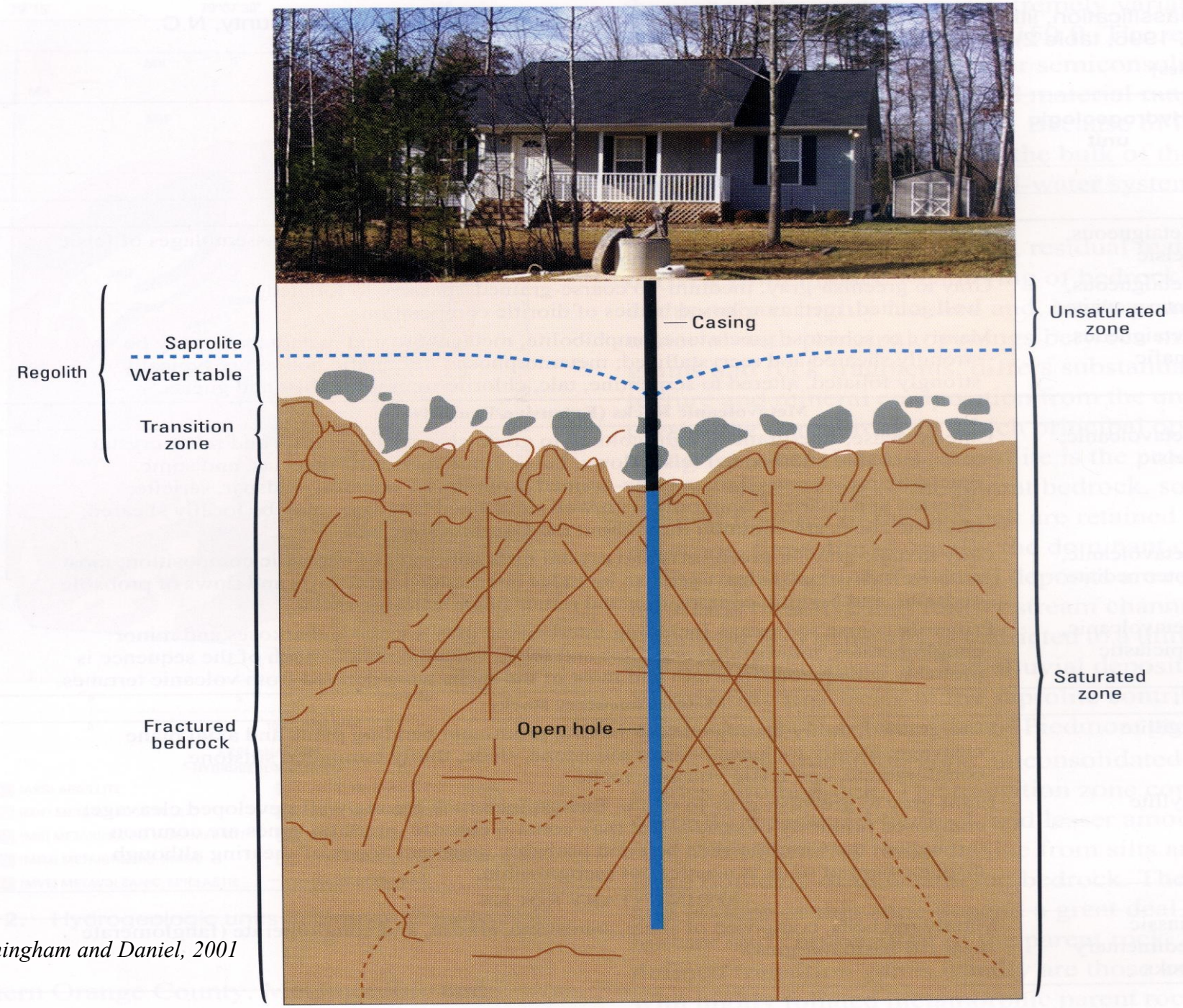
From Driscoll, 1986, Groundwater & Wells

Groundwater in the Piedmont



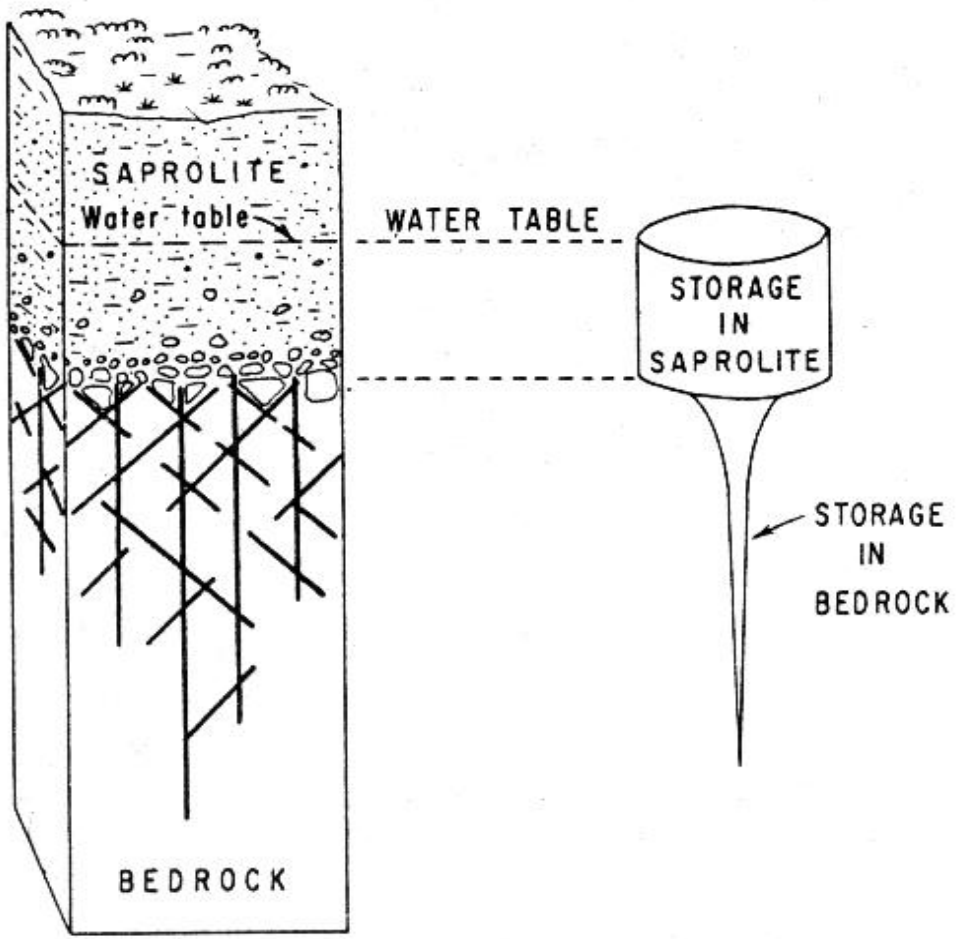
Source: Heath, 1980

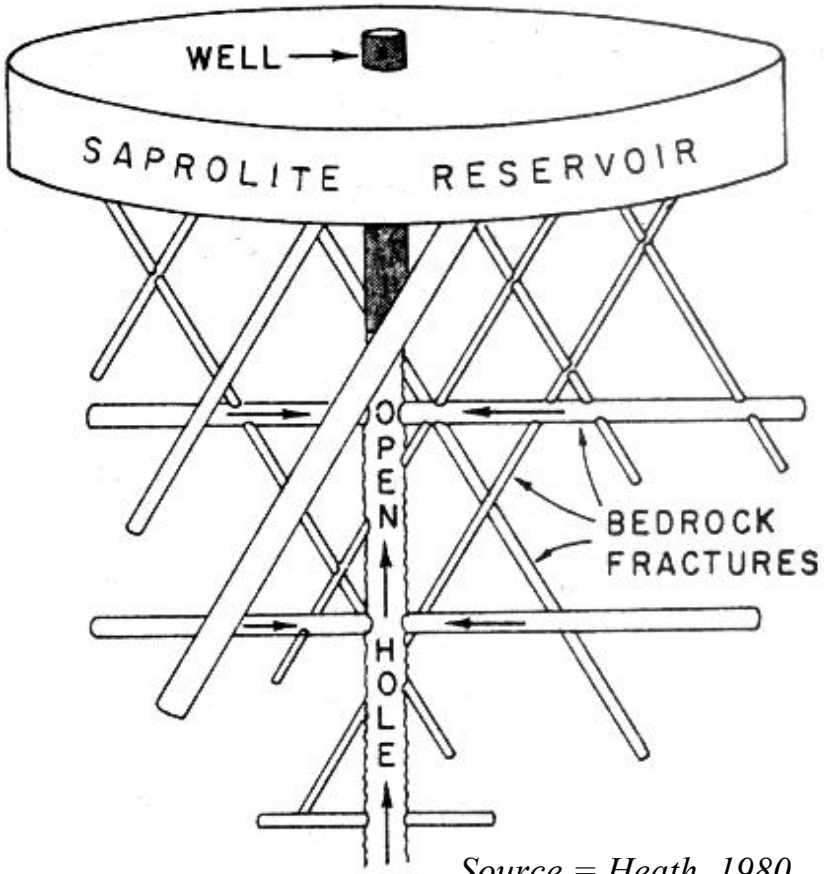
New Hope Creek @ Duke Forest (10/3/2007)



Source: Cunningham and Daniel, 2001

Hydraulic Characteristics of the Piedmont and Mountain Ground-Water System





Source = Heath, 1980

Soil & Saprolite

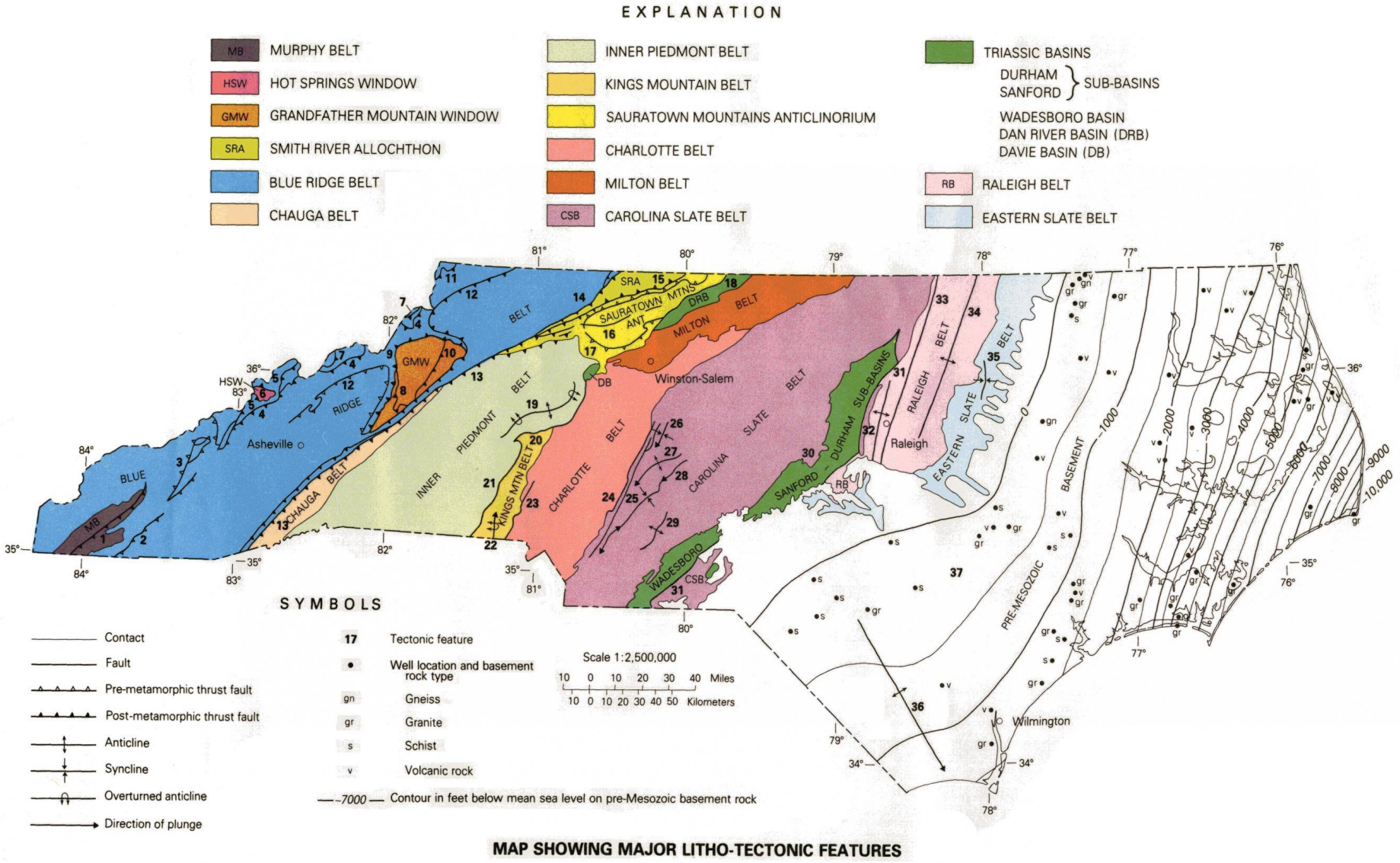
Transition Zone

Bedrock


Run #18: 85.0'-90.0' Rec=5.0'
Run #18 cont.
Run #19; 90.0-95.0' Rec.=5.0'
Run #20; 95.0-100.0' Rec=5.0'
85.0'
90'
95
100

NCSU Lake Wheeler Rd. Site - *RAL-2*

Litho-Tectonic Belts



MAP SHOWING MAJOR LITHO-TECTONIC FEATURES

1. Many King Mountain fault

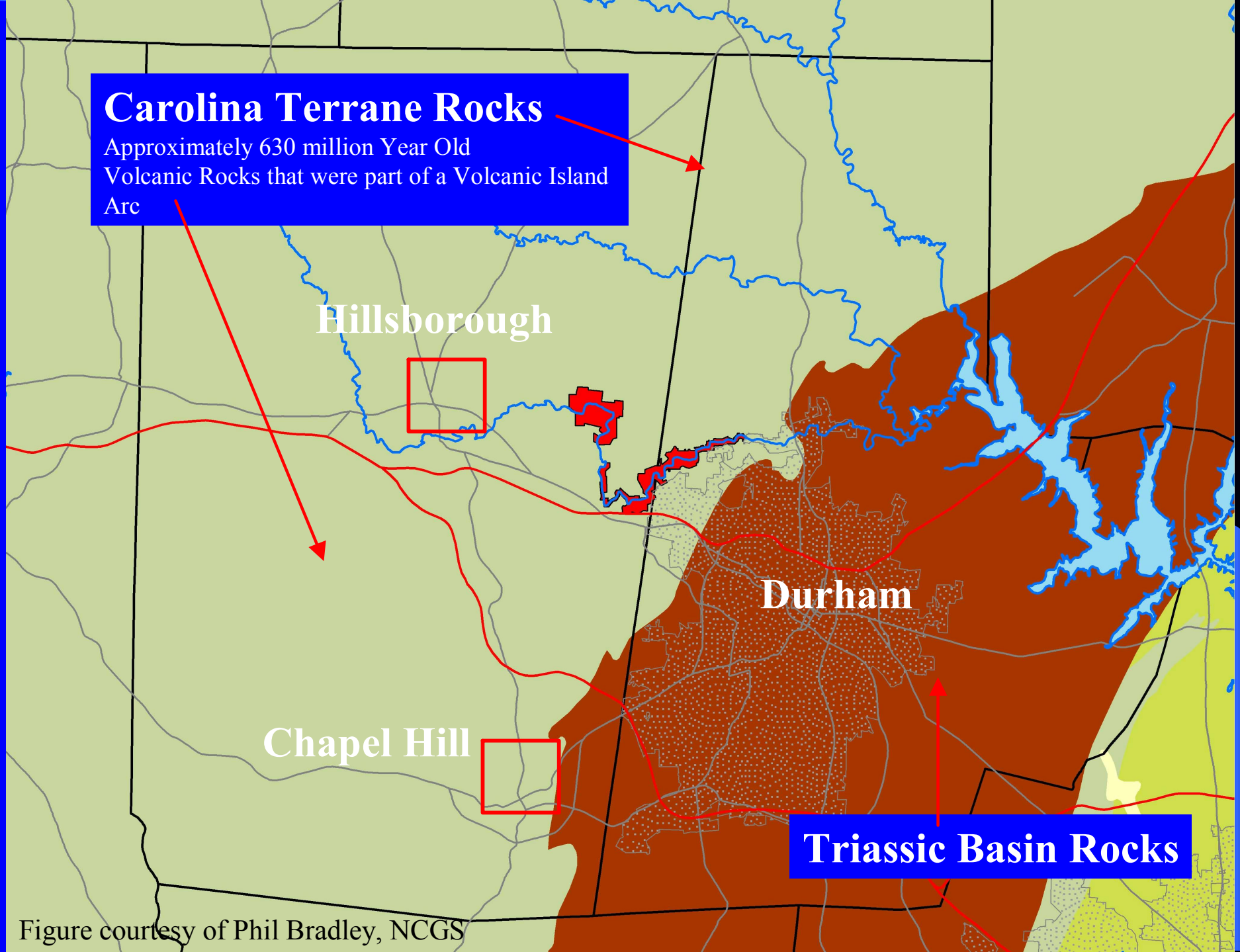
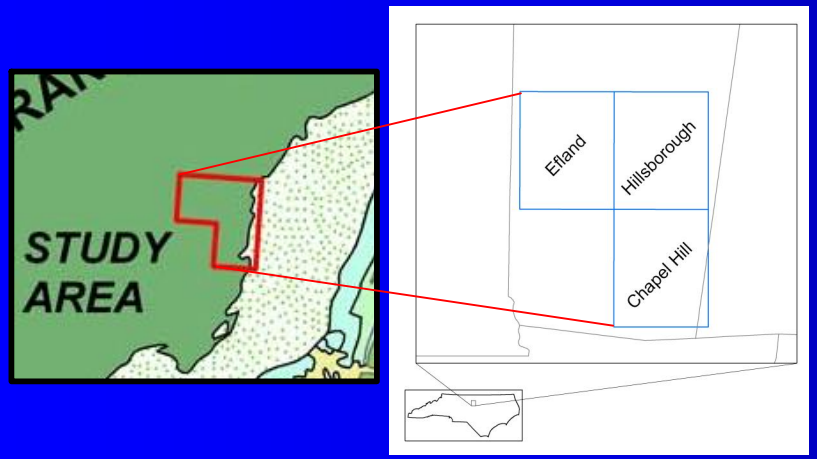


Figure courtesy of Phil Bradley, NCGS

Geologic Map of the Chapel Hill, Hillsborough and Efland Quadrangle



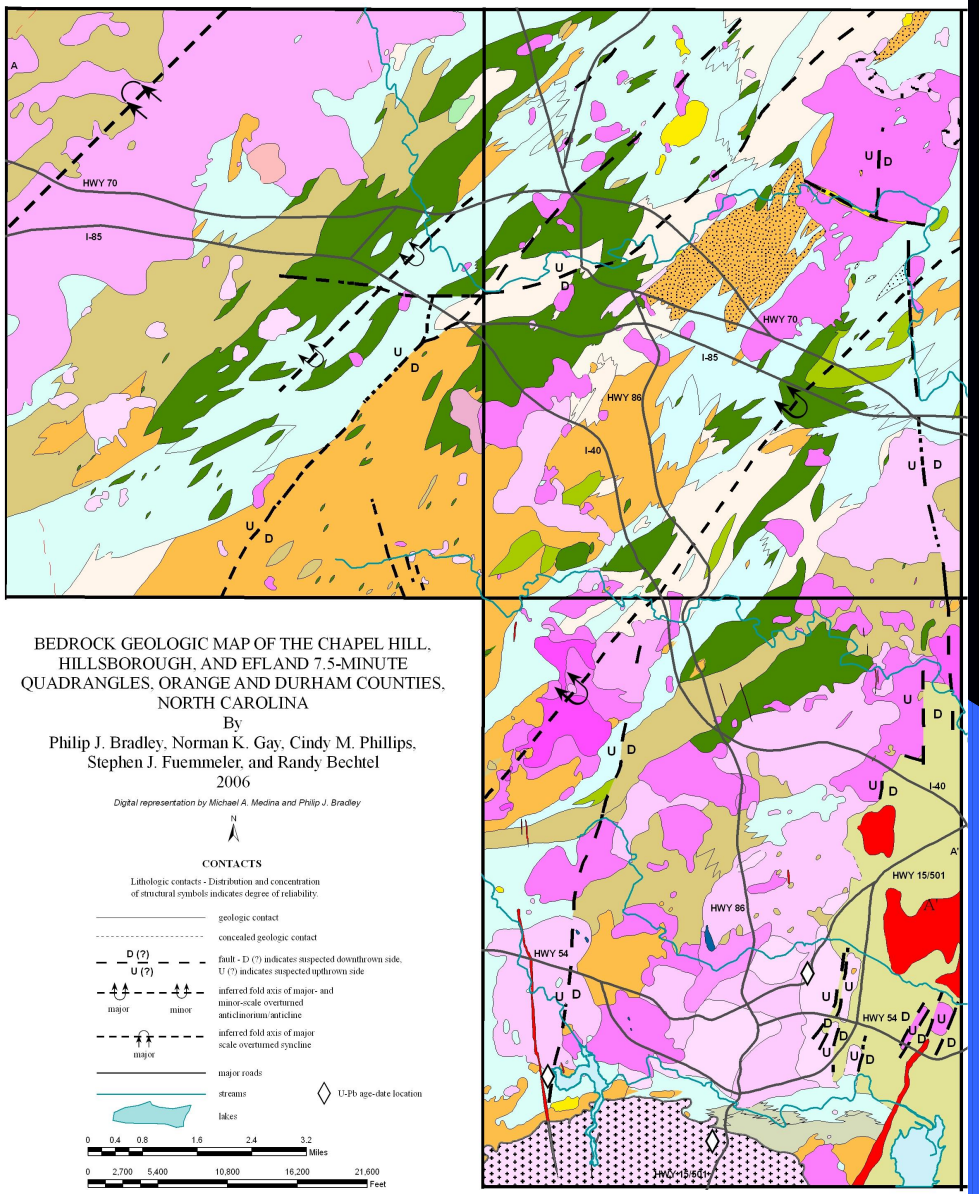
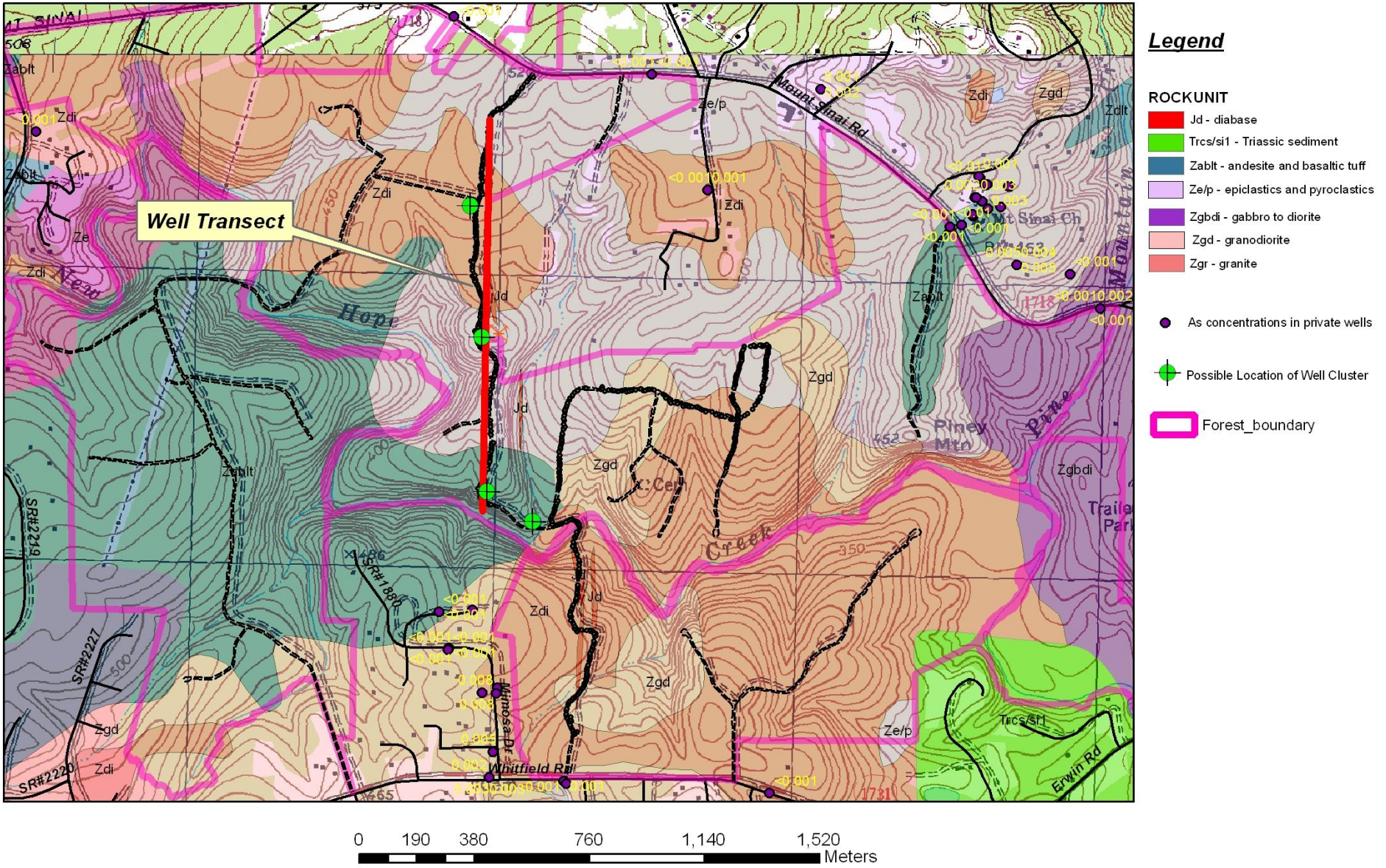


Figure courtesy of Phil Bradley, NCGS

Duke Forest Hydrogeologic Research Station



Core from Duke Forest

Source = Cunningham & Daniel, 2001

Hydrograph Box Plot Orange Co. Well; 1980-1991

Source = Cunningham & Daniel, 2001

Drought Considerations

- Water is stored in clayey *saprolite*, and transmitted to bedrock wells by fractures.
- Thicker saprolite means more water storage and better protection from drought.
- Precipitation usually increases in late Fall.
- Groundwater levels don't usually start to respond until early Spring.
- Even if your well is fine now, you should still try to conserve water.