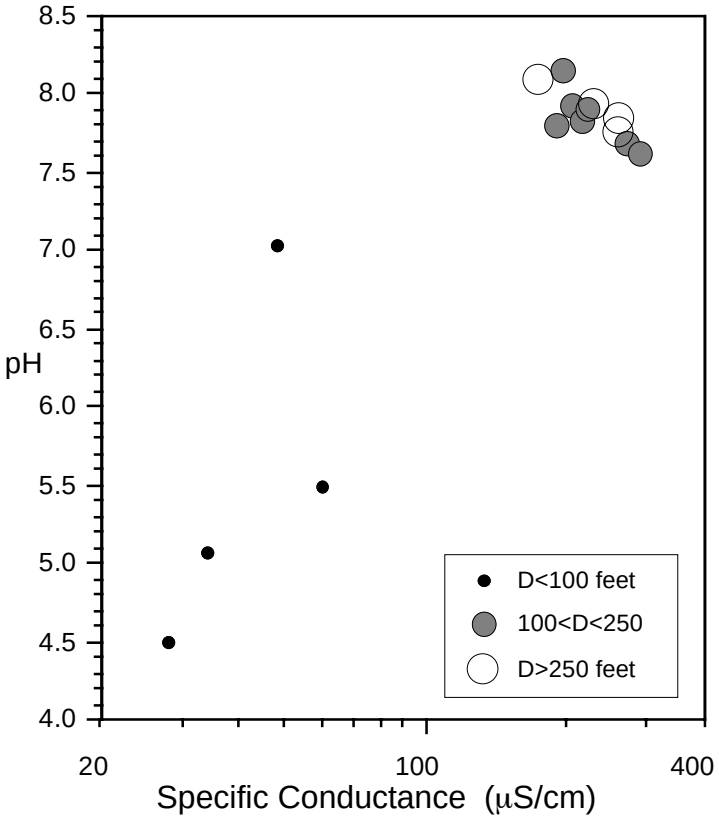
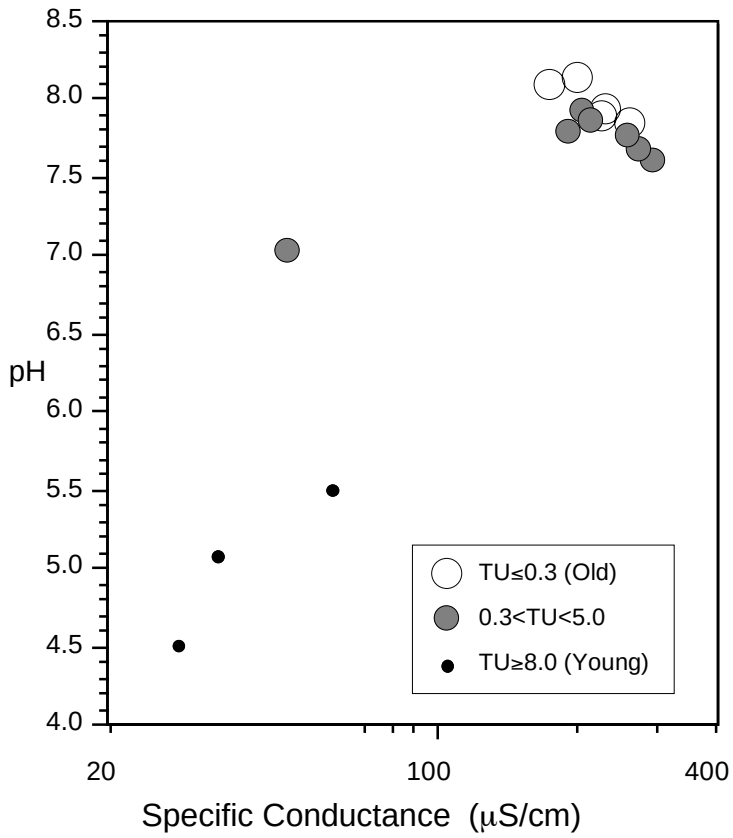
Change in pH and total dissolved solids of groundwater with depth and time

As rainwater descends into an aquifer as groundwater, one would expect the water to change in response to weathering reactions or diagenetic reactions with aquifer minerals. For example, one would expect that the water's initially low pH would be buffered, and that its concentration of total dissolvd solids would increase.

The data below support that model in two respects. On the left, pH and TDS increase with depth in groundwater near Valdosta, Georgia, in the coastal plain of the southeastern United States. On the right, tritium data from the same samples confirm that the deeper waters with greater pH and TDS are indeed older, supporting the notion of chemical aging of the water.





Data are from McConnell, J.B., Busenberg, E., and Plummer, L.N., 1994, Water-Resources data for the Valdosta area, south-central Georgia, 1961-93: U.S. Geological Survey Open-File Report 94-350, 58p.