

Multidisciplinary approaches for understanding regional aquifer systems

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Understanding the dynamics of regional groundwater flow systems requires a multidisciplinary approach including hydrology, geochemistry, environmental tracers, flow and transport modelling etc. Residence times of regional groundwater flow systems range from thousands to millions of years and aquifer dynamics therefore are influenced by changes in climate, vegetation, landforms, and human activities. There is great interest in these regional aquifers because they often are an essential resource for domestic and agricultural water use. Environmental isotopes (e.g. radiocarbon) give us a long-term average recharge rate of the aquifer, while hydrogeological approaches are more representative of the aquifer conditions at the time of measurement, and a numerical model will allow projections into the future. A comprehensive evaluation of the aquifer would have to combine all these approaches and

These concepts will be illustrated using case studies from Bangladesh, the United States, and Australia.