and ranges up to ~70 m in thickness in this area (as inferred from well logs in surrounding regions). Under the Hawthorne lie the Eocene limestones of the Floridan Aquifer, a karstic, high-permeability unit that is the principal groundwater source in southeastern Georgia and Florida. In and around the Okefenokee, the Floridan Aquifer is generally confined by the Hawthorne Group, and artesian conditions historically existed (Thom 2015, Clarke *et al* 1990). This stratigraphy gave rise to the assumption of hydraulic isolation: most studies have treated the Hawthorne confining beds as a barrier separating the swamp's shallow water from the Floridan Aquifer (Rykiel 1977). Nevertheless, the possibility of breaches or windows in the confining layer has been noted about 100 km west of Okefenokee in Valdosta, Georgia (Plummer *et al* 1998). The swamp's geologic history includes subsidence and perhaps karst activity; indeed, localized sinkhole-like features in the swamp's substratum have been hypothesized, which could facilitate focused seepage through the Hawthorne Group (Priest 2004, Loftin 1998, Rykiel 1977). Additionally, Trail Ridge – a Pleistocene sand ridge forming the eastern boundary of the swamp (Thom 2015) – creates a hydrologic divide; west of Trail Ridge, groundwater gradients would direct flow toward the swamp, while to the east groundwater flows away. This raises the complexity that any vertical exchange might vary spatially across the swamp.

The UFA in southeast Georgia and north Florida has seen significant anthropogenic drawdown over the past half-century due to municipal and industrial pumping in coastal Georgia (e.g., Brunswick) (Krause and Clarke 2001, Clarke *et al* 1990). The swamp's water level (surface elevation ~36–38 m AMSL in wetter periods) is typically higher than the potentiometric surface of the Floridan Aquifer beneath by several meters (Kitchens and Rasmussen 1995). Historically, artesian pressure may have approached the swamp surface, but today, the head in the UFA is considerably lower, establishing a downward hydraulic gradient virtually year-round (Kitchens and Rasmussen 1995). Thus, if permeable pathways exist, Okefenokee's waters would be expected to percolate into the aquifer. Conversely, upward discharge of Floridan water into the swamp is not observed – consistent with geochemical evidence (the swamp lacks the calcium-rich signature of Floridan spring water) (Yu 1986, Kitchens and Rasmussen 1995). In summary, the setting is one of a large, shallow wetland underlain by a regional aquifer with a confining layer that is generally of low permeability, but with a persistent head difference that drives potential downward leakage.

The Suwanee and St. Marys River basins encompass nearly twice the swamp's area, so basin-average yields (291 and 310 mm/yr, respectively) cannot isolate the swamp's contribution. Nearby non-swamp basins yield similar values (262-345 mm/yr), making it unlikely that surface yield alone distinguishes swamp vs. upland behavior. Instead, any residual must be evaluated through mass balance and tracer constraints.