



**Figure 1. Study site.** (A) Map of a section of southeast Georgia, USA (see inset) showing the Okefenokee Swamp, Trail Ridge, well locations open to the UFA from Clark et al. (1997;  $n = 15$ ) and this study ( $n = 16$ ); also shown are locations of our river and swamp samples as are Flowpaths 1-3 as delineated by Plummer (1993). The polygon on the inset shows the spatial extent of the map shown in (A). (B-D) Elevation cross-section profiles of respective flowpaths shown in (A); Okefenokee Swamp and Trail Ridge are annotated in (D).

## 2.2 Stable isotope sampling and analysis

We analyzed stable isotopes of hydrogen and oxygen ( $\delta^2\text{H}$  and  $\delta^{18}\text{O}$ ) in water samples from both surface waters and groundwater wells to evaluate water sources and mixing between the swamp and aquifer. We compiled isotope data from a 1997 study (Clark et al 1997) for baseline comparison ( $N = 15$ ) and collected new samples in the vicinity of the swamp in February 2025 ( $N = 32$ ). The Clark et al. (1997) dataset included  $\delta^2\text{H}$  and  $\delta^{18}\text{O}$  measurements from UFA wells following flowpaths 1 and 2 (Figure 1A), as delineated by Plummer (1993). Those samples were originally analyzed via isotope-ratio mass spectrometry; the reported analytical precision was on the order of  $\pm 0.1\text{‰}$  for  $\delta^{18}\text{O}$  and  $\pm 1\text{‰}$  for  $\delta^2\text{H}$ . For our 2025 sampling, we selected representative locations in and