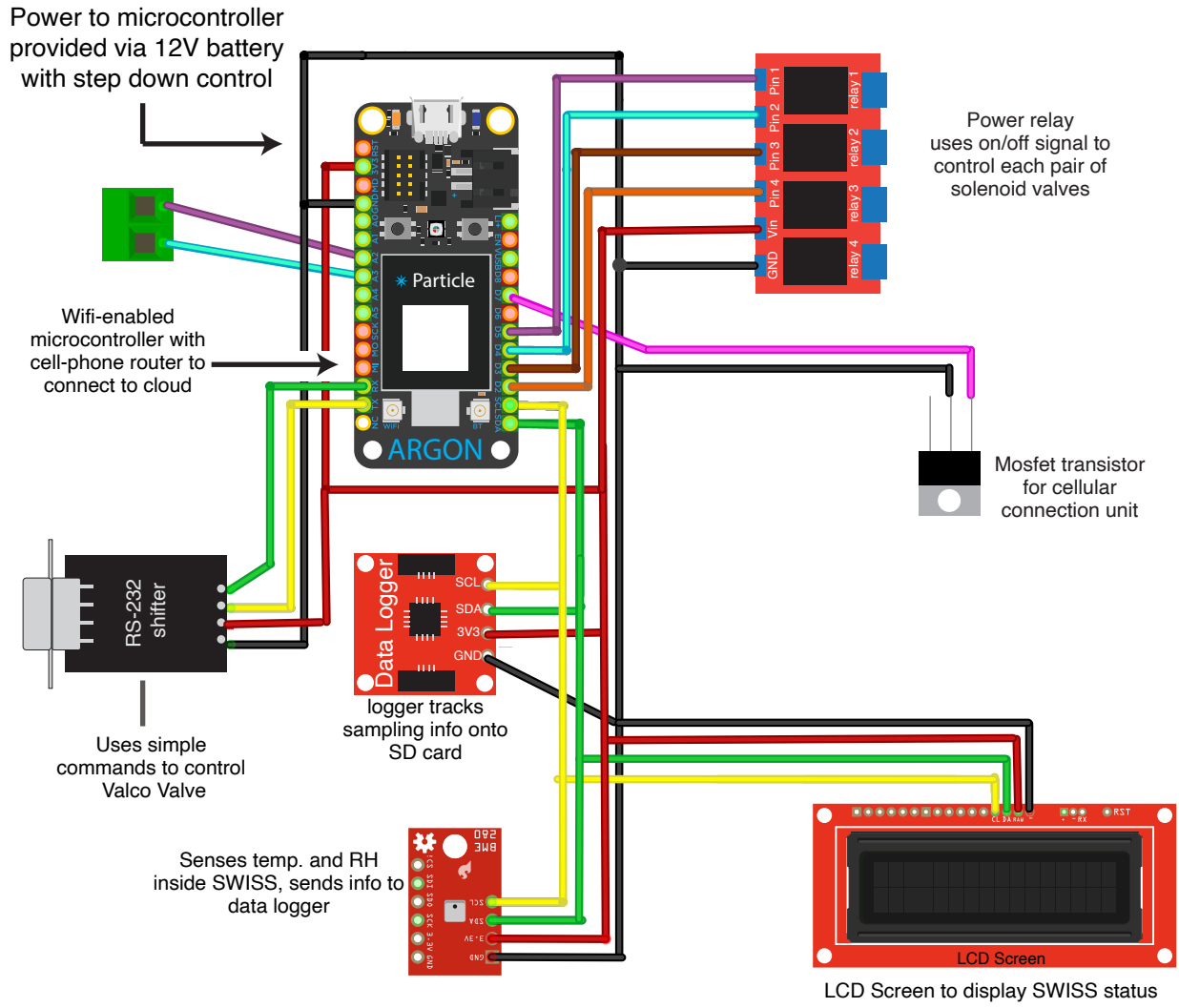
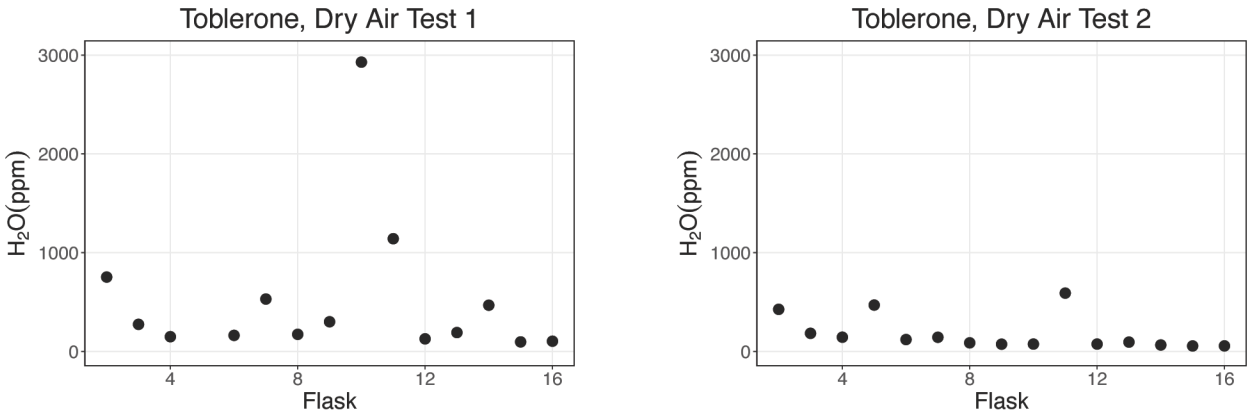
Automation components and wiring



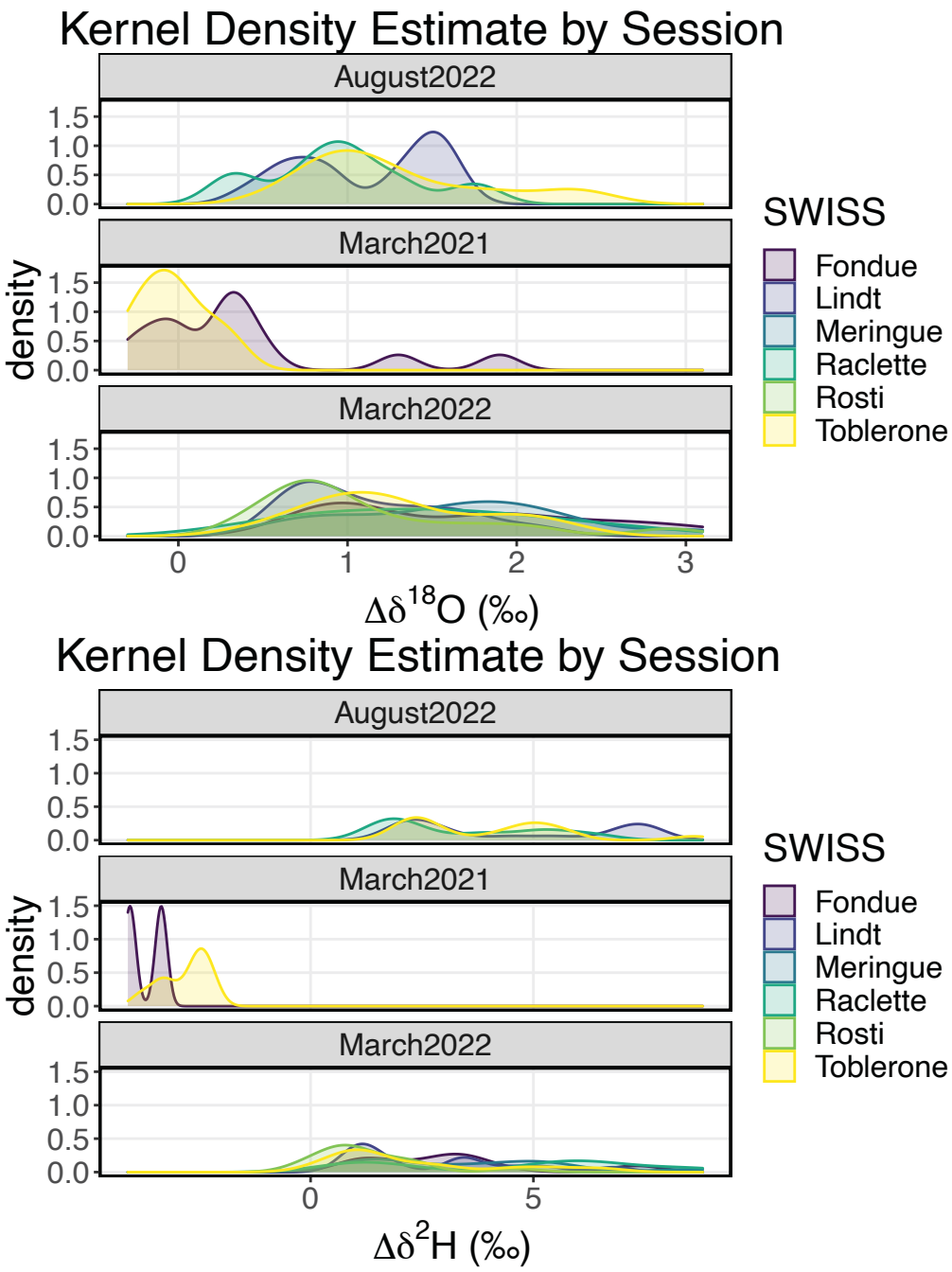
Supplemental Figure 1. A wiring schematic of the components used to automate the SWISS.

Supplemental figure 1
Havranek et al.,



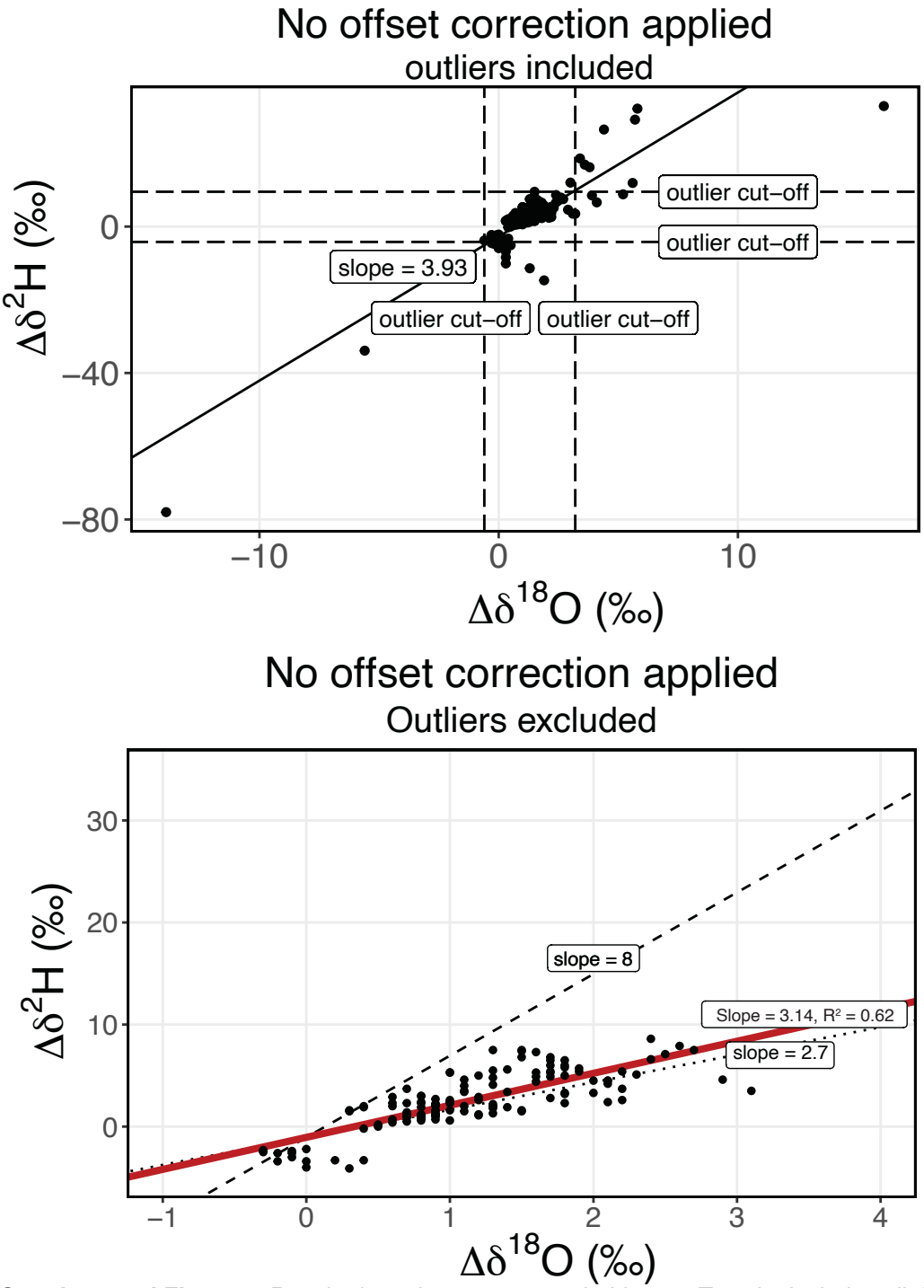
Supplemental Figure 2. The results of two successive dry air tests completed on the SWISS unit named Toblerone. Between the two tests we tightened the Swagelok and Valco valve fittings.

Supplemental figure 2
Havranek et al.,



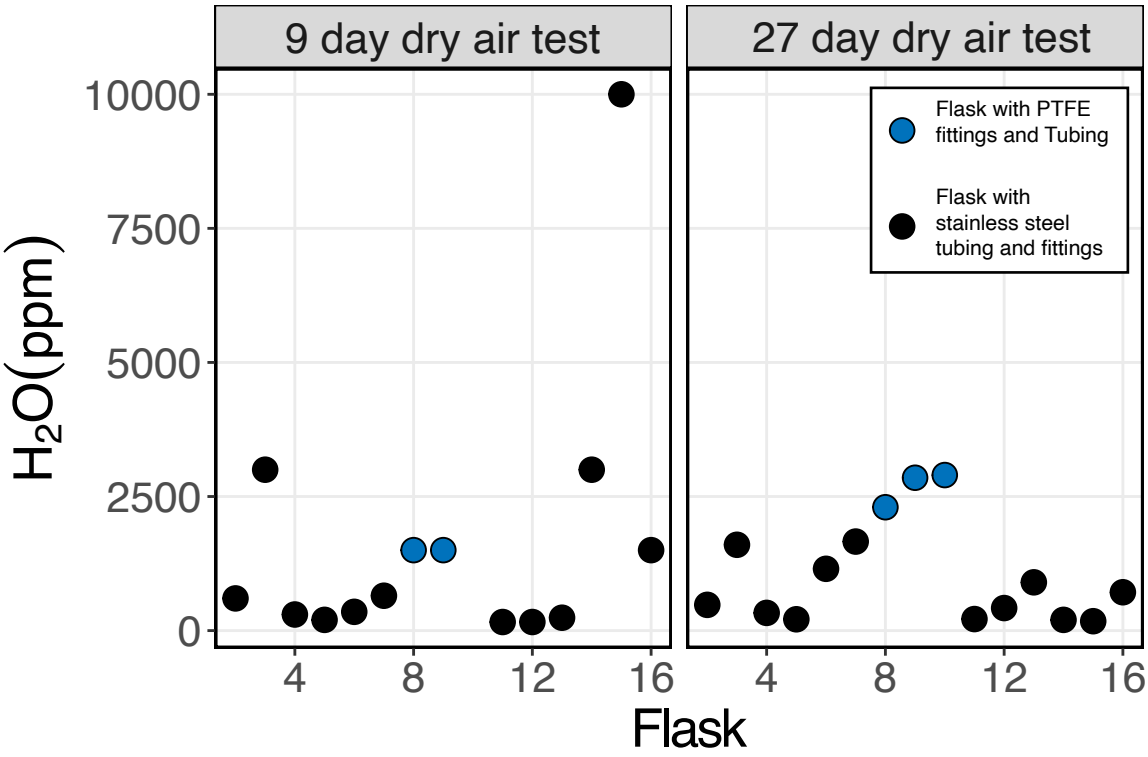
Supplemental Figure 3. Kernal density estimates from three different water vapor hold test analytical sessions. KDEs are colored by SWISS unit. Each analytical session used a different tertiary standard.

Supplemental figure 3
Havranek et al.,



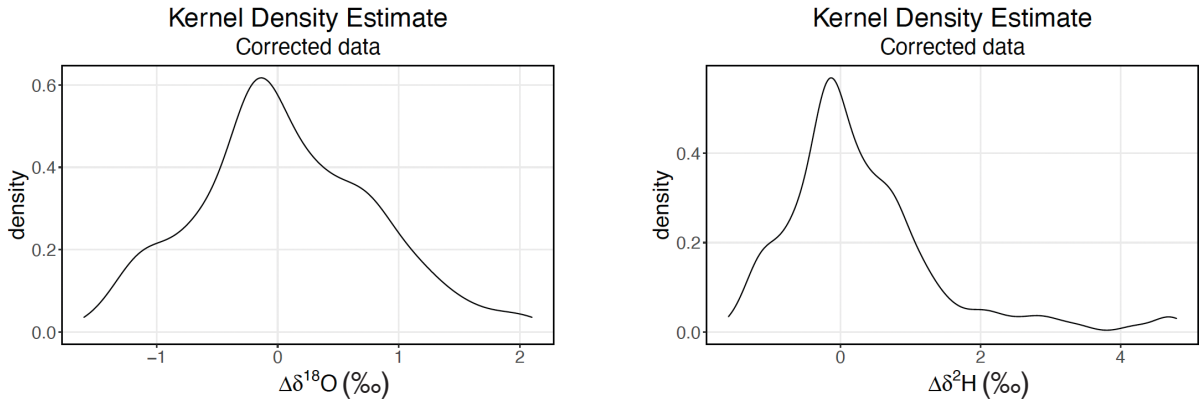
Supplemental Figure 4. Results from the water vapor hold tests. Top plot includes all data and the bottom plot has excluded outliers. With outliers, the regressed slope is 3.93, and without outliers the slope is 3.14 (R^2 = 0.62). We have also plotted the slope of pure diffusion, which is approx. 2.7 (Gonfinatini et a., 2018).

Havranek et al.,
Supplemental Figure 4



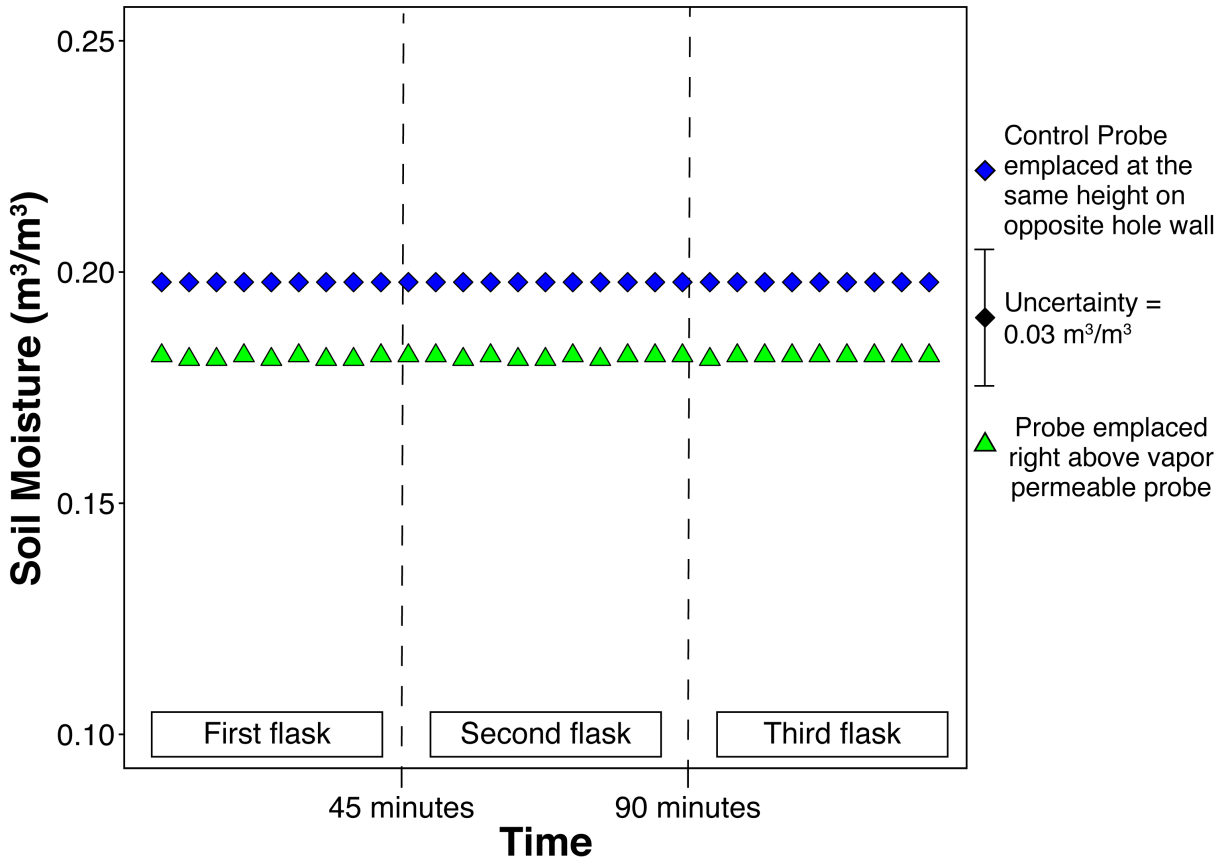
Supplemental Figure 5. Results of 2 separate dry air tests done with the SWISS unit Toblerone. 3 sets of stainless steel fittings and tubing were replaced with PTFE fittings. The PTFE fittings performed reasonably well over 9 days, but performed much worse than the stainless steel fittings over 27 days.

Supplemental Figure 5
Havranek et al.,



Supplemental Figure 6. Kernal density estimates from three different water vapor hold test analytical sessions after the offset correction has been applied.

Supplemental figure 6
Havranek et al.,



Supplemental Figure 7. We buried soil moisture probes just above the vapor permeable probes and in the same hole, but on the opposite wall. We saw no variability in soil moisture as a result of flushing dry air through the vapor permeable probing for 135 minutes. This gives us confidence that our long sampling time does not alter natural conditions in the soil.

Supplemental Figure 7
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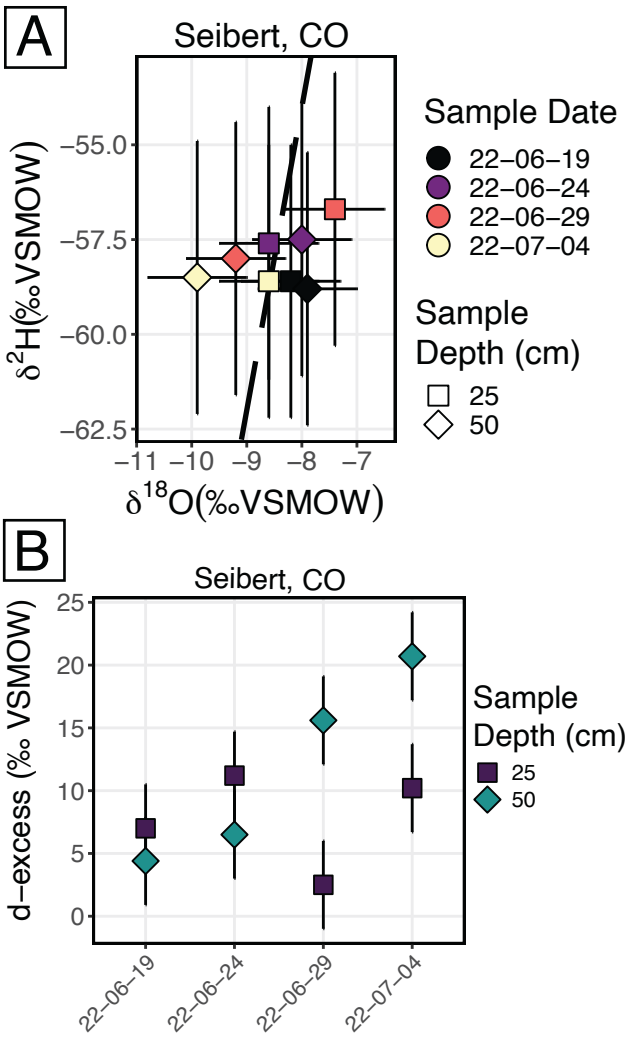

Supplemental Figure 8. A) A dual isotope plot of the Seibert, CO results. The dashed line is the GMWL. B) Deuterium excess vs. date fro all samples. The data from 25 cm scatter around 10 ± 2.6‰, but the data from 50 cm linearly increase through the sampling plan. Data from 75 cm were excluded from these plots.

Supplemental figure 8
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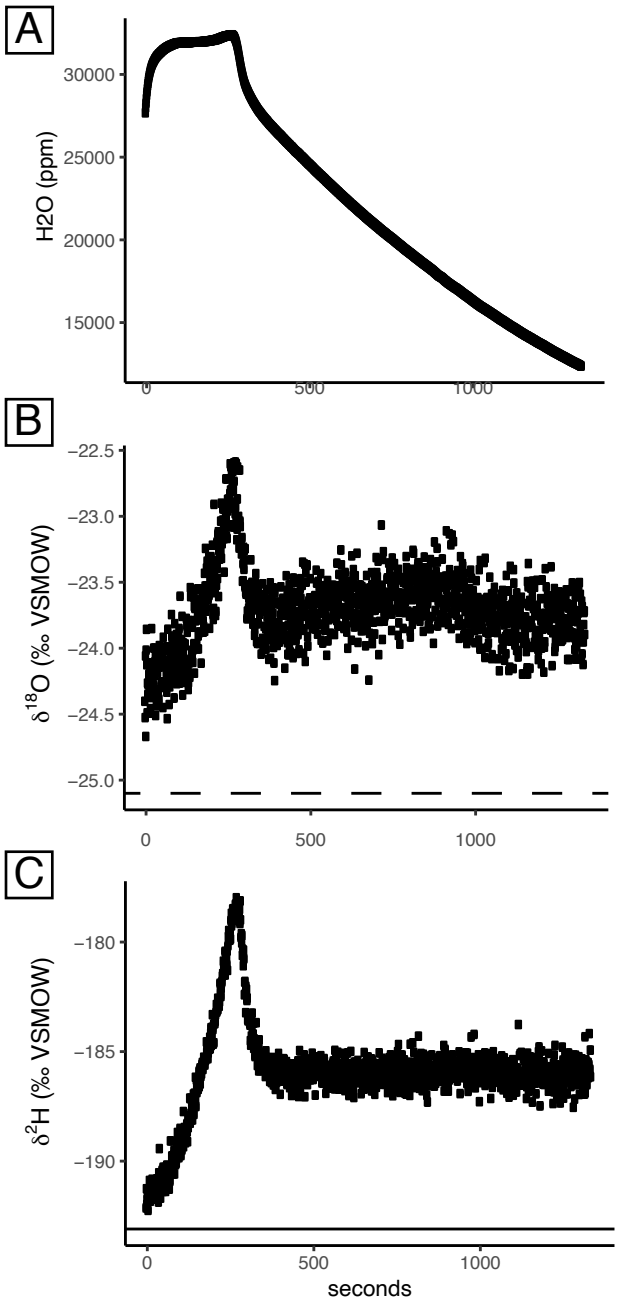

Supplemental Figure 3.A) Water vapor mole fraction during a test using the dry air carrier gas sampling introduction method. Water vapor increases before decreasing as expected. B) Oxygen isotope values increase as water vapor mole fraction increases. C) Hydrogen isotope values increase as water vapor mole fraction increases until the condensation is cleared.

Supplemental figure 9
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