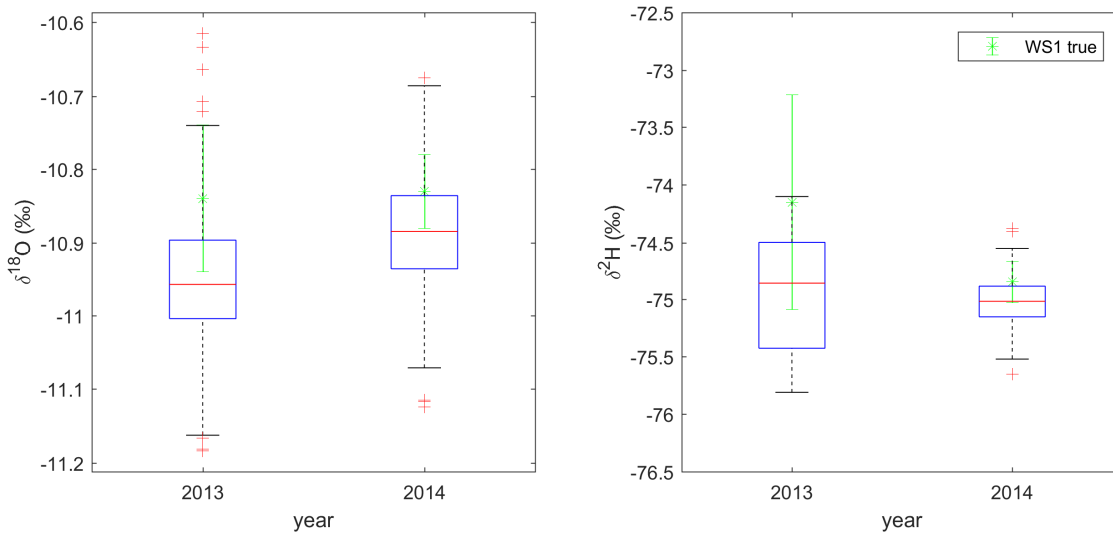Atmospheric
Measurement
Techniques

Supplement of

Calculating uncertainty for the RICE ice core continuous flow analysis water isotope record

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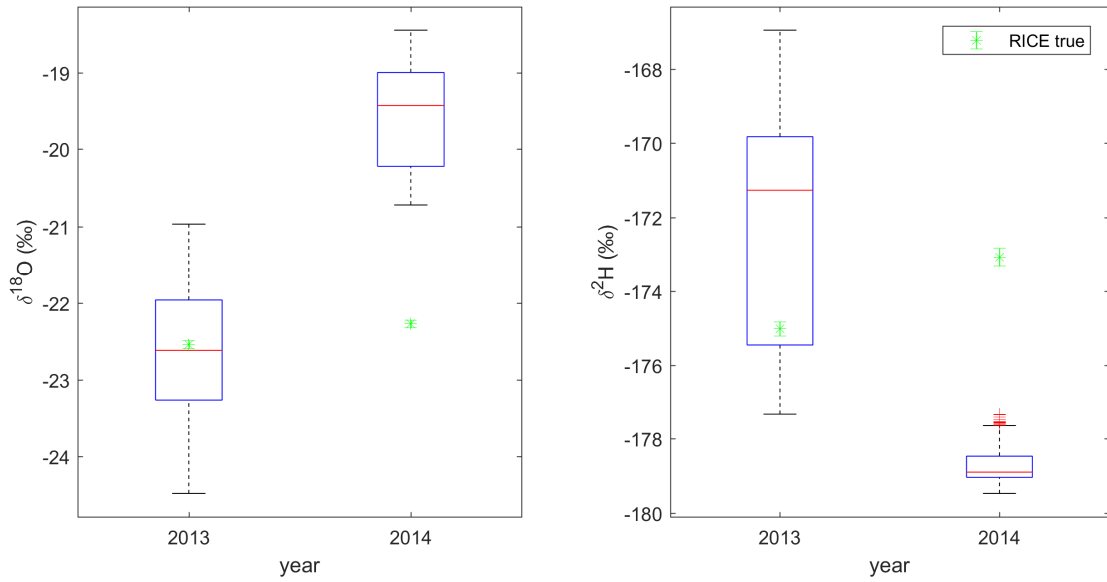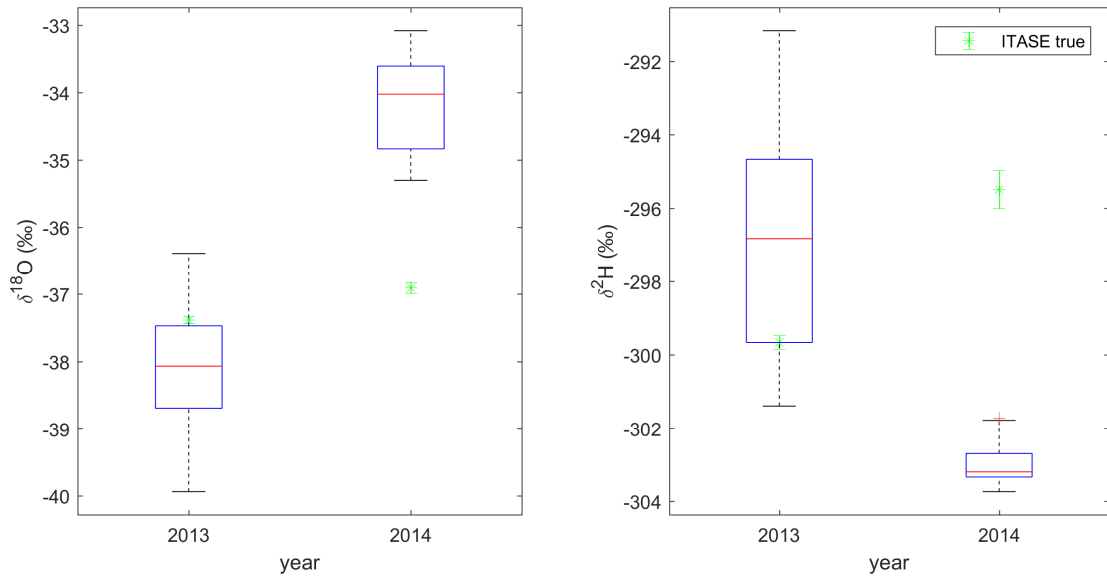**Figures**

Figure S1. Box and Whisker plot showing the spread of WS1 δ^{18}O (left) and δ^2H (right) measurements (after calibration using Eq. 3) used to calculate the calibration error. The median is shown as a red line. The blue boxes indicate the 25th and 75th percentiles. Red crosses indicate outliers. Green star indicates the assigned "true" value of WS1 as determined in each year, shown with error bars, corresponding to the values reported in Table 1.
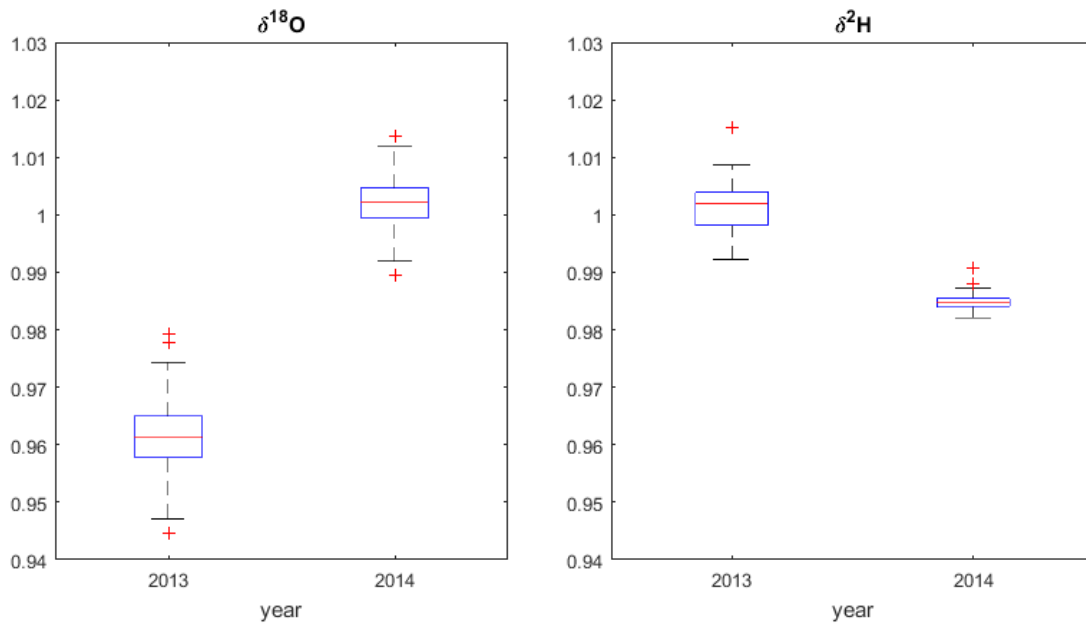
Figure S2. Box and Whisker plot showing the range of calculated slopes (Eq. 2) used to calibrate the δ^{18}O (left) and δ^2H (right) isotope data in Eq. 3. The median is shown as a red line. The blue boxes indicate the 25th and 75th percentiles. Red crosses indicate outliers.

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Figure S3. Box and Whisker plot showing the range of RICE standard δ¹⁸O (left) and δ²H (right) measurements (raw) used to calibrate the isotope data in Eq. 3. The median is shown as a red line. The blue boxes indicate the 25th and 75th percentiles. Red crosses indicate outliers. Green star indicates the assigned "true" value of RICE as determined in each year, shown with error bars, corresponding to the values reported in Table 1. (Note some errors are too small to be visible on the scale of the plot.)

Figure S4. Box and Whisker plot showing the range of ITASE standard δ¹⁸O (left) and δ²H (right) measurements (raw) used to calibrate the isotope data in Eq. 3. The median is shown as a red line. The blue boxes indicate the 25th and 75th percentiles. Red crosses indicate outliers. Green star indicates the assigned "true" value of ITASE as determined in each year, shown with error bars, corresponding to the values reported in Table 1. (Note some errors are too small to be visible on the scale of the plot.)

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Tables

Table S1. Mean and standard deviation (SD) for WS1 after calibration (using Eq. 3), RICE and ITASE (raw measurements) and
5 slope corrections used in Eq. 3 to calibrate the isotope data.

Water Standard	$\delta^{18}O$ (‰)		δ^2H (‰)	
	Mean	SD	Mean	SD
WS1-13 (calibrated)	-10.95	0.096	-74.95	0.491
WS1-14 (calibrated)	-10.89	0.078	-75.02	0.203
RICE-13 (raw)	-22.62	0.798	-172.53	2.907
RICE-14 (raw)	-19.60	0.661	-178.69	0.520
ITASE-13 (raw)	-38.07	0.790	-297.14	2.634
ITASE-14 (raw)	-34.21	0.651	-303.00	0.497
Slope (2013)	0.96	0.006	1.00	0.004
Slope (2014)	1.00	0.004	0.98	0.001