

APPENDIX E. ISOLAB REPORT ON CARBON AND NITROGEN STABLE ISOTOPE ANALYSES

General notes from the original Excel file from IsoLab:

- u Laboratory – IsoLab, Department of Earth and Space Sciences, University of Washington, 206.543.6327, isolab@uw.edu, <http://isolab.ess.washington.edu/>
- u Method – Samples were analyzed on a ThermoFinnigan MAT 253 / Costech EA, for d13C and d15N of solid material. You can read more about our implementation of this method on our website at this link: <http://isolab.ess.washington.edu/isolab/sample-prep-analysis/solid-cn>
- u Analysis
 - u Date of Analysis (MM/DD/YY): 01/03/18
 - u Original Filename: 180103_CN_Vandervort_171103.csv
 - u Reduced Filename: 180103_CN_Vandervort_171103_reduced.txt
 - u Run type: N2CO2
 - u Run comments:
- u Reference materials
 - u All internationally recognized reference material accepted values can be found at the CIAAW (<http://www.ciaaw.org/>).
 - u All IsoLab in-house reference material accepted values can be found at <http://isolab.ess.washington.edu/isolab/reference-materials#solid>.
 - u For this particular analysis, the accepted values are from the MATLAB script shrek_standards.m - 170118.

Table E-1. Reference materials in this run and their accepted values

Reference Material Name	Material	Accepted d15N vs AirN2 (permil)	Accepted % N	Accepted d13C vs VPDB (permil)	Accepted % C
GA2	glutamic acid	-5.7	9.52	-13.7	40.8168
Salmon	Bristol Bay sockeye salmon	11.3	11.8	-21.3	45.7
GA1	glutamic acid	-4.6	9.52	-28.3	40.8168

VPDB – Vienna pee dee belemnite

Table E-2. Run 1 reference material performance summary

Material	Mean d15N (permil)	Standard Deviation d15N (permil)	Mean d13C (permil)	Standard Deviation d13C (permil)	n
Raw GA2	-5.395	0.41769	-13.1503	0.018656	5
Raw salmon	10.252	0.35029	-20.645	0.05514	5
Raw GA1	-4.4059	0.2672	-27.6149	0.018404	5
Corrected GA2	-5.7	0.44934	-13.7	0.018831	-
Corrected salmon	11.3	0.4405	-21.2649	0.055657	-
Corrected GA1	-4.6502	0.31332	-28.3	0.018576	-

Table E-3. Run 1 reference material performance summary: calibration curves

Analyte	Slope	Intercept	Reference Material Used
d15N	1.0359	-0.03568	GA2 and Salmon
d13C	1.0094	-0.0097932	GA1 and GA2
%N	0.00027041	0.015433	Both GA1 and salmon are used and the range in N quantity is not controlled.
%C	0.0025671	-0.0045187	Both GA1 and salmon are used and the range in C quantity is not controlled.

Table E-4. Run 1 reference material performance summary: accuracy and precision

Analyte	Accuracy	Precision	Reference Used
d15N (permil)	-0.050171	0.31332	GA1
d13C (permil)	0.035114	0.055657	salmon
%N	-0.44872	0.79193	GA2
%C	-0.61597	0.32576	GA2

Table E-5. Run 2 reference material performance summary

Material	Mean d15N (permil)	Standard Deviation d15N (permil)	Mean d13C (permil)	Standard Deviation d13C (permil)	n
Raw GA2	-5.7241	0.057296	-13.3047	0.039695	5
Raw Salmon	10.9953	0.095648	-20.62	0.047516	5
Raw GA1	-4.6528	0.055346	-27.6201	0.036667	5
Corrected GA2	-5.7	0.060164	-13.7	0.040484	-

Material	Mean d15N (permil)	Standard Deviation d15N (permil)	Mean d13C (permil)	Standard Deviation d13C (permil)	n
Corrected salmon	11.3	0.11185	-21.1608	0.048461	-
Corrected GA1	-4.6033	0.057821	-28.3	0.037396	-

Table E-6. Run 2 reference material performance summary: calibration curves

Analyte	Slope	Intercept	Reference Material Used
d15N	0.98419	0.016001	GA2 and salmon
d13C	1.0199	-0.020018	GA1 and GA2
% N	0.00046302	0.00092381	A distinct set of GA1s are analyzed at a range of weights.
% C	0.0025475	0.0050605	A distinct set of GA1s are analyzed at a range of weights.

Table E-7. Run 1 reference material performance summary: accuracy and precision

Analyte	Accuracy	Precision	Reference Used
d15N (permil)	-0.003321	0.057821	GA1
d13C (permil)	0.13922	0.048461	salmon
% N	-0.12889	0.46087	GA2
% C	-0.4108	1.795	GA2

Table E-8. Stable isotope data

Sample Tracking Analysis Date	IsoLab Sample No.	Composite ID	Other Vial ID	Identifier2	Analysis No.	Amount (mg)	Cmts.	Nitrogen Data						Carbon Data							
								PeakArea N (Vs)	% N	% N Accuracy	%N Precision	d15N vs Air N2 (permil)	d15N Accuracy	d15N Precision	PeakArea C (Vs)	% C	%C Accuracy	%C Precision	d13C vs VPDB (permil)	d13C Accuracy	d13C Precision
20180103	13	LDW17-R1-GCEM-comp01	L28215-13	Vandervort_171103	91635	0.54	-	159.281	10.8341	-0.44872	0.79193	12.2952	-0.050171	0.31332	90.099	41.9961	-0.61597	0.32576	-17.5092	0.035114	0.055657
20180103	14	LDW17-R1-GCEM-comp02	L28215-14	Vandervort_171103	91644	0.727	-	187.536	9.0983	-0.44872	0.79193	12.2025	-0.050171	0.31332	114.787	39.9115	-0.61597	0.32576	-17.3243	0.035114	0.055657
20180103	15	LDW17-R1-GCEM-comp03	L28215-15	Vandervort_171103	91639	0.756	-	211.862	9.6194	-0.44872	0.79193	13.0482	-0.050171	0.31332	127.885	42.8282	-0.61597	0.32576	-17.0254	0.035114	0.055657
20180103	16	LDW17-R1-GCEM-comp04	L28215-16	Vandervort_171103	91638	0.493	-	136.42	10.6131	-0.44872	0.79193	12.1188	-0.050171	0.31332	78.725	40.0771	-0.61597	0.32576	-17.8254	0.035114	0.055657
20180105	17	LDW17-R1-GCEM-comp05	L28215-17	Vandervort_171103	91735	0.524	-	143.165	12.8266	-0.12889	0.46087	12.39	-0.003321	0.057821	86.58	43.0578	-0.4108	1.795	-17.6059	0.13922	0.048461
20180103	18	LDW17-R1-GCEM-comp06	L28215-18	Vandervort_171103	91645	0.756	-	207.353	9.4581	-0.44872	0.79193	12.2287	-0.050171	0.31332	125.781	42.1137	-0.61597	0.32576	-18.11	0.035114	0.055657
20180103	19	LDW17-R2-GCEM-comp01	L28215-19	Vandervort_171103	91646	0.467	-	123.096	10.4324	-0.44872	0.79193	12.5352	-0.050171	0.31332	76.078	40.8533	-0.61597	0.32576	-20.5097	0.035114	0.055657
20180103	20	LDW17-R2-GCEM-comp02	L28215-20	Vandervort_171103	91648	0.459	-	121.245	10.5052	-0.44872	0.79193	14.0819	-0.050171	0.31332	74.603	40.7404	-0.61597	0.32576	-17.9609	0.035114	0.055657
20180103	21	LDW17-R2-GCEM-comp03	L28215-21	Vandervort_171103	91637	0.572	-	144.86	9.5463	-0.44872	0.79193	12.9168	-0.050171	0.31332	87.246	38.3662	-0.61597	0.32576	-20.5724	0.035114	0.055657
20180103	22	LDW17-R2-GCEM-comp04	L28215-22	Vandervort_171103	91649	0.516	-	132.12	9.9147	-0.44872	0.79193	12.2894	-0.050171	0.31332	81.749	39.7952	-0.61597	0.32576	-20.9511	0.035114	0.055657
20180105	23	LDW17-R2-GCEM-comp05	L28215-23	Vandervort_171103	91734	0.491	-	129.196	12.3714	-0.12889	0.46087	12.3468	-0.003321	0.057821	80.622	42.8605	-0.4108	1.795	-19.9012	0.13922	0.048461
20180103	24	LDW17-R2-GCEM-comp06	L28215-24	Vandervort_171103	91643	0.502	-	137.51	10.4815	-0.44872	0.79193	12.0331	-0.050171	0.31332	83.161	41.6271	-0.61597	0.32576	-20.9525	0.035114	0.055657
20180103	25	LDW17-DCEM-comp01	L28215-25	Vandervort_171103	91636	0.536	-	147.74	10.3327	-0.44872	0.79193	12.5148	-0.050171	0.31332	95.617	44.9523	-0.61597	0.32576	-20.4519	0.035114	0.055657
20180105	26	LDW17-DCEM-comp02	L28215-26	Vandervort_171103	91733	0.522	-	134.355	12.0943	-0.12889	0.46087	12.7191	-0.003321	0.057821	87.129	43.4907	-0.4108	1.795	-20.1781	0.13922	0.048461
20180103	27	LDW17-DCEM-comp03	L28215-27	Vandervort_171103	91647	0.518	-	138.772	10.2236	-0.44872	0.79193	13.1036	-0.050171	0.31332	91.635	44.5409	-0.61597	0.32576	-19.5078	0.035114	0.055657

ID – identification
 VPDB – Vienna pee dee belemnite