NACHO Data Report for bulk δ^{13}C and δ^{15}N

XXX

LABORATORY

UW Facility for Compound-Specific Isotope Analysis of Environmental Samples (known informally a NACHO)
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METHOD

Your solid samples were analyzed for bulk δ^{13}C and δ^{15}N on a ThermoFinnigan Delta V with a Carlo Erba elemental analyzer in continuous flow mode following the general method of Fry et al. 1992. Automated analysis system for coupled d13C and d15N measurements. Analytical Chemistry 64, 288-291.

ANALYSIS

Date of Analysis (MM/DD/YY):
Original Filename(s):
Processed data folder file path:/Users/gordonholtgrieve/RPackages/HEEL/data_test/processed/
Run type: bulk C and N
Run comments:

REFERENCE MATERIALS

All internationally recognized reference material accepted values can be found at the CIAAW. Typically we use IsoLab working standards GA1, GA2, and Bristol Bay Sockeye (salmon) on NACHO. You can find information about these standards on the IsoLab web page. Below are data specific to this run:

Table 1: Lab reference materials used in this run and their accepted values.

group	d13C_VPDB	d15N_air	percent.C	percent.N
GA1	-28.3	-4.6	40.8	9.5
GA2	-13.7	-5.7	40.8	9.5
SALMON	-21.3	11.3	45.7	11.8

Table 2: Mean measured d13C and d15N of working standards both raw and adjusted to international standards.

group	d13C_raw	d15N_raw	d13C_VPDB	d15N_air
GA1	-17.2	-4.2	-28.3	-4.7
GA2	-2.7	-5.2	-13.7	-5.7
SALMON	-10.2	11.8	-21.3	11.3

Table 3: Linear calibration curve coefficents used for this run (y=mx + b).

Value	Intercept	Slope
d13C	-10.9840	1.0056
d15N	-0.4922	0.9998
Percent C	0.0031	0.0014
Percent N	0.0003	0.0020

Table 4: Accuracy and precision of standards for this run.

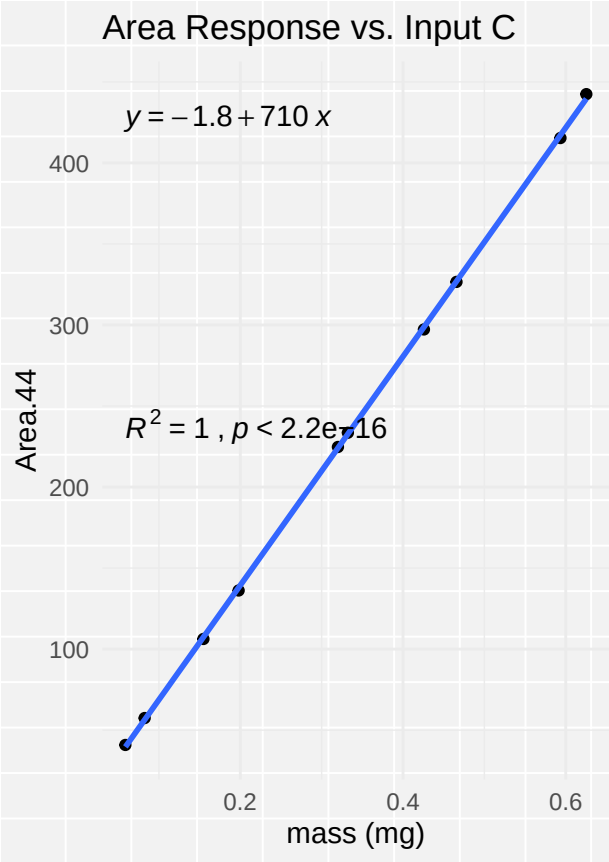
Value	Precision	Accuracy
d13C_VPDB	0.51	0.01
d15N_air	0.04	-0.10
percent.C	0.80	1.05
percent.N	0.13	0.03

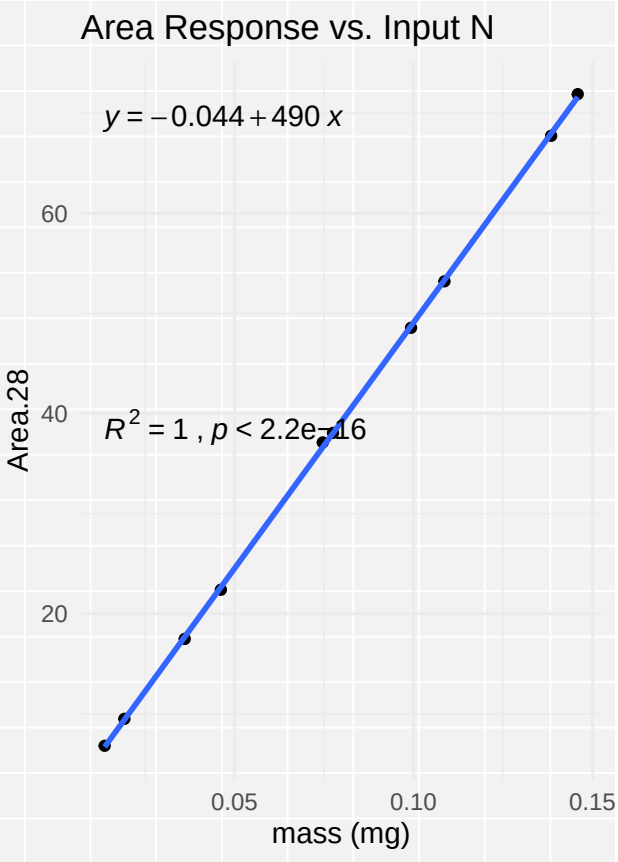
ZEROS & BLANKS

Blanks are empty tins while zeros are no tin or sample. The table below, if given, contains the data for blanks and zero from this run. No table indicates blanks and zeros were not measurable. A blank correction has not been implemented in the script.

MASS EFFECTS

Your data were analysed for effects of sample mass on peak area and isotopic ratios. Ideally, there should be a strong linear response of mass C (or N) in the standard on area 44 (or 28) and no effect of peak area on δ^{13}C or δ^{15}N.


Area Response vs. Input C
y = −1.8 + 710 x
R² = 1 , p < 2.2e−16
Area.44
400
300
200
100
0.2
0.4
0.6
mass (mg)


Area Response vs. Input N
y = −0.044 + 490 x
R² = 1 , p < 2.2e−16
Area.28
60
40
20
0.05
0.10
0.15
mass (mg)

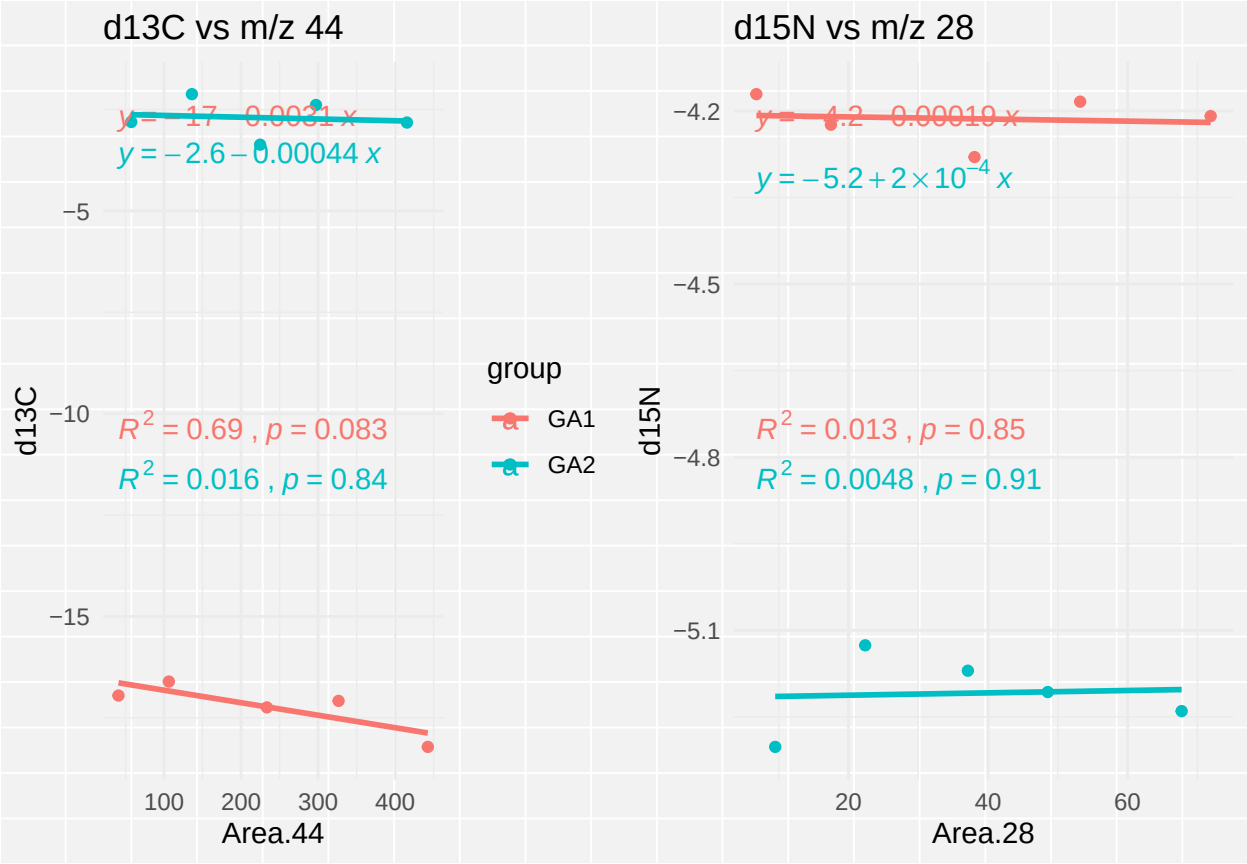


Table 5: Liner model coefficients of mass effects.

Model	Intercept	Slope
d13C.vs.Area44	-9.3434	-0.0027
d15N.vs.Area28	-4.7188	0.0002
MassC.vs.Area44	0.0026	0.0014
MassN.vs.Area28	0.0001	0.0020

SAMPLE MASS CHECK

The following samples are 30% below the target mass:

Analysis	Unique.ID
C	
N	FEC5010_R2_36036

The following samples are 50% below the target mass:

Analysis	Unique.ID
C	
N	30MU_R1_36038

The following samples are 200% above the target mass:

Analysis	Unique.ID
C	HPR1_R3_36005, CPT2_R3_36007, EWC1_R3_36009, SFT3_R1_36014, LMR3_R2_36016, MFB2_R3_36018, CWR1_R3_36020, CPT3_R2_36025, CPT2_R1_36027, MFB1_R2_36029, EMC2_R2_36031, MR1_R2_36040, FCC2_R3_36042
N	MFB1_R2_36029, EMC2_R2_36031

SAMPLE DATA

Below is a short summary of your sample data. A more complete data set has been saved as a .csv file in the 'processed' folder.

Table 9: Sample Data

Identifier.1	d.13C.12C.VPDB	d.15N.14N.air	percent.C	percent.N
WFM4_R2	-26.29	1.74	NA	NA
HPR1_R3	-32.99	1.85	NA	NA
CPT2_R3	-27.10	0.06	NA	NA
EWC1_R3	-27.75	1.32	NA	NA
SFT3_R1	-28.07	1.34	NA	NA
LMR3_R2	-29.40	4.00	NA	NA
MFB2_R3	-28.14	5.38	NA	NA
CWR1_R3	-20.38	2.83	NA	NA
CPT3_R2	-25.76	-0.63	NA	NA
CPT2_R1	-26.89	0.39	NA	NA
MFB1_R2	-31.89	4.16	NA	NA
EMC2_R2	-29.75	-1.61	NA	NA
FEC5010_R2	-30.46	5.36	NA	NA
30MU_R1	-26.72	3.34	NA	NA
MR1_R2	-25.65	4.66	NA	NA
FCC2_R3	-26.03	2.22	NA	NA

DATA REDUCTION DETAILS

```
##
##
## |                       |           |
## |:----------------------|:----------|
## |File rendered on:      |23 Sep 2022 |
## |R version:             |4.2.1      |
## |HEEL package version: |0.3.2      |
```