

Quantifying Degradation of Archaeological Bone In Situ and in Museum Storage: A Comparison Between Environment and Degradation over Forty-Three Years for Bones from the Aasivissuit Site, Western Greenland

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FIG. S1. Examples of bones in five different states of preservation categories, as described in Table 1. Photo: Kasper Lykke Hansen.

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TABLE S1. Bones from *R. tarandus* used for detailed studies.

no.	Excavated	x-coord	y-coord	Layer	Element	Fragmentation	Sym	Age	Pres. stage	Oxford hist. index	General hist index	Cracking index	Birefring index	Organic content w/dw	Density (g dw/cm ³ wvol)
1	2021	130.0	176.0	2	costa affixa	almost complete	sin	adult	5					0.330	1.223
2	2021	130.0	176.0	2	costa	dist part	dex	adult	5					0.274	1.283
3	2021	130.0	176.0	2	costa # 1	complete	sin	adult	5					0.315	1.183
4	2021	130.0	176.0	3	costa	complete	sin	adult	5					0.365	0.892
5	2021	130.0	176.0	3	costa	complete	dex	adult	5	5	5	0	1	0.333	0.976
6	2021	130.0	176.0	3	costa	complete	dex	adult	5					0.357	0.963
7	2021	130.0	176.0	4	costa	mid-piece	dex	adult/subadult	2					0.353	1.122
8	2021	101	200	1	costa	complete	dex	juvenile	3	5	4	0	1	0.311	1.253
9	2021	101	200	2	costa # 2	complete	sin	subadult	4	5	4	0	1	0.398	0.792
10	2021	101	201	2	costa	mid-piece	dex	adult/subadult	4					0.348	1.122
11	2021	101	201	2	costa	prox part	dex	adult	4					0.321	1.222
12	2021	101	200	3	costa affixa	almost complete	dex	adult	5					0.338	0.949
13	2021	101	200	3	costa # 1	almost complete	sin	adult	5	5	4	12	1	0.369	0.974
14	2021	101	200	3	costa fluctuans	prox part	dex	adult	5					0.322	1.610
15	2021	101	201	4	costa	mid-piece	sin	adult/subadult	3					0.338	1.202
16	2021	128.5	170.5	4	costa	mid-piece	dex	adult	4	5	3	34	1	0.393	1.092
636	2021	130.0	176.0	3	tibia	shaft-fragment	dex	adult	5					0.253	1.698
17	1978	129.0	174.5	1	costa vera # 2	complete	dex	subadult	5					0.334	0.980
18	1978	129.0	174.5	1	costa affixa	mid-piece	dex	adult/subadult	4	5	5	0	1	0.319	1.364
19	1978	128.5	174.0	2	costa vera	complete	sin	subadult	5					0.331	1.107
20	1978	128.5	174.0	2	costa vera	dist part	dex	adult	5					0.314	0.769
21	1978	128.5	174.0	2	costa vera	prox part	dex	subadult	4					0.305	1.137
22	1978	128.5	174.0	2	costa vera	prox part	dex	subadult	5	5	5	0	1	0.279	1.464
23	1978	128.5	174.0	2	costa fluctuans	complete	dex	subadult	5					0.341	1.106
24	1978	128.5	174.0	2	costa fluctuans	complete	dex	subadult	5					0.368	0.825
25	1978	128.5	172.5	3	costa vera	complete	sin	adult	5	5	4	0	1	0.453	0.549
26	1978	128.5	172.5	3	costa vera # 3	complete	sin	subadult	4					0.348	0.936
27	1978	128.5	172.5	3	costa vera	prox part	sin	subadult	4					0.309	1.276
28	1978	128.5	172.5	3	costa vera	almost complete	sin	subadult	4	5	4	0	1	0.411	0.845
29	1978	128.5	172.5	3	costa vera	complete	dex	subadult	4					0.405	0.884
30	1978	128.5	172.5	3	costa affixa	complete	dex	adult	5					0.434	0.891
31	1978	128.5	172.0	4	costa vera # 1	complete	sin	adult	5	5	4	0	1	0.367	1.005
32	1978	128.5	172.0	4	costa vera	prox part	dex	subadult	4					0.322	1.431
33	1978	128.5	172.0	4	costa vera # 3	mid-piece	dex	adult/subadult	4					0.391	0.892

w: weight

dw: dry weight

ww: wet weight

wvol: wet volume

d: day

TABLE. S1. Bones from *R.tarandius* used for detailed studies – continued:

no.	Water (saturated) w/dw	Water w/ww	Collagen w/ww	Mineral w/ww	O ₂ cons. –5°C mgO ₂ /g dw/d	O ₂ cons. 1°C mgO ₂ /g dw/d	O ₂ cons. 5°C mgO ₂ /g dw/d	O ₂ cons. 10°C mgO ₂ /g dw/d	O ₂ cons. 15°C mgO ₂ /g dw/d
1	0.380	0.275	0.239	0.486	0.001	0.006	0.021	0.033	0.045
2	0.384	0.277	0.198	0.525	0.002	0.004	0.009	0.016	0.027
3	0.480	0.324	0.213	0.463	0.003	0.006	0.016	0.025	0.045
4	0.651	0.394	0.221	0.385	0.001	0.007	0.021	0.032	0.055
5	0.641	0.390	0.203	0.407	0.002	0.005	0.021	0.039	0.056
6	0.623	0.384	0.220	0.396	0.001	0.007	0.025	0.030	0.055
7	0.501	0.334	0.235	0.431	0.001	0.007	0.034	0.042	0.072
8	0.383	0.275	0.226	0.499	0.001	0.004	0.022	0.028	0.044
9	0.532	0.457	0.216	0.327	0.002	0.033	0.057	0.186	0.369
10	0.429	0.347	0.227	0.425	0.002	0.015	0.039	0.074	0.159
11	0.619	0.294	0.225	0.481	0.001	0.006	0.029	0.036	0.056
12	0.488	0.382	0.209	0.409	0.000	0.009	0.031	0.053	0.075
13	0.359	0.328	0.248	0.424	0.001	0.013	0.045	0.070	0.105
14	0.500	0.264	0.237	0.499	0.002	0.007	0.042	0.044	0.055
15	0.480	0.329	0.226	0.444	0.002	0.015	0.074	0.100	0.126
16	0.221	0.324	0.266	0.410	0.002	0.057	0.048	0.253	0.747
636	0.800	0.181	0.207	0.612	0.000	0.001	0.003	0.006	0.007
17	0.800	0.438	0.188	0.374	0.001	0.012	0.031	0.061	0.083
18	0.390	0.280	0.229	0.491	0.001	0.005	0.022	0.028	0.053
19	0.498	0.332	0.221	0.447	0.001	0.006	0.015	0.029	0.044
20	0.948	0.486	0.161	0.352	0.001	0.006	0.020	0.014	0.033
21	0.482	0.325	0.206	0.469	0.001	0.004	0.013	0.022	0.033
22	0.277	0.217	0.218	0.565	0.000	0.003	0.011	0.014	0.019
23	0.543	0.352	0.221	0.428	0.003	0.011	0.041	0.050	0.079
24	0.676	0.403	0.220	0.377	0.001	0.013	0.025	0.060	0.111
25	1.321	0.569	0.196	0.236	0.003	0.043	0.174	0.202	0.372
26	0.699	0.411	0.205	0.384	0.001	0.009	0.033	0.049	0.080
27	0.385	0.278	0.223	0.499	0.001	0.006	0.024	0.032	0.045
28	0.788	0.440	0.230	0.330	0.002	0.021	0.066	0.087	0.171
29	0.751	0.429	0.231	0.340	0.002	0.016	0.022	0.076	0.130
30	0.784	0.439	0.243	0.317	0.002	0.013	0.028	0.044	0.109
31	0.656	0.395	0.222	0.383	0.002	0.016	0.070	0.062	0.119
32	0.342	0.254	0.240	0.506	0.001	0.005	0.017	0.025	0.039
33	0.800	0.444	0.217	0.338	0.005	0.032	0.102	0.105	0.220

w: weight
dw: dry weight
ww: wet weight
wvol: wet volume
d: day

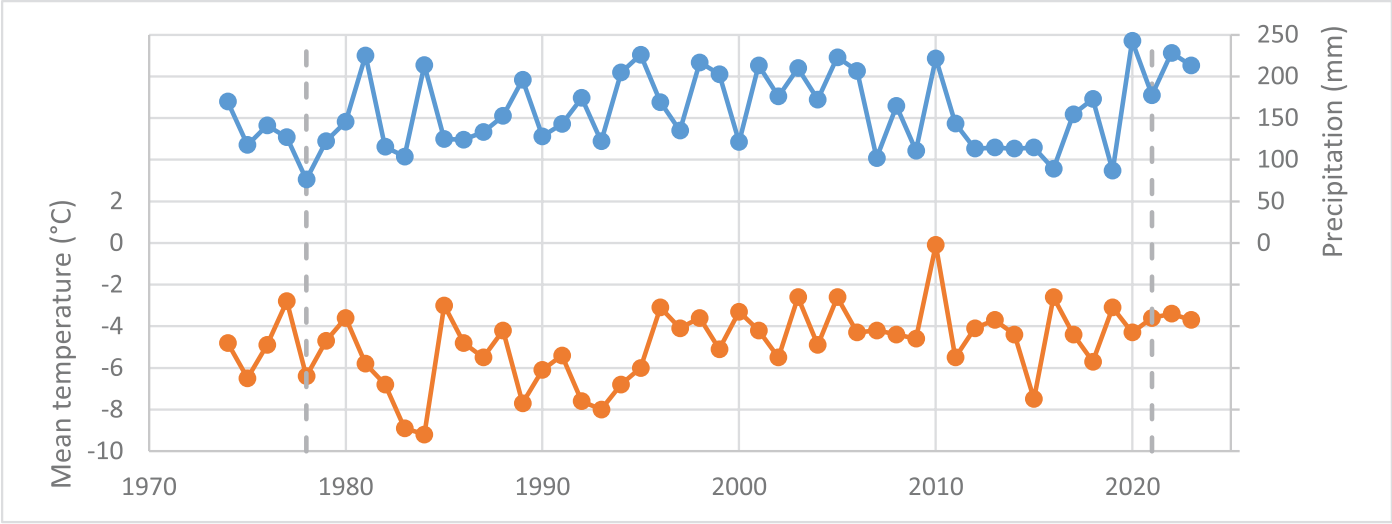


FIG. S2. Yearly precipitation (blue) and mean air temperature (orange) at Kangerlussuaq Airport from 1974 to 2023. Excavations at Aasivissuit are marked by vertical grey lines. Data from the Danish Meteorological Institute (<https://www.dmi.dk/vejrkiv/>).

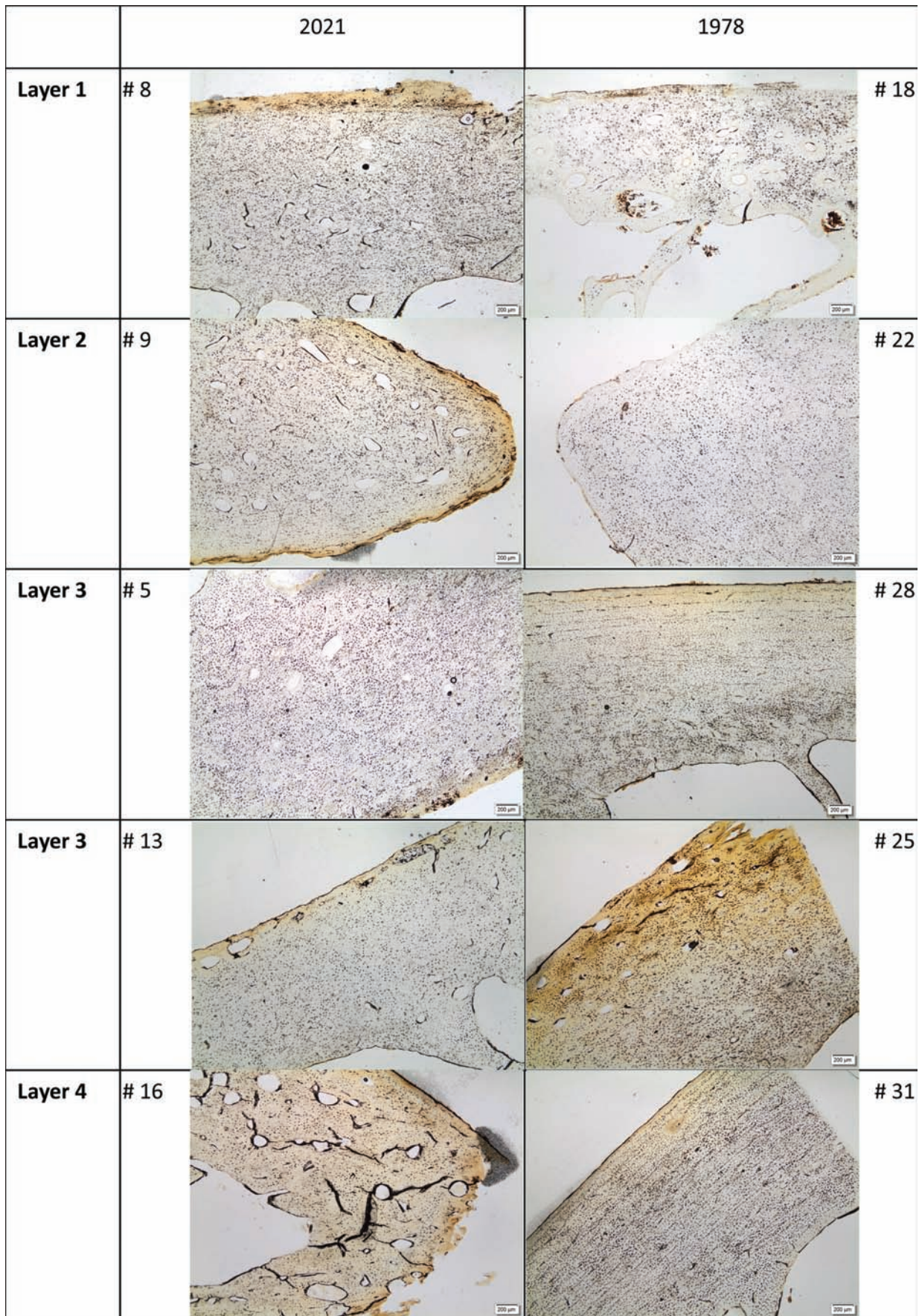


FIG. S3. Optical microscopy of thin sections of 10 bones described in more detail in Table S1.

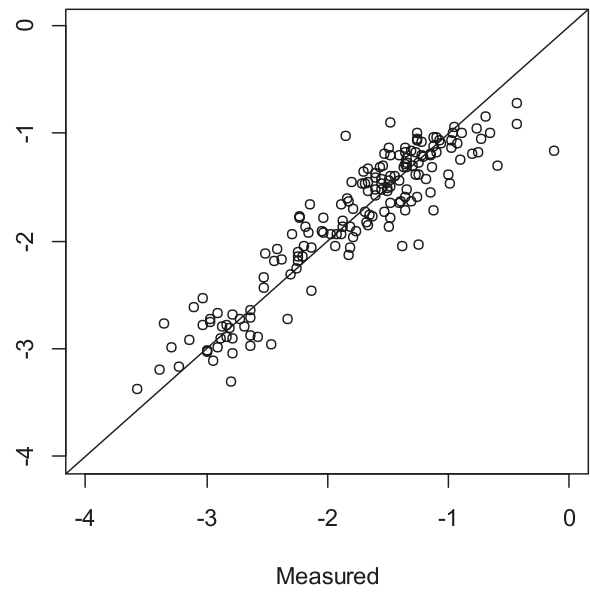


FIG. S4. Best fit of all oxygen consumption measurements, where “predicted” represents oxygen consumption calculated by equation 3.

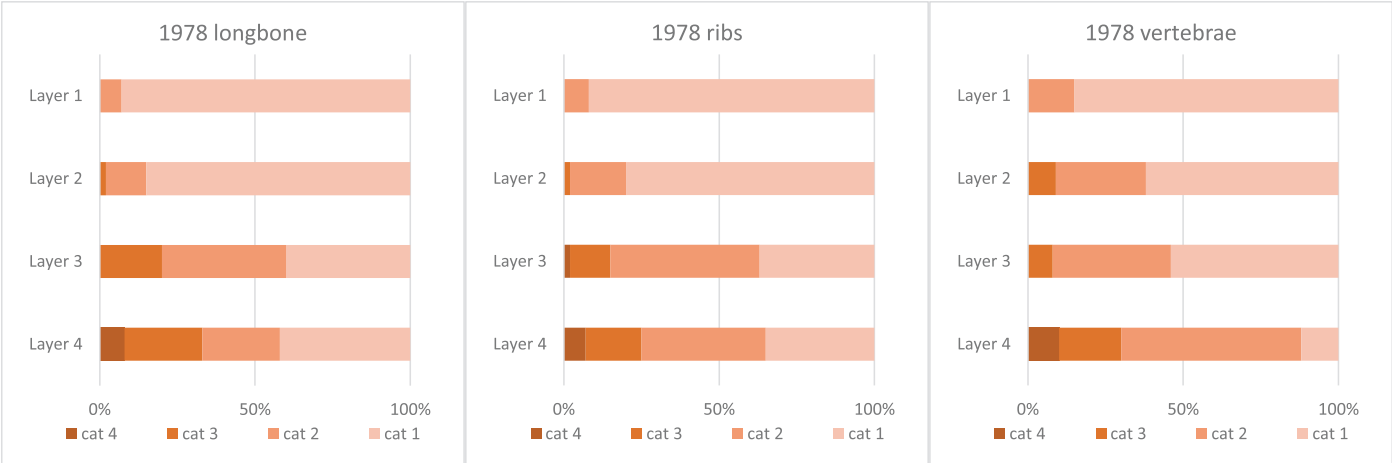


FIG. S5. Preservation category of caribou bone material described during the excavation in 1978, based on 345 caribou bone from layer 1, 2884 from layer 2, 7776 from layer 3, and 356 from layer 4. Data from Grønnow et al. (1983:69 and 79).