Table DR1. Stable isotope ($\delta^{18}O$, $\delta^{13}C$, δD) for lake sediments, tufas, and waters of Dakhleh Oasis, as well as the UTM coordinates for selected outcrops.

WBD=West Balat Duricrust, BBS = Balat Basal Sediment, BCS = Balat Carbonate Sediment, TS = Tineida Sediment, TD = Tineida Duricrust, KCS = Kellis Carbonate Sediment, EKS = East Kellis Sediment, RZ = rhizolith, ET= Escarpment Tufa;

Sample ID	$\delta^{13}C$	$\delta^{18}O$	δD	Stdev ($\delta^{13}C$)	Stdev ($\delta^{18}O$)	Basin	Facies	Easting	Northing
B31-80	-5.4	-9.2		1.48	0.01	Balat	WBD	717002	2824127
B31-130	-8.6	-10.1		0.08	0.05	Balat	WBD	717002	2824127
B31-180	-3.1	-8.4		0.05	0.22	Balat	WBD	717002	2824127
B31-30	-3.5	-8.2		0.13	0.18	Balat	WBD	717002	2824127
B31-CAP	-6.3	-9.4		0.08	0.21	Balat	WBD	717002	2824127
B32-150	-4.3	-8.8		0.08	0.02	Balat	WBD	716730	2824146
B32-CAP[◊]	-6.1	-7.7		0.03	0.10	Balat	WBD	716730	2824146
B33-70	-2.7	-9.5		0.00	0.04	Balat	WBD	716730	2821051
B35-100	-0.9	-7.1		0.85	0.37	Balat	WBD	716224	2817449
B34-127[◊]	1.9	-10.5		0.03	0.05	Balat	WBD	715504	2821012
B35-140	-1.7	-7.7		0.03	0.09	Balat	WBD	716224	2817449
B36-155	-3.9	-10.1				Balat	WBD	716691	2821051
B36-205	-2.3	-8.8		0.24	0.04	Balat	WBD	716691	2821051
B36-127	-4.3	-9.6		1.74	0.92	Balat	WBD	716691	2821051
B36-205	-3.9	-9.3		0.92	0.58	Balat	WBD	716691	2821051
B37-150	-4.3	-9.1		0.06	0.27	Balat	WBD	716516	2818500
B37-250	-4.3	-9.8		0.10	0.04	Balat	WBD	716516	2818500
B37-270	-2.3	-8.2		0.06	0.62	Balat	WBD	716516	2818500
B37-302	-3.2	-7.8		0.10	0.02	Balat	WBD	716516	2818500
B1-100	-2.2	-8.4		0.05	0.12	Balat	WBD	715504	2821012
B1-150	-3.8	-9.5		1.09	0.16	Balat	WBD	715504	2821012
B1-50	-3.4	-9.2		0.21	0.11	Balat	WBD	715504	2821012
B20-121	-6.0	-9.0		0.09	0.06	Balat	BCS	719533	2823543
B20-197	-6.6	-9.1		0.01	0.02	Balat	BCS	719533	2823543
B20-76	-5.0	-8.5		0.02	0.06	Balat	BCS	719533	2823543
B35-50	-2.9	-7.7		0.79	0.00	Balat	BBS	716224	2817449
B4-143	-3.5	-7.6		0.16	0.17	Balat	BBS	719456	2821323
B4-203	-2.3	-7.5		0.27	0.28	Balat	BBS	719456	2821323
B4-260	-6.1	-7.9		0.01	0.03	Balat	BCS	719456	2821323
B4-390	-6.6	-7.4		0.11	0.17	Balat	BCS	719456	2821323
B4-445	-6.2	-6.4		0.04	0.28	Balat	BCS	719456	2821323
B4-73	-3.5	-8.5		0.38	0.10	Balat	BCS	719456	2821323
B28-198	-5.6	-9.8		0.10	0.06	Balat	BBS	720312	2822492
B28-50	-5.5	-9.5		0.29	0.39	Balat	BCS	720312	2822492
B28-95	-6.8	-9.9		0.14	0.02	Balat	BCS	720312	2822492
B28-145	-6.5	-9.9		0.35	0.27	Balat	BCS	720312	2822492
B15-146	-6.3	-8.3		0.06	0.04	Balat	BCS	719261	2818831

Sample ID	$\delta^{13}C$	$\delta^{18}O$	δD	Stdev ($\delta^{13}C$)	Stdev ($\delta^{18}O$)	Basin	Facies	Easting	Northing
B15-246	-6.7	-8.7		0.11	0.15	Balat	BCS	719261	2818831
B15-66	-2.6	-9.8		0.14	0.21	Balat	BBS	719261	2818831
B15-96	-4.2	-8.1		0.02	0.03	Balat	BBS	719261	2818831
TB9-150	-8.4	-8.8		0.13	0.07	Tineida	TS	736004	2818091
TB9-150	-8.1	-8.6		0.03	0.11	Tineida	TS	736004	2818091
TB9-200	-6.1	-9.1		0.34	0.30	Tineida	TS	736004	2818091
TB9-200	-5.2	-8.7		0.14	0.09	Tineida	TS	736004	2818091
TB9-250	-6.0	-8.9		0.39	0.05	Tineida	TD	736004	2818091
TB9-250	-6.2	-8.8		0.18	0.22	Tineida	TD	736004	2818091
TB9-300	-6.5	-8.8		0.13	0.30	Tineida	TD	736004	2818091
TB9-300	-6.4	-8.7		0.24	0.20	Tineida	TD	736004	2818091
TB10-100	-3.9	-8.1		0.02	0.08	Tineida	TS	737313	2816359
TB10-180	-3.7	-6.9		0.20	0.17	Tineida	TS	737313	2816359
TB10-200	-7.7	-10.0		1.07	0.06	Tineida	TS	737313	2816359
TB10-250	-9.0	-10.0		0.00	0.21	Tineida	TS	737313	2816359
TB10-348	-10.5	-9.2		0.03	0.10	Tineida	TS	737313	2816359
TB10-350	-9.5	-9.4		0.06	0.11	Tineida	TS	737313	2816359
TB10-380	-9.7	-9.3		0.63	0.01	Tineida	TS	737313	2816359
TB10-590	-5.4	-10.0		0.01	0.07	Tineida	TD	737313	2816359
TB10-80	-4.8	-8.7		0.31	0.80	Tineida	TS	737313	2816359
TB3-435	-2.8	-8.5		1.17	0.08	Tineida	TS	734388	2818423
TB3-485	-5.1	-7.8		0.07	0.02	Tineida	TS	734388	2818423
TB5-300	-4.7	-8.9		0.07	0.15	Tineida	TD	737250	2817157
TB5-350	-4.2	-9.1		0.04	0.02	Tineida	TD	737250	2817157
TB3-185	-5.8	-8.8		0.15	0.12	Tineida	TS	734388	2818423
TB3-235	-7.8	-9.4		0.10	0.06	Tineida	TS	734388	2818423
TB3-285	-7.3	-10.1		0.80	0.04	Tineida	TS	734388	2818423
TB3-335	-6.2	-9.6		2.01	0.77	Tineida	TS	734388	2818423
TB3-535	-4.7	-7.9		0.29	0.06	Tineida	TS	734388	2818423
TB3-694	-2.3	-7.5		8.01	3.06	Tineida	TS	734388	2818423
TB3-85	-5.2	-9.9		0.39	0.36	Tineida	TS	734388	2818423
D11-115	-3.4	-9.3		0.06	0.22	Kellis	KCS	707329	2819428
D11-215	-2.8	-9.0				Kellis	KCS	707329	2819428
D11-265	-0.8	-9.7		0.04	0.08	Kellis	KCS	707329	2819428
D11-315	-0.3	-9.8		0.02	0.05	Kellis	KCS	707329	2819428
D11-387	-4.1	-8.0		0.01	0.04	Kellis	KCS	707329	2819428
D11-407	-6.9	-8.3		0.37	0.13	Kellis	KCS	707329	2819428
D11-427	-7.2	-8.5		0.05	0.08	Kellis	KCS	707329	2819428
D11-467	-6.8	-9.0		0.06	0.22	Kellis	KCS	707329	2819428
D11-477	-5.9	-8.2		0.35	0.22	Kellis	KCS	707329	2819428
D11-482	-8.1	-8.0		0.03	0.23	Kellis	KCS	707329	2819428
D11-495†	-8.2	-8.5		0.17	0.27	Kellis	KCS	707329	2819428
D11-504†	-7.5	-8.0		0.18	0.04	Kellis	KCS	707329	2819428
D11-509†	-8.5	-8.1		0.02	0.04	Kellis	KCS	707329	2819428
D11-519†	-9.1	-8.5		0.00	0.08	Kellis	KCS	707329	2819428
D11-524†	-8.3	-8.0		0.50	0.01	Kellis	KCS	707329	2819428
D11-574†	-9.1	-8.7		0.59	0.09	Kellis	KCS	707329	2819428
D11-589†	-7.1	-8.3		0.01	0.07	Kellis	KCS	707329	2819428

Sample ID	$\delta^{13}C$	$\delta^{18}O$	δD	Stdev ($\delta^{13}C$)	Stdev ($\delta^{18}O$)	Basin	Facies	Easting	Northing
D11-594†	-6.9	-8.3		0.17	0.14	Kellis	KCS	707329	2819428
D11-604†	-7.9	-8.1		0.03	0.03	Kellis	KCS	707329	2819428
D11-614	-7.5	-8.3		0.00	0.12	Kellis	KCS	707329	2819428
D11-634	-7.7	-8.6		0.18	0.32	Kellis	KCS	707329	2819428
D11-644	-8.9	-7.9		0.05	0.07	Kellis	KCS	707329	2819428
D11-654	-8.3	-8.0		0.19	0.06	Kellis	KCS	707329	2819428
D11-664‡	-9.3	-9.0		0.03	0.19	Kellis	KCS	707329	2819428
D17-RTH	-6.8	-9.6		0.18	0.23	Kellis	RZ	708084	2819288
D18-238	-4.8	-10.1		0.57	0.00	Kellis	EKS	712135	2818910
D18-288	-3.9	-9.9		0.21	0.16	Kellis	EKS	712135	2818910
D18-338	-4.2	-9.7		0.00	0.01	Kellis	EKS	712135	2818910
D18-T	-4.1	-9.3		0.07	0.03	Kellis	EKS	712135	2818910
D2B	-6.1	-9.6		0.29	0.24	Kellis	KCS	705250	2819546
D2-10	-3.2	-9.5		0.83	0.08	Kellis	KCS	705250	2819546
D2-60	-2.8	-8.3		1.03	0.45	Kellis	KCS	705250	2819546
D2-110	-3.7	-9.2		0.03	0.42	Kellis	KCS	705250	2819546
D2-160	-3.9	-8.4		0.17	0.11	Kellis	KCS	705250	2819546
D2-210	-5.1	-9.7		0.35	0.03	Kellis	KCS	705250	2819546
D2-260	-2.9	-8.6		0.36	0.37	Kellis	KCS	705250	2819546
D2-300	-2.6	-10.9		0.05	0.06	Kellis	KCS	705250	2819546
Y2K DOP1*	-3.6	-11.3					ET		
Y2K DOP2*	-1.2	-9.1					ET		
JS DOPT2*	-1.5	-10.5					ET		
JS DOPT3*	-0.8	-11.4					ET		
JS DOPT4*	-9.5	-11.0					ET		
JS Y2K6*	-2.2	-9.5					ET		
Bulaq		-11.2	-84.4			Nubian aquifer water			
Qasr		-11.6	-85.6			Nubian aquifer water			
Mut3		-11.6	-85.2			Nubian aquifer water			
Bashendi		-11.5	-85.6			Nubian aquifer water			
Sheikh Wali		-11.5	-85.3			Nubian aquifer water			

◊ Outlier removed from least squares regression for WBD in Figure 11
† Disturbed Sediment associated with Dakhleh Glass
‡Highly indurated cap at D11

*Data published in:

Smith, J. R., 2001, Geoarchaeology, stable isotope geochemistry, and geochronology of fossil spring tufas, Western Desert, Egypt [PhD thesis]: University of Pennsylvania, 180 p.

Table DR2. Sensitivity of the water balance for the Dakhleh paleolake to changes in input parameters. Precipitation and evaporation are rounded to the nearest 10 mm/yr. Italicized values indicate parameters, which are being varied in sensitivity tests. Underlined values correspond to tests of groundwater five and ten times the discharge in Dakhleh Oasis predicted by Heinl and Brinkmann (1989). A_l = area of lake, A_b = area of drainage basin, T= temperature, G = groundwater inflow, C= fraction of cloud cover, I = top of atmosphere insolation, P= precipitation, E=evaporation

A_l(km^2)	A_b (km^2)	T(°K)	G (m^3/yr)	C	I (W/m^2)	P (mm/yr)	E(mm/yr)
735	8645	301	1.93E+08	*0.55*	367.15	680	1350
1735	20145	301	1.93E+08	*0.55*	367.15	530	1350
1735	8645	301	1.93E+08	*0.5*	367.15	720	1430
1735	20145	301	1.93E+08	0.5	367.15	560	1430
1735	8645	301	1.93E+08	*0.45*	367.15	750	1510
1735	20145	301	1.93E+08	*0.45*	367.15	590	1510
1735	8645	301	1.93E+08	*0.4*	367.15	810	1590
1735	20145	301	1.93E+08	*0.4*	367.15	640	1590
1735	8645	301	1.93E+08	*0.35*	367.15	860	1680
1735	20145	301	1.93E+08	*0.35*	367.15	670	1680
1735	8645	301	1.93E+08	0.5	*362.15*	720	1400
1735	20145	301	1.93E+08	0.5	*362.15*	550	1400
1735	8645	301	1.93E+08	0.5	*357.15*	720	1380
1735	20145	301	1.93E+08	0.5	*357.15*	510	1380
1735	8645	301	1.93E+08	0.5	*352.15*	650	1350
1735	20145	301	1.93E+08	0.5	*352.15*	500	1350
1735	8645	301	1.93E+08	0.5	*347.15*	630	1330
1735	20145	301	1.93E+08	0.5	*347.15*	480	1330
1735	8645	301	1.93E+08	0.5	*342.15*	620	1300
1735	20145	301	1.93E+08	0.5	*342.15*	470	1300
1735	8645	*297*	1.93E+08	0.5	367.15	680	1330
1735	20145	*297*	1.93E+08	0.5	367.15	530	1330
1735	8645	*293*	1.93E+08	0.5	367.15	630	1260
1735	20145	293	1.93E+08	0.5	367.15	490	1260
1735	8645	301	*1.17E+08*	0.5	367.15	740	1430
1735	20145	301	*1.17E+08*	0.5	367.15	570	1430
1735	8645	301	*1.21E+08*	0.5	367.15	730	1430
1735	20145	301	*1.21E+08*	0.5	367.15	570	1430

A_l(km^2)	A_b (km^2)	T(°K)	G (m^3/yr)	C	I (W/m^2)	P (mm/yr)	E(mm/yr)
1735	8645	301	*1.53E+08*	0.5	367.15	730	1430
1735	20145	301	*1.53E+08*	0.5	367.15	570	1430
1735	8645	301	*2.47E+08*	0.5	367.15	710	1430
1735	20145	301	*2.47E+08*	0.5	367.15	570	1430
1735	8645	301	*5.85E+08*	0.5	367.15	650	1430
1735	20145	301	*5.85E+08*	0.5	367.15	520	1430
1735	8645	301	*1.17E+09*	0.5	367.15	520	1430
1735	20145	301	*1.17E+09*	0.5	367.15	440	1430
633	8645	301	1.93E+08	0.5	367.15	500	1430
633	20145	301	1.93E+08	0.5	367.15	410	1430
899	8645	301	1.93E+08	0.5	367.15	570	1430
899	20145	301	1.93E+08	0.5	367.15	430	1430
1231	8645	301	1.93E+08	0.5	367.15	640	1430
1231	20145	301	1.93E+08	0.5	367.15	510	1430
1806	8645	301	1.93E+08	0.5	367.15	730	1430
1806	20145	301	1.93E+08	0.5	367.15	570	1430
1968	8645	301	1.93E+08	0.5	367.15	760	1430
1968	20145	301	1.93E+08	0.5	367.15	590	1430