

# Microhabitats: macro-differences. A survey of temperature records in Victoria Land terrestrial and freshwater environments

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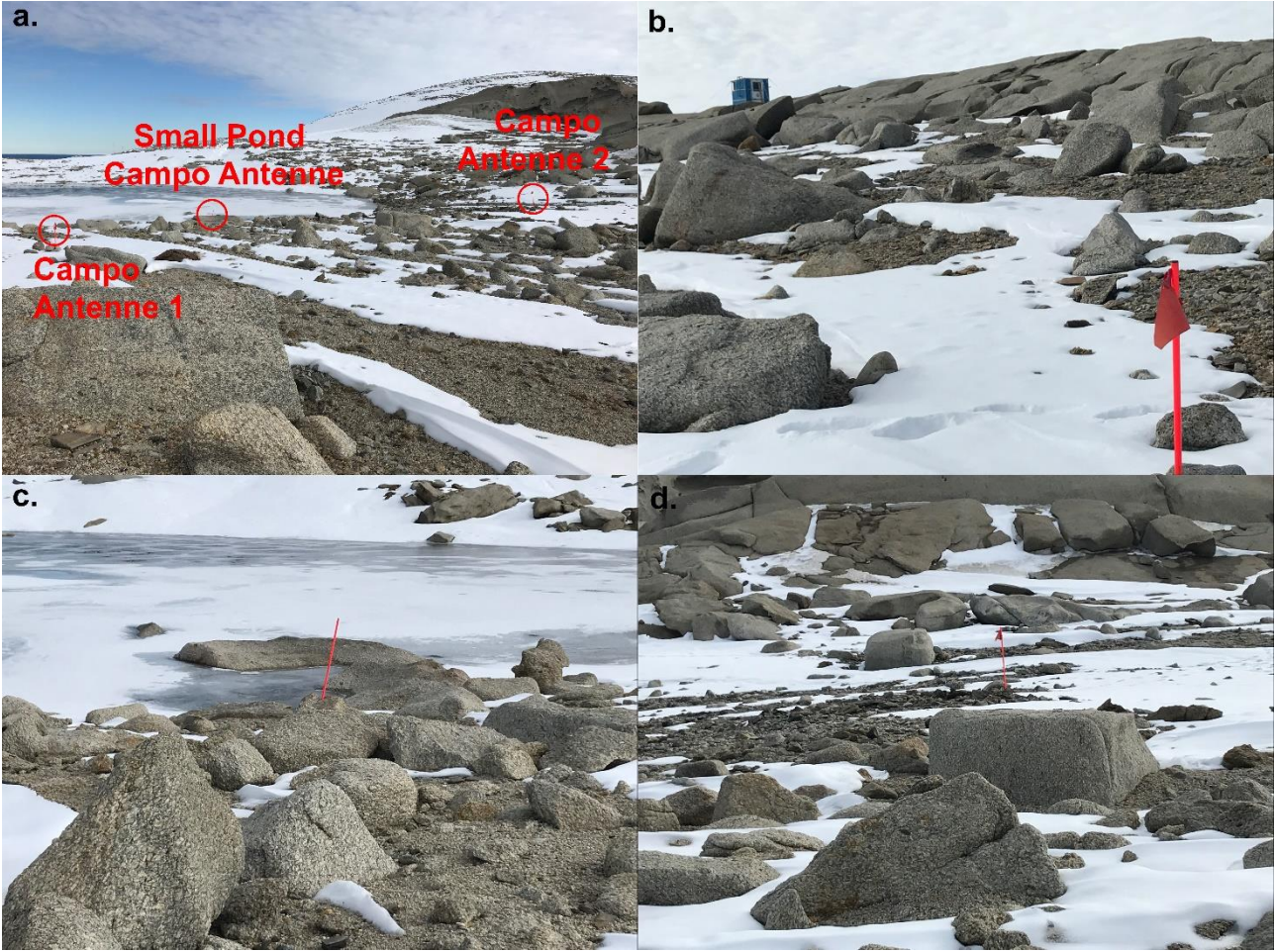
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**Supplementary Material**

**Figure S1.** Detail of sampling sites in Campo Antenne. a) Overall dataloggers distribution in Campo Antenne. b) Campo Antenne 1 (under rocks). c) Small Pond Campo Antenne. d) Campo Antenne 2 (under rocks).



**Figure S2.** Detail of Oasi small pond site.



**Figure S3.** Temperatures registered in July 2019 at the 5 sites, detail of hourly measurements (upper panel). Distribution of daily minima/means/maxima at the 5 sites (lower panel) Eneide: MZS (Eneide); spCA: Small pond Campo Antenne; spO: Small pond Oasi; sCA1: Campo Antenne 1; sCA2: Campo Antenne 2.

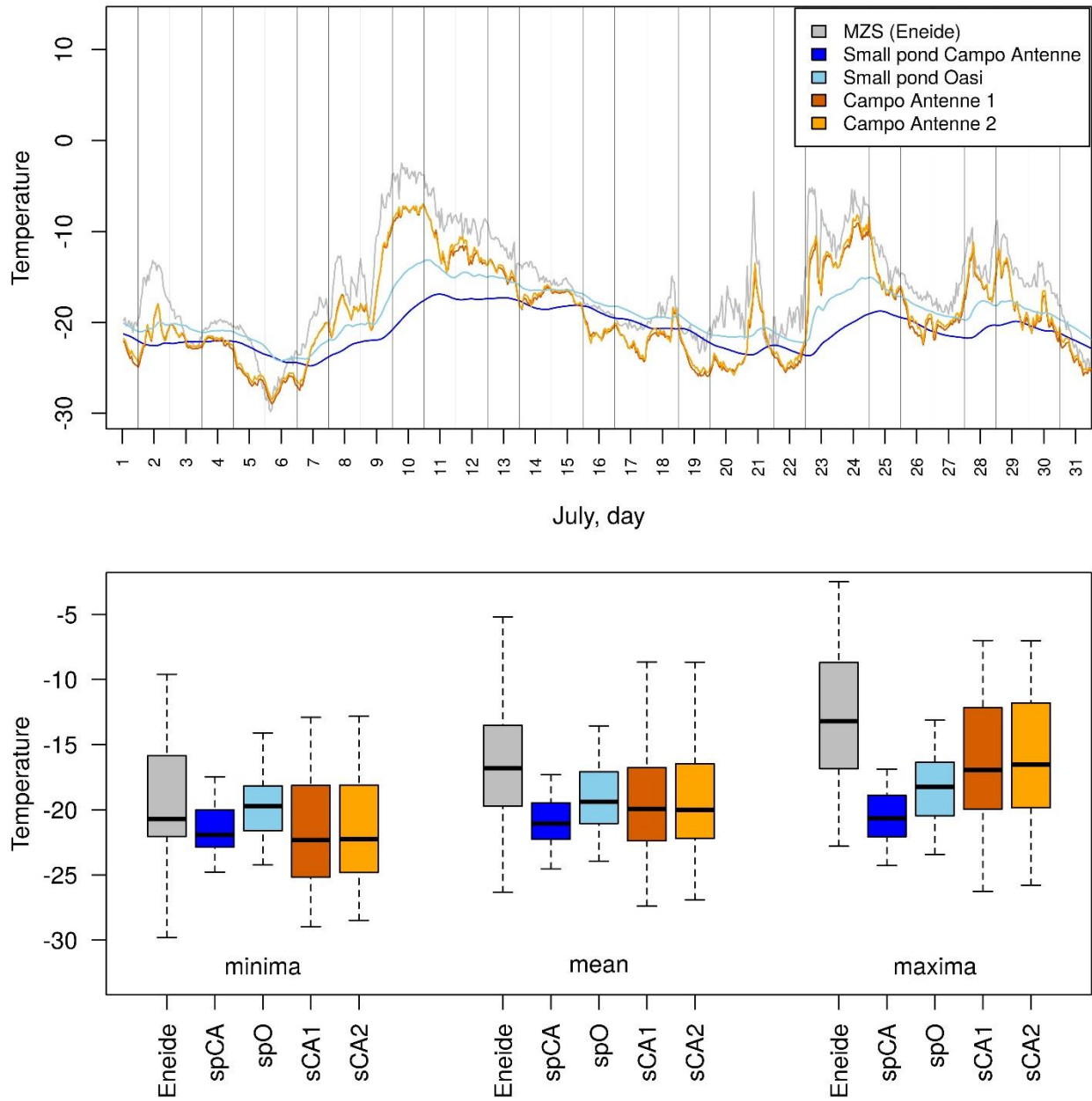


Table S1. Statistical analysis of temperatures registered in Victoria Land's microhabitats

Table Analyzed	January				
Two-way RM ANOVA	Matching: Stacked				
Alpha	0,05				
Source of Variation	% of total variation	P value	P value summary	Significant?	
Interaction	8,477	< 0,0001	****	Yes	
Day	36,55	< 0,0001	****	Yes	
Site	46,96	0,0295	*	Yes	
Subjects (matching)	2,897	< 0,0001	****	Yes	
ANOVA table	SS	DF	MS	F (DFn, DFd)	P value
Interaction	68,91	30		2,297 F (30, 60) = 3,316	P < 0,0001
Day	297,2	30		9,905 F (30, 60) = 14,30	P < 0,0001
Site	381,7	1		381,7 F (1, 2) = 32,41	P = 0,0295
Subjects (matching)	23,55	2		11,78 F (2, 60) = 17,00	P < 0,0001
Residual	41,57	60		0,6928	
Number of missing values	0				
Table Analyzed	February				
Two-way RM ANOVA	Matching: Stacked				
Alpha	0,05				
Source of Variation	% of total variation	P value	P value summary	Significant?	
Interaction	3,723	< 0,0001	****	Yes	

Day	12,45 < 0,0001	****	Yes
Site	79,64	0,0187 *	Yes
Subjects (matching)	3,062 < 0,0001	****	Yes

ANOVA table	SS	DF	MS	F (DFn, DFd)	P value
Interaction		43,19	27	1,6 F (27, 54) = 6,618	P < 0,0001
Day		144,5	27	5,351 F (27, 54) = 22,14	P < 0,0001
Site		924	1	924 F (1, 2) = 52,02	P = 0,0187
Subjects (matching)		35,52	2	17,76 F (2, 54) = 73,48	P < 0,0001
Residual		13,05	54	0,2417	

Number of missing values 0

Table Analyzed March

Two-way RM ANOVA  
Alpha Matching: Stacked  
0,05

Source of Variation	% of total variation	P value	P value summary	Significant?
Interaction	6,838	< 0,0001	****	Yes
Day	53,92	< 0,0001	****	Yes
Site	31,02	0,0853	ns	No
Subjects (matching)	6,059	< 0,0001	****	Yes

ANOVA table	SS	DF	MS	F (DFn, DFd)	P value
Interaction		188,5	30	6,283 F (30, 60) = 6,327	P < 0,0001
Day		1486	30	49,54 F (30, 60) = 49,89	P < 0,0001
Site		855,1	1	855,1 F (1, 2) = 10,24	P = 0,0853
Subjects (matching)		167	2	83,51 F (2, 60) = 84,09	P < 0,0001

Residual	59,59	60	0,9931
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Number of missing values	0
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Table Analyzed	April
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Two-way RM ANOVA	Matching: Stacked
Alpha	0,05

Source of Variation	% of total variation	P value	P value summary	Significant?
Interaction	23,3	< 0,0001	****	Yes
Day	66,56	< 0,0001	****	Yes
Site	7,98	0,0268	*	Yes
Subjects (matching)	0,4452	0,0012	**	Yes

ANOVA table	SS	DF	MS	F (DFn, DFd)	P value
Interaction	430,4	29	14,84	F (29, 58) = 27,22	P < 0,0001
Day	1230	29	42,4	F (29, 58) = 77,77	P < 0,0001
Site	147,4	1	147,4	F (1, 2) = 35,85	P = 0,0268
Subjects (matching)	8,225	2	4,112	F (2, 58) = 7,542	P = 0,0012
Residual	31,62	58	0,5452		

Number of missing values	0
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Table Analyzed	May
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Two-way RM ANOVA	Matching: Stacked
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Alpha 0,05

Source of Variation	% of total variation	P value	P value summary	Significant?
Interaction	18,79	< 0,0001	****	Yes
Day	76,48	< 0,0001	****	Yes
Site	1,621	0,3629	ns	No
Subjects (matching)	2,372	< 0,0001	****	Yes

ANOVA table	SS	DF	MS	F (DFn, DFd)	P value
Interaction	199,9	30		6,665 F (30, 60) = 50,73	P < 0,0001
Day	813,7	30		27,12 F (30, 60) = 206,5	P < 0,0001
Site	17,25	1		17,25 F (1, 2) = 1,367	P = 0,3629
Subjects (matching)	25,24	2		12,62 F (2, 60) = 96,07	P < 0,0001
Residual	7,882	60		0,1314	

Number of missing values 0

Table Analyzed June

Two-way RM ANOVA  
Alpha Matching: Stacked  
0,05

Source of Variation	% of total variation	P value	P value summary	Significant?
Interaction	15,77	< 0,0001	****	Yes
Day	80,68	< 0,0001	****	Yes
Site	1,309	0,3171	ns	No
Subjects (matching)	1,498	< 0,0001	****	Yes

ANOVA table	SS	DF	MS	F (DFn, DFd)	P value
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Interaction	314,4	29	10,84	F (29, 58) = 42,60	P < 0,0001
Day	1609	29	55,47	F (29, 58) = 218,0	P < 0,0001
Site	26,1	1	26,1	F (1, 2) = 1,748	P = 0,3171
Subjects (matching)	29,87	2	14,93	F (2, 58) = 58,68	P < 0,0001
Residual	14,76	58	0,2545		

Number of missing values 0

Table Analyzed July

Two-way RM ANOVA Matching: Stacked  
Alpha 0,05

Source of Variation	% of total variation	P value	P value summary	Significant?
Interaction	17,53	< 0,0001	****	Yes
Day	77,14	< 0,0001	****	Yes
Site	1,183	0,4887	ns	No
Subjects (matching)	3,342	< 0,0001	****	Yes

ANOVA table	SS	DF	MS	F (DFn, DFd)	P value
Interaction	313	30	10,43	F (30, 60) = 43,51	P < 0,0001
Day	1377	30	45,91	F (30, 60) = 191,5	P < 0,0001
Site	21,13	1	21,13	F (1, 2) = 0,7080	P = 0,4887
Subjects (matching)	59,67	2	29,84	F (2, 60) = 124,4	P < 0,0001
Residual	14,39	60	0,2398		

Number of missing values 0

Table Analyzed August

Two-way RM ANOVA  
Alpha Matching: Stacked  
0,05

Source of Variation	% of total variation	P value	P value summary	Significant?
Interaction	14,56	< 0,0001	****	Yes
Day	81,92	< 0,0001	****	Yes
Site	0,03633	0,8773	ns	No
Subjects (matching)	2,378	< 0,0001	****	Yes

ANOVA table	SS	DF	MS	F (DFn, DFd)	P value
Interaction	290,9	30		9,698 F (30, 60) = 26,30	P < 0,0001
Day	1637	30		54,56 F (30, 60) = 148,0	P < 0,0001
Site	0,7259	1		0,7259 F (1, 2) = 0,03055	P = 0,8773
Subjects (matching)	47,52	2		23,76 F (2, 60) = 64,43	P < 0,0001
Residual	22,12	60		0,3687	

Number of missing values 0

Table Analyzed September

Two-way RM ANOVA  
Alpha Matching: Stacked  
0,05

Source of Variation	% of total variation	P value	P value summary	Significant?
Interaction	12,42	< 0,0001	****	Yes
Day	81,51	< 0,0001	****	Yes

Site	0,144	0,8299	ns	No
Subjects (matching)	4,833	< 0,0001	****	Yes

ANOVA table	SS	DF	MS	F (DFn, DFd)	P value
Interaction		115,7	29	3,99 F (29, 58) = 22,73	P < 0,0001
Day		759,4	29	26,19 F (29, 58) = 149,2	P < 0,0001
Site		1,342	1	1,342 F (1, 2) = 0,05959	P = 0,8299
Subjects (matching)		45,03	2	22,51 F (2, 58) = 128,2	P < 0,0001
Residual		10,18	58	0,1756	

Number of missing values 0

Table Analyzed October

Two-way RM ANOVA Matching: Stacked  
Alpha 0,05

Source of Variation	% of total variation	P value	P value summary	Significant?
Interaction	5,322	< 0,0001	****	Yes
Day	93,43	< 0,0001	****	Yes
Site	0,01463	0,6818	ns	No
Subjects (matching)	0,1299	0,0356	*	Yes

ANOVA table	SS	DF	MS	F (DFn, DFd)	P value
Interaction		82,42	30	2,747 F (30, 60) = 9,638	P < 0,0001
Day		1447	30	48,23 F (30, 60) = 169,2	P < 0,0001
Site		0,2266	1	0,2266 F (1, 2) = 0,2254	P = 0,6818
Subjects (matching)		2,011	2	1,005 F (2, 60) = 3,527	P = 0,0356
Residual		17,1	60	0,285	

Number of missing values 0

Table Analyzed November

Two-way RM ANOVA Matching: Stacked  
Alpha 0,05

Source of Variation	% of total variation	P value	P value summary	Significant?
Interaction	4,571	< 0,0001	****	Yes
Day	84,75	< 0,0001	****	Yes
Site	0,1996	0,8479	ns	No
Subjects (matching)	8,425	< 0,0001	****	Yes

ANOVA table	SS	DF	MS	F (DFn, DFd)	P value
Interaction	68,08	29		2,348 F (29, 58) = 4,453	P < 0,0001
Day	1262	29		43,52 F (29, 58) = 82,56	P < 0,0001
Site	2,973	1		2,973 F (1, 2) = 0,04739	P = 0,8479
Subjects (matching)	125,5	2		62,73 F (2, 58) = 119,0	P < 0,0001
Residual	30,57	58		0,5271	

Number of missing values 0

Table Analyzed December

Two-way RM ANOVA Matching: Stacked  
Alpha 0,05

Source of Variation	% of total variation	P value	P value summary	Significant?
Interaction	6,928	0,0672	ns	No
Day	30,13	< 0,0001	****	Yes
Site	53,05	0,0102	*	Yes
Subjects (matching)	1,103	0,0288	*	Yes

ANOVA table	SS	DF	MS	F (DFn, DFd)	P value
Interaction	64,75	30		2,158 F (30, 60) = 1,576	P = 0,0672
Day	281,6	30		9,386 F (30, 60) = 6,854	P < 0,0001
Site	495,8	1		495,8 F (1, 2) = 96,16	P = 0,0102
Subjects (matching)	10,31	2		5,156 F (2, 60) = 3,765	P = 0,0288
Residual	82,17	60		1,369	

Number of missing values 0

Table S2. Statistical analysis of excursion temperatures registered in Victoria Land's microhabitat

Table Analyzed	January				
Two-way RM ANOVA	Matching: Stacked				
Alpha	0,05				
Source of Variation	% of total variation	P value	P value summary	Significant?	
Interaction	9,153	0,001	**	Yes	
Day	26,41	< 0,0001	****	Yes	
Site	55,05	0,0194	*	Yes	
Subjects (matching)	2,197	0,0003	***	Yes	
ANOVA table	SS	DF	MS	F (DFn, DFd)	P value
Interaction	72,4	30		2,413 F (30, 60) = 2,547	P = 0,0010
Day	208,9	30		6,964 F (30, 60) = 7,350	P < 0,0001
Site	435,5	1		435,5 F (1, 2) = 50,13	P = 0,0194
Subjects (matching)	17,37	2		8,687 F (2, 60) = 9,170	P = 0,0003
Residual	56,84	60		0,9474	
Number of missing values	0				
Table Analyzed	February				
Two-way RM ANOVA	Matching: Stacked				
Alpha	0,05				
Source of Variation	% of total variation	P value	P value summary	Significant?	
Interaction	13,41	< 0,0001	****	Yes	

Day	16,86	< 0,0001	****	Yes
Site	66,84	0,0043	**	Yes
Subjects (matching)	0,5813	0,0023	**	Yes

ANOVA table	SS	DF	MS	F (DFn, DFd)	P value
Interaction		128,4	27	4,756 F (27, 54) = 11,65	P < 0,0001
Day		161,4	27	5,978 F (27, 54) = 14,65	P < 0,0001
Site		639,8	1	639,8 F (1, 2) = 230,0	P = 0,0043
Subjects (matching)		5,565	2	2,783 F (2, 54) = 6,817	P = 0,0023
Residual		22,04	54	0,4081	

Number of missing values 0

Table Analyzed March

Two-way RM ANOVA  
Alpha Matching: Stacked  
0,05

Source of Variation	% of total variation	P value	P value summary	Significant?
Interaction	15,98	< 0,0001	****	Yes
Day	22,59	< 0,0001	****	Yes
Site	58,25	0,008	**	Yes
Subjects (matching)	0,9435	< 0,0001	****	Yes

ANOVA table	SS	DF	MS	F (DFn, DFd)	P value
Interaction		113,6	30	3,787 F (30, 60) = 14,32	P < 0,0001
Day		160,5	30	5,351 F (30, 60) = 20,23	P < 0,0001
Site		414	1	414 F (1, 2) = 123,5	P = 0,0080
Subjects (matching)		6,706	2	3,353 F (2, 60) = 12,68	P < 0,0001

Residual	15,87	60	0,2645
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Number of missing values	0
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Table Analyzed	April
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Two-way RM ANOVA	Matching: Stacked
Alpha	0,05

Source of Variation	% of total variation	P value	P value summary	Significant?
Interaction	15,58	< 0,0001	****	Yes
Day	21,11	< 0,0001	****	Yes
Site	61,12	0,0021	**	Yes
Subjects (matching)	0,2584	0,0262	*	Yes

ANOVA table	SS	DF	MS	F (DFn, DFd)	P value
Interaction	134,8	29		4,647 F (29, 58) = 16,14	P < 0,0001
Day	182,6	29		6,296 F (29, 58) = 21,88	P < 0,0001
Site	528,6	1		528,6 F (1, 2) = 473,1	P = 0,0021
Subjects (matching)	2,234	2		1,117 F (2, 58) = 3,882	P = 0,0262
Residual	16,69	58		0,2878	

Number of missing values	0
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Table Analyzed	May
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Two-way RM ANOVA	Matching: Stacked
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Alpha 0,05

Source of Variation	% of total variation	P value	P value summary	Significant?
Interaction	17,66	< 0,0001	****	Yes
Day	23,03	< 0,0001	****	Yes
Site	57,04	0,0048	**	Yes
Subjects (matching)	0,5473	0,0003	***	Yes

ANOVA table	SS	DF	MS	F (DFn, DFd)	P value
Interaction	113,5	30		3,783 F (30, 60) = 20,48	P < 0,0001
Day	148,1	30		4,935 F (30, 60) = 26,72	P < 0,0001
Site	366,7	1		366,7 F (1, 2) = 208,4	P = 0,0048
Subjects (matching)	3,518	2		1,759 F (2, 60) = 9,523	P = 0,0003
Residual	11,08	60		0,1847	

Number of missing values 0

Table Analyzed June

Two-way RM ANOVA Matching: Stacked  
Alpha 0,05

Source of Variation	% of total variation	P value	P value summary	Significant?
Interaction	19,04	< 0,0001	****	Yes
Day	28,69	< 0,0001	****	Yes
Site	48,71	0,0099	**	Yes
Subjects (matching)	0,9742	< 0,0001	****	Yes

ANOVA table	SS	DF	MS	F (DFn, DFd)	P value
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Interaction	112,9	29	3,893	F (29, 58) = 14,70	P < 0,0001
Day	170,1	29	5,866	F (29, 58) = 22,14	P < 0,0001
Site	288,8	1	288,8	F (1, 2) = 99,99	P = 0,0099
Subjects (matching)	5,776	2	2,888	F (2, 58) = 10,90	P < 0,0001
Residual	15,36	58	0,2649		

Number of missing values 0

Table Analyzed July

Two-way RM ANOVA Matching: Stacked  
Alpha 0,05

Source of Variation	% of total variation	P value	P value summary	Significant?
Interaction	19,7	< 0,0001	****	Yes
Day	31,59	< 0,0001	****	Yes
Site	47,29	0,0025	**	Yes
Subjects (matching)	0,2395	0,004	**	Yes

ANOVA table	SS	DF	MS	F (DFn, DFd)	P value
Interaction	205,4	30	6,847	F (30, 60) = 33,21	P < 0,0001
Day	329,4	30	10,98	F (30, 60) = 53,26	P < 0,0001
Site	493,2	1	493,2	F (1, 2) = 394,9	P = 0,0025
Subjects (matching)	2,498	2	1,249	F (2, 60) = 6,058	P = 0,0040
Residual	12,37	60	0,2062		

Number of missing values 0

Table Analyzed August

Two-way RM ANOVA  
Alpha Matching: Stacked  
0,05

Source of Variation	% of total variation	P value	P value summary	Significant?
Interaction	22,69	< 0,0001	****	Yes
Day	36,68	< 0,0001	****	Yes
Site	37,9	0,0114	*	Yes
Subjects (matching)	0,8758	< 0,0001	****	Yes

ANOVA table	SS	DF	MS	F (DFn, DFd)	P value
Interaction	152,4	30	5,082	F (30, 60) = 24,62	P < 0,0001
Day	246,4	30	8,215	F (30, 60) = 39,80	P < 0,0001
Site	254,6	1	254,6	F (1, 2) = 86,55	P = 0,0114
Subjects (matching)	5,884	2	2,942	F (2, 60) = 14,25	P < 0,0001
Residual	12,38	60	0,2064		

Number of missing values 0

Table Analyzed September

Two-way RM ANOVA  
Alpha Matching: Stacked  
0,05

Source of Variation	% of total variation	P value	P value summary	Significant?
Interaction	11,56	< 0,0001	****	Yes
Day	24,81	< 0,0001	****	Yes

Site	60,08	0,0128 *	Yes
Subjects (matching)	1,563	< 0,0001 ****	Yes

ANOVA table	SS	DF	MS	F (DFn, DFd)	P value
Interaction		102,3	29	3,527 F (29, 58) = 11,59	P < 0,0001
Day		219,5	29	7,57 F (29, 58) = 24,88	P < 0,0001
Site		531,6	1	531,6 F (1, 2) = 76,85	P = 0,0128
Subjects (matching)		13,83	2	6,917 F (2, 58) = 22,73	P < 0,0001
Residual		17,65	58	0,3043	

Number of missing values 0

Table Analyzed October

Two-way RM ANOVA Matching: Stacked  
Alpha 0,05

Source of Variation	% of total variation	P value	P value summary	Significant?
Interaction	8,926	< 0,0001 ****	****	Yes
Day	23,35	< 0,0001 ****	****	Yes
Site	60,71	0,038 *	*	Yes
Subjects (matching)	4,889	< 0,0001 ****	****	Yes

ANOVA table	SS	DF	MS	F (DFn, DFd)	P value
Interaction		96,29	30	3,21 F (30, 60) = 8,393	P < 0,0001
Day		251,9	30	8,396 F (30, 60) = 21,96	P < 0,0001
Site		654,8	1	654,8 F (1, 2) = 24,83	P = 0,0380
Subjects (matching)		52,74	2	26,37 F (2, 60) = 68,96	P < 0,0001
Residual		22,94	60	0,3824	

Number of missing values 0

Table Analyzed November

Two-way RM ANOVA Matching: Stacked  
Alpha 0,05

Source of Variation	% of total variation	P value	P value summary	Significant?
Interaction	8,714	0,0014 **		Yes
Day	7,803	0,0043 **		Yes
Site	74,09	0,0162 *		Yes
Subjects (matching)	2,46	0,0002 ***		Yes

ANOVA table	SS	DF	MS	F (DFn, DFd)	P value
Interaction	113,1	29		3,899 F (29, 58) = 2,513	P = 0,0014
Day	101,2	29		3,491 F (29, 58) = 2,250	P = 0,0043
Site	961,4	1		961,4 F (1, 2) = 60,23	P = 0,0162
Subjects (matching)	31,92	2		15,96 F (2, 58) = 10,29	P = 0,0002
Residual	90	58		1,552	

Number of missing values 0

Table Analyzed December

Two-way RM ANOVA Matching: Stacked  
Alpha 0,05

Source of Variation	% of total variation	P value	P value summary	Significant?
Interaction	15,17	0,0057	**	Yes
Day	50,26	< 0,0001	****	Yes
Site	5,941	0,4618	ns	No
Subjects (matching)	14,57	< 0,0001	****	Yes

ANOVA table	SS	DF	MS	F (DFn, DFd)	P value
Interaction	143,5	30		4,782 F (30, 60) = 2,158	P = 0,0057
Day	475,3	30		15,84 F (30, 60) = 7,148	P < 0,0001
Site	56,18	1		56,18 F (1, 2) = 0,8155	P = 0,4618
Subjects (matching)	137,8	2		68,89 F (2, 60) = 31,09	P < 0,0001
Residual	133	60		2,216	

Number of missing values 0