Supporting Information. Using metabolic and thermal ecology to predict temperature dependent ecosystem activity: a test with prairie ants. Rebecca M. Prather, Karl A. Roeder, Nathan J. Sanders, and Michael Kaspari. *Ecology*. 2018.

Appendix S1. Supporting tables and figures.

Table S1. Best-fit power law regressions ($y = aX^b$) for ant responses to NaCl and sucrose vials with soil temperature, broken down by time of day. Curves were fit with the Marquardt-Levenberg algorithm.

9:00h

Discovery		**Coefficient**	**Std. Error**	**t**	**Pr>t**	**Adjusted r²**
NaCl	a	2.08E-08	5.41E-08	0.3834	0.7047	0.87
	b	6.4974	0.805	8.0715	<0.0001	
Sucrose	a	0.0009	0.0021	0.423	0.6759	0.44
	b	2.9796	0.7396	4.0286	0.0005	
Recruitment		**Coefficient**	**Std. Error**	**t**	**Pr>t**	**Adjusted r²**
NaCl	a	4.09E-06	1.11E-05	0.3674	0.7164	0.66
	b	4.3999	0.845	5.2073	<0.0001	
Sucrose	a	1.2773	0.7254	1.7608	0.091	0
	b	9.98E-10	0.1852	5.39E-09	1	

13:00h

Discovery		**Coefficient**	**Std. Error**	**t**	**Pr>t**	**Adjusted r²**
NaCl	a	0.001	0.005	0.2016	0.8419	0.14
	b	2.8571	1.5211	1.8783	0.0721	
Sucrose	a	0.6184	1.7782	0.3478	0.7309	0
	b	0.7381	0.9007	0.8195	0.4203	
Recruitment		**Coefficient**	**Std. Error**	**t**	**Pr>t**	**Adjusted r²**
NaCl	a	0.0002	0.0008	0.2929	0.772	0.29
	b	3.0027	1.0456	2.8717	0.0082	
Sucrose	a	0.9688	0.8725	1.1103	0.2774	0
	b	0.0793	0.2848	0.2785	0.783	

17:00h

Discovery		**Coefficient**	**Std. Error**	**t**	**Pr>t**	**Adjusted r²**
NaCl	a	0.0001	0.0002	0.5475	0.5887	0.74
	b	3.7253	0.5497	6.7765	<0.0001	
Sucrose	a	0.0012	0.0022	0.5418	0.5925	0.56
	b	2.8854	0.5584	5.1672	<0.0001	
Recruitment		**Coefficient**	**Std. Error**	**t**	**Pr>t**	**Adjusted r²**
NaCl	a	3.78E-05	8.04E-05	0.4707	0.6418	0.66
	b	3.6578	0.6396	5.7186	<0.0001	
Sucrose	a	0.4232	0.5493	0.7703	0.4481	0
	b	0.4246	0.4036	1.052	0.3025	

Table S2. Results of an ANCOVA test of temperature sensitivity on average discovery (log_{10} number of vials with at least one ant) and average recruitment (log_{10} number of ants per vial) of ants to four sucrose concentrations at Pigtail Alley Prairie. We test the prediction of a positive effect of increased temperature on overall bait discovery and recruitment and whether discovery or recruitment changed with sucrose concentration.

	Discovery		**Recruitment**	
	$F_{3, 96}$	**Pr>F**	**$F_{3, 96}$**	**Pr>F**
Log_{10} Mean Soil Temperature	1.514	0.2216	16.962	<0.0001
Sucrose Concentration (1%, 5%, 10%, 20%)	25.516	<0.0001	64.399	<0.0001
Interaction	0.536	0.6585	1.988	0.1209

Table S3. Best-fit power law regressions ($y = aX^b$) for ant recruitment with soil temperature for vials stocked with one of 4 concentrations of sucrose solution. Curves were fit with the Marquardt-Levenberg algorithm.

Concentration		Coefficient	Std. Error	t	Pr>t	Adjusted r^2
1%	a	1.5449	1.9422	0.7954	0.4342	0.0000
	b	0.0000	0.3752	0.0000	1.000	
5%	a	0.0953	0.2729	0.3493	0.7299	0.0548
	b	0.9484	0.8444	1.1231	0.2725	
10%	a	0.0040	0.0117	0.3432	0.7344	0.1710
	b	2.0341	0.8534	2.3835	0.0254	
20%	a	0.0122	0.0328	0.3710	0.7139	0.1824
	b	1.8414	0.7905	2.3295	0.0286	

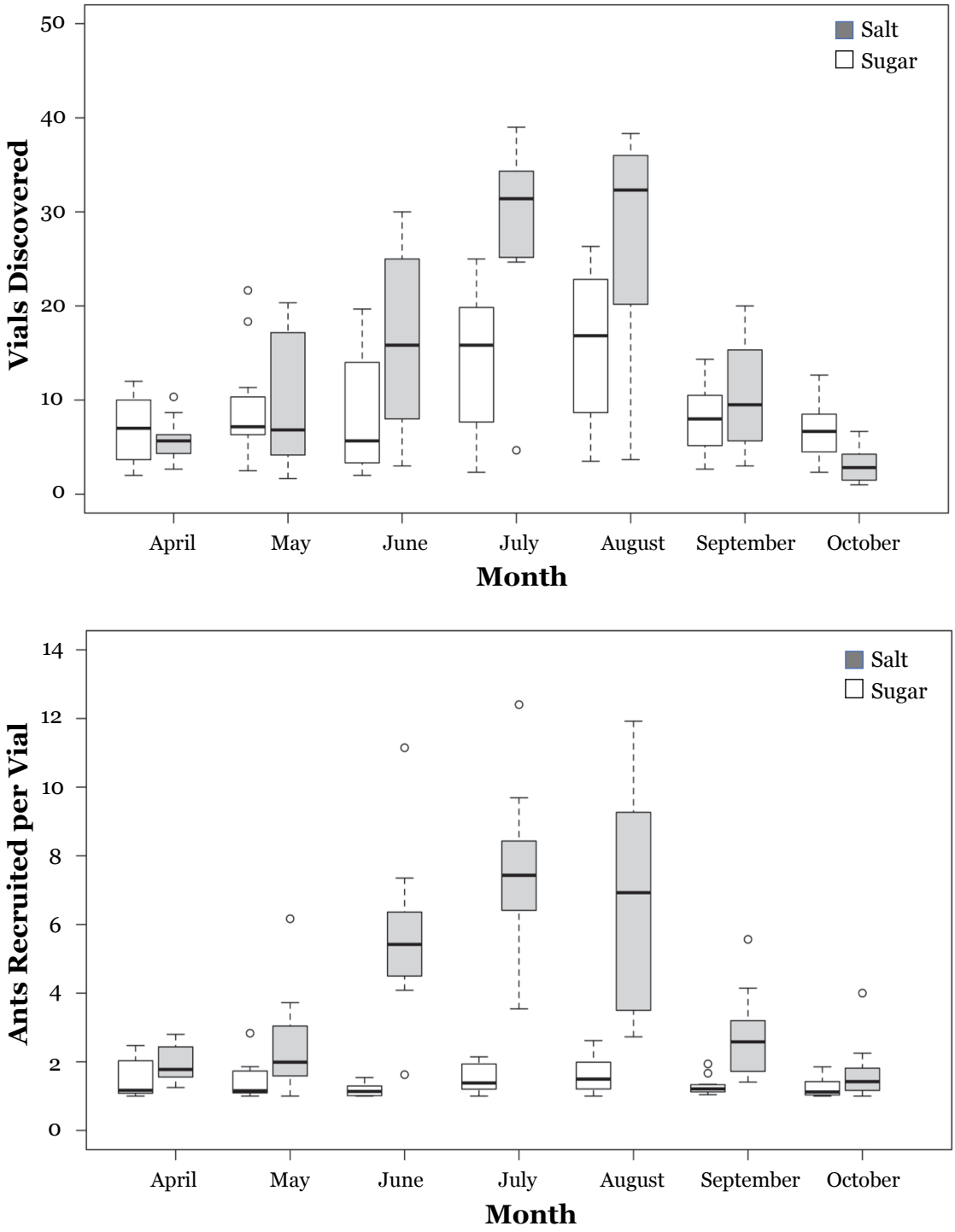

Figure S1: Ant discovery of NaCl and sucrose vials by month. **Top**: Ant activity – the average number of vials in which we found an ant (of 50) across three transects. **Bottom**: An estimate of ant recruitment to a bait – the average number of ants in a discovered vial. In each month ant behavior at three transects was measured across four days at 9:00h, 13:00h, and 17:00h.

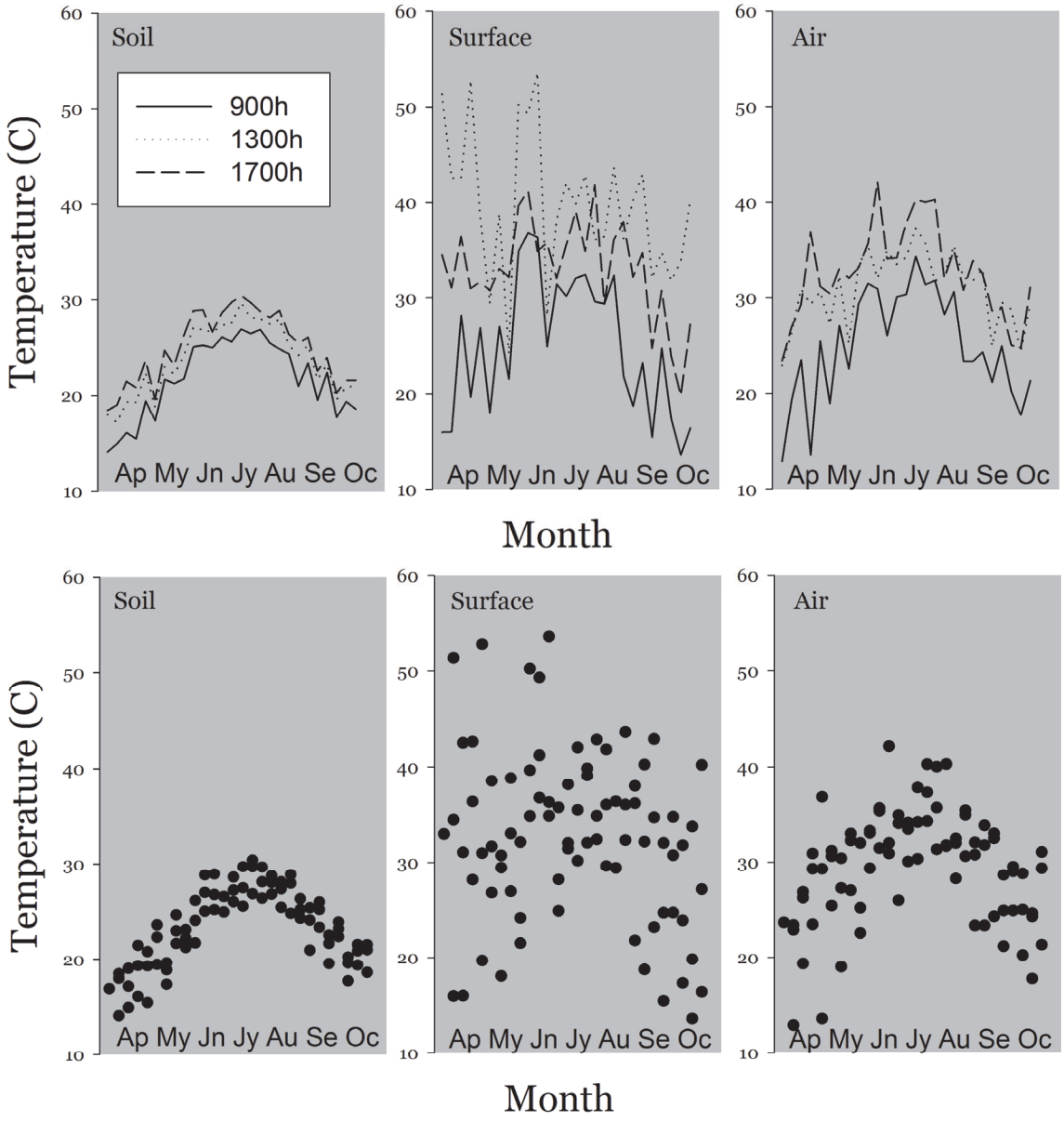

Figure S2: Distribution of three kinds of temperature measured over the duration of this study. **Top**: Each line represents samples at one of three times of day: 9:00h, 13:00h, and 17:00h. **Bottom**: Each point represents a sampling event (n = 82).

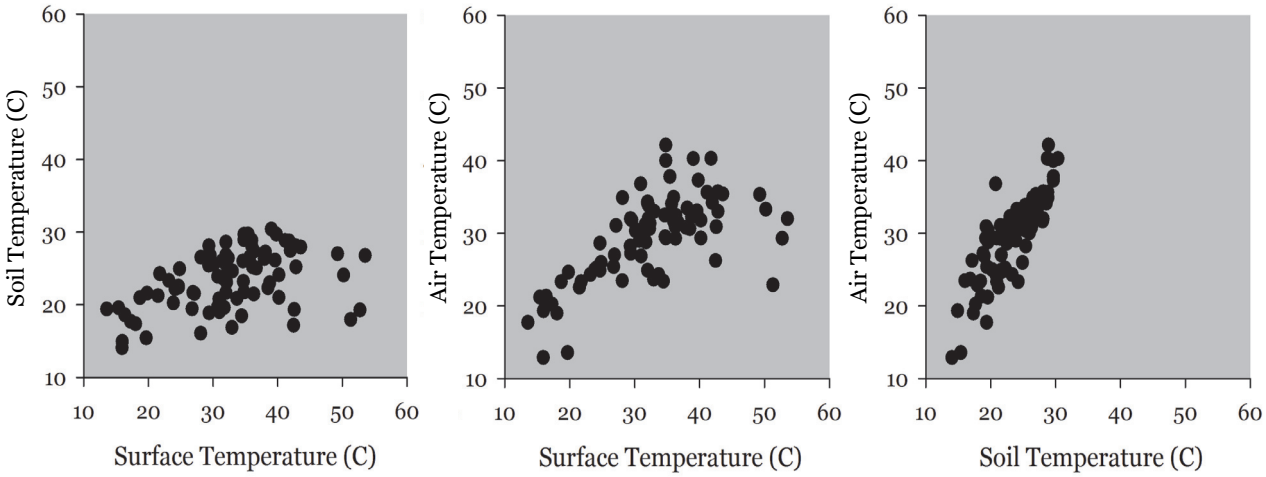

Figure S3: Correlations among the three measures of temperature (soil, surface, and air) associated with each sampling event.

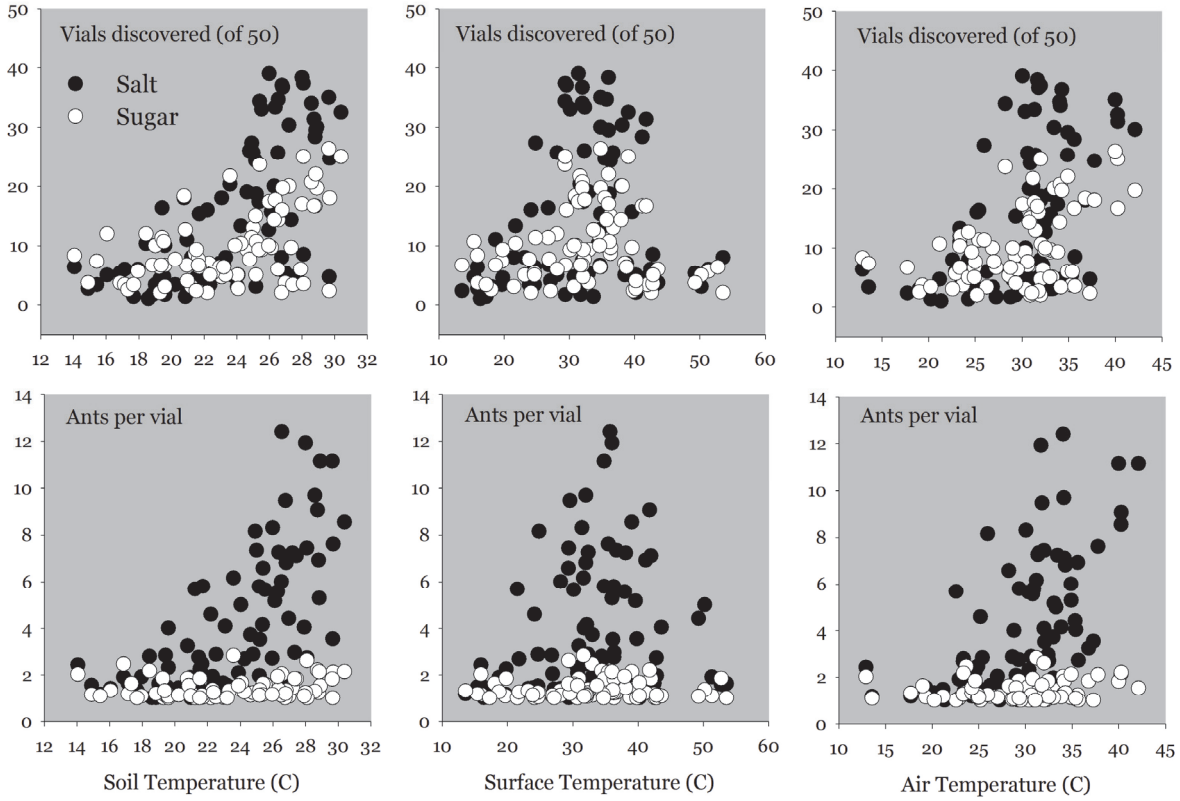

Figure S4: Plot of discovery rates (Vials Discovered) and Recruitment (Ants per Vial) against three measures of environmental temperature taken at the same time.

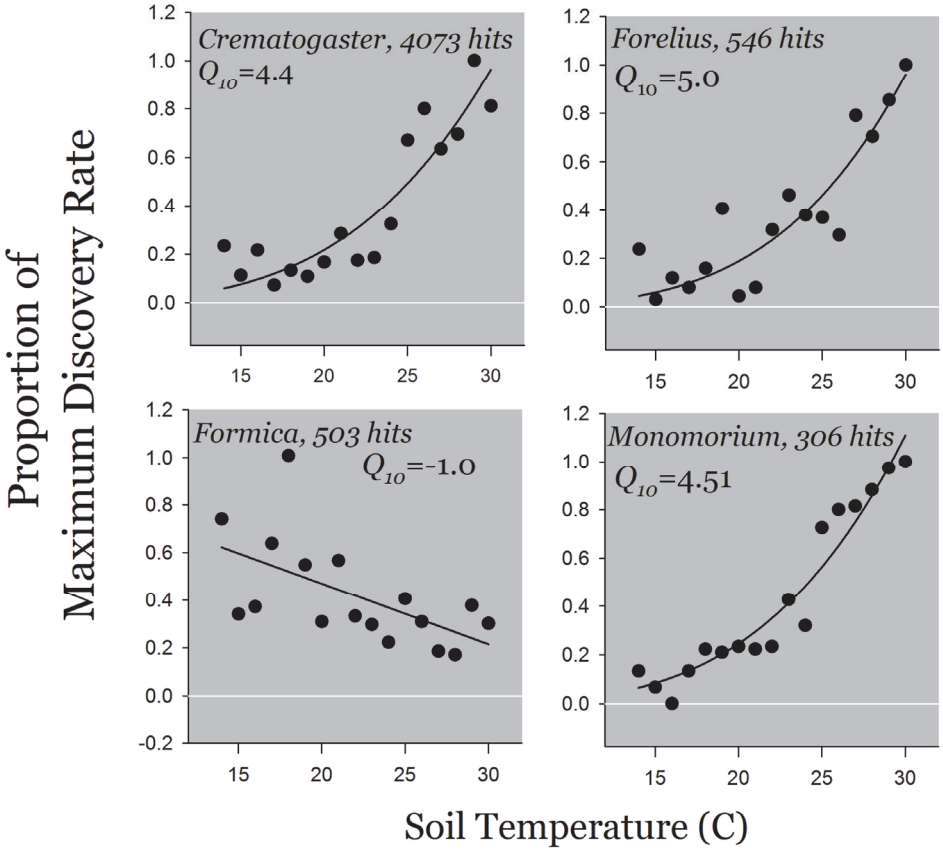

Figure S5: The discovery rate of NaCl and sucrose vials versus soil temperature, expressed as fraction of maximum for four species (*Crematogaster lineolata*, *Forelius pruinosus*, *Formica pallidefulva*, and *Monomorium minimum*) representing 94% of total bait discoveries in this prairie community. Linear and Power curves were fitted to the data, and only best fit curves shown.