Supporting Information

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Table S1. Best models found to explain variance in estimated species richness [determined by the Jackknife2 estimator (S_{jack2})] in relation to whether a site was geothermal or not

Response	Predictors (sig)	*n*	% Dev explained	Distribution	AIC (DIC)	Package
All geothermal sites						
Plants	$ACBR_{RE}$; (+)log(N_R)***; (+)A_{IF}**; (+)V_L***	35	77	Poisson (GH)	132	lme4
Inverts	$ACBR_{RE}$; (+)log(N_R)***; (−)H_{ASL}**	18	74	Poisson (MCMC)	(118)	MCMCglmm
Fungi	$ACBR_{RE}$; log(N_R)***; (+)log (A_{IF})***; −H_{ASL}***; (+)V_S	42	79	Poisson (GH)	245	lme4
	(+)log(N_R)***; (−)H_{ASL}*; (−)R_R#; s(lat,lon)***; (+)V_S*	42	99	Poisson (GAM)	339	mgcv
Antarctic Peninsula sites only						
Plants	$ACBR_{RE}$; (+)log(N_R)***; (+)V_S; (+)V_L***	12	91	Poisson (GH)	94	lme4
Inverts	$ACBR_{RE}$; (+)log(N_R)***; (−)H_{ASL}**	10	98	Poisson (GH)	10	lme4
Fungi	$ACBR_{RE}$; (+)log(N_R)***; (−)H_{ASL}*	15	89	Poisson (MCMC)	(131)	MCMCglmm
Antarctic continent sites only						
Plants	$ACBR_{RE}$; (+)log(N_R)***; (−)H_{ASL}***; (−)R_R*; (+)V_S*; (+)V_L***	15	88	Poisson (GH)	45	lme4
Inverts	$ACBR_{RE}$; (+)log(N_R); (+)H_{ASL}***; (−)R_R***	6	97	Poisson(GH)	11	lme4
Fungi	$ACBR_{RE}$; (+)log(N_R)***; (−)T_{DD}***; (+)log(A_{IF})*; (+)R_R**; (−)H_{ASL}***	18	89	Poisson (GH)	66	lme4

Models were fitted to data from plants, invertebrates (Inverts), and fungi. Models were also fitted to data from the whole of Antarctica, the Antarctic Peninsula only, and continental Antarctica only. Geothermal sites were categorized as short-lived (V_S) or long-lived (V_L). Other predictors were as follows: $ACBR_{RE}$, Antarctic Conservation Biogeographic Regions as a random effect; A_{IF}, area of ice-free land (square kilometers); H_{ASL}, altitude above sea level (meters); N_R, number of records; R_R, rugosity as measured by the Terrain Roughness Index; s(lat,lon) (smoothed spatial covariate); T_{DD}, temperature as measured by degree days with a 5 °C threshold. Parameter details and data sources are provided in Table S7. Signs of model coefficients are shown in parentheses immediately preceding the predictor. Significance levels of predictors (sig) were assessed using Wald's Z statistic [Gaussian–Hermite (GH) and general additive models (GAMs)] and Markov Chain Monte Carlo (Bayesian p value, pMCMC; MCMCglmm) on the following scale: ***$P < 0.001$; **$P < 0.01$; *$P < 0.05$; #$P < 0.08$. No significance symbol indicates that the predictor was in the best model [by Akaike information criterion (AIC)] but not significant by the Wald test. A log term was added to predictors on the basis of partial residual plots. Shading demonstrates evidence of geothermal effect (geothermal predictors present in the best model). DIC, deviance information criterion.

Table S2. Best models found to explain variance in estimated S_{jack2} in relation to distance of nongeothermal site to nearest geothermal site

Response	Predictors (sig)	*n*	% Dev explained	Distribution	AIC	Package
Antarctic Peninsula sites only						
Plants	$ACBR_{RE}$; (+)log(N_R)***; (−)A_{IF} #; (−)R_R#; (−)T_{DD}; (−)D_V***	12	89	Poisson (GH)	32	lme4
Inverts	$ACBR_{RE}$; (+)log(N_R)***; (−)H_{ASL}**	10	98	Poisson (GH)	10	lme4
Fungi	$ACBR_{RE}$; (+)log(N_R)***; (+)A_{IF}**; (−)H_{ASL}**; (−)D_V*	15	89	Poisson (GH)	36	lme4
Antarctic continent sites only						
Plants	$ACBR_{RE}$; (+)log(N_R)***; (−)T_{DD}*; (+)H_{ASL}#; (−)R_R***; (−)D_V*	15	85	Poisson (GH)	54	lme4
Inverts	$ACBR_{RE}$; (−)R_R***; (−)D_V***	6	89	Poisson(GH)	12	lme4
Fungi	$ACBR_{RE}$; (+)log(N_R)***; (−)T_{DD}***; (−)H_{ASL}***; (+)R_R**; (−)D_V***	18	86	Poisson (GH)	76	lme4

Models were fitted to data from plants, invertebrates, and fungi. Models were also fitted to data from the whole of Antarctica, the Antarctic Peninsula only, and continental Antarctica only. Distance from nearest geothermal site was shown by D_V. Other predictors were $ACBR_{RE}$, A_{IF}, H_{ASL}, N_R, R_R, and T_{DD}. Parameter details and data sources are provided in Table S7. Signs of model coefficients are shown in parentheses immediately preceding the predictor. Significance levels of predictors were assessed using Wald's Z statistic (GH and GAMs) and pMCMC (MCMCglmm) on the following scale: ***$P < 0.001$; **$P < 0.01$; *$P < 0.05$; #$P <$ 0.08. No significance symbol indicates that the predictor was in the best model (by AIC) but not significant by the Wald test. A log term was added to predictors on the basis of partial residual plots. Shading demonstrates evidence of geothermal effect (geothermal predictors present in best the model).

Table S3. Best models found to explain variance in observed species richness (S_{obs}) in relation to whether a site was geothermal or not

Response	Predictors (sig)	n	% Dev explained	Distribution	AIC (DIC)	Package
All volcanoes						
Plants	$ACBR_{RE}$; (+)log(N_R)***; (+)A_{IF}*; (+)V_S*; (+)V_L***	35	81	Poisson (GH)	95	lme4
Inverts	$ACBR_{RE}$; (+)log(N_R)***; (−)H_{ASL}**	18	74	Poisson (MCMC)	(106)	MCMCglmm
Fungi	$ACBR_{RE}$; (+)log(N_R)***; (+)log(A_{IF})**; (−)H_{ASL}***; (−)R_R#; (+)V_S*	42	94	Poisson (GH)	114	lme4
	log(N_R)***; (−)H_{ASL}**; (+)V_S**; s(lat,lon)***	43	99	Poisson (GAM)	302	mgcv
Antarctic Peninsula sites only						
Plants	$ACBR_{RE}$; (+)log(N_R)***; (+)V_S#; (+)V_L*	12	97	Poisson (GH)	15	lme4
Inverts	$ACBR_{RE}$; (+)log(N_R)***	10	91	Poisson (GH)	10	lme4
Fungi	$ACBR_{RE}$; (+)log(N_R)***; (−)H_{ASL}*	15	92	Poisson (MCMC)	(123)	MCMCglmm
Antarctic continent sites only						
Plants	$ACBR_{RE}$; (+)log(N_R); (−)R_R***; (−)H_{ASL}**; (+)V_S**; (+)V_L***	15	90	Poisson (GH)	32	lme4
Inverts	$ACBR_{RE}$; (+)log(N_R); (−)T_{DD}	6	90	Poisson(MCMC)	(38)	MCMCglmm
Fungi	$ACBR_{RE}$; (+)log(N_R)***; (−)T_{DD}**; (−)R_R*; (+)V_S*	18	86	Poisson (GH)	50	lme4

Models were fitted to data from plants, invertebrates, and fungi. Models were also fitted to data from the whole of Antarctica, the Antarctic Peninsula only, and continental Antarctica only. Geothermal sites were categorized as V_S or V_L. Other predictors were $ACBR_{RE}$, A_{IF}, H_{ASL}, N_R, R_R, and T_{DD}. Parameter details and data sources are provided in Table S7. Signs of model coefficients are shown in brackets immediately preceding the predictor. Significance levels of predictors were assessed using Wald's Z statistic (GH and GAMs) and pMCMC (MCMCglmm) on the following scale: ***$P < 0.001$; **$P < 0.01$; *$P < 0.05$; #$P < 0.08$. No significance symbol indicates that the predictor was in the best model (by AIC) but not significant by the Wald test. A log term was added to predictors on the basis of partial residual plots. Shading demonstrates evidence of geothermal effect (geothermal predictors present in best the model).

Table S4. Best models found to explain variance in S_{obs} in relation to distance of nongeothermal site to nearest geothermal site

Response	Predictors	n	% Dev explained	Distribution	AIC (DIC)	Package
Antarctic Peninsula sites only						
Plants	$ACBR_{RE}$; (+)log(N_R)***; (−)D_V*	12	96	Poisson (MCMC)	(80)	MCMCglmm
Inverts	$ACBR_{RE}$; (+)log(N_R)***	10	91	Poisson (GH)	10	lme4
Fungi	$ACBR_{RE}$; (+)log(N_R)***; (−)T_{DD}; (−)H_{ASL}*; (−)D_V**	15	94	Poisson (GH)	36	lme4
Antarctic continent sites only						
Plants	$ACBR_{RE}$; (+)log(N_R)***; (−)T_{DD}**; (−)R_R*; (−)D_V***	15	85	Poisson (GH)	38	lme4
Inverts	$ACBR_{RE}$; (+)log(N_R)***; (−)T_{DD}*	6	90	Poisson(MCMC)	(37.8)	MCMCglmm
Fungi	$ACBR_{RE}$; (+)log(N_R)***; (+) log(A_{if})#; (−)T_{DD}***; (−)H_{ASL}***; (−)D_V**	18	89	Poisson (GH)	47	lme4

Models were fitted to data from plants, invertebrates, and fungi. Models were also fitted to data from the whole of Antarctica, the Antarctic Peninsula only, and continental Antarctica only. Geothermal sites were categorized as V_S or V_L. Other predictors were $ACBR_{RE}$, A_{IF}, H_{ASL}, N_R, R_R, and T_{DD}. Parameter details and data sources are provided in Table S7. Signs of model coefficients are shown in brackets immediately preceding the predictor. Significance levels of predictors were assessed using Wald's Z statistic (GH and GAMs) and pMCMC (MCMCglmm) on the following scale: ***$P < 0.001$; **$P < 0.01$; *$P < 0.05$; #$P < 0.08$. No significance symbol indicates that the predictor was in the best model (by AIC) but not significant by the Wald test. A log term was added to predictors on the basis of partial residual plots. Shading demonstrates evidence of geothermal effect (geothermal predictors present in best the model).

Table S5. Number of records used in analyses

	Plants	Fungi	Invertebrates
Antarctica	13,649 (429)	15,159 (819)	2,002 (134)
Peninsula	7,486 (227)	7,310 (537)	1,753 (76)
Continental	6,163 (248)	7,849 (330)	249 (61)

Number of taxa are shown in parentheses.

Table S6. Antarctic geothermal sites active since the Last Glacial Maximum

Classification	Name	Latitude	Longitude	Altitude of summit, m	Last known eruption
Small	Paulet Island	−63.581	−55.7707	353	Holocene
Small	Penguin Island	−62.101	−57.9174	180	1905 (?)
Small	Seal Nunataks	−65.067	−60.2842	368	1980
Small	The Pleiades	−72.6722	165.4995	3,040	1050 B.C. ± 1,000 y
Small	Royal Society Range volcanoes	−78.252	163.5991	3,000	Holocene
Large	Deception Island	−62.968	−60.6505	576	1987
Large	Mount Erebus	−77.5354	167.2825	3,794	2012
Large	Mount Melbourne	−74.3521	164.6994	2,732	1750 ± 100 y
Large	Mount Rittman	−73.4667	165.6167	2,600	Uncertain, but warm ground indicates it is active
Large	Broknes Peninsula*	−69.3947	76.33494	0	N/A

*The only nonvolcanic geothermal site in our analyses was the Broknes Peninsula in the Larsemann Hills. N/A, not applicable (no eruption possible).

Table S7. Predictors used in models presented

Predictor	Type	Description
$ACBR_{FE}$	Categorical fixed effect	Antarctic Conservation Biogeographic Region (1), fixed effect
$ACBR_{RE}$	Categorical random effect	As above but as a random effect
T_{DD}	Continuous	Mean cumulative annual degree days, calculated using a −5 °C threshold; degree days were derived from Modern Era Retrospective-analyses for Research and Applications (MERRA) data for 2012, interpolated to 50-km cells
H_{ASL}	Continuous	Mean height above sea level, calculated from 200 m pixels of Radarsat Antarctic Mapping Project Digital Elevation Model Version 2 (RAMP DEM) (http://nsidc.org/data/nsidc-0082.html)
A_{IF}	Continuous	Area of ice-free land in each site
N_R	Continuous	Number of records
R_R	Continuous	Rugosity: based on the Terrain Roughness Index, from variation in altitude between one 200-m pixel in RAMP DEM and surrounding pixels
s(lat,lon)	Bivariate smooth	Smoothed location covariate based on the latitude and longitude of the geothermal or nongeothermal location; only used in generalized additive models
D_V	Continuous	Distance from geothermal site: distance of nongeothermal location to edge of nearest geothermal 100-km radius buffer
V_S	Binary categorical	Small geothermal site: volcano with sporadic activity and a small magma chamber
V_L	Binary categorical	Large geothermal site: volcano with a large magma chamber and extended periods of activity or a nonvolcanic geothermal site with slow radiogenic decay of rocks (in the case of the Larsemann Hills)

Site refers to a 100-km radius circle around each geothermal or nongeothermal location.

1. Terauds A, et al. (2012) Conservation biogeography of the Antarctic. *Divers Distrib* 18(7):726–741.