Supplementary Material
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Energy use

Coordinates corresponding to measurements of Reptile FMR were extracted from the references compiled in Nagy (2005) (table S1). Text descriptions of study areas were georeferenced in Biogeomancer (http://www.biogeomancer.org/) and Google Maps when necessary.

Thermal limits

The thermal tolerance data was extracted from Sunday et al. (2010). For endotherm data sources, see table S2. The temperatures are lethal limits for ectotherms and the limits of the thermoneutral zone for endotherms.

Seasonal patterns of energy use and activity time

Latitudinal, seasonal comparison: We used hourly temperature data for 2008 to calculate the proportion of activity time and metabolic rates (National Climatic Data Center, www.ncdc.noaa.gov, stations 718580 and 767620). For the global analysis, we used average near-surface air temperature estimate in 3 hour resolution for the year 2000 from a global Atmosphere-Ocean General Circulation Model (CNRM-CM3, 2004; Scenario: IPCC SRES A2; cell size 2.8125 degrees) (Déqué et al. 1994). We calculate daylength using the function in the pheno R library.

Bird and lizard comparison: Lizard richness was estimated within equal area equivalents to 1° grid cells at the equator (110x110km) using range maps available from NatureServe (www.natureserve.org). The data from the National Park Service Inventory and Monitoring initiative is described in Buckley and Jetz (2010). In figure 5C, the numbers of individuals and species were adjusted for sampling time for each park. We calculated the expected abundance for a fixed amount of effort (52 party hours, which is the minimum for parks in the dataset). We then used rarefaction to estimate the expected number of species in a sample of the number of individuals expected to be observed in 52hrs.

Avian richness and abundance were examined from 2,585 survey routes of the North American Breeding Bird Survey (BBS; Bystrak 1981) for the year 2002 (data described in Hurlbert 2004). Rarefaction analyses are presented for the subset of BBS routes occurring in deciduous forest as described and implemented in Hurlbert (2004).

We estimated the normalized difference vegetation index (NDVI), a measure of greenness, at the observation sites using data from the NOAA Advanced Very High Resolution Radiometer Satellite (see Hurlbert 2004). Temperatures were estimated using the Climatic Research Unit's 10-minute mean annual temperature coverage for the period 1961-1990 (New et al. 2002).

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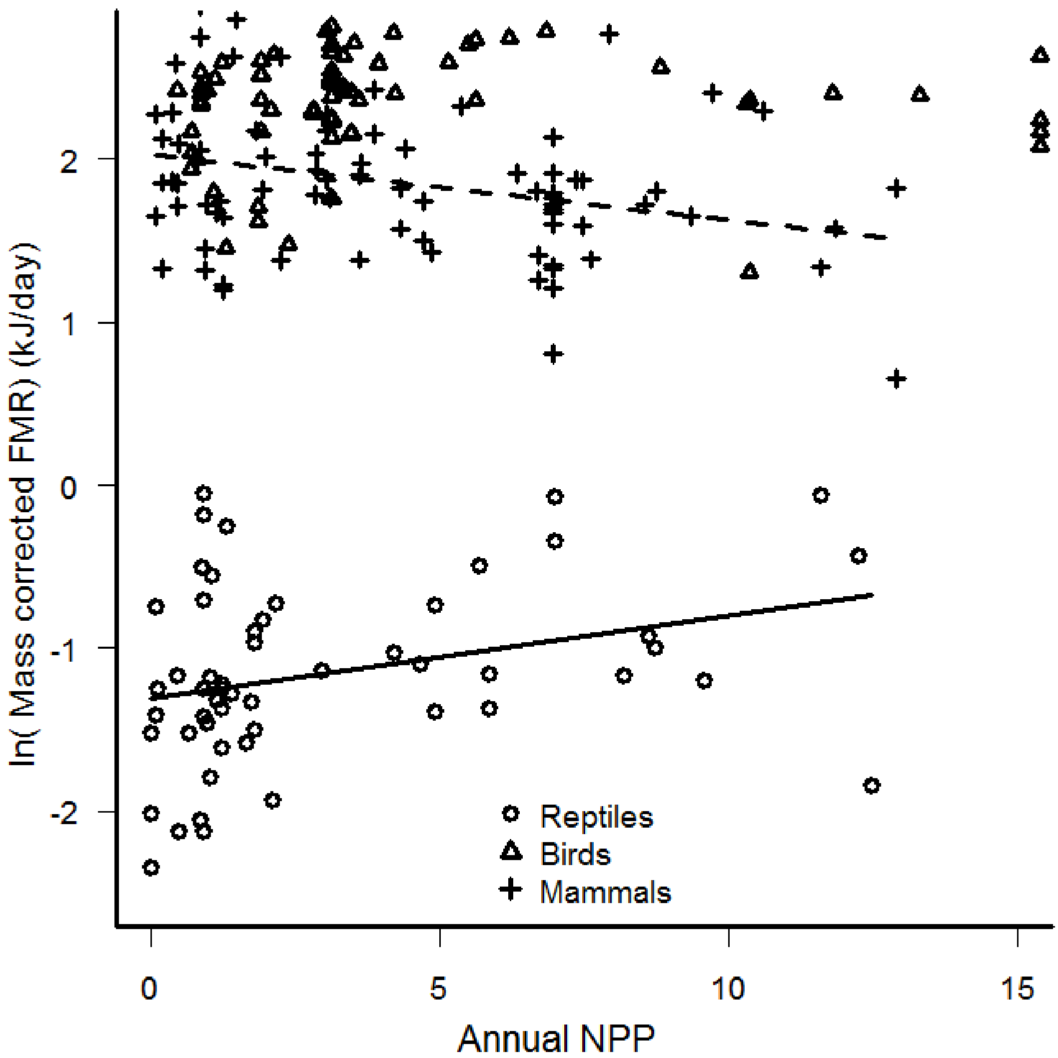

Figure S1. The log of mass corrected ($M^{0.75}$, grams) field metabolic rate is weakly related to NPP (t C ha^{-1} $year^{-1}$) for birds ($p = 0.98$, $r^2=0.00$), mammals ($p = 0.01$, $r^2=0.07$), and lizards ($p = 0.04$, $r^2=0.08$).

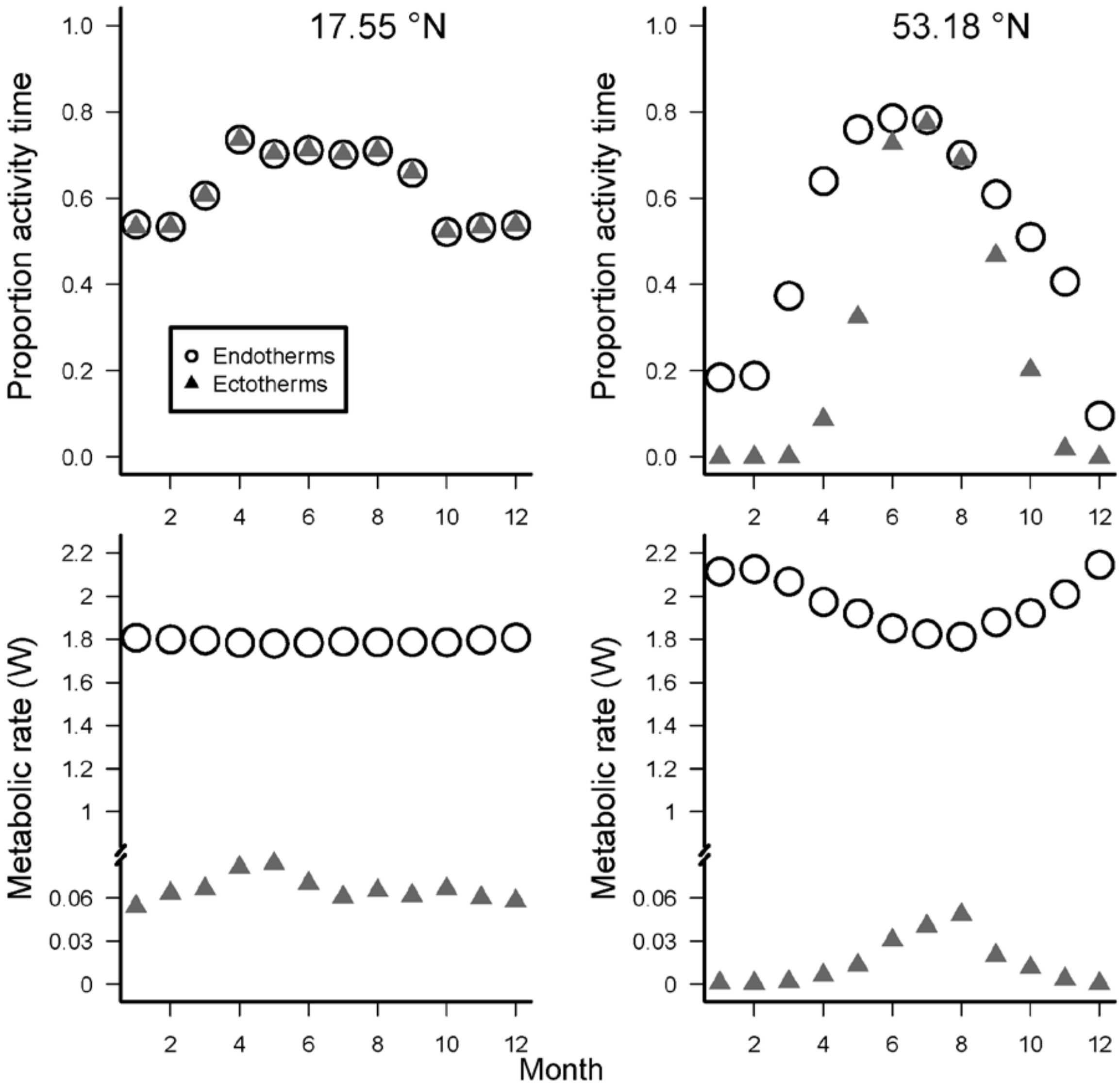

Figure S2. A comparison of the proportional time available for activity (top) and metabolic rate (W, bottom) for idealized endothermic (circles) and ectothermic (triangles) vertebrates of size 50g across seasons. The metrics are calculated using hourly temperature data from weather stations located in Chilpancingo, Guerrero Mexico (17.55 °N) and Grand rapids, Manitoba, Canada (53.18 °N). Metabolic rate calculations reflect basal metabolic rate and account for environmental temperature dependence; activity time calculations additionally account for variation in usable daylight.

Table A1 Georeferenced reptile FMR (Field metabolic rate, kJ/day) data from Figure 1 compiled by Nagy (2005).

Species	Common Name	Mass (g)	FMR (kJ/day)	Latitude (S-)	Longitude (W-)
Acanthodactylus pardalis	Sand lizard	4.5	0.2	34.76	11.07
Agama impalearis	Bibron's agama	54.4	16.8	31.79	-7.09
Amblyrhynchus cristatus	Galapagos marine iguana	1610.0	91.2	-0.82	-91.10
Angolosaurus skoogi	Skoog's lizard	57.4	3.0	-20.15	13.23
Callisaurus draconoides	Zebra-tailed lizard	7.1	1.1	33.71	-115.41
Chalcides sexlineatus	Gran Canarian skink	7.8	0.7	27.92	-15.55
Chlamydosaurus kingii	Frillneck lizard	635.0	52.4	-12.44	130.87
Cnemidophorus hyperythrus	Orangethroat whiptail	4.3	1.1	22.89	-109.92
Cnemidophorus tigris	Western whiptail	16.5	4.1	33.71	-115.41
Coluber constrictor	Racer	132.0	12.8	33.28	-81.73
Crotalus cerastes	Sidewinder	129.0	5.0	34.72	-118.11
Crotalus lepidus	Mottled rock rattlesnakes	109.0	4.7	29.23	-103.26
Ctenophorus nuchalis	Central netted dragon	36.8	9.6	-25.93	113.53
Dipsosaurus dorsalis	Desert iguana	52.5	6.5	33.82	-116.39
Elgaria multicarinatus	Southern alligator lizard	25.3	2.0	32.72	-117.16
Galloti altantica	Agamid lizard	11.9	1.5	28.29	-16.63
Galloti galloti	Agamid lizard	25.6	4.6	28.29	-16.63
Galloti stehlini	Giant agamid lizard	47.3	7.9	28.29	-16.63
Gopherus agassizzi	Desert tortoise	2120.0	42.9	35.65	-115.25
Heliobolus lugubris	Bushveld lizard	3.8	0.8	-25.12	20.35
Iguana iguana	Green iguana	860.0	60.1	12.12	-68.88
Lacerta viridis	Common lizard	25.5	5.8	46.12	0.67
Mabuya striata	Stiped skink	19.5	2.9	-25.12	20.35
Masticophus flagellum	Coachwhip	124.0	11.7	34.72	-118.11
Meroles anchietae	Namib Desert dune lizard	4.0	0.6	-22.09	16.97
Mesalina olivieri	Sand lizard	1.1	0.3	34.76	11.07
Microlophus albemariensis	Lava lizard	28.2	3.3	-0.82	-91.10
Pachydactylus bibronii	Birbon's gecko	16.6	2.2	-25.12	20.35
Pedioplanis lineoocellata	Spotted sand lizard	3.3	0.5	-25.12	20.35
Phrynosoma platyrhinos	Desert horned lizard	23.0	2.7	35.00	-188.16
Podarcis lilfordi	Lacertid lizard	7.4	1.5	39.62	3.04
Ptyodactylus hasselquistii	Negev Desert gecko	9.1	1.2	30.87	34.95
Rhoptropus afer	Namib Desert gecko	2.6	0.2	-23.01	14.98
Sauromalus obesus	Chuckwalla	167.0	15.7	34.04	-117.23
Sceloporus graciosus	Sagebrush lizard	5.0	0.8	37.44	-113.40
Sceloporus jarrovi	Yarrow's spiny lizard	16.6	1.9	32.80	-109.72
Sceloporus occidentalis	Western fence lizard	12.1	1.8	34.22	-118.50
Sceloporus variabilis	Rosebelly lizard	7.7	1.9	19.13	-96.20
Sceloporus virgatus	Striped plateau lizard	6.3	1.1	33.83	-111.95
Thamnophis sirtalis	Common garter snake	22.0	5.2	40.63	-120.87
Tupinambis teguixin	Tegu	1170.0	214.0	7.77	-68.95
Urosaurus nigricaudus	Black-tailed brush lizard	3.2	1.4	24.14	-110.32
Uta stansburiana	Side-blotched lizard	3.2	0.7	36.63	-116.31
Varanus acanthurus	Ridge-tailed monitor	60.0	3.7	6.15	81.04
Varanus bengalensis	Bengal monitor	2560.0	393.0	-21.31	116.06
Varanus caudolineatus	Goanna/monitor lizard	10.4	3.0	-27.58	114.67
varanus giganteus	Perenties	7700.0	807.0	-21.31	116.06
Varanus gouldii	Sand monitor	1320.0	233.0	-12.70	132.37
Varanus komodensis	Komodo dragon	45200.0	2430.0	-8.55	119.45
Varanus mertensi	Merten's water monitor	1210.0	143.0	-12.75	131.00
Varanus panoptes	Goanna/monitor	1350.0	180.0	-12.70	132.37
Varanus rosenbergi	Goanna/monitor lizard	1180.0	100.0	-35.78	137.21
Varanus salvator	Goanna/monitor lizard	7530.0	906.0	-21.31	116.06
Varanus scalaris	Goanna/monitor lizard	66.4	7.8	-12.33	131.12
Vipera aspis	European viper	67.2	6.3	46.12	0.67

Table A2 Endotherm thermal tolerance data from figure 2.

Latin	Taxon	Abs. Latitude (°)	Lower (°C)	Upper (°C)	Source
Turdoides squamiceps	Aves	22	31.6	40	Anava et al. 2001
Lonchura cucullata	Aves		33.7	38	Seagram et al. 2001
Taeniopygia guttata	Aves	25	33		Meijer et al. 1996
Manacus vitellinus	Aves	7	25		Bartholomew et al. 1983
Pipra mentalis	Aves	13	27		Bartholomew et al. 1983
Carduelis spinus	Aves	54	31.6		Saarela et al. 95
Sporophila minuta	Aves	6	28.9	39.2	Saarela et al. 95
Amadina fasciata	Aves		31	38	Marschall & Prinzinger 1991
Estrilda melpoda	Aves	3	35	43	Marschall & Prinzinger 1991
Taeniopygia guttata	Aves	25	33	39	Marschall & Prinzinger 1991
Chloebia gouldiae	Aves	16	30	43	Marschall & Prinzinger 1991
Padda oryzivora	Aves	7	31	43	Marschall & Prinzinger 1991
Eurostopodus guttatus	Aves	25	33		Yarbrough 1971
Phalaenoptilus nuttallii	Aves	37	35.4		Yarbrough 1971
Chordeiles minor	Aves	43	28		Yarbrough 1971
Nyctidromus albicollis	Aves	5	23		Yarbrough 1971
Otus trichopsis	Aves	23	26.6		Yarbrough 1971
Micrathene whitneyi	Aves	29	27.2		Yarbrough 1971
Glaucidium gnoma	Aves	24	26		Yarbrough 1971
Aegolius acadicus	Aves	45	20		Yarbrough 1971
Taeniopygia castanotis	Aves		30.5		Yarbrough 1971
Estrilda troglodytes	Aves	11	28		Yarbrough 1971
Vidua paradisea	Aves	9	31		Yarbrough 1971
Eugenes fulgens	Aves	21	30.5		Yarbrough 1971
Lampornis clemenciae	Aves	23	31		Yarbrough 1971
Patagona gigas	Aves	20	27		Yarbrough 1971
Hesperiphona vespertina	Aves	47	15.5		Yarbrough 1971
Cyanocitta cristata	Aves	43	12.2		Yarbrough 1971
Loxia leucoptera	Aves	56	14		Yarbrough 1971
Loxia curvirostra	Aves	51	15		Yarbrough 1971
Perisoreus canadensis	Aves	55	7		Yarbrough 1971
Estrilda troglodytes	Aves	11		38	Weathers 1981
Poephila guttata	Aves	25		42	Weathers 1981
Cardinalis sinuata	Aves	28		43	Weathers 1981
Cardinalis cardinalis	Aves	35		42.5	Weathers 1981
Gallus domesticus	Aves			40	Weathers 1981
Eremophila alpestris	Aves	50		40	Weathers 1981
Lonchura malabarica	Aves	23		42	Weathers 1981
Myiopsitta monachus	Aves	30		38.5	Weathers 1981
Cinclus mexicanus	Aves	51		34	Weathers 1981
Melopsittacus undulatus	Aves	26		41	Weathers 1981
Lonchura fuscans	Aves	1		39	Weathers 1981
Molothrus ater	Aves			40	Weathers 1981
Zonotrichia leucophrys	Aves	58		38	Weathers 1981
Geococcyx califorianus	Aves			36	Weathers 1981
Columba livia	Aves	42		36	Weathers 1981
Athene cunicularia	Aves			37	Weathers 1981
Icterus galbula	Aves	43		34.5	Weathers 1981
Pica nutalli	Aves	37		33.5	Weathers 1981
Pica pica	Aves	47		32.5	Weathers 1981
Amphispiza bilineata	Aves	33		36	Weathers 1981
Carpodacus cassinii	Aves	43		37	Weathers 1981

Carpodacus mexicanus	Aves	36		37	Weathers 1981
Agelaius phoeniceus	Aves	44		38	Weathers 1981
Coturnix coturnix	Aves	41		38	Weathers 1981
Lophortyx gambelii	Aves	34		40.5	Weathers 1981
Volatinia jacarina	Aves	8		40	Weathers 1981
Plectroplienax nivalis	Aves	71	9		Scholander et al. 1950
Perisoreus canadensis	Aves	55	-3		Scholander et al. 1950
Troglodytes aedon	Aves	4	25		Scholander et al. 1950
Passer domesticus	Aves	36	22		Scholander et al. 1950
Spizella passerina	Aves	46	24.4		Yarbrough 1971
Ammodramus savannarum	Aves	40	25.3		Yarbrough 1971
Melospiza georgiana	Aves	51	24.1		Yarbrough 1971
Melospiza melodia	Aves	47	24.5		Yarbrough 1971
Passerculus sandwichensis	Aves	53	22.6		Yarbrough 1971
Pooecetes gramineus	Aves	46	22.5		Yarbrough 1971
Zonotrichia albicollis	Aves	53	23.6		Yarbrough 1971
Zonotrichia eucophrys	Aves	30	20.6		Yarbrough 1971
Zonotrichia querula	Aves	64	20.7		Yarbrough 1971
Passerella iliaca	Aves	57	19		Yarbrough 1971
Parula americana	Aves	40	25.7		Yarbrough 1971
Vermivora pinus	Aves	40	26.6		Yarbrough 1971
Vermivora celuta	Aves	30	22.4		Yarbrough 1971
Mniotilta varia	Aves	47	24.9		Yarbrough 1971
Dendroica dominica	Aves	35	25.2		Yarbrough 1971
Dendroica palmarum	Aves	53	23.3		Yarbrough 1971
Dendroica coronata	Aves	53	23.2		Yarbrough 1971
Dendroica pinus	Aves	30	23.4		Yarbrough 1971
Geothlypis trichas	Aves	45	23.8		Yarbrough 1971
Wilsonia citrina	Aves	36	24.9		Yarbrough 1971
Protonotaria citrea	Aves	36	26.9		Yarbrough 1971
Seiurus noveboracensis	Aves	55	25.5		Yarbrough 1971
Seiurus aurocapillus	Aves	47	22.9		Yarbrough 1971
Empidonax virescens	Aves	37	26.3		Yarbrough 1971
Contopus virens	Aves	40	22.2		Yarbrough 1971
Sayornis phoebe	Aves	46	23.3		Yarbrough 1971
Myiarchus crinitus	Aves	40	24.3		Yarbrough 1971
Tyrannus tyrannus	Aves	45	23.7		Yarbrough 1971
Trogon rufus	Aves	5	30		Yarbrough 1971
Cardinalis cardinalis	Aves	35	22.3		Root 1988
Choleopus hoffmani	Mammalia	9	29		Scholander et al. 1950
Procyon cancrivorus	Mammalia	9	28.5		Scholander et al. 1950
Aoutus trivirgatus	Mammalia	9	28		Scholander et al. 1950
Leontocebus geoffroy	Mammalia	9	25		Scholander et al. 1950
Nasua narica	Mammalia	9	22		Scholander et al. 1950
Mustela rixosa	Mammalia	71	17		Scholander et al. 1950
Proechimyus semispinosus	Mammalia	9	23		Scholander et al. 1950
Dicrostonyx groenlandicus	Mammalia	71	16		Scholander et al. 1950
Citellus parryii	Mammalia	71	8		Scholander et al. 1950
Thalarctos niaritimus	Mammalia	71	4		Scholander et al. 1950
Alopex lagopus	Mammalia	71	-40		Scholander et al. 1950
Vulpes vulpes alascensis	Mammalia	60	-13		Irving et al. 1955

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