Supporting Information for "Bayesian hierarchical regression analysis of variations in sea surface temperature change over the past million years"

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1. Caption for Data Set S1

Introduction This supporting information provides R code for the paper's methods. Text S1 includes the method to estimate dating uncertainty described in Section 3. Text S2 includes the Bayesian Hierarchical regressions used in this analysis and described in

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Section 4.2. Tables S1-S4 display regression results cited in the text. Data Set S1 includes all the proxy reconstructions used in this research.

Text S1. As described in Section 3, this research presents a new method to estimate the uncertainty introduced when correlating two independent records using uncertain absolute timescales (R. Samsworth was instrumental in developing this method). The following R code can be used to implement the method.

```
# Step 1:  Define data
# Define desired target time ("time.new"), note time.new should fall within
time.old
# For time series of variable of interest define:  1) time ("time.old"); 2)
uncertainty in time ("time.old.sd"); 3) variable of interest ("variable.old");
and 4) uncertainty in variable of interest ("variable.old.sd").

# Step 2:  Interpolate uncertainty estimates - new timescale
time.old.sd.int ← spline (time.old, time.old.sd, xout = time.new)$y
variable.old.sd.int ← spline (time.old, variable.old.sd, xout = time.new)$y

# Step 3:  Estimate variable of interest at new timescale using weighted averages
variable.new ← rep(NA, length(time.new))
for (i in 1:length(time.new)) variable.new[i] ← ksmooth (time.old, variable.old,
kernel = "normal", bandwidth = time.old.sd.int[i], x.points = time.new[i])[[2]]

# Step 4:  Estimating variance including the variance from the dating uncertainty
```

```
plus from uncertainty in the variable

Residuals ← (variable.old %o% rep(1,length(time.new)) - rep(1,length(time.old))

%o% variable.new)^2

variable.new.var.dating ← rep(NA,length(time.new)) # estimating uncertainty

from dating

for(j in 1:length(time.new)) variable.new.var.dating[j] ← ksmooth (time.old,

Residuals[,j], kernel=‘‘normal", bandwidth= time.old.sd.int[j], x.points =

time.new[j])[[2]]

variable.new.var.total ← (variable.new.var.dating + (variable.old.sd.int)^2

2) # summing variances from both dating uncertainty and variable uncertainty

variable.new.sd ← sqrt(variable.new.var.total)
```

Text S2.

I implement the Bayesian Hierarchical regressions used in this analysis and described in Section 4.2 using the program `JAGS` (Just Another Gibbs Sampler, http://www-fis.iarc.fr/ martyn/software/jags/) via the `rjags` package in the `R` statistical program (http://cran.r-project.org/web/packages/rjags/index.html). The following code follows the same notation as in Section 4.2.1.

```
******* JAGS MODEL ********
model {
#Level One Model:  Loop over all individual observations (yi = Bi * Xi + e)
  for (i in 1:N) {
    y.hat[i] ← inprod (B[group[i],], X[i,]) + inprod (b.0, X.0[i,])
    y[i] ∼ dnorm (y.hat[i], tau.y[i])
    var.y[i] ← sigma.y^2 * se.obs[i]^2
    tau.y[i] ← 1 / var.y[i]
    e.y[i] ← y[i] - y.hat[i]
  }
  Rsquared.y ← 1- ( sd(e.y)^2 ) / (sd(y)^2)
#Level One Model:  Prior for within group variance
  sigma.y ∼ dunif (0, 100)
#Level One Model:  Priors for non-group modeled predictors
  for (k in 1:K.0) {
```

```
    b.0[k] ~ dnorm(0, 1E-4)
  }
#Level Two Model:  Loop over all groups (Bj = Gj * Uj + ee)
  for (j in 1:J){
    for (k in 1:K) {
      B.hat[j,k] <- inprod (G[k,], U[j,])
      E.B[j,k] <- B[j,k] - B.hat[j,k]
    }
  B[j,1:K] ~ dmnorm (B.hat[j,], Tau.B[,])
}
#Level Two Model:  R2-calculation
  for (k in 1:K) {
    Rsquared.B[k] <- 1- ( sd (E.B[,k])^2 ) / (sd(B[,k])^2)
  }
#Level Two Model:  G-matrix prior for group-level coefficients
  for (k in 1:K) {
    for (l in 1:L) {
      G[k,l] ~ dnorm (0, 1E-4)
    }
  }
#Level Two Model:  Covariance matrix using "Scaled Inverse-Wishart Model" for
priors
```

```
  Tau.B[1:K, 1:K] ~ dwish(W[,], df)

  Sigma.B[1:K, 1:K] <- inverse(Tau.B)

  for (k in 1:K) {

    sigma.B[k] <- sqrt(Sigma.B[k,k])

    for (k.prime in 1:K){

      rho.B[k,k.prime] <- Sigma.B[k,k.prime] /

      sqrt(Sigma.B[k,k] * Sigma.B[k.prime,k.prime])

    }

  }

}

***************
```

Data Set S1.

Paleoclimate reconstructions used in this analysis (see Section 2 and Table 1 for references and details). [Uploaded separately as Data_Set_S1.xlsx.]

Table S1. Local SST responsiveness estimated from independent regressions. Regression results from 54 independent regressions of 54 local SST reconstructions with each of eight climate indicators. See Section 4.1.1 for methods and Table 1 for record references. Parentheticals display standard errors.

	c1	c2	c3	c4	c5	c6	c7	c8
Record 1								
Intercept	0.14	0.12	0.16	0.13	0.04	0.11	0.12	0.1
	(0.06)	(0.05)	(0.06)	(0.05)	(0.04)	(0.06)	(0.06)	(0.05)
Responsiveness	0.54	0.67	0.59	0.23	0.23	2.55	2.05	-3.35
	(0.02)	(0.02)	(0.02)	(0.01)	(0)	(0.08)	(0.07)	(0.09)
Adjusted-R2	0.8	0.83	0.79	0.85	0.9	0.8	0.8	0.86
Record 2								
Intercept	0.11	0.12	0.12	0.01	0.07	0.13	0.13	0.15
	(0.05)	(0.05)	(0.05)	(0.06)	(0.06)	(0.06)	(0.06)	(0.05)
Responsiveness	0.09	0.12	0.1	0.03	0.03	0.48	0.39	-0.63
	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.08)	(0.07)	(0.1)
Adjusted-R2	0.34	0.37	0.36	0.19	0.21	0.32	0.32	0.36
Record 3								
Intercept	0.02	0.02	0.03	-0.02	0.02	0.04	0.04	0.08
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Responsiveness	0.12	0.16	0.15	0.06	0.05	0.63	0.52	-0.81
	(0.01)	(0.01)	(0.01)	(0.01)	(0)	(0.05)	(0.04)	(0.06)
Adjusted-R2	0.61	0.64	0.66	0.58	0.57	0.57	0.58	0.62
Record 4								
Intercept	0.37	0.51	0.55	0.02	0.11	0.35	0.36	1.02
	(0.05)	(0.07)	(0.08)	(0.08)	(0.09)	(0.06)	(0.06)	(0.04)
Responsiveness	0.22	0.34	0.25	0.13	0.15	1.04	0.84	-2.09
	(0.02)	(0.03)	(0.03)	(0.02)	(0.01)	(0.09)	(0.07)	(0.05)
Adjusted-R2	0.4	0.53	0.36	0.54	0.68	0.34	0.35	0.7
Record 5								
Intercept	0.65	0.51	0.6	0.01	0.01	0.63	0.63	0.69
	(0.07)	(0.08)	(0.1)	(0.14)	(0.11)	(0.08)	(0.08)	(0.07)
Responsiveness	0.28	0.35	0.24	0.13	0.14	1.39	1.13	-2.08
	(0.02)	(0.03)	(0.03)	(0.02)	(0.01)	(0.12)	(0.1)	(0.14)
Adjusted-R2	0.31	0.44	0.26	0.53	0.61	0.29	0.3	0.41
Record 6								
Intercept	0.13	0.14	0.16	-0.03	-0.04	0.18	0.18	0.21
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.05)
Responsiveness	0.19	0.23	0.18	0.07	0.07	0.86	0.69	-1.09
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.07)	(0.05)	(0.09)
Adjusted-R2	0.74	0.7	0.63	0.66	0.63	0.59	0.59	0.55
Record 7								
Intercept	-0.03	0.14	0.17	0.04	-0.03	0.01	0	0.04
	(0.04)	(0.07)	(0.07)	(0.07)	(0.06)	(0.04)	(0.04)	(0.03)
Responsiveness	0.2	0.14	0.16	0.11	0.1	0.8	0.66	-2.95
	(0.01)	(0.03)	(0.02)	(0.01)	(0.01)	(0.07)	(0.05)	(0.03)
Adjusted-R2	0.41	0.15	0.25	0.64	0.68	0.3	0.32	0.81
Record 8								
Intercept	0.02	0.08	0.2	-0.03	0.03	-0.08	-0.06	0.06
	(0.07)	(0.09)	(0.07)	(0.12)	(0.11)	(0.07)	(0.07)	(0.05)
Responsiveness	0.41	0.44	0.45	0.19	0.17	2.06	1.7	-3.27
	(0.02)	(0.03)	(0.03)	(0.02)	(0.01)	(0.11)	(0.09)	(0.13)
Adjusted-R2	0.65	0.48	0.65	0.65	0.63	0.62	0.64	0.77
Record 9								
Intercept	0.13	0.15	0.19	-0.1	-0.07	0.18	0.19	0.2
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.05)	(0.05)	(0.05)
Responsiveness	0.48	0.58	0.5	0.17	0.16	1.98	1.64	-2.77
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.07)	(0.06)	(0.1)
Adjusted-R2	0.71	0.69	0.64	0.57	0.53	0.5	0.52	0.52
Record 10								

Intercept	0.15	0.11	0.14	0	0.15	0.11	0.12	0.14
	(0.04)	(0.04)	(0.04)	(0.03)	(0.04)	(0.04)	(0.04)	(0.03)
Responsiveness	0.41	0.53	0.45	0.18	0.19	2.23	1.79	-3.15
	(0.01)	(0.01)	(0.01)	(0)	(0)	(0.05)	(0.04)	(0.05)
Adjusted-R2	0.66	0.73	0.65	0.76	0.71	0.75	0.75	0.84
Record 11								
Intercept	0.19	0.2	0.25	0.01	0.14	0.23	0.24	0.32
	(0.05)	(0.05)	(0.06)	(0.06)	(0.06)	(0.05)	(0.05)	(0.05)
Responsiveness	0.4	0.51	0.43	0.15	0.18	2.11	1.7	-2.76
	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.08)	(0.06)	(0.09)
Adjusted-R2	0.84	0.86	0.77	0.82	0.83	0.85	0.85	0.87
Record 12								
Intercept	0.1	0.09	0.11	-0.01	0.09	0.09	0.1	0.08
	(0.05)	(0.05)	(0.05)	(0.04)	(0.05)	(0.05)	(0.05)	(0.04)
Responsiveness	0.22	0.27	0.22	0.08	0.09	1.08	0.86	-1.7
	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.08)	(0.06)	(0.08)
Adjusted-R2	0.6	0.64	0.53	0.58	0.59	0.62	0.61	0.78
Record 13								
Intercept	0.22	0.19	0.25	0.11	-0.06	0.22	0.21	0.19
	(0.1)	(0.09)	(0.1)	(0.1)	(0.12)	(0.1)	(0.1)	(0.09)
Responsiveness	0.46	0.63	0.5	0.26	0.23	2.46	2.03	-3.58
	(0.03)	(0.03)	(0.03)	(0.02)	(0.02)	(0.16)	(0.13)	(0.19)
Adjusted-R2	0.64	0.72	0.66	0.8	0.73	0.64	0.66	0.72
Record 14								
Intercept	-0.52	-0.11	-0.04	0	0.1	-0.69	-0.67	-0.56
	(0.16)	(0.15)	(0.14)	(0.24)	(0.2)	(0.17)	(0.17)	(0.15)
Responsiveness	0.37	0.38	0.37	0.15	0.14	1.6	1.32	-2.63
	(0.05)	(0.06)	(0.05)	(0.03)	(0.03)	(0.28)	(0.22)	(0.34)
Adjusted-R2	0.36	0.38	0.48	0.48	0.52	0.26	0.27	0.39
Record 15								
Intercept	0.24	0.24	0.24	0.01	0.11	0.27	0.28	0.32
	(0.08)	(0.08)	(0.08)	(0.07)	(0.08)	(0.08)	(0.08)	(0.08)
Responsiveness	0.18	0.24	0.19	0.05	0.07	0.93	0.73	-1.11
	(0.02)	(0.03)	(0.02)	(0.01)	(0.01)	(0.12)	(0.1)	(0.17)
Adjusted-R2	0.35	0.38	0.36	0.2	0.28	0.34	0.33	0.28
Record 16								
Intercept	0.16	0.15	0.18	0.04	0.13	0.18	0.19	0.2
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Responsiveness	0.57	0.71	0.6	0.21	0.22	2.64	2.1	-3.84
	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.08)	(0.06)	(0.09)
Adjusted-R2	0.58	0.63	0.59	0.51	0.53	0.54	0.53	0.66
Record 17								
Intercept	0.44	0.47	0.5	-0.03	-0.08	0.51	0.52	0.55
	(0.11)	(0.12)	(0.12)	(0.14)	(0.12)	(0.12)	(0.12)	(0.12)
Responsiveness	0.31	0.38	0.3	0.16	0.16	1.46	1.18	-2.04
	(0.03)	(0.04)	(0.04)	(0.02)	(0.02)	(0.19)	(0.15)	(0.25)
Adjusted-R2	0.46	0.45	0.37	0.54	0.63	0.4	0.4	0.43
Record 18								
Intercept	0.77	0.75	0.79	-0.02	0.04	0.78	0.79	0.86
	(0.12)	(0.12)	(0.13)	(0.13)	(0.12)	(0.12)	(0.12)	(0.12)
Responsiveness	0.31	0.4	0.32	0.18	0.18	1.6	1.28	-2.22
	(0.04)	(0.05)	(0.04)	(0.02)	(0.02)	(0.2)	(0.17)	(0.27)
Adjusted-R2	0.37	0.4	0.36	0.58	0.67	0.38	0.37	0.4
Record 19								
Intercept	0.3	0.32	0.38	-0.01	0.2	0.35	0.37	0.46
	(0.11)	(0.1)	(0.12)	(0.1)	(0.11)	(0.11)	(0.11)	(0.1)
Responsiveness	0.4	0.52	0.41	0.17	0.18	2.04	1.63	-2.99

	(0.03)	(0.04)	(0.04)	(0.02)	(0.02)	(0.18)	(0.15)	(0.21)
Adjusted-R2	0.61	0.65	0.54	0.61	0.65	0.59	0.58	0.7
Record 20								
Intercept	0.19	0.15	0.22	0.14	0.15	0.16	0.16	0.13
	(0.07)	(0.06)	(0.07)	(0.08)	(0.07)	(0.07)	(0.07)	(0.04)
Responsiveness	0.58	0.74	0.67	0.24	0.24	2.9	2.4	-4.37
	(0.02)	(0.03)	(0.02)	(0.01)	(0.01)	(0.11)	(0.09)	(0.1)
Adjusted-R2	0.68	0.74	0.72	0.57	0.62	0.7	0.71	0.87
Record 21								
Intercept	-0.01	-0.01	0.03	-0.06	0.08	0.05	0.06	0.14
	(0.1)	(0.09)	(0.1)	(0.13)	(0.11)	(0.1)	(0.1)	(0.1)
Responsiveness	0.35	0.46	0.37	0.13	0.15	1.81	1.46	-2.28
	(0.03)	(0.03)	(0.03)	(0.02)	(0.01)	(0.15)	(0.12)	(0.21)
Adjusted-R2	0.6	0.65	0.59	0.44	0.6	0.6	0.6	0.57
Record 22								
Intercept	0.03	0.03	0.05	0	-0.01	0.08	0.09	0.13
	(0.08)	(0.07)	(0.08)	(0.08)	(0.07)	(0.09)	(0.09)	(0.08)
Responsiveness	0.42	0.55	0.47	0.19	0.2	2.15	1.76	-3.04
	(0.02)	(0.03)	(0.03)	(0.01)	(0.01)	(0.14)	(0.11)	(0.16)
Adjusted-R2	0.77	0.82	0.76	0.75	0.85	0.71	0.72	0.77
Record 23								
Intercept	0.1	0.09	0.13	0.01	0.11	0.1	0.11	0.14
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)
Responsiveness	0.24	0.31	0.25	0.1	0.11	1.27	1.02	-1.79
	(0.01)	(0.01)	(0.01)	(0)	(0)	(0.02)	(0.02)	(0.03)
Adjusted-R2	0.6	0.65	0.51	0.62	0.69	0.71	0.7	0.79
Record 24								
Intercept	-0.07	-0.09	-0.1	-0.03	0	-0.06	-0.06	-0.09
	(0.05)	(0.06)	(0.05)	(0.06)	(0.06)	(0.05)	(0.05)	(0.04)
Responsiveness	0.21	0.23	0.21	0.1	0.11	0.91	0.75	-1
	(0.02)	(0.03)	(0.02)	(0.01)	(0.01)	(0.08)	(0.06)	(0.1)
Adjusted-R2	0.46	0.39	0.5	0.6	0.74	0.39	0.41	0.23
Record 25								
Intercept	0.11	0.09	0.08	-0.04	0.05	0.04	0.05	0.12
	(0.04)	(0.05)	(0.04)	(0.05)	(0.05)	(0.04)	(0.04)	(0.04)
Responsiveness	0.31	0.3	0.33	0.12	0.13	1.48	1.21	-1.97
	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.07)	(0.05)	(0.1)
Adjusted-R2	0.77	0.53	0.75	0.79	0.82	0.71	0.71	0.67
Record 26								
Intercept	0.11	0.1	0.11	-0.01	0.05	0.13	0.13	0.16
	(0.02)	(0.02)	(0.03)	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)
Responsiveness	0.28	0.35	0.3	0.08	0.09	1.25	1.02	-1.67
	(0.01)	(0.01)	(0.01)	(0)	(0)	(0.05)	(0.04)	(0.07)
Adjusted-R2	0.79	0.77	0.75	0.71	0.75	0.63	0.63	0.56
Record 27								
Intercept	0	0	0.05	-0.01	-0.06	0.04	0.05	0.05
	(0.08)	(0.08)	(0.08)	(0.1)	(0.08)	(0.07)	(0.07)	(0.06)
Responsiveness	0.28	0.34	0.29	0.16	0.15	1.52	1.25	-2.28
	(0.03)	(0.03)	(0.03)	(0.01)	(0.01)	(0.12)	(0.1)	(0.14)
Adjusted-R2	0.56	0.52	0.59	0.77	0.82	0.64	0.65	0.75
Record 28								
Intercept	-0.04	-0.03	-0.03	0	-0.02	-0.02	-0.02	-0.03
	(0.04)	(0.04)	(0.04)	(0.04)	(0.05)	(0.04)	(0.04)	(0.03)
Responsiveness	0.28	0.31	0.27	0.1	0.09	1.18	0.97	-1.73
	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.09)	(0.07)	(0.1)
Adjusted-R2	0.65	0.62	0.7	0.6	0.48	0.6	0.62	0.72
Record 29								

Intercept	0.16	0.12	0.16	-0.03	-0.05	0.19	0.19	0.3
	(0.03)	(0.04)	(0.04)	(0.06)	(0.06)	(0.03)	(0.03)	(0.03)
Responsiveness	0.24	0.28	0.26	0.13	0.11	1.06	0.87	-1.5
	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.06)	(0.04)	(0.06)
Adjusted-R2	0.65	0.69	0.74	0.79	0.75	0.52	0.54	0.51
Record 30								
Intercept	0.1	0.11	0.18	0.01	0	0.08	0.07	0.09
	(0.05)	(0.05)	(0.05)	(0.07)	(0.07)	(0.05)	(0.05)	(0.05)
Responsiveness	0.2	0.26	0.2	0.1	0.1	0.96	0.8	-1.45
	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.09)	(0.08)	(0.11)
Adjusted-R2	0.5	0.6	0.47	0.68	0.65	0.45	0.47	0.59
Record 31								
Intercept	0.15	0.18	0.2	0.01	0.07	0.16	0.17	0.2
	(0.04)	(0.05)	(0.05)	(0.07)	(0.06)	(0.05)	(0.05)	(0.05)
Responsiveness	0.19	0.21	0.19	0.09	0.1	0.83	0.69	-1.15
	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)	(0.08)	(0.06)	(0.1)
Adjusted-R2	0.57	0.45	0.51	0.64	0.7	0.45	0.46	0.46
Record 32								
Intercept	0.09	0.06	0.1	-0.01	0.05	0.1	0.1	0.17
	(0.04)	(0.03)	(0.04)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Responsiveness	0.3	0.42	0.33	0.14	0.15	1.66	1.36	-2.28
	(0.01)	(0.01)	(0.01)	(0)	(0)	(0.05)	(0.04)	(0.07)
Adjusted-R2	0.7	0.82	0.71	0.81	0.81	0.79	0.8	0.8
Record 33								
Intercept	0.11	0.1	0.12	-0.02	0.01	0.03	0.04	0.07
	(0.04)	(0.07)	(0.04)	(0.06)	(0.06)	(0.05)	(0.05)	(0.05)
Responsiveness	0.51	0.46	0.54	0.21	0.19	2.39	1.96	-3.13
	(0.01)	(0.03)	(0.01)	(0.01)	(0.01)	(0.07)	(0.06)	(0.11)
Adjusted-R2	0.83	0.47	0.84	0.81	0.8	0.74	0.75	0.67
Record 34								
Intercept	0.18	0.27	0.23	0.14	-0.1	0.23	0.23	0.34
	(0.14)	(0.15)	(0.15)	(0.13)	(0.14)	(0.15)	(0.15)	(0.14)
Responsiveness	0.28	0.34	0.28	0.19	0.15	1.25	1.04	-1.97
	(0.04)	(0.06)	(0.05)	(0.02)	(0.02)	(0.25)	(0.2)	(0.32)
Adjusted-R2	0.5	0.47	0.42	0.87	0.74	0.39	0.41	0.5
Record 35								
Intercept	-0.14	-0.18	-0.02	-0.23	0	-0.15	-0.15	-0.08
	(0.17)	(0.18)	(0.17)	(0.31)	(0.23)	(0.19)	(0.18)	(0.16)
Responsiveness	0.31	0.35	0.32	0.16	0.15	1.29	1.14	-2.1
	(0.06)	(0.08)	(0.06)	(0.04)	(0.03)	(0.31)	(0.25)	(0.38)
Adjusted-R2	0.52	0.47	0.5	0.61	0.68	0.41	0.46	0.57
Record 36								
Intercept	0	0.01	0.02	0.01	0.02	0	0.01	0.05
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Responsiveness	0.14	0.18	0.14	0.06	0.06	0.77	0.62	-1
	(0.01)	(0.01)	(0.01)	(0)	(0)	(0.04)	(0.03)	(0.06)
Adjusted-R2	0.67	0.71	0.55	0.6	0.7	0.75	0.74	0.66
Record 37								
Intercept	-0.12	-0.12	-0.11	0	-0.01	-0.12	-0.12	-0.1
	(0.02)	(0.03)	(0.03)	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)
Responsiveness	0.2	0.21	0.15	0.1	0.1	0.8	0.67	-1.05
	(0.01)	(0.01)	(0.01)	(0)	(0)	(0.05)	(0.04)	(0.07)
Adjusted-R2	0.39	0.33	0.26	0.7	0.74	0.32	0.33	0.3
Record 38								
Intercept	0	0	0.02	0.01	0.07	0.01	0.02	0.08
	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.01)	(0.02)
Responsiveness	0.25	0.33	0.3	0.1	0.09	1.29	1.04	-1.64

	(0)	(0)	(0)	(0)	(0)	(0.02)	(0.02)	(0.03)
Adjusted-R2	0.75	0.85	0.83	0.79	0.7	0.8	0.81	0.8
Record 39								
Intercept	0.01	0.02	0.02	0.02	0	0.04	0.05	0.11
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.06)	(0.06)	(0.05)
Responsiveness	0.32	0.42	0.34	0.14	0.15	1.68	1.35	-2.27
	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.1)	(0.08)	(0.13)
Adjusted-R2	0.69	0.7	0.72	0.69	0.68	0.64	0.64	0.65
Record 40								
Intercept	-0.18	-0.08	-0.08	-0.06	-0.09	0.04	0.03	0.09
	(0.16)	(0.17)	(0.17)	(0.21)	(0.22)	(0.19)	(0.18)	(0.22)
Responsiveness	0.74	0.91	0.79	0.33	0.31	3.79	3.03	-4.67
	(0.04)	(0.06)	(0.05)	(0.03)	(0.03)	(0.28)	(0.22)	(0.45)
Adjusted-R2	0.78	0.75	0.76	0.62	0.58	0.7	0.71	0.58
Record 41								
Intercept	-0.47	-0.39	-0.34	-0.07	-0.09	-0.42	-0.43	-0.47
	(0.11)	(0.13)	(0.12)	(0.09)	(0.1)	(0.12)	(0.12)	(0.11)
Responsiveness	0.44	0.43	0.4	0.2	0.25	1.91	1.55	-2.67
	(0.04)	(0.05)	(0.04)	(0.02)	(0.02)	(0.19)	(0.15)	(0.24)
Adjusted-R2	0.52	0.35	0.42	0.77	0.81	0.44	0.45	0.49
Record 42								
Intercept	-0.05	-0.03	-0.05	-0.03	0.06	0	0.02	0.15
	(0.11)	(0.1)	(0.12)	(0.09)	(0.08)	(0.09)	(0.09)	(0.07)
Responsiveness	0.55	0.76	0.54	0.32	0.31	3.23	2.63	-4.76
	(0.03)	(0.04)	(0.04)	(0.01)	(0.01)	(0.15)	(0.12)	(0.15)
Adjusted-R2	0.5	0.59	0.42	0.8	0.82	0.65	0.65	0.78
Record 43								
Intercept	-0.01	-0.06	0.03	0	-0.08	-0.04	-0.03	-0.06
	(0.04)	(0.04)	(0.04)	(0.05)	(0.06)	(0.05)	(0.05)	(0.06)
Responsiveness	0.48	0.59	0.53	0.2	0.19	2.32	1.85	-3.03
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.07)	(0.06)	(0.1)
Adjusted-R2	0.89	0.9	0.88	0.82	0.8	0.83	0.84	0.81
Record 44								
Intercept	0.13	0.13	0.21	-0.05	-0.04	0.21	0.22	0.25
	(0.05)	(0.06)	(0.05)	(0.09)	(0.08)	(0.06)	(0.06)	(0.06)
Responsiveness	0.32	0.35	0.32	0.11	0.1	1.39	1.16	-1.84
	(0.02)	(0.03)	(0.02)	(0.02)	(0.01)	(0.11)	(0.09)	(0.15)
Adjusted-R2	0.61	0.47	0.57	0.45	0.47	0.48	0.5	0.47
Record 45								
Intercept	0.81	0.31	0.36	-0.2	0	0.92	0.93	0.96
	(0.09)	(0.11)	(0.11)	(0.14)	(0.15)	(0.09)	(0.09)	(0.09)
Responsiveness	0.21	0.29	0.26	0.14	0.15	0.84	0.69	-1.13
	(0.03)	(0.04)	(0.03)	(0.02)	(0.02)	(0.14)	(0.11)	(0.19)
Adjusted-R2	0.29	0.39	0.46	0.69	0.7	0.19	0.19	0.18
Record 46								
Intercept	0.02	0.03	0.09	0.04	-0.1	0.11	0.12	0.17
	(0.12)	(0.13)	(0.13)	(0.17)	(0.15)	(0.14)	(0.14)	(0.15)
Responsiveness	0.38	0.47	0.38	0.15	0.16	1.7	1.37	-2.09
	(0.04)	(0.05)	(0.04)	(0.03)	(0.02)	(0.21)	(0.17)	(0.29)
Adjusted-R2	0.54	0.53	0.45	0.31	0.4	0.4	0.4	0.35
Record 47								
Intercept	0.23	0.21	0.24	0.04	0.1	0.25	0.26	0.34
	(0.09)	(0.09)	(0.1)	(0.08)	(0.09)	(0.09)	(0.09)	(0.09)
Responsiveness	0.25	0.32	0.25	0.14	0.13	1.31	1.05	-1.72
	(0.02)	(0.03)	(0.03)	(0.01)	(0.01)	(0.13)	(0.1)	(0.18)
Adjusted-R2	0.59	0.6	0.52	0.72	0.7	0.6	0.59	0.57
Record 48								

Intercept	-0.14	-0.1	-0.07	0.14	-0.06	-0.08	-0.07	-0.05
	(0.15)	(0.15)	(0.15)	(0.19)	(0.18)	(0.13)	(0.13)	(0.13)
Responsiveness	0.25	0.32	0.29	0.11	0.11	1.46	1.16	-1.91
	(0.04)	(0.05)	(0.05)	(0.03)	(0.02)	(0.19)	(0.15)	(0.24)
Adjusted-R2	0.48	0.49	0.47	0.36	0.38	0.59	0.58	0.59
Record 49								
Intercept	-0.89	-0.74	-0.73	-0.25	-0.31	-0.94	-0.93	-0.91
	(0.12)	(0.13)	(0.14)	(0.24)	(0.2)	(0.13)	(0.13)	(0.13)
Responsiveness	0.26	0.28	0.24	0.19	0.19	1.03	0.84	-1.66
	(0.04)	(0.05)	(0.05)	(0.03)	(0.03)	(0.2)	(0.16)	(0.28)
Adjusted-R2	0.31	0.23	0.24	0.52	0.6	0.21	0.21	0.26
Record 50								
Intercept	-0.1	-0.23	-0.16	0.1	0.04	-0.25	-0.22	-0.08
	(0.22)	(0.2)	(0.21)	(0.14)	(0.15)	(0.22)	(0.21)	(0.18)
Responsiveness	0.44	0.53	0.49	0.14	0.12	1.97	1.62	-2.89
	(0.07)	(0.07)	(0.07)	(0.02)	(0.02)	(0.3)	(0.23)	(0.34)
Adjusted-R2	0.68	0.74	0.72	0.82	0.76	0.69	0.71	0.79
Record 51								
Intercept	-0.27	-0.22	-0.22	0.08	-0.23	-0.28	-0.26	-0.26
	(0.2)	(0.2)	(0.2)	(0.21)	(0.18)	(0.24)	(0.23)	(0.19)
Responsiveness	0.52	0.62	0.57	0.24	0.23	2.12	1.79	-3.51
	(0.07)	(0.08)	(0.08)	(0.03)	(0.03)	(0.38)	(0.3)	(0.4)
Adjusted-R2	0.64	0.63	0.63	0.69	0.72	0.48	0.51	0.69
Record 52								
Intercept	-0.32	-0.34	-0.2	-0.28	-0.53	-0.39	-0.4	-0.47
	(0.19)	(0.19)	(0.18)	(0.19)	(0.2)	(0.24)	(0.23)	(0.2)
Responsiveness	0.57	0.66	0.66	0.29	0.23	2.28	1.95	-3.68
	(0.06)	(0.07)	(0.07)	(0.03)	(0.02)	(0.36)	(0.28)	(0.4)
Adjusted-R2	0.68	0.67	0.71	0.79	0.69	0.51	0.54	0.67
Record 53								
Intercept	-0.11	-0.12	-0.15	0.15	0.15	-0.17	-0.15	-0.12
	(0.27)	(0.27)	(0.32)	(0.26)	(0.27)	(0.22)	(0.22)	(0.27)
Responsiveness	0.39	0.5	0.35	0.17	0.19	2.18	1.76	-3
	(0.08)	(0.1)	(0.1)	(0.04)	(0.03)	(0.31)	(0.26)	(0.5)
Adjusted-R2	0.57	0.59	0.41	0.59	0.68	0.73	0.72	0.65
Record 54								
Intercept	0.41	0.31	0.48	0.01	0.25	0.23	0.25	0.28
	(0.13)	(0.13)	(0.16)	(0.1)	(0.14)	(0.11)	(0.11)	(0.13)
Responsiveness	0.65	0.8	0.67	0.21	0.26	3.09	2.52	-4.15
	(0.04)	(0.05)	(0.06)	(0.01)	(0.02)	(0.16)	(0.13)	(0.27)
Adjusted-R2	0.71	0.73	0.56	0.73	0.67	0.81	0.79	0.72

Table S2. Change in local SST responsiveness over latitude from a single regression. Regression results from a single regression of 54 estimates of local SST reconstructions (from Table S1) against $\sin^2$(latitude), repeated for each of eight climate indicators. See Section 4.1.2 for methods and Table 1 for record references. Parentheticals display standard errors.

Label	c1	c2	c3	c4	c5	c6	c7	c8
Intercept	0.22	0.29	0.25	0.09	0.09	1.12	0.91	-1.79
	(0.01)	(0.01)	(0.01)	(0)	(0.01)	(0.06)	(0.05)	(0.11)
Coefficient for $\sin^2$(latitude)	0.46	0.54	0.44	0.19	0.2	2.14	1.73	-2.65
	(0.05)	(0.07)	(0.06)	(0.02)	(0.02)	(0.27)	(0.22)	(0.52)
Adjusted-R2	0.62	0.55	0.49	0.6	0.57	0.54	0.54	0.32

Table S3. Bayesian hierarchical regressions of local SST responsiveness over latitude, repeated for each of eight climate indicators. Level One model estimates local SST responsiveness for 54 SST reconstructions. Level Two model estimates the effect of $\sin^2$(latitude) on local SST responsiveness. See Section 4.2 for methods and Table 1 for record references. Parentheticals display 95% intervals.

	c1	c2	c3	c4	c5	c6	c7	c8
Level One Model Estimates								
Record 1: Intercept	0.13	0.11	0.15	0.12	0.04	0.11	0.12	0.1
	(0.01 to 0.26)	(-0.01 to 0.24)	(0.03 to 0.28)	(0.01 to 0.22)	(-0.08 to 0.15)	(-0.02 to 0.24)	(-0.01 to 0.25)	(-0.01 to 0.22)
Record 1: Responsiveness	0.53	0.67	0.58	0.69	0.68	2.53	2.03	-3.33
	(0.49 to 0.57)	(0.62 to 0.72)	(0.54 to 0.63)	(0.64 to 0.73)	(0.64 to 0.73)	(2.34 to 2.73)	(1.88 to 2.19)	(-3.55 to -3.11)
Record 2: Intercept	0.11	0.11	0.12	0	0.06	0.12	0.12	0.15
	(-0.07 to 0.29)	(-0.06 to 0.28)	(-0.07 to 0.3)	(-0.17 to 0.17)	(-0.12 to 0.24)	(-0.07 to 0.31)	(-0.06 to 0.31)	(-0.02 to 0.33)
Record 2: Responsiveness	0.1	0.13	0.11	0.1	0.11	0.54	0.43	-0.69
	(0.04 to 0.15)	(0.06 to 0.2)	(0.05 to 0.17)	(0.02 to 0.19)	(0.03 to 0.19)	(0.25 to 0.82)	(0.2 to 0.66)	(-1.03 to -0.36)
Record 3: Intercept	0.03	0.03	0.04	-0.01	0.02	0.04	0.04	0.08
	(-0.11 to 0.16)	(-0.11 to 0.16)	(-0.1 to 0.18)	(-0.15 to 0.12)	(-0.12 to 0.16)	(-0.1 to 0.19)	(-0.1 to 0.18)	(-0.05 to 0.21)
Record 3: Responsiveness	0.13	0.16	0.15	0.18	0.16	0.65	0.54	-0.84
	(0.08 to 0.17)	(0.11 to 0.22)	(0.1 to 0.2)	(0.11 to 0.24)	(0.1 to 0.22)	(0.43 to 0.88)	(0.36 to 0.71)	(-1.09 to -0.59)
Record 4: Intercept	0.36	0.49	0.52	0.01	0.09	0.34	0.35	1.01
	(0.26 to 0.46)	(0.35 to 0.62)	(0.38 to 0.65)	(-0.15 to 0.18)	(-0.07 to 0.26)	(0.23 to 0.44)	(0.24 to 0.46)	(0.93 to 1.08)
Record 4: Responsiveness	0.23	0.35	0.25	0.39	0.46	1.06	0.85	-2.1
	(0.19 to 0.26)	(0.29 to 0.4)	(0.21 to 0.3)	(0.3 to 0.49)	(0.38 to 0.54)	(0.89 to 1.21)	(0.72 to 0.98)	(-2.19 to -2.02)
Record 5: Intercept	0.63	0.48	0.57	0	0.01	0.61	0.61	0.68
	(0.53 to 0.73)	(0.36 to 0.61)	(0.43 to 0.7)	(-0.18 to 0.19)	(-0.18 to 0.19)	(0.51 to 0.71)	(0.51 to 0.71)	(0.59 to 0.77)
Record 5: Responsiveness	0.28	0.36	0.25	0.4	0.43	1.4	1.14	-2.08
	(0.25 to 0.31)	(0.31 to 0.4)	(0.2 to 0.29)	(0.32 to 0.48)	(0.34 to 0.51)	(1.24 to 1.57)	(1.01 to 1.27)	(-2.27 to -1.89)
Record 6: Intercept	0.13	0.14	0.16	-0.03	-0.03	0.17	0.18	0.21
	(-0.01 to 0.27)	(0 to 0.28)	(0.02 to 0.31)	(-0.17 to 0.12)	(-0.18 to 0.12)	(0.03 to 0.32)	(0.03 to 0.32)	(0.07 to 0.34)
Record 6: Responsiveness	0.19	0.23	0.18	0.23	0.23	0.87	0.7	-1.11
	(0.14 to 0.23)	(0.18 to 0.28)	(0.14 to 0.23)	(0.16 to 0.29)	(0.16 to 0.29)	(0.65 to 1.09)	(0.53 to 0.87)	(-1.38 to -0.84)
Record 7: Intercept	-0.03	0.13	0.16	0.03	-0.01	0.01	0	0.05
	(-0.12 to 0.07)	(0 to 0.27)	(0.02 to 0.31)	(-0.15 to 0.2)	(-0.2 to 0.17)	(-0.09 to 0.11)	(-0.1 to 0.1)	(-0.01 to 0.11)
Record 7: Responsiveness	0.2	0.15	0.16	0.33	0.29	0.8	0.67	-2.94
	(0.17 to 0.23)	(0.09 to 0.2)	(0.11 to 0.21)	(0.22 to 0.43)	(0.2 to 0.38)	(0.65 to 0.95)	(0.55 to 0.78)	(-3 to -2.88)
Record 8: Intercept	0.03	0.08	0.2	-0.03	0.03	-0.06	-0.05	0.07
	(-0.09 to 0.15)	(-0.04 to 0.21)	(0.07 to 0.33)	(-0.19 to 0.14)	(-0.14 to 0.2)	(-0.18 to 0.07)	(-0.17 to 0.08)	(-0.04 to 0.18)
Record 8: Responsiveness	0.41	0.44	0.45	0.55	0.5	2.02	1.68	-3.22
	(0.37 to 0.45)	(0.39 to 0.49)	(0.41 to 0.5)	(0.47 to 0.64)	(0.43 to 0.58)	(1.83 to 2.21)	(1.52 to 1.83)	(-3.47 to -2.96)
Record 9: Intercept	0.13	0.14	0.19	-0.1	-0.07	0.17	0.18	0.2
	(0.06 to 0.2)	(0.08 to 0.21)	(0.12 to 0.25)	(-0.16 to -0.03)	(-0.13 to 0)	(0.1 to 0.24)	(0.12 to 0.25)	(0.14 to 0.26)
Record 9: Responsiveness	0.48	0.58	0.5	0.52	0.49	1.99	1.64	-2.78
	(0.46 to 0.5)	(0.56 to 0.61)	(0.48 to 0.53)	(0.48 to 0.55)	(0.46 to 0.52)	(1.88 to 2.09)	(1.56 to 1.73)	(-2.91 to -2.65)
Record 10: Intercept	0.14	0.11	0.14	0	0.14	0.11	0.11	0.14
	(0.08 to 0.21)	(0.05 to 0.18)	(0.07 to 0.21)	(-0.06 to 0.07)	(0.08 to 0.21)	(0.04 to 0.18)	(0.05 to 0.18)	(0.08 to 0.2)
Record 10: Responsiveness	0.41	0.53	0.45	0.55	0.57	2.23	1.79	-3.15
	(0.39 to 0.43)	(0.51 to 0.55)	(0.43 to 0.47)	(0.53 to 0.58)	(0.55 to 0.6)	(2.13 to 2.32)	(1.72 to 1.87)	(-3.27 to -3.03)
Record 11: Intercept	0.19	0.19	0.25	0.01	0.12	0.24	0.25	0.32
	(0.05 to 0.33)	(0.06 to 0.33)	(0.1 to 0.39)	(-0.14 to 0.16)	(-0.03 to 0.27)	(0.09 to 0.38)	(0.1 to 0.39)	(0.18 to 0.45)
Record 11: Responsiveness	0.4	0.51	0.42	0.46	0.53	2.07	1.67	-2.72
	(0.36 to 0.44)	(0.45 to 0.56)	(0.37 to 0.47)	(0.38 to 0.53)	(0.46 to 0.6)	(1.84 to 2.29)	(1.48 to 1.85)	(-2.99 to -2.45)
Record 12: Intercept	0.1	0.09	0.11	-0.01	0.08	0.1	0.1	0.09
	(-0.04 to 0.24)	(-0.04 to 0.23)	(-0.03 to 0.25)	(-0.13 to 0.12)	(-0.05 to 0.21)	(-0.05 to 0.24)	(-0.04 to 0.24)	(-0.04 to 0.22)
Record 12: Responsiveness	0.22	0.27	0.22	0.26	0.28	1.08	0.86	-1.69
	(0.17 to 0.26)	(0.22 to 0.33)	(0.17 to 0.27)	(0.19 to 0.33)	(0.22 to 0.35)	(0.85 to 1.31)	(0.68 to 1.05)	(-1.99 to -1.4)
Record 13: Intercept	0.2	0.18	0.23	0.08	-0.04	0.21	0.21	0.19
	(0.05 to 0.36)	(0.03 to 0.33)	(0.07 to 0.39)	(-0.1 to 0.25)	(-0.23 to 0.14)	(0.05 to 0.38)	(0.05 to 0.37)	(0.04 to 0.34)
Record 13: Responsiveness	0.46	0.63	0.5	0.76	0.69	2.45	2.02	-3.55
	(0.42 to 0.51)	(0.57 to 0.68)	(0.45 to 0.55)	(0.66 to 0.85)	(0.6 to 0.77)	(2.2 to 2.7)	(1.82 to 2.23)	(-3.87 to -3.24)
Record 14: Intercept	-0.47	-0.1	-0.03	0	0.06	-0.64	-0.62	-0.52
	(-0.64 to -0.31)	(-0.28 to 0.08)	(-0.22 to 0.16)	(-0.23 to 0.24)	(-0.18 to 0.3)	(-0.81 to -0.47)	(-0.79 to -0.45)	(-0.68 to -0.37)
Record 14: Responsiveness	0.37	0.39	0.38	0.45	0.45	1.62	1.33	-2.65
	(0.31 to 0.42)	(0.31 to 0.46)	(0.31 to 0.45)	(0.33 to 0.58)	(0.33 to 0.57)	(1.34 to 1.89)	(1.11 to 1.56)	(-3 to -2.31)
Record 15: Intercept	0.23	0.23	0.23	0.01	0.09	0.26	0.26	0.31
	(0.08 to 0.38)	(0.08 to 0.37)	(0.07 to 0.38)	(-0.13 to 0.15)	(-0.05 to 0.24)	(0.1 to 0.41)	(0.11 to 0.42)	(0.17 to 0.45)
Record 15: Responsiveness	0.18	0.24	0.2	0.17	0.23	0.96	0.75	-1.15
	(0.14 to 0.23)	(0.18 to 0.3)	(0.15 to 0.25)	(0.1 to 0.24)	(0.16 to 0.3)	(0.72 to 1.2)	(0.56 to 0.95)	(-1.45 to -0.85)
Record 16: Intercept	0.16	0.15	0.18	0.04	0.13	0.18	0.19	0.2
	(0.1 to 0.21)	(0.09 to 0.21)	(0.12 to 0.24)	(-0.02 to 0.09)	(0.08 to 0.19)	(0.12 to 0.24)	(0.13 to 0.24)	(0.15 to 0.26)
Record 16: Responsiveness	0.57	0.71	0.6	0.63	0.65	2.63	2.1	-3.84
	(0.54 to 0.59)	(0.68 to 0.73)	(0.58 to 0.63)	(0.61 to 0.66)	(0.63 to 0.68)	(2.52 to 2.74)	(2.01 to 2.18)	(-3.97 to -3.7)
Record 17: Intercept	0.41	0.43	0.46	-0.02	-0.05	0.49	0.49	0.53

	(0.24 to 0.58)	(0.27 to 0.6)	(0.29 to 0.63)	(-0.2 to 0.15)	(-0.23 to 0.13)	(0.31 to 0.66)	(0.32 to 0.67)	(0.37 to 0.7)
Record 17: Responsiveness	0.31	0.37	0.3	0.48	0.47	1.44	1.17	-2.02
	(0.25 to 0.36)	(0.31 to 0.44)	(0.24 to 0.36)	(0.38 to 0.57)	(0.39 to 0.55)	(1.16 to 1.72)	(0.94 to 1.39)	(-2.37 to -1.68)
Record 18: Intercept	0.72	0.69	0.72	-0.02	0.04	0.74	0.74	0.82
	(0.57 to 0.88)	(0.53 to 0.84)	(0.57 to 0.89)	(-0.19 to 0.16)	(-0.13 to 0.22)	(0.57 to 0.9)	(0.58 to 0.9)	(0.67 to 0.97)
Record 18: Responsiveness	0.31	0.4	0.32	0.53	0.54	1.59	1.27	-2.2
	(0.26 to 0.36)	(0.34 to 0.46)	(0.26 to 0.38)	(0.43 to 0.62)	(0.46 to 0.62)	(1.32 to 1.86)	(1.06 to 1.49)	(-2.54 to -1.86)
Record 19: Intercept	0.28	0.3	0.35	-0.01	0.16	0.33	0.35	0.44
	(0.11 to 0.46)	(0.13 to 0.46)	(0.18 to 0.53)	(-0.18 to 0.15)	(-0.01 to 0.32)	(0.15 to 0.51)	(0.17 to 0.53)	(0.28 to 0.6)
Record 19: Responsiveness	0.4	0.51	0.41	0.5	0.54	2	1.6	-2.93
	(0.34 to 0.45)	(0.44 to 0.58)	(0.35 to 0.47)	(0.41 to 0.59)	(0.46 to 0.62)	(1.71 to 2.28)	(1.38 to 1.84)	(-3.29 to -2.57)
Record 20: Intercept	0.18	0.15	0.22	0.13	0.14	0.16	0.16	0.13
	(0.07 to 0.29)	(0.05 to 0.26)	(0.11 to 0.32)	(0.03 to 0.23)	(0.04 to 0.24)	(0.05 to 0.28)	(0.05 to 0.27)	(0.03 to 0.24)
Record 20: Responsiveness	0.58	0.74	0.67	0.71	0.72	2.87	2.38	-4.34
	(0.54 to 0.62)	(0.69 to 0.78)	(0.62 to 0.71)	(0.65 to 0.76)	(0.67 to 0.76)	(2.69 to 3.05)	(2.23 to 2.53)	(-4.57 to -4.11)
Record 21: Intercept	0	0	0.04	-0.04	0.06	0.05	0.06	0.14
	(-0.17 to 0.17)	(-0.16 to 0.17)	(-0.14 to 0.21)	(-0.21 to 0.12)	(-0.11 to 0.24)	(-0.13 to 0.23)	(-0.11 to 0.24)	(-0.02 to 0.3)
Record 21: Responsiveness	0.35	0.46	0.37	0.41	0.45	1.8	1.46	-2.29
	(0.3 to 0.41)	(0.39 to 0.52)	(0.31 to 0.42)	(0.32 to 0.49)	(0.38 to 0.53)	(1.53 to 2.08)	(1.24 to 1.68)	(-2.62 to -1.97)
Record 22: Intercept	0.04	0.04	0.06	0	0	0.09	0.09	0.14
	(-0.14 to 0.21)	(-0.13 to 0.21)	(-0.12 to 0.23)	(-0.16 to 0.16)	(-0.16 to 0.16)	(-0.09 to 0.27)	(-0.08 to 0.27)	(-0.03 to 0.3)
Record 22: Responsiveness	0.42	0.55	0.47	0.55	0.59	2.13	1.73	-3.01
	(0.37 to 0.47)	(0.49 to 0.61)	(0.41 to 0.52)	(0.47 to 0.63)	(0.52 to 0.66)	(1.86 to 2.39)	(1.52 to 1.95)	(-3.34 to -2.68)
Record 23: Intercept	0.1	0.09	0.13	0.01	0.1	0.1	0.11	0.14
	(0.05 to 0.15)	(0.04 to 0.14)	(0.08 to 0.18)	(-0.04 to 0.06)	(0.05 to 0.15)	(0.05 to 0.15)	(0.06 to 0.16)	(0.09 to 0.19)
Record 23: Responsiveness	0.24	0.31	0.25	0.3	0.33	1.27	1.02	-1.79
	(0.22 to 0.25)	(0.29 to 0.33)	(0.23 to 0.26)	(0.28 to 0.32)	(0.31 to 0.34)	(1.2 to 1.34)	(0.96 to 1.08)	(-1.88 to -1.7)
Record 24: Intercept	-0.07	-0.07	-0.07	-0.02	0	-0.05	-0.05	-0.08
	(-0.18 to 0.05)	(-0.21 to 0.07)	(-0.22 to 0.07)	(-0.19 to 0.15)	(-0.18 to 0.18)	(-0.17 to 0.07)	(-0.17 to 0.07)	(-0.18 to 0.01)
Record 24: Responsiveness	0.21	0.23	0.21	0.3	0.34	0.91	0.75	-1.01
	(0.17 to 0.25)	(0.17 to 0.29)	(0.15 to 0.26)	(0.2 to 0.39)	(0.25 to 0.43)	(0.72 to 1.11)	(0.59 to 0.91)	(-1.21 to -0.81)
Record 25: Intercept	0.11	0.09	0.09	-0.03	0.04	0.05	0.06	0.12
	(-0.01 to 0.23)	(-0.03 to 0.2)	(-0.04 to 0.21)	(-0.18 to 0.12)	(-0.11 to 0.21)	(-0.08 to 0.17)	(-0.06 to 0.18)	(0.01 to 0.23)
Record 25: Responsiveness	0.31	0.3	0.33	0.34	0.38	1.47	1.2	-1.96
	(0.27 to 0.35)	(0.26 to 0.35)	(0.28 to 0.37)	(0.27 to 0.42)	(0.32 to 0.45)	(1.27 to 1.66)	(1.04 to 1.36)	(-2.21 to -1.72)
Record 26: Intercept	0.11	0.11	0.11	-0.01	0.05	0.13	0.13	0.16
	(0.03 to 0.2)	(0.02 to 0.19)	(0.03 to 0.2)	(-0.09 to 0.07)	(-0.03 to 0.13)	(0.05 to 0.22)	(0.05 to 0.22)	(0.08 to 0.24)
Record 26: Responsiveness	0.28	0.35	0.3	0.24	0.28	1.25	1.02	-1.67
	(0.26 to 0.31)	(0.31 to 0.38)	(0.27 to 0.33)	(0.21 to 0.28)	(0.25 to 0.32)	(1.12 to 1.38)	(0.91 to 1.12)	(-1.83 to -1.5)
Record 27: Intercept	0	-0.01	0.05	0	-0.04	0.03	0.04	0.04
	(-0.17 to 0.16)	(-0.17 to 0.15)	(-0.12 to 0.21)	(-0.2 to 0.19)	(-0.24 to 0.17)	(-0.14 to 0.2)	(-0.13 to 0.21)	(-0.11 to 0.2)
Record 27: Responsiveness	0.28	0.35	0.3	0.5	0.46	1.57	1.3	-2.33
	(0.23 to 0.34)	(0.28 to 0.42)	(0.24 to 0.36)	(0.39 to 0.61)	(0.36 to 0.56)	(1.29 to 1.86)	(1.06 to 1.53)	(-2.7 to -1.98)
Record 28: Intercept	-0.05	-0.03	-0.03	0	-0.02	-0.04	-0.04	-0.04
	(-0.2 to 0.11)	(-0.18 to 0.12)	(-0.19 to 0.13)	(-0.14 to 0.13)	(-0.17 to 0.12)	(-0.2 to 0.12)	(-0.2 to 0.12)	(-0.19 to 0.11)
Record 28: Responsiveness	0.29	0.33	0.29	0.32	0.29	1.37	1.12	-1.94
	(0.21 to 0.37)	(0.24 to 0.42)	(0.21 to 0.37)	(0.24 to 0.4)	(0.2 to 0.37)	(1.02 to 1.72)	(0.83 to 1.4)	(-2.38 to -1.49)
Record 29: Intercept	0.16	0.12	0.16	-0.02	-0.03	0.19	0.19	0.3
	(0.07 to 0.25)	(0 to 0.25)	(0.03 to 0.3)	(-0.19 to 0.14)	(-0.2 to 0.14)	(0.1 to 0.28)	(0.1 to 0.28)	(0.23 to 0.36)
Record 29: Responsiveness	0.24	0.28	0.26	0.38	0.33	1.07	0.87	-1.5
	(0.21 to 0.27)	(0.23 to 0.33)	(0.21 to 0.31)	(0.29 to 0.47)	(0.25 to 0.41)	(0.91 to 1.22)	(0.75 to 1)	(-1.67 to -1.34)
Record 30: Intercept	0.11	0.11	0.18	0.01	0	0.08	0.08	0.1
	(-0.04 to 0.25)	(-0.03 to 0.25)	(0.03 to 0.32)	(-0.18 to 0.2)	(-0.19 to 0.2)	(-0.07 to 0.23)	(-0.08 to 0.23)	(-0.04 to 0.24)
Record 30: Responsiveness	0.2	0.26	0.2	0.3	0.29	0.97	0.8	-1.45
	(0.15 to 0.25)	(0.2 to 0.32)	(0.15 to 0.26)	(0.2 to 0.39)	(0.2 to 0.38)	(0.72 to 1.23)	(0.59 to 1.01)	(-1.77 to -1.14)
Record 31: Intercept	0.15	0.17	0.2	0.01	0.06	0.16	0.16	0.2
	(0.01 to 0.28)	(0.04 to 0.3)	(0.06 to 0.34)	(-0.17 to 0.19)	(-0.12 to 0.23)	(0.02 to 0.3)	(0.02 to 0.3)	(0.07 to 0.33)
Record 31: Responsiveness	0.19	0.21	0.19	0.29	0.3	0.85	0.7	-1.18
	(0.14 to 0.23)	(0.16 to 0.26)	(0.14 to 0.24)	(0.2 to 0.38)	(0.22 to 0.37)	(0.63 to 1.07)	(0.53 to 0.89)	(-1.46 to -0.9)
Record 32: Intercept	0.09	0.07	0.11	-0.01	0.05	0.1	0.1	0.17
	(-0.02 to 0.19)	(-0.04 to 0.17)	(0 to 0.21)	(-0.11 to 0.09)	(-0.05 to 0.15)	(-0.01 to 0.2)	(0 to 0.21)	(0.07 to 0.27)
Record 32: Responsiveness	0.3	0.42	0.33	0.43	0.45	1.65	1.35	-2.27
	(0.27 to 0.34)	(0.37 to 0.46)	(0.29 to 0.36)	(0.37 to 0.48)	(0.4 to 0.5)	(1.47 to 1.82)	(1.21 to 1.49)	(-2.49 to -2.06)
Record 33: Intercept	0.11	0.1	0.11	-0.02	0.01	0.03	0.04	0.07
	(0.01 to 0.21)	(0 to 0.2)	(0.01 to 0.21)	(-0.15 to 0.11)	(-0.13 to 0.15)	(-0.07 to 0.14)	(-0.06 to 0.14)	(-0.03 to 0.16)
Record 33: Responsiveness	0.51	0.46	0.54	0.62	0.57	2.38	1.95	-3.13
	(0.48 to 0.54)	(0.42 to 0.5)	(0.5 to 0.57)	(0.55 to 0.68)	(0.52 to 0.63)	(2.21 to 2.55)	(1.82 to 2.09)	(-3.34 to -2.92)
Record 34: Intercept	0.15	0.22	0.2	0.06	-0.05	0.18	0.19	0.31
	(-0.09 to 0.39)	(-0.02 to 0.44)	(-0.05 to 0.43)	(-0.19 to 0.31)	(-0.3 to 0.21)	(-0.06 to 0.43)	(-0.06 to 0.44)	(0.07 to 0.55)

Record 34: Responsiveness	0.29 (0.21 to 0.37)	0.36 (0.25 to 0.46)	0.29 (0.2 to 0.38)	0.56 (0.4 to 0.72)	0.47 (0.33 to 0.61)	1.39 (0.98 to 1.79)	1.15 (0.82 to 1.48)	-2.1 (-2.63 to -1.57)
Record 35: Intercept	-0.11 (-0.4 to 0.17)	-0.13 (-0.4 to 0.13)	0 (-0.28 to 0.28)	-0.08 (-0.36 to 0.19)	0 (-0.28 to 0.29)	-0.14 (-0.44 to 0.15)	-0.14 (-0.43 to 0.15)	-0.07 (-0.35 to 0.2)
Record 35: Responsiveness	0.32 (0.21 to 0.43)	0.37 (0.24 to 0.49)	0.34 (0.22 to 0.46)	0.48 (0.31 to 0.66)	0.48 (0.31 to 0.66)	1.5 (1 to 1.98)	1.29 (0.89 to 1.69)	-2.31 (-2.96 to -1.66)
Record 36: Intercept	0.01 (-0.13 to 0.15)	0.01 (-0.12 to 0.15)	0.03 (-0.12 to 0.17)	0.01 (-0.12 to 0.14)	0.02 (-0.11 to 0.15)	0.01 (-0.14 to 0.15)	0.01 (-0.13 to 0.16)	0.05 (-0.08 to 0.19)
Record 36: Responsiveness	0.14 (0.1 to 0.18)	0.18 (0.13 to 0.23)	0.14 (0.09 to 0.18)	0.18 (0.12 to 0.24)	0.2 (0.14 to 0.26)	0.79 (0.56 to 1.02)	0.63 (0.46 to 0.82)	-1.02 (-1.31 to -0.74)
Record 37: Intercept	-0.12 (-0.2 to -0.04)	-0.12 (-0.19 to -0.04)	-0.11 (-0.19 to -0.03)	0 (-0.09 to 0.08)	-0.01 (-0.1 to 0.08)	-0.12 (-0.2 to -0.03)	-0.12 (-0.2 to -0.03)	-0.1 (-0.17 to -0.02)
Record 37: Responsiveness	0.2 (0.16 to 0.23)	0.22 (0.17 to 0.26)	0.15 (0.12 to 0.19)	0.29 (0.24 to 0.34)	0.3 (0.25 to 0.34)	0.81 (0.66 to 0.97)	0.68 (0.55 to 0.81)	-1.07 (-1.27 to -0.87)
Record 38: Intercept	0 (-0.06 to 0.05)	0 (-0.05 to 0.06)	0.02 (-0.03 to 0.08)	0.01 (-0.05 to 0.07)	0.07 (0.01 to 0.13)	0.01 (-0.04 to 0.07)	0.02 (-0.04 to 0.08)	0.08 (0.03 to 0.13)
Record 38: Responsiveness	0.25 (0.23 to 0.26)	0.33 (0.31 to 0.35)	0.3 (0.28 to 0.32)	0.31 (0.29 to 0.33)	0.28 (0.26 to 0.3)	1.29 (1.21 to 1.36)	1.04 (0.98 to 1.11)	-1.64 (-1.74 to -1.55)
Record 39: Intercept	0.01 (-0.12 to 0.14)	0.02 (-0.1 to 0.14)	0.02 (-0.11 to 0.15)	0.02 (-0.1 to 0.14)	0 (-0.11 to 0.12)	0.03 (-0.09 to 0.16)	0.04 (-0.09 to 0.17)	0.1 (-0.01 to 0.22)
Record 39: Responsiveness	0.32 (0.28 to 0.37)	0.42 (0.37 to 0.47)	0.34 (0.3 to 0.39)	0.43 (0.38 to 0.49)	0.45 (0.39 to 0.52)	1.7 (1.48 to 1.92)	1.37 (1.19 to 1.55)	-2.3 (-2.58 to -2.02)
Record 40: Intercept	-0.15 (-0.34 to 0.04)	-0.05 (-0.23 to 0.13)	-0.05 (-0.24 to 0.14)	-0.04 (-0.21 to 0.12)	-0.07 (-0.24 to 0.11)	0.07 (-0.13 to 0.26)	0.06 (-0.14 to 0.26)	0.1 (-0.08 to 0.29)
Record 40: Responsiveness	0.73 (0.68 to 0.79)	0.9 (0.83 to 0.97)	0.78 (0.72 to 0.84)	0.97 (0.89 to 1.06)	0.9 (0.82 to 0.99)	3.64 (3.34 to 3.95)	2.92 (2.68 to 3.16)	-4.55 (-4.92 to -4.17)
Record 41: Intercept	-0.43 (-0.59 to -0.28)	-0.35 (-0.5 to -0.21)	-0.31 (-0.46 to -0.15)	-0.05 (-0.23 to 0.13)	-0.06 (-0.25 to 0.13)	-0.4 (-0.55 to -0.24)	-0.4 (-0.56 to -0.24)	-0.45 (-0.59 to -0.3)
Record 41: Responsiveness	0.44 (0.38 to 0.49)	0.42 (0.36 to 0.49)	0.4 (0.34 to 0.45)	0.59 (0.49 to 0.69)	0.74 (0.64 to 0.84)	1.9 (1.64 to 2.16)	1.55 (1.34 to 1.76)	-2.67 (-2.97 to -2.35)
Record 42: Intercept	-0.05 (-0.17 to 0.06)	-0.03 (-0.14 to 0.08)	-0.04 (-0.16 to 0.08)	-0.02 (-0.15 to 0.1)	0.05 (-0.07 to 0.19)	0 (-0.12 to 0.12)	0.02 (-0.1 to 0.13)	0.14 (0.03 to 0.25)
Record 42: Responsiveness	0.55 (0.52 to 0.59)	0.76 (0.71 to 0.8)	0.54 (0.5 to 0.58)	0.94 (0.89 to 1)	0.93 (0.88 to 0.99)	3.2 (3.01 to 3.38)	2.61 (2.45 to 2.76)	-4.73 (-4.96 to -4.49)
Record 43: Intercept	-0.01 (-0.14 to 0.11)	-0.06 (-0.18 to 0.06)	0.03 (-0.1 to 0.16)	0 (-0.12 to 0.12)	-0.07 (-0.19 to 0.05)	-0.03 (-0.16 to 0.09)	-0.03 (-0.15 to 0.1)	-0.05 (-0.17 to 0.07)
Record 43: Responsiveness	0.48 (0.45 to 0.52)	0.59 (0.55 to 0.63)	0.53 (0.49 to 0.57)	0.59 (0.54 to 0.64)	0.56 (0.51 to 0.61)	2.31 (2.14 to 2.49)	1.85 (1.71 to 1.99)	-3.04 (-3.25 to -2.82)
Record 44: Intercept	0.13 (0 to 0.25)	0.12 (0 to 0.25)	0.2 (0.07 to 0.33)	-0.04 (-0.2 to 0.13)	-0.03 (-0.2 to 0.14)	0.2 (0.07 to 0.33)	0.2 (0.07 to 0.33)	0.24 (0.12 to 0.36)
Record 44: Responsiveness	0.32 (0.27 to 0.37)	0.35 (0.3 to 0.41)	0.32 (0.27 to 0.37)	0.35 (0.26 to 0.44)	0.3 (0.22 to 0.39)	1.44 (1.2 to 1.68)	1.2 (1 to 1.4)	-1.9 (-2.19 to -1.61)
Record 45: Intercept	0.77 (0.63 to 0.9)	0.29 (0.11 to 0.47)	0.34 (0.15 to 0.52)	-0.11 (-0.34 to 0.13)	0.01 (-0.22 to 0.25)	0.87 (0.73 to 1.01)	0.88 (0.74 to 1.02)	0.93 (0.81 to 1.06)
Record 45: Responsiveness	0.22 (0.17 to 0.26)	0.3 (0.23 to 0.37)	0.27 (0.2 to 0.33)	0.4 (0.28 to 0.53)	0.45 (0.34 to 0.56)	0.89 (0.67 to 1.1)	0.73 (0.56 to 0.9)	-1.17 (-1.44 to -0.89)
Record 46: Intercept	0.03 (-0.14 to 0.21)	0.05 (-0.12 to 0.21)	0.1 (-0.07 to 0.28)	0.03 (-0.13 to 0.19)	-0.07 (-0.24 to 0.1)	0.12 (-0.06 to 0.3)	0.13 (-0.05 to 0.3)	0.18 (0.01 to 0.34)
Record 46: Responsiveness	0.37 (0.32 to 0.42)	0.46 (0.4 to 0.53)	0.38 (0.32 to 0.44)	0.44 (0.36 to 0.52)	0.47 (0.39 to 0.55)	1.65 (1.38 to 1.92)	1.33 (1.11 to 1.55)	-2.06 (-2.4 to -1.73)
Record 47: Intercept	0.22 (0.02 to 0.42)	0.2 (0.01 to 0.39)	0.23 (0.03 to 0.43)	0.03 (-0.16 to 0.21)	0.08 (-0.11 to 0.27)	0.24 (0.04 to 0.45)	0.25 (0.05 to 0.46)	0.33 (0.14 to 0.52)
Record 47: Responsiveness	0.25 (0.19 to 0.3)	0.32 (0.25 to 0.39)	0.25 (0.19 to 0.32)	0.4 (0.31 to 0.5)	0.4 (0.31 to 0.49)	1.29 (0.99 to 1.59)	1.04 (0.8 to 1.29)	-1.72 (-2.09 to -1.34)
Record 48: Intercept	-0.09 (-0.33 to 0.15)	-0.05 (-0.28 to 0.18)	-0.01 (-0.26 to 0.23)	0.08 (-0.13 to 0.29)	-0.03 (-0.25 to 0.2)	-0.03 (-0.27 to 0.22)	-0.02 (-0.27 to 0.22)	-0.01 (-0.24 to 0.22)
Record 48: Responsiveness	0.25 (0.18 to 0.32)	0.32 (0.23 to 0.41)	0.29 (0.2 to 0.37)	0.32 (0.21 to 0.43)	0.32 (0.22 to 0.42)	1.4 (1.04 to 1.76)	1.12 (0.83 to 1.4)	-1.87 (-2.31 to -1.43)
Record 49: Intercept	-0.81 (-0.97 to -0.65)	-0.65 (-0.82 to -0.48)	-0.62 (-0.8 to -0.45)	-0.15 (-0.36 to 0.07)	-0.18 (-0.41 to 0.03)	-0.85 (-1.02 to -0.67)	-0.84 (-1.01 to -0.67)	-0.85 (-1 to -0.69)
Record 49: Responsiveness	0.25 (0.2 to 0.3)	0.27 (0.21 to 0.34)	0.24 (0.18 to 0.3)	0.56 (0.45 to 0.67)	0.55 (0.45 to 0.65)	1 (0.73 to 1.26)	0.82 (0.6 to 1.03)	-1.63 (-1.97 to -1.3)
Record 50: Intercept	-0.07 (-0.37 to 0.24)	-0.15 (-0.44 to 0.14)	-0.08 (-0.38 to 0.21)	0.04 (-0.21 to 0.31)	0.02 (-0.25 to 0.29)	-0.18 (-0.49 to 0.13)	-0.16 (-0.47 to 0.15)	-0.05 (-0.35 to 0.24)
Record 50: Responsiveness	0.44 (0.34 to 0.55)	0.53 (0.41 to 0.65)	0.49 (0.38 to 0.61)	0.44 (0.28 to 0.6)	0.39 (0.25 to 0.53)	2 (1.56 to 2.45)	1.65 (1.29 to 2.01)	-2.93 (-3.48 to -2.36)
Record 51: Intercept	-0.21 (-0.47 to 0.05)	-0.16 (-0.41 to 0.09)	-0.14 (-0.41 to 0.12)	0.04 (-0.18 to 0.26)	-0.14 (-0.36 to 0.08)	-0.22 (-0.49 to 0.05)	-0.21 (-0.49 to 0.06)	-0.21 (-0.47 to 0.04)
Record 51: Responsiveness	0.51	0.61	0.56	0.72	0.69	2.13	1.79	-3.44

	(0.41 to 0.61)	(0.5 to 0.73)	(0.45 to 0.67)	(0.6 to 0.84)	(0.58 to 0.8)	(1.69 to 2.57)	(1.43 to 2.16)	(-3.98 to -2.9)
Record 52: Intercept	-0.24	-0.24	-0.12	-0.16	-0.33	-0.31	-0.31	-0.39
	(-0.5 to 0.01)	(-0.49 to 0)	(-0.38 to 0.13)	(-0.38 to 0.05)	(-0.56 to -0.1)	(-0.57 to -0.04)	(-0.58 to -0.04)	(-0.64 to -0.14)
Record 52: Responsiveness	0.56	0.65	0.64	0.84	0.65	2.23	1.9	-3.56
	(0.47 to 0.64)	(0.55 to 0.75)	(0.54 to 0.75)	(0.73 to 0.95)	(0.55 to 0.75)	(1.83 to 2.63)	(1.57 to 2.22)	(-4.06 to -3.04)
Record 53: Intercept	-0.08	-0.07	-0.08	0.07	0.08	-0.12	-0.1	-0.08
	(-0.39 to 0.23)	(-0.36 to 0.23)	(-0.38 to 0.23)	(-0.19 to 0.32)	(-0.18 to 0.34)	(-0.43 to 0.19)	(-0.42 to 0.22)	(-0.39 to 0.22)
Record 53: Responsiveness	0.39	0.5	0.36	0.5	0.57	2.15	1.75	-3
	(0.29 to 0.49)	(0.38 to 0.63)	(0.26 to 0.47)	(0.35 to 0.66)	(0.44 to 0.69)	(1.67 to 2.62)	(1.37 to 2.13)	(-3.57 to -2.42)
Record 54: Intercept	0.36	0.28	0.43	0.01	0.2	0.2	0.23	0.26
	(0.2 to 0.53)	(0.11 to 0.44)	(0.26 to 0.6)	(-0.14 to 0.16)	(0.05 to 0.36)	(0.03 to 0.38)	(0.06 to 0.4)	(0.1 to 0.42)
Record 54: Responsiveness	0.65	0.8	0.67	0.62	0.77	3.08	2.51	-4.15
	(0.59 to 0.71)	(0.74 to 0.87)	(0.6 to 0.74)	(0.55 to 0.69)	(0.71 to 0.84)	(2.82 to 3.34)	(2.3 to 2.72)	(-4.48 to -3.81)
Adjusted R2	0.63	0.65	0.62	0.64	0.65	0.62	0.62	0.77
	(0.63 to 0.64)	(0.65 to 0.65)	(0.62 to 0.62)	(0.64 to 0.64)	(0.65 to 0.65)	(0.61 to 0.62)	(0.62 to 0.62)	(0.77 to 0.77)
Level Two Intercept Model Estimates								
Intercept	0.14	0.13	0.16	-0.01	0.02	0.16	0.16	0.22
	(0.02 to 0.25)	(0.03 to 0.23)	(0.05 to 0.27)	(-0.08 to 0.07)	(-0.06 to 0.1)	(0.03 to 0.28)	(0.04 to 0.29)	(0.09 to 0.36)
Coefficient for sin2(latitude)	-0.27	-0.23	-0.19	0.01	-0.04	-0.33	-0.33	-0.38
	(-0.63 to 0.09)	(-0.54 to 0.08)	(-0.51 to 0.12)	(-0.21 to 0.23)	(-0.28 to 0.2)	(-0.7 to 0.04)	(-0.7 to 0.04)	(-0.77 to 0.01)
Adjusted R2	0.04	0.04	0.02	-0.01	-0.01	0.06	0.06	0.07
	(-0.07 to 0.09)	(-0.08 to 0.11)	(-0.09 to 0.08)	(-0.28 to 0.07)	(-0.21 to 0.06)	(-0.04 to 0.11)	(-0.05 to 0.11)	(-0.03 to 0.11)
Level Two Responsiveness Model Estimates								
Intercept	0.23	0.29	0.24	0.33	0.34	1.13	0.91	-1.63
	(0.17 to 0.3)	(0.21 to 0.36)	(0.17 to 0.31)	(0.25 to 0.4)	(0.26 to 0.42)	(0.92 to 1.33)	(0.75 to 1.08)	(-1.91 to -1.35)
Coefficient for sin2(latitude)	0.45	0.54	0.48	0.54	0.5	2.16	1.78	-3.02
	(0.26 to 0.65)	(0.32 to 0.76)	(0.27 to 0.69)	(0.31 to 0.77)	(0.27 to 0.73)	(1.55 to 2.75)	(1.29 to 2.27)	(-3.83 to -2.2)
Adjusted R2	0.53	0.49	0.49	0.42	0.4	0.52	0.53	0.51
	(0.41 to 0.6)	(0.38 to 0.55)	(0.37 to 0.55)	(0.32 to 0.5)	(0.29 to 0.48)	(0.44 to 0.58)	(0.46 to 0.6)	(0.45 to 0.56)

Table S4. Bayesian hierarchical regressions of local SST responsiveness over latitude, repeated for each of eight climate indicators, as in Table S3. A Level Two model estimates the effect of $\sin^2$(latitude), the Indian Ocean, and the Mg/Ca proxy interactive with $\sin^2$(latitude) on local SST responsiveness. See Section 4.2 for methods. Parentheticals display 95% intervals.

	c1	c2	c3	c4	c5	c6	c7	c8
Level Two Intercept Model Estimates								
Intercept	0.13 (0 to 0.26)	0.12 (0.01 to 0.23)	0.15 (0.04 to 0.26)	-0.01 (-0.09 to 0.07)	0.02 (-0.06 to 0.11)	0.15 (0.02 to 0.28)	0.15 (0.02 to 0.29)	0.2 (0.06 to 0.35)
Coefficient for sin2(latitude)	-0.27 (-0.66 to 0.11)	-0.22 (-0.56 to 0.12)	-0.18 (-0.52 to 0.16)	0.02 (-0.23 to 0.26)	-0.03 (-0.28 to 0.24)	-0.33 (-0.73 to 0.07)	-0.33 (-0.74 to 0.08)	-0.37 (-0.81 to 0.05)
Coefficient for Indian Ocean	0.03 (-0.2 to 0.26)	0.05 (-0.15 to 0.25)	0.05 (-0.15 to 0.25)	0 (-0.14 to 0.14)	0 (-0.15 to 0.15)	0.05 (-0.19 to 0.28)	0.05 (-0.19 to 0.28)	0.11 (-0.14 to 0.37)
Coefficient for Mg/Ca proxy*sin2(latitude)	0 (-0.62 to 0.62)	-0.03 (-0.58 to 0.53)	-0.07 (-0.63 to 0.5)	-0.03 (-0.43 to 0.38)	-0.07 (-0.49 to 0.37)	0.03 (-0.63 to 0.68)	0.01 (-0.65 to 0.67)	-0.05 (-0.75 to 0.66)
Level Two Responsiveness Model Estimates								
Intercept	0.25 (0.18 to 0.32)	0.3 (0.23 to 0.37)	0.26 (0.19 to 0.33)	0.35 (0.27 to 0.43)	0.36 (0.28 to 0.44)	1.21 (1.03 to 1.38)	0.98 (0.83 to 1.13)	-1.74 (-1.99 to -1.5)
Coefficient for sin2(latitude)	0.51 (0.31 to 0.72)	0.64 (0.42 to 0.86)	0.55 (0.34 to 0.77)	0.6 (0.35 to 0.84)	0.58 (0.34 to 0.81)	2.49 (1.93 to 3.03)	2.04 (1.59 to 2.49)	-3.46 (-4.21 to -2.71)
Coefficient for Indian Ocean	-0.1 (-0.22 to 0.01)	-0.1 (-0.23 to 0.02)	-0.1 (-0.23 to 0.02)	-0.13 (-0.27 to 0.02)	-0.13 (-0.27 to 0)	-0.48 (-0.81 to -0.17)	-0.4 (-0.66 to -0.13)	0.68 (0.24 to 1.12)
Coefficient for Mg/Ca proxy*sin2(latitude)	-0.26 (-0.59 to 0.06)	-0.43 (-0.79 to -0.08)	-0.3 (-0.65 to 0.04)	-0.26 (-0.66 to 0.13)	-0.34 (-0.72 to 0.05)	-1.41 (-2.32 to -0.5)	-1.1 (-1.84 to -0.36)	1.93 (0.67 to 3.16)