

# ANEXO 1- CÓDIGO SPIDER

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```
library(ggplot2)
library(tidyverse)
library(DHARMA)
library(performance)
library(dplyr)
library(tidyr)
library(GGally)
library(MASS)
library(psych)
library(mgcv)
library(glmmTMB)
library(AER)
library(purrr)
library(patchwork)
library(jagsUI)
pacman::p_load(lme4,lmerTest, itsadug)
```

En el siguiente documento se encuentran todos los códigos de R y gráficas empleados para la reproducibilidad de la tarea de Spider.

## Carga de datos:

```
load("Spider.RData")
summary(Spider)
```

```
##      Site      Specie  Abundance      length      colour
##  1      : 12  Alopacce: 28  Min.   : 0.000  Min.   :1.504  dark   :140
## 10      : 12  Alopcone: 28  1st Qu.: 0.000  1st Qu.:1.504  yellow:168
## 11      : 12  Alopfabr: 28  Median : 1.000  Median :1.910  NA's   : 28
## 12      : 12  Arctlute: 28  Mean    : 9.932  Mean    :1.847
## 13      : 12  Arctperi: 28  3rd Qu.: 9.000  3rd Qu.:2.110
## 14      : 12  Auloalbi: 28  Max.     :135.000  Max.     :2.398
## (Other):264  (Other) :168                      NA's     :28
##      marks      soil.dry  fallen.leaves      moss
## none   : 28  Min.    :0.9555  Min.    :0.000  Min.    :0.0000
## spots  : 56  1st Qu.:2.1040  1st Qu.:0.000  1st Qu.:0.6931
## stripes:224  Median :2.6494  Median :0.000  Median :1.7918
## NA's   : 28  Mean     :2.4713  Mean     :1.529  Mean     :2.1145
##                      3rd Qu.:3.0922  3rd Qu.:4.296  3rd Qu.:3.7424
##                      Max.      :3.5175  Max.      :4.605  Max.      :4.3307
##
```

```
## herb.layer
## Min. :0.6931
## 1st Qu.:3.0445
## Median :3.4340
## Mean :3.2550
## 3rd Qu.:4.4684
## Max. :4.6151
##
```

## Gráficos:

```
# Variables categóricas
cat_vars <- c("Site", "Specie", "colour", "marks")

# Variables numéricas (excluyendo Abundance)
num_vars <- c("length", "soil.dry", "fallen.leaves", "moss", "herb.layer")

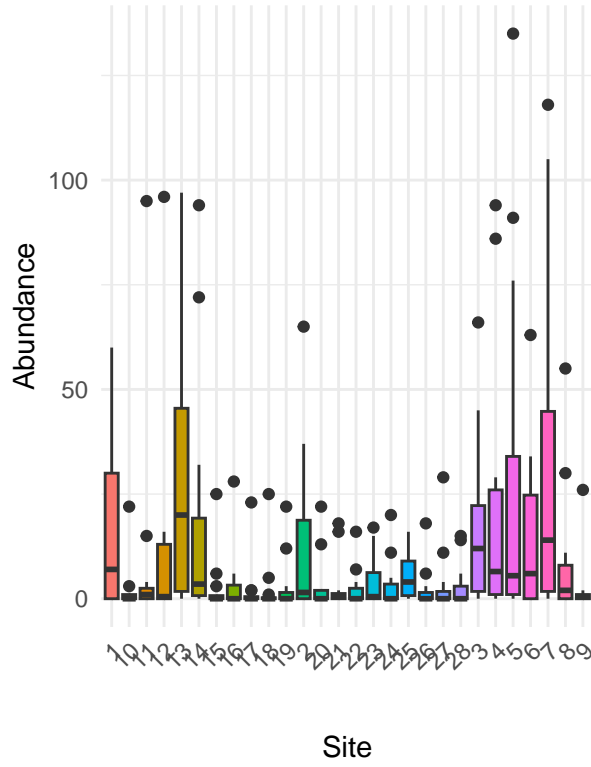
# 1. Boxplots de Abundance según variables categóricas
plots_cat <- map(cat_vars, \(var) {
  ggplot(Spider, aes(x = .data[[var]], y = Abundance)) +
    geom_boxplot(aes(fill = .data[[var]]), show.legend = FALSE) +
    theme_minimal() +
    theme(axis.text.x = element_text(angle = 45, hjust = 1)) +
    labs(title = paste("Abundance según", var), x = var, y = "Abundance")
})

# 2. Gráficos de dispersión entre Abundance y variables numéricas
plots_num <- map(num_vars, \(var) {
  ggplot(Spider, aes(x = .data[[var]], y = Abundance)) +
    geom_point(color = "steelblue", alpha = 0.6) +
    geom_smooth(method = "loess", se = FALSE, color = "darkred") +
    theme_minimal() +
    labs(title = paste("Abundance vs", var), x = var, y = "Abundance")
})

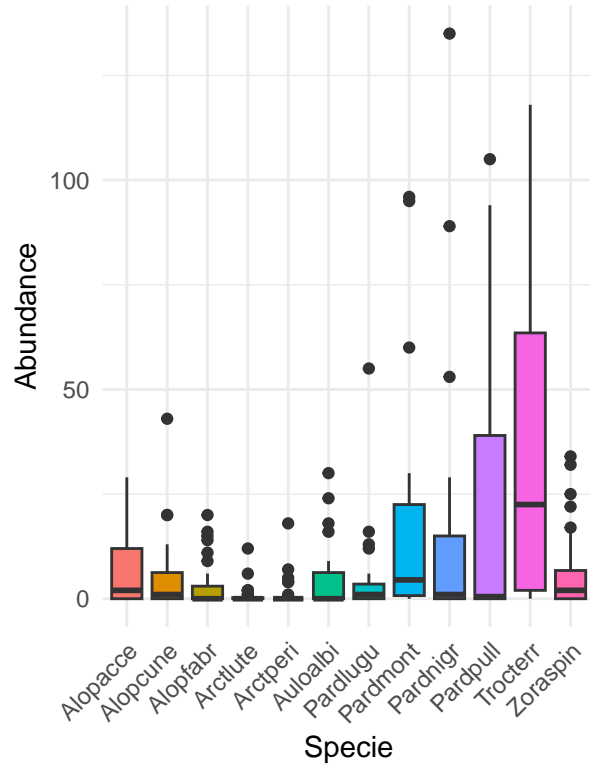
# Juntar todos los gráficos
all_plots <- c(plots_cat, plots_num)

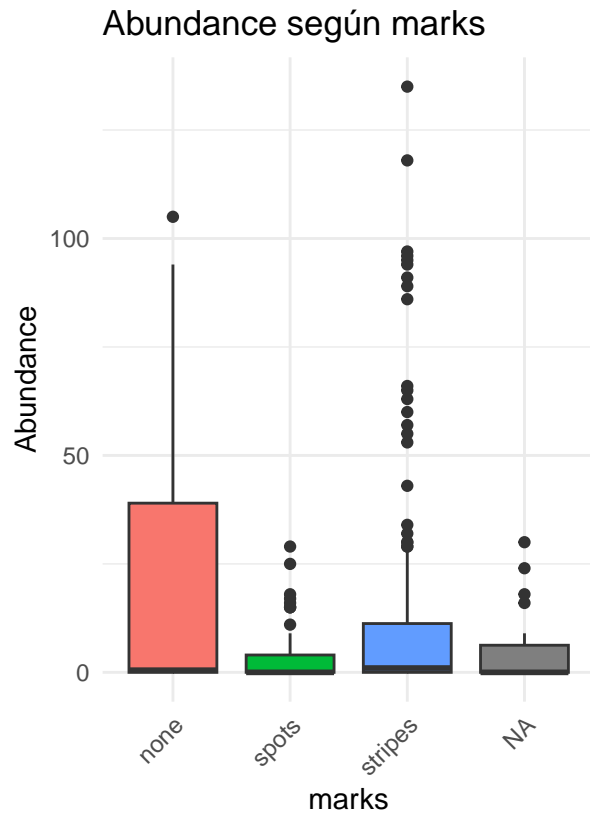
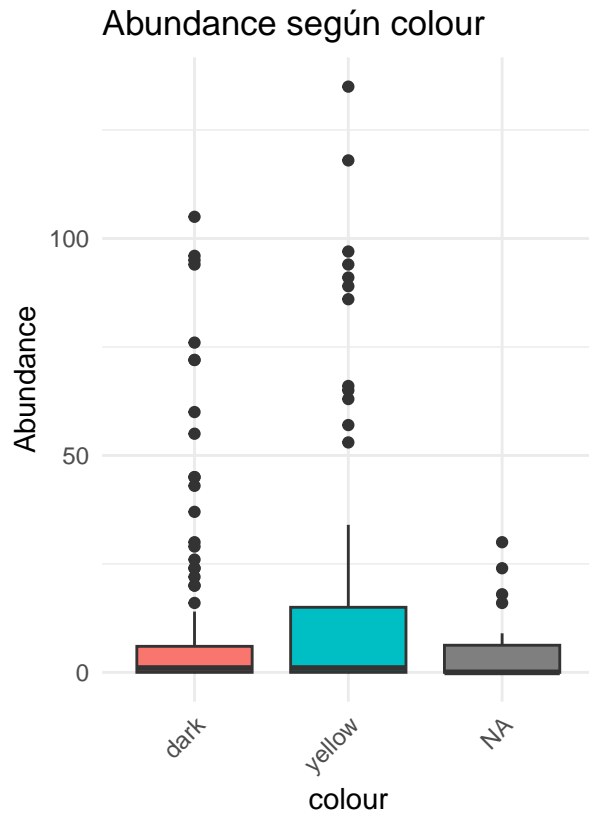
# Mostrar 2 por salida
walk(seq(1, length(all_plots), by = 2), \(i) {
  wrap_plots(all_plots[i:min(i+1, length(all_plots))], ncol = 2) |> print()
})
```

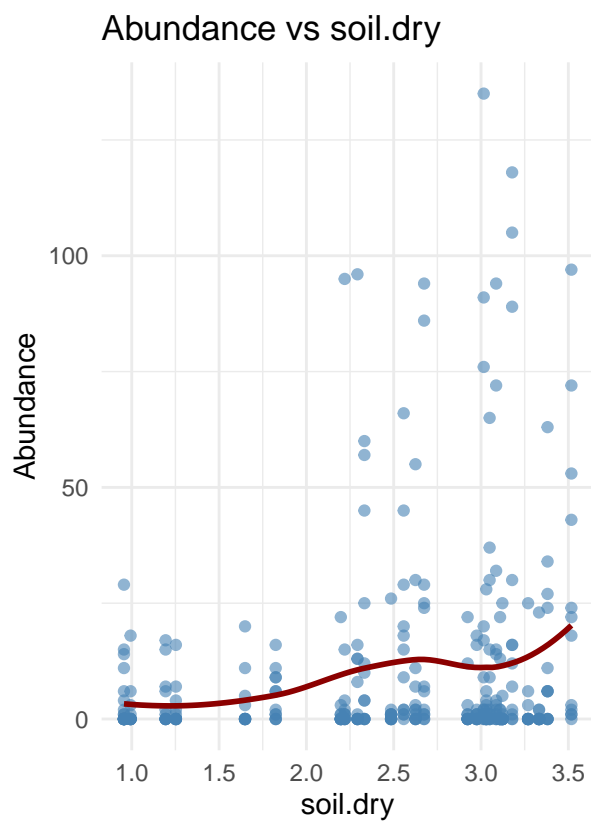
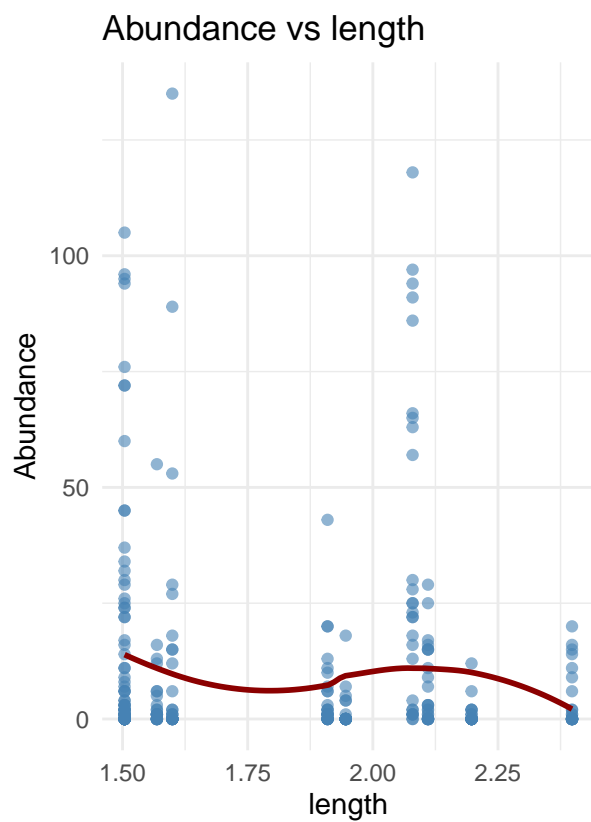
Abundance según Site

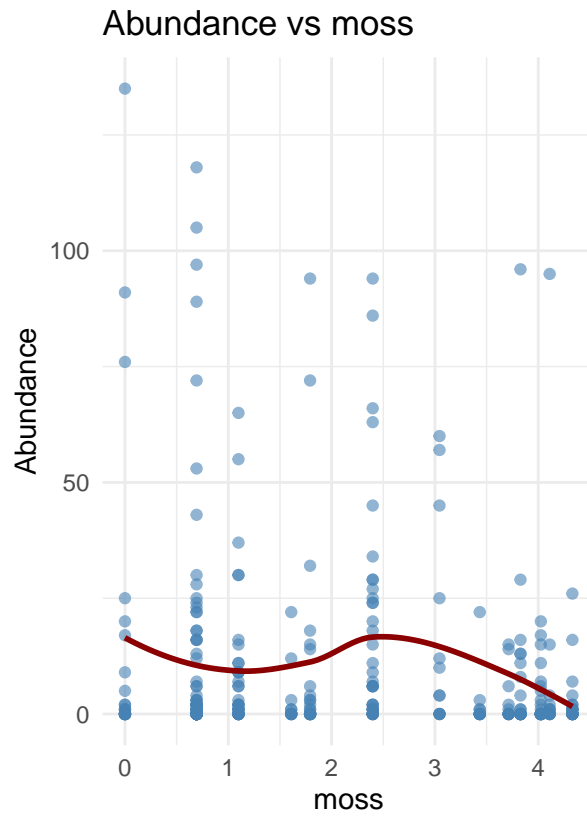
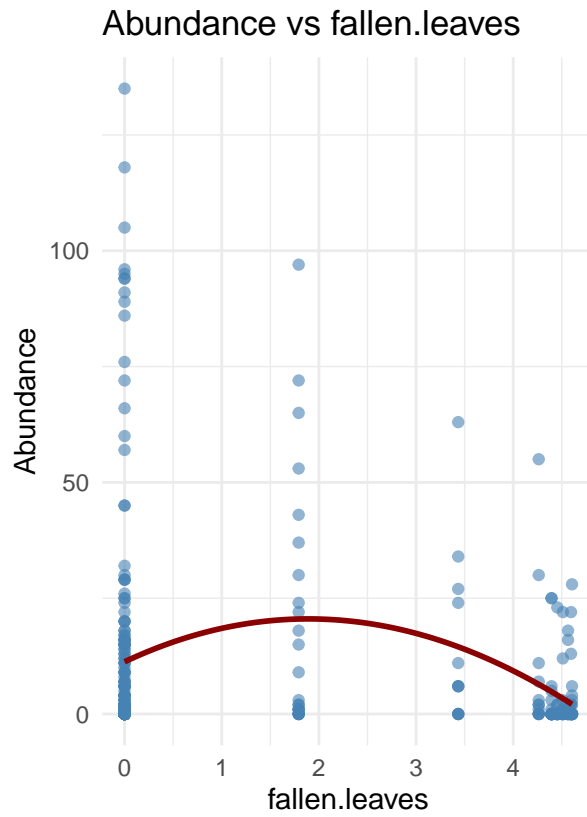


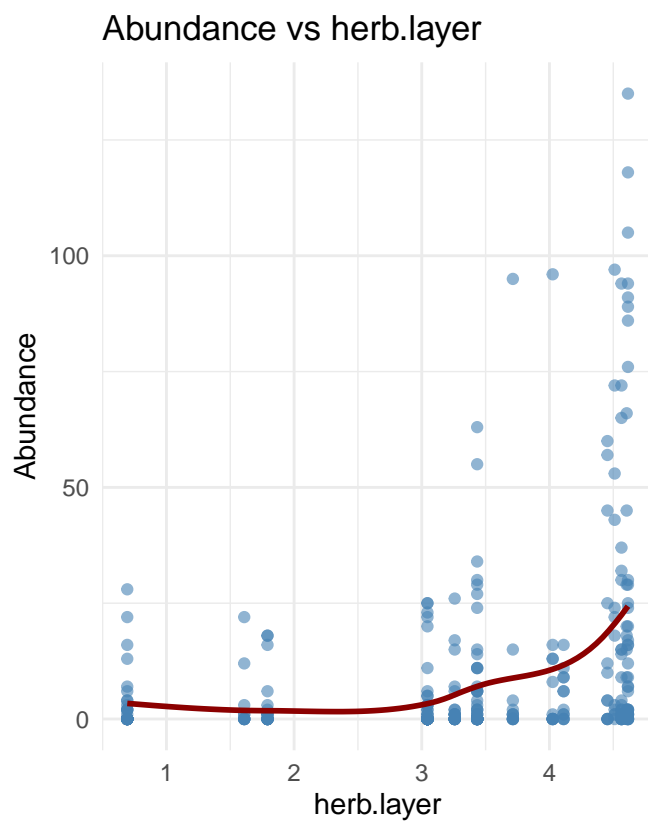
Abundance según Specie











### Imputación de datos faltantes:

```
Spider[Spider$Specie == "Auloalbi", c("length", "colour", "marks")] <- list(log(4.1), "dark", "none")
summary(Spider)
```

```
##      Site      Specie  Abundance      length      colour
##  1      : 12  Alopacce: 28  Min.    : 0.000  Min.    :1.411  dark   :168
## 10      : 12  Alopcone: 28  1st Qu.: 0.000  1st Qu.:1.504  yellow:168
## 11      : 12  Alopfabr: 28  Median : 1.000  Median :1.754
## 12      : 12  Arctlute: 28  Mean    : 9.932  Mean    :1.811
## 13      : 12  Arctperi: 28  3rd Qu.: 9.000  3rd Qu.:2.087
## 14      : 12  Auloalbi: 28  Max.    :135.000  Max.    :2.398
## (Other):264  (Other) :168
##      marks      soil.dry  fallen.leaves      moss
## none      : 56  Min.    :0.9555  Min.    :0.000  Min.    :0.0000
## spots     : 56  1st Qu.:2.1040  1st Qu.:0.000  1st Qu.:0.6931
## stripes:224  Median :2.6494  Median :0.000  Median :1.7918
##              Mean    :2.4713  Mean    :1.529  Mean    :2.1145
##              3rd Qu.:3.0922  3rd Qu.:4.296  3rd Qu.:3.7424
##              Max.    :3.5175  Max.    :4.605  Max.    :4.3307
##
##      herb.layer
## Min.    :0.6931
## 1st Qu.:3.0445
## Median :3.4340
## Mean    :3.2550
## 3rd Qu.:4.4684
## Max.    :4.6151
##
```

### Creación variable appearance:

```
library(dplyr)
library(forcats)

# 1. Ver combinaciones posibles
table(Spider$marks, Spider$colour)

##
##      dark yellow
## none      56      0
## spots      0     56
## stripes 112    112

# 2. Crear variable de interacción completa
Spider$appearance <- interaction(Spider$marks, Spider$colour, sep = "_", drop = TRUE)

# 3. Ver número de observaciones por combinación
comb_count <- Spider %>%
  count(appearance) %>%
  arrange(n)

print(comb_count)
```



```
## # A tibble: 4 x 2
##   appearance      n
##   <fct>         <int>
## 1 none_dark      56
## 2 spots_yellow   56
## 3 stripes_dark  112
## 4 stripes_yellow 112
```

```
# 4. Eliminar combinaciones con cero o muy pocos casos (ej. 1)
Spider <- Spider %>%
  filter(!appearance %in% comb_count$appearance[comb_count$n == 0])

# También podrías eliminar combinaciones con n < 5 si es muy desequilibrado
# Spider <- Spider %>% filter(!appearance %in% comb_count$appearance[comb_count$n < 5])

# 5. Reconvertir appearance a factor sin niveles vacíos
Spider$appearance <- fct_drop(Spider$appearance)

# Verificar que todo está bien
summary(Spider$appearance)
```

```
##      none_dark  stripes_dark  spots_yellow stripes_yellow
##           56           112           56           112
```

## PCA ambientales:

```
# 1. Selección de variables ambientales
amb_vars <- c("soil.dry", "fallen.leaves", "moss", "herb.layer")

# 2. Escalado y PCA
pca_env <- prcomp(Spider[, amb_vars], scale. = TRUE)

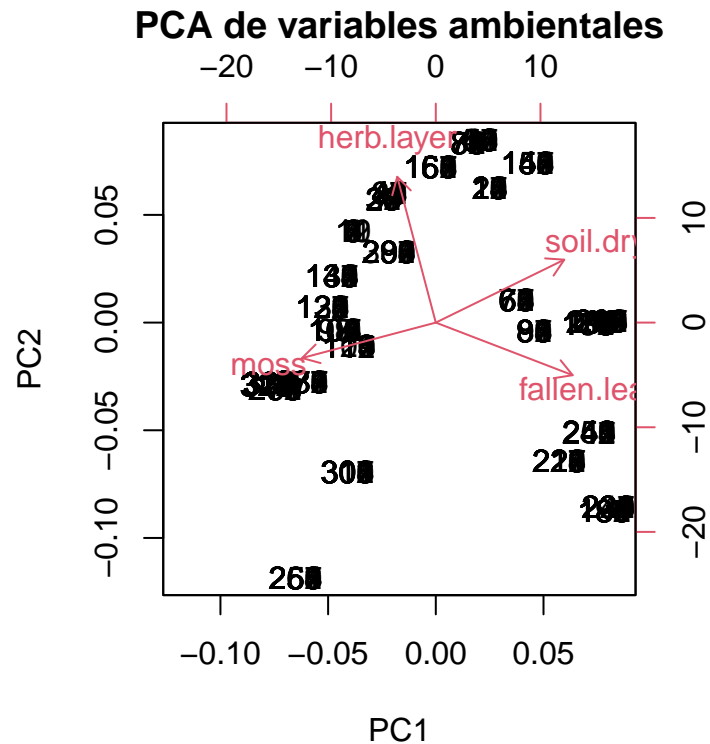
# 3. Ver resumen del PCA
summary(pca_env)           # Importancia de componentes (varianza explicada)
```

```
## Importance of components:
##                PC1      PC2      PC3      PC4
## Standard deviation  1.5225 1.1141 0.54896 0.37338
## Proportion of Variance 0.5795 0.3103 0.07534 0.03485
## Cumulative Proportion 0.5795 0.8898 0.96515 1.00000
```

```
pca_env$rotation           # Cargas de cada variable en cada componente
```

```
##                PC1      PC2      PC3      PC4
## soil.dry      0.5497001 0.3678390 0.57319974 0.4837006
## fallen.leaves 0.5856736 -0.3076226 0.23631830 -0.7116940
## moss         -0.5723459 -0.2073684 0.78407519 -0.1210147
## herb.layer   -0.1650342 0.8526788 0.02866735 -0.4948543
```

```
# 4. Visualización básica
biplot(pca_env, main = "PCA de variables ambientales")
```



```
# 5. Añadir componentes al dataframe original
```

```
Spider$PC1 <- pca_env$x[, 1]
Spider$PC2 <- pca_env$x[, 2]
```

```
# Resumen del PCA
```

```
summary(pca_env)
```

```
## Importance of components:
```

```
##           PC1      PC2      PC3      PC4
## Standard deviation  1.5225 1.1141 0.54896 0.37338
## Proportion of Variance 0.5795 0.3103 0.07534 0.03485
## Cumulative Proportion 0.5795 0.8898 0.96515 1.00000
```

```
# Porcentaje de varianza explicada por componente
```

```
var_exp <- summary(pca_env)$importance[2, ] * 100
var_exp
```

```
##      PC1      PC2      PC3      PC4
## 57.949 31.032  7.534  3.485
```

```
# Cargas (contribución de cada variable)
```

```
round(pca_env$rotation, 3)
```

```
##           PC1    PC2    PC3    PC4
## soil.dry    0.550  0.368  0.573  0.484
## fallen.leaves 0.586 -0.308 0.236 -0.712
## moss        -0.572 -0.207 0.784 -0.121
## herb.layer   -0.165  0.853 0.029 -0.495
```

```
library(factoextra)
```

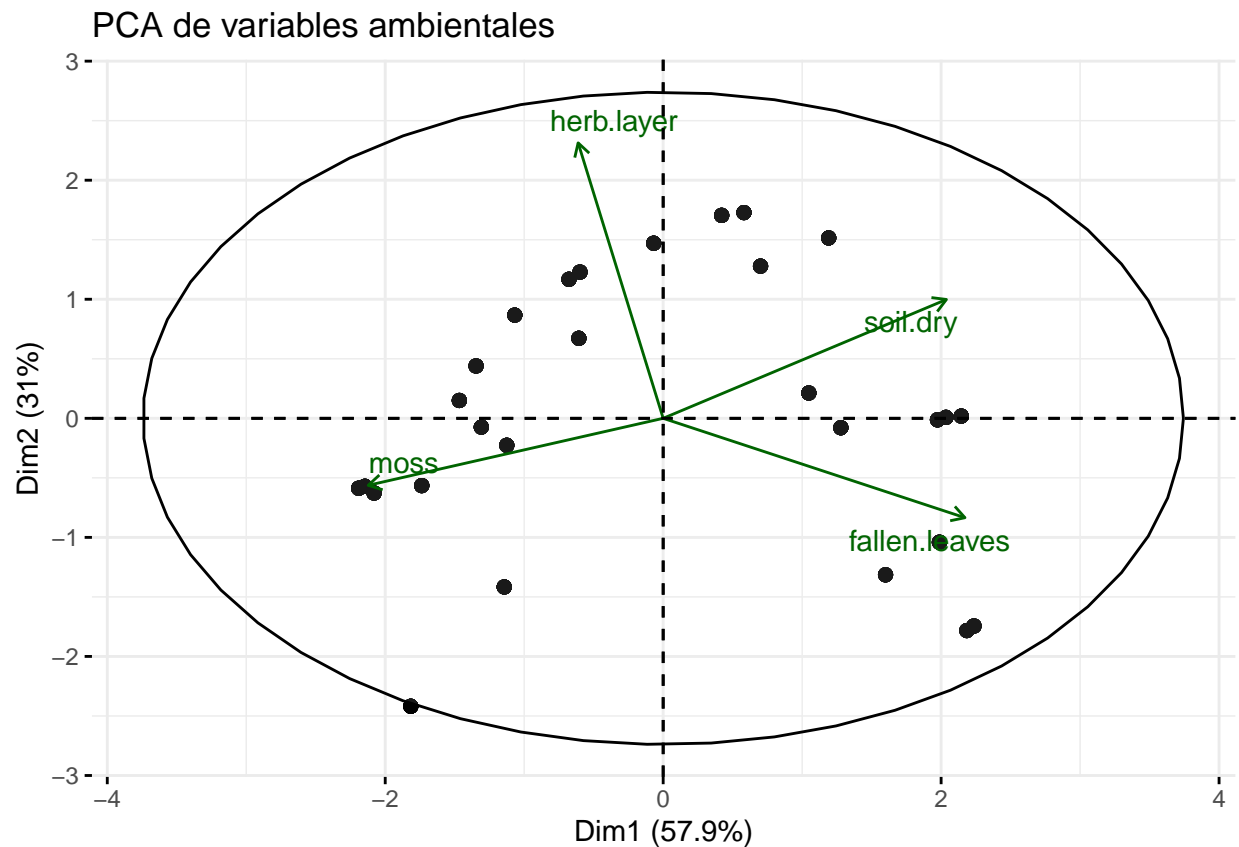
```
## Warning: package 'factoextra' was built under R version 4.4.2
```

```
## Welcome! Want to learn more? See two factoextra-related books at https://goo.gl/ve3WBa
```

```
# PCA ya realizado: pca_env
```

```
# Gráfico biplot con color según 'colour' (apariencia)
```

```
fviz_pca_biplot(
  pca_env,
  geom.ind = "point",
  addEllipses = TRUE,
  col.var = "darkgreen",
  pointsize = 2,
  repel = TRUE,
  palette = "Set2"                                # Paleta de colores suaves y distinguibles
) +
  ggtitle("PCA de variables ambientales")
```



## MODELOS GLM

### Modelo GLM Poisson:

$$\text{Abundance}_i \sim \text{Poisson}(\mu_i)$$

$$\begin{aligned} \log(\mu_i) = & \beta_0 + \sum_{j=1}^3 \beta_{1j} \cdot \text{appearance}_{ij} + \beta_2 \cdot \text{length}_i + \beta_3 \cdot \text{PC1}_i + \beta_4 \cdot \text{PC2}_i \\ & + \sum_{j=1}^3 \gamma_{1j} \cdot (\text{appearance}_{ij} \times \text{PC1}_i) + \sum_{j=1}^3 \gamma_{2j} \cdot (\text{appearance}_{ij} \times \text{PC2}_i) \\ & + b_{\text{Site}[i]} + b_{\text{Specie}[i]} \end{aligned}$$

```
glmm_model_pois <- glmmTMB(  
  Abundance ~ appearance + length + PC1 + PC2 + appearance:PC1 + appearance:PC2 + (1 | Site) + (1 | Sp  
  family = poisson(), # Modelo de referencia sin sobredispersión  
  data = Spider  
)  
  
# Evaluación inicial  
summary(glmm_model_pois)
```

```
## Family: poisson ( log )  
## Formula:  
## Abundance ~ appearance + length + PC1 + PC2 + appearance:PC1 +  
## appearance:PC2 + (1 | Site) + (1 | Specie)  
## Data: Spider  
##  
##      AIC      BIC    logLik -2*log(L)  df.resid  
##   3652.5   3709.7   -1811.2    3622.5     321  
##  
## Random effects:  
##  
## Conditional model:  
## Groups Name      Variance Std.Dev.  
## Site (Intercept) 0.2737   0.5231  
## Specie (Intercept) 0.6759   0.8222  
## Number of obs: 336, groups: Site, 28; Specie, 12  
##  
## Conditional model:  
##              Estimate Std. Error z value Pr(>|z|)  
## (Intercept)      2.33397    1.43927   1.622   0.1049  
## appearancestripes_dark      1.07128    0.78366   1.367   0.1716  
## appearancespots_yellow     -0.10383    0.99774  -0.104   0.9171  
## appearancestripes_yellow      1.62577    0.82257   1.976   0.0481 *  
## length             -1.20526    0.89678  -1.344   0.1790  
## PC1                  0.04853    0.08786   0.552   0.5807  
## PC2                  1.87025    0.12677  14.753 < 2e-16 ***  
## appearancestripes_dark:PC1   -0.15785    0.06373  -2.477   0.0133 *  
## appearancespots_yellow:PC1   -1.33799    0.14662  -9.126 < 2e-16 ***  
## appearancestripes_yellow:PC1  0.30468    0.05889   5.173  2.3e-07 ***  
## appearancestripes_dark:PC2   -1.45785    0.09494 -15.356 < 2e-16 ***  
## appearancespots_yellow:PC2   -1.75296    0.13876 -12.633 < 2e-16 ***
```

```
## appearancestripes_yellow:PC2 -0.94839    0.09010 -10.526 < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

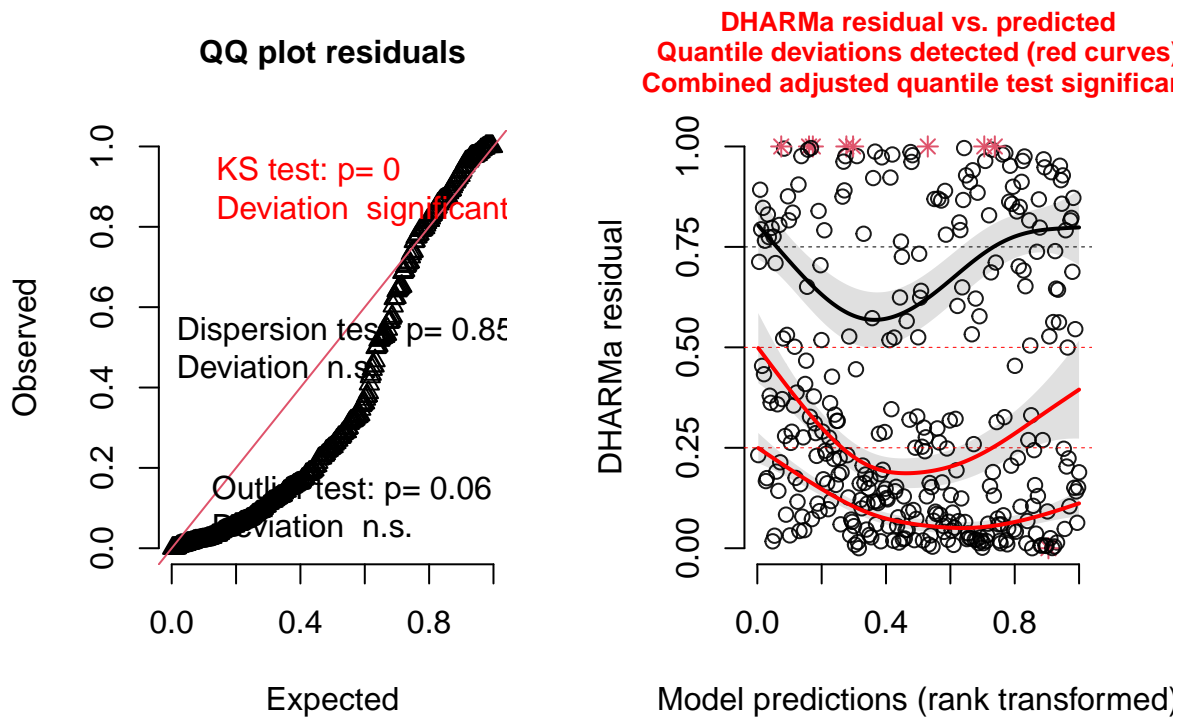
```
AIC(glm_model_pois)
```

```
## [1] 3652.461
```

```
# Diagnóstico de residuos con DHARMA
library(DHARMA)

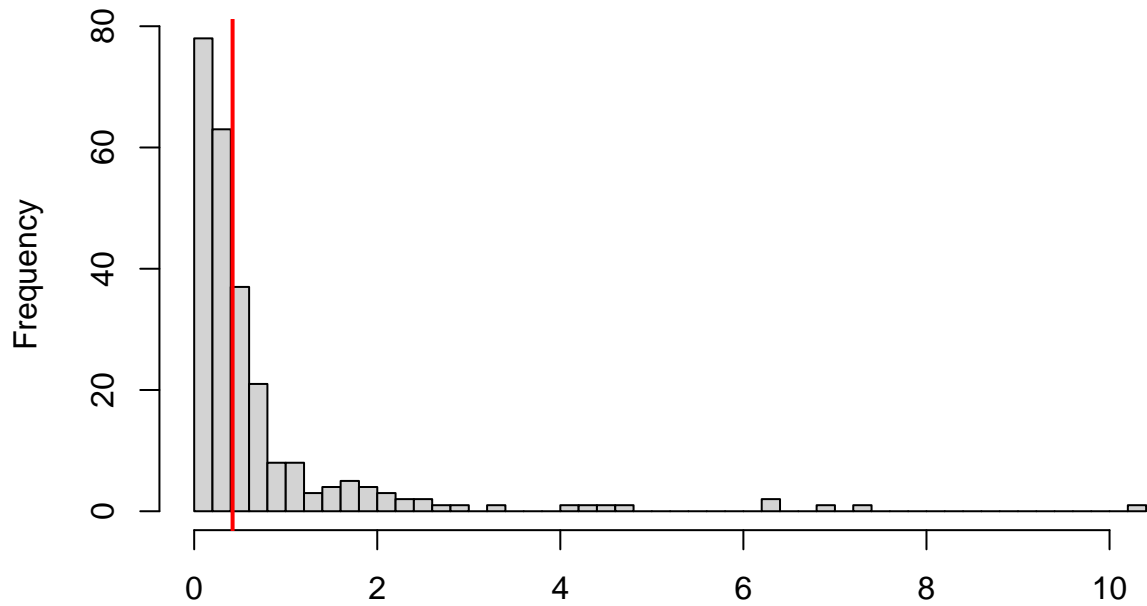
res_pois <- simulateResiduals(glm_model_pois)
plot(res_pois)
```

## DHARMA residual



```
testDispersion(res_pois)
```

### DHARMA nonparametric dispersion test via sd of residuals fitted vs. simulated



Simulated values, red line = fitted model. p-value (two.sided) = 0.856

```
##
## DHARMA nonparametric dispersion test via sd of residuals fitted vs.
## simulated
##
## data: simulationOutput
## dispersion = 0.57326, p-value = 0.856
## alternative hypothesis: two.sided
```

### Modelo Nb2

$$\text{Abundance}_i \sim \text{NB}(\mu_i, \theta)$$

$$\begin{aligned} \log(\mu_i) = & \beta_0 + \sum_{j=1}^3 \beta_{1j} \cdot \text{appearance}_{ij} + \beta_2 \cdot \text{length}_i + \beta_3 \cdot \text{PC1}_i + \beta_4 \cdot \text{PC2}_i \\ & + \sum_{j=1}^3 \gamma_{1j} \cdot (\text{appearance}_{ij} \times \text{PC1}_i) + \sum_{j=1}^3 \gamma_{2j} \cdot (\text{appearance}_{ij} \times \text{PC2}_i) \\ & + b_{\text{Site}[i]} + b_{\text{Specie}[i]} \end{aligned}$$

```
library(glmmTMB)
```

```
glmm_model_nb2 <- glmmTMB(
```

```
  Abundance ~ appearance + length + PC1 + PC2 + appearance:PC1 + appearance:PC2 + (1 | Site) + (1 | Sp
  family = nbinom2(), # alternativo
```

```

data = Spider
)
step(glmm_model_nb2)

## Start: AIC=1669.52
## Abundance ~ appearance + length + PC1 + PC2 + appearance:PC1 +
## appearance:PC2
##
##           Df      AIC
## <none>          1669.5
## - length        3 1697.3
## - appearance:PC2 5 1725.4
## - appearance:PC1 5 1729.8

## Formula:
## Abundance ~ appearance + length + PC1 + PC2 + appearance:PC1 +
## appearance:PC2
## Data: Spider
##      AIC      BIC    logLik -2*log(L)  df.resid
## 1669.5177 1730.5914 -818.7588 1637.5177      320
## Random-effects (co)variances:
##
## Conditional model:
## Groups Name      Std.Dev.
## Site (Intercept) 0.4017
## Specie (Intercept) 0.8900
##
## Number of obs: 336 / Conditional model: Site, 28; Specie, 12
##
## Dispersion parameter for nbinom2 family (): 0.423
##
## Fixed Effects:
##
## Conditional model:
##           (Intercept)          appearancestripes_dark
##              0.88105              1.27253
## appearancespots_yellow appearancestripes_yellow
##           -0.04430              2.23160
##              length              PC1
##           -0.54404              0.29419
##              PC2 appearancestripes_dark:PC1
##           2.56724              -0.01106
## appearancespots_yellow:PC1 appearancestripes_yellow:PC1
##           -1.71957              -0.14486
## appearancestripes_dark:PC2 appearancespots_yellow:PC2
##           -1.87476              -2.56971
## appearancestripes_yellow:PC2
##           -1.83745

summary(glmm_model_nb2)

## Family: nbinom2 ( log )

```

```
## Formula:
## Abundance ~ appearance + length + PC1 + PC2 + appearance:PC1 +
## appearance:PC2 + (1 | Site) + (1 | Specie)
## Data: Spider
##
##      AIC      BIC    logLik -2*log(L)  df.resid
##    1669.5    1730.6    -818.8    1637.5      320
##
## Random effects:
##
## Conditional model:
## Groups Name      Variance Std.Dev.
## Site (Intercept) 0.1614   0.4017
## Specie (Intercept) 0.7922   0.8900
## Number of obs: 336, groups: Site, 28; Specie, 12
##
## Dispersion parameter for nbinom2 family (): 0.423
##
## Conditional model:
##              Estimate Std. Error z value Pr(>|z|)
## (Intercept)      0.88105    1.73471   0.508   0.6115
## appearancestripes_dark      1.27253    0.92828   1.371   0.1704
## appearancespots_yellow     -0.04430    1.19211  -0.037   0.9704
## appearancestripes_yellow      2.23160    0.98111   2.275   0.0229 *
## length             -0.54404    1.07605  -0.506   0.6131
## PC1                  0.29419    0.24906   1.181   0.2375
## PC2                  2.56724    0.38284   6.706 2.00e-11 ***
## appearancestripes_dark:PC1    -0.01106    0.28221  -0.039   0.9687
## appearancespots_yellow:PC1    -1.71957    0.37156  -4.628 3.69e-06 ***
## appearancestripes_yellow:PC1  -0.14486    0.28633  -0.506   0.6129
## appearancestripes_dark:PC2    -1.87476    0.41915  -4.473 7.72e-06 ***
## appearancespots_yellow:PC2    -2.56971    0.48567  -5.291 1.22e-07 ***
## appearancestripes_yellow:PC2  -1.83745    0.40610  -4.525 6.05e-06 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

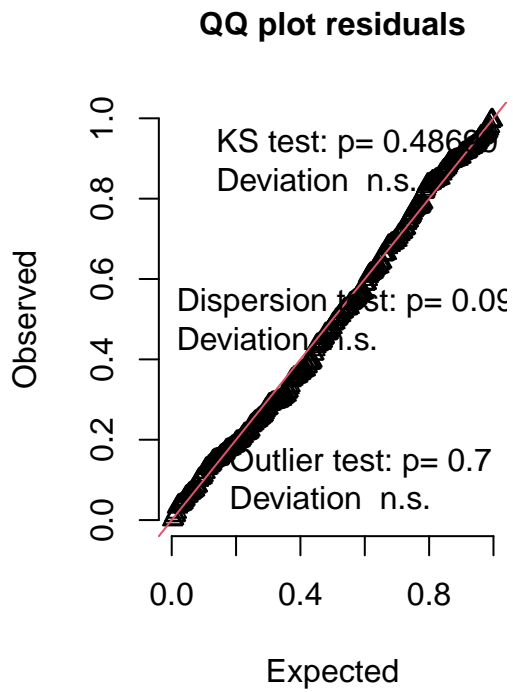
```
AIC(glm_model_nb2)
```

```
## [1] 1669.518
```

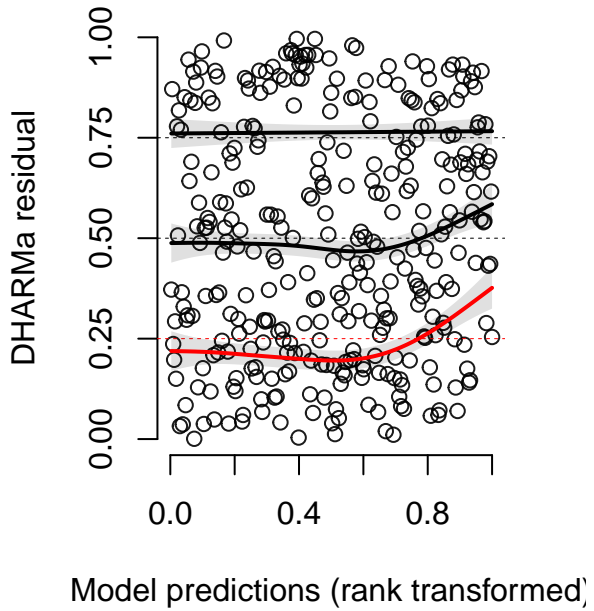
```
library(DHARMA)
res <- simulateResiduals(glm_model_nb2)
plot(res)
```



## DHARMa residual

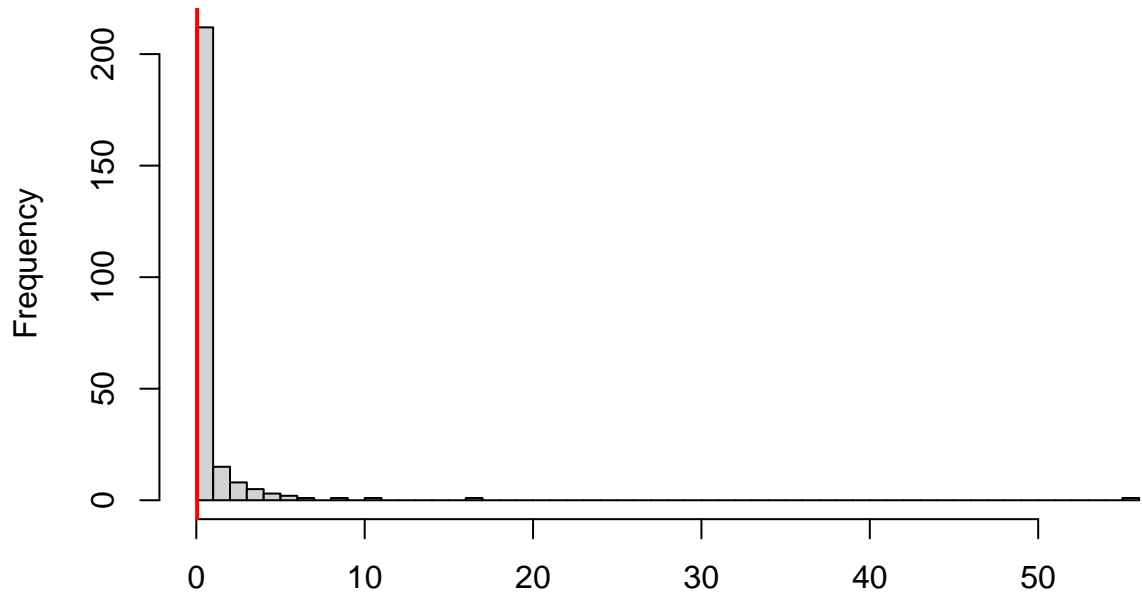


**DHARMa residual vs. predicted**  
Quantile deviations detected (red curves)  
Combined adjusted quantile test n.s.



```
testDispersion(res)
```

### DHARMA nonparametric dispersion test via sd of residuals fitted vs. simulated



Simulated values, red line = fitted model. p-value (two.sided) = 0.096

```
##
## DHARMA nonparametric dispersion test via sd of residuals fitted vs.
## simulated
##
## data: simulationOutput
## dispersion = 0.053799, p-value = 0.096
## alternative hypothesis: two.sided
```

Modelo Nb1 completo:

$$\text{Abundance}_i \sim \text{NB1}(\mu_i, \theta)$$

$$\begin{aligned} \log(\mu_i) = & \beta_0 + \sum_{j=1}^3 \beta_{1j} \cdot \text{appearance}_{ij} + \beta_2 \cdot \text{length}_i + \beta_3 \cdot \text{PC1}_i + \beta_4 \cdot \text{PC2}_i \\ & + \sum_{j=1}^3 \gamma_{1j} \cdot (\text{appearance}_{ij} \times \text{PC1}_i) + \sum_{j=1}^3 \gamma_{2j} \cdot (\text{appearance}_{ij} \times \text{PC2}_i) \\ & + b_{\text{Site}[i]} + b_{\text{Specie}[i]} \end{aligned}$$

```
library(glmmTMB)
```

```
glmm_model_x <- glmmTMB(
```

```
  Abundance ~ appearance + length + PC1 + PC2 + appearance:PC1 + appearance:PC2 + (1 | Site) + (1 | Sp
  family = nbinom1(),
```

```

data = Spider
)
step(glmm_model_x)

## Start: AIC=1597.82
## Abundance ~ appearance + length + PC1 + PC2 + appearance:PC1 +
## appearance:PC2
##
##           Df      AIC
## <none>           1597.8
## - length         3 1685.6
## - appearance:PC2  5 1705.9
## - appearance:PC1  5 1710.2

## Formula:
## Abundance ~ appearance + length + PC1 + PC2 + appearance:PC1 +
## appearance:PC2
## Data: Spider
##      AIC      BIC    logLik -2*log(L)  df.resid
## 1597.8177 1658.8915 -782.9088 1565.8177      320
## Random-effects (co)variances:
##
## Conditional model:
## Groups Name      Std.Dev.
## Site (Intercept) 0.3163
## Specie (Intercept) 0.7672
##
## Number of obs: 336 / Conditional model: Site, 28; Specie, 12
##
## Dispersion parameter for nbinom1 family (): 14.5
##
## Fixed Effects:
##
## Conditional model:
##           (Intercept)      appearancestripes_dark
##           2.229634           0.763491
##      appearancespots_yellow      appearancestripes_yellow
##           -0.096940           1.288800
##           length           PC1
##           -0.929017           -0.003162
##           PC2      appearancestripes_dark:PC1
##           1.808521           0.044524
##      appearancespots_yellow:PC1      appearancestripes_yellow:PC1
##           -1.168184           0.303313
##      appearancestripes_dark:PC2      appearancespots_yellow:PC2
##           -1.284153           -1.632675
##      appearancestripes_yellow:PC2
##           -0.996311

summary(glmm_model_x)

## Family: nbinom1 ( log )

```

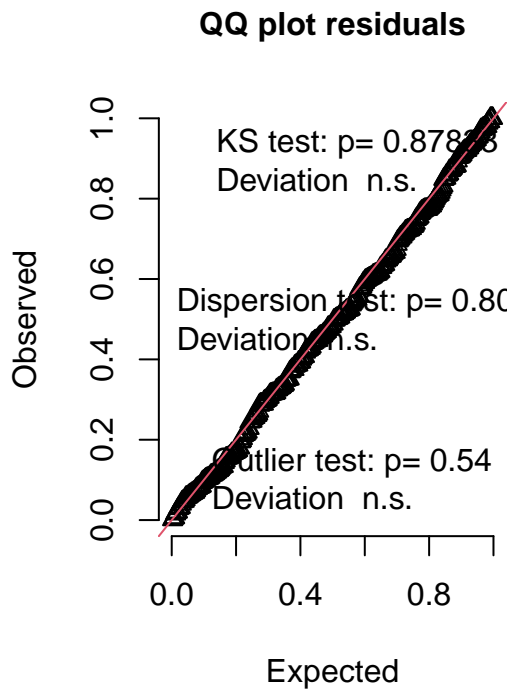
```
## Formula:
## Abundance ~ appearance + length + PC1 + PC2 + appearance:PC1 +
## appearance:PC2 + (1 | Site) + (1 | Specie)
## Data: Spider
##
##      AIC      BIC    logLik -2*log(L)  df.resid
##    1597.8    1658.9    -782.9    1565.8      320
##
## Random effects:
##
## Conditional model:
## Groups Name      Variance Std.Dev.
## Site (Intercept) 0.1000   0.3163
## Specie (Intercept) 0.5885   0.7672
## Number of obs: 336, groups: Site, 28; Specie, 12
##
## Dispersion parameter for nbinom1 family (): 14.5
##
## Conditional model:
##
##              Estimate Std. Error z value Pr(>|z|)
## (Intercept)      2.229634    1.421041   1.569 0.116644
## appearancestripes_dark      0.763491    0.790907   0.965 0.334377
## appearancespots_yellow     -0.096940    1.042126  -0.093 0.925887
## appearancestripes_yellow      1.288800    0.824390   1.563 0.117973
## length             -0.929017    0.878492  -1.058 0.290277
## PC1                 -0.003162    0.162589  -0.019 0.984483
## PC2                  1.808521    0.228277   7.922 2.33e-15 ***
## appearancestripes_dark:PC1      0.044524    0.181042   0.246 0.805734
## appearancespots_yellow:PC1     -1.168184    0.310811  -3.759 0.000171 ***
## appearancestripes_yellow:PC1    0.303313    0.167715   1.809 0.070529 .
## appearancestripes_dark:PC2     -1.284153    0.242042  -5.306 1.12e-07 ***
## appearancespots_yellow:PC2     -1.632675    0.318265  -5.130 2.90e-07 ***
## appearancestripes_yellow:PC2   -0.996311    0.232158  -4.292 1.77e-05 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
AIC(glm_model_x)
```

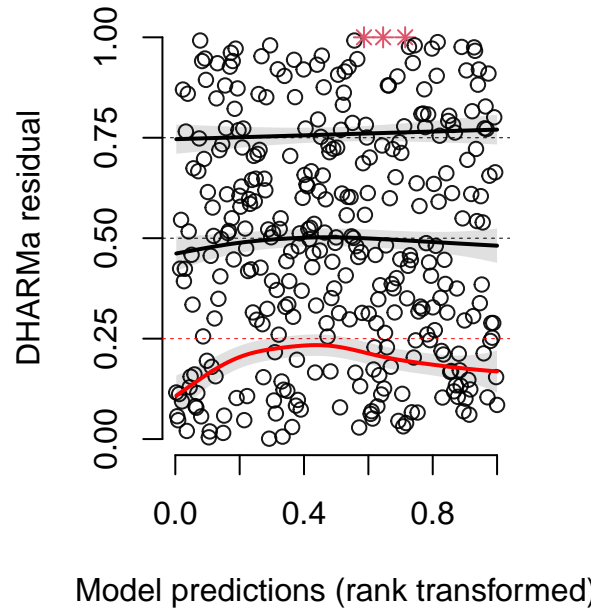
```
## [1] 1597.818
```

```
library(DHARMA)
res <- simulateResiduals(glm_model_x)
plot(res)
```

## DHARMa residual

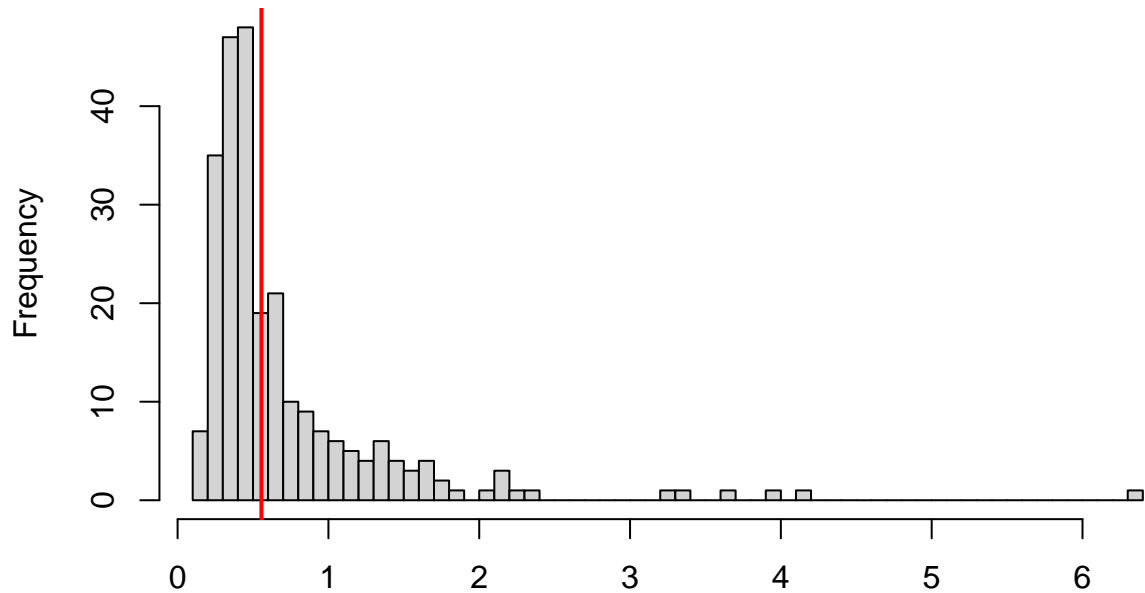


**DHARMa residual vs. predicted**  
Quantile deviations detected (red curves)  
Combined adjusted quantile test significant



```
testDispersion(glm_model_x)
```

### DHARMA nonparametric dispersion test via sd of residuals fitted vs. simulated



Simulated values, red line = fitted model. p-value (two.sided) = 0.808

```
##
## DHARMA nonparametric dispersion test via sd of residuals fitted vs.
## simulated
##
## data: simulationOutput
## dispersion = 0.77512, p-value = 0.808
## alternative hypothesis: two.sided
```

Modelo Nb1 reducido (FINAL):

$$\text{Abundance}_i \sim \text{NB1}(\mu_i, \theta)$$

$$\log(\mu_i) = \beta_0 + \beta_1 \cdot \text{PC2}_i + \sum_{j=1}^3 \gamma_{1j} \cdot (\text{appearance}_{ij} \times \text{PC1}_i) + \sum_{j=1}^3 \gamma_{2j} \cdot (\text{appearance}_{ij} \times \text{PC2}_i) + b_{\text{Site}[i]} + b_{\text{Specie}[i]}$$

```
library(glmmTMB)

glmm_model_x <- glmmTMB(
  Abundance ~ PC2 + appearance:PC1 + appearance:PC2 + (1 | Site) + (1 | Specie),
  family = nbinom1(),
  data = Spider
)
step(glmm_model_x)
```

```

## Start: AIC=1594.57
## Abundance ~ PC2 + appearance:PC1 + appearance:PC2
##
##           Df      AIC
## <none>          1594.6
## - appearance:PC1  6 1720.3
## - PC2:appearance  5 1734.1

## Formula:          Abundance ~ PC2 + appearance:PC1 + appearance:PC2
## Data: Spider
##           AIC      BIC    logLik -2*log(L)  df.resid
## 1594.574 1640.379 -785.287 1570.574      324
## Random-effects (co)variances:
##
## Conditional model:
## Groups Name      Std.Dev.
## Site (Intercept) 0.3142
## Specie (Intercept) 0.9278
##
## Number of obs: 336 / Conditional model: Site, 28; Specie, 12
##
## Dispersion parameter for nbinom1 family (): 14.4
##
## Fixed Effects:
##
## Conditional model:
##           (Intercept)                      PC2
##           1.243148                      1.776384
## appearancenone_dark:PC1 appearancestripes_dark:PC1
##           0.003234                      0.041145
## appearancespots_yellow:PC1 appearancestripes_yellow:PC1
##          -1.040956                      0.304929
## PC2:appearancestripes_dark PC2:appearancespots_yellow
##          -1.246334                      -1.653953
## PC2:appearancestripes_yellow
##          -0.952576

```

```
summary(glmm_model_x)
```

```

## Family: nbinom1 ( log )
## Formula:
## Abundance ~ PC2 + appearance:PC1 + appearance:PC2 + (1 | Site) +
## (1 | Specie)
## Data: Spider
##
##           AIC      BIC    logLik -2*log(L)  df.resid
## 1594.6 1640.4 -785.3 1570.6      324
##
## Random effects:
##
## Conditional model:
## Groups Name      Variance Std.Dev.
## Site (Intercept) 0.09874 0.3142

```

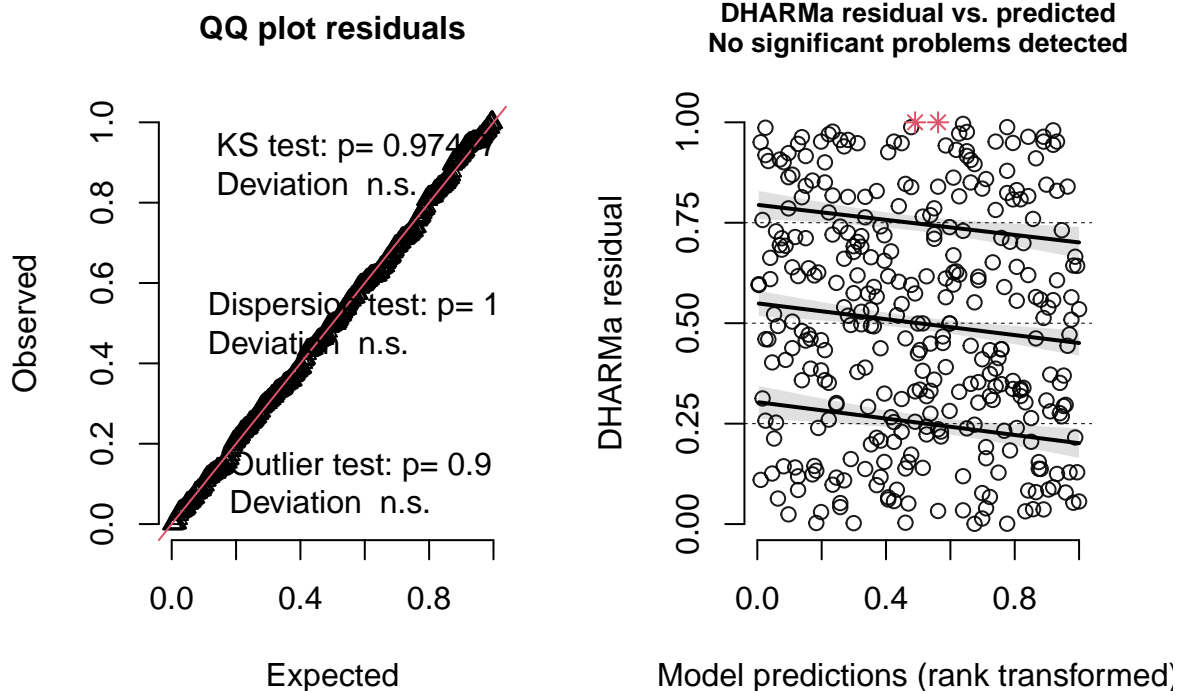
```
## Specie (Intercept) 0.86078 0.9278
## Number of obs: 336, groups: Site, 28; Specie, 12
##
## Dispersion parameter for nbinom1 family (): 14.4
##
## Conditional model:
##
##               Estimate Std. Error z value Pr(>|z|)
## (Intercept)    1.243148   0.303435   4.097 4.19e-05 ***
## PC2            1.776384   0.212953   8.342 < 2e-16 ***
## appearancenone_dark:PC1 0.003234   0.158199   0.020 0.983690
## appearancestripes_dark:PC1 0.041145   0.101683   0.405 0.685739
## appearancespots_yellow:PC1 -1.040956   0.222557  -4.677 2.91e-06 ***
## appearancestripes_yellow:PC1 0.304929   0.083860   3.636 0.000277 ***
## PC2:appearancestripes_dark -1.246334   0.227058  -5.489 4.04e-08 ***
## PC2:appearancespots_yellow -1.653953   0.287415  -5.755 8.69e-09 ***
## PC2:appearancestripes_yellow -0.952576   0.217295  -4.384 1.17e-05 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

```
AIC(glm_model_x)
```

```
## [1] 1594.574
```

```
library(DHARMA)
res <- simulateResiduals(glm_model_x)
plot(res)
```

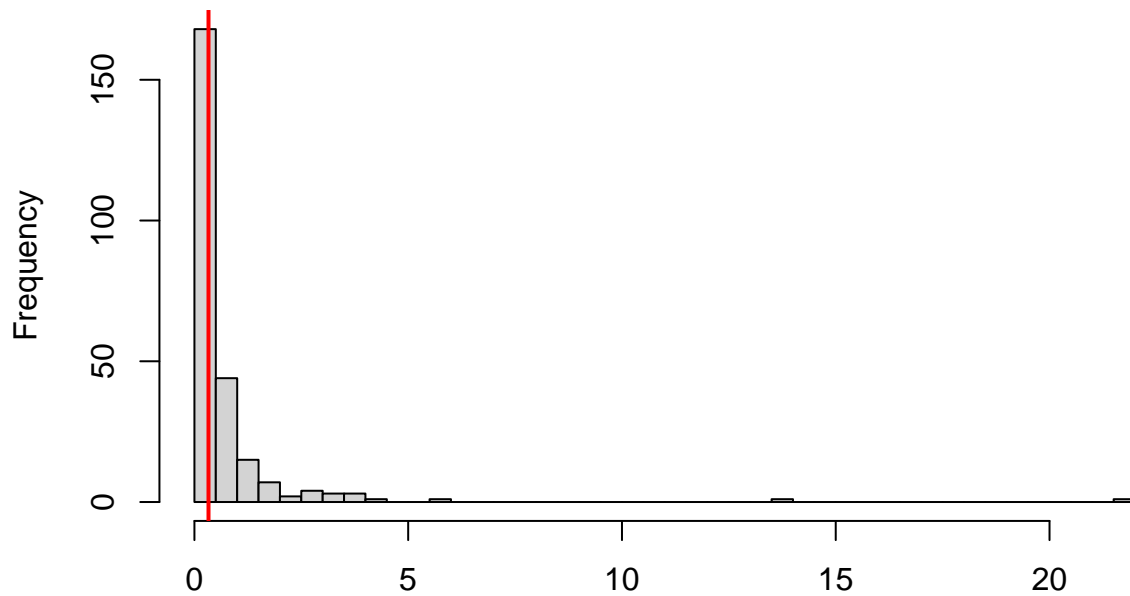
## DHARMA residual





```
testDispersion(glm_model_x)
```

### DHARMA nonparametric dispersion test via sd of residuals fitted vs. simulated



Simulated values, red line = fitted model. p-value (two.sided) = 1

```
##
## DHARMA nonparametric dispersion test via sd of residuals fitted vs.
## simulated
##
## data:  simulationOutput
## dispersion = 0.43161, p-value = 1
## alternative hypothesis: two.sided
```

### Predictivas modelos GLM

```
library(glmTMB)

# Leave-One-Out Cross-Validation (LOOCV)
set.seed(123)
n <- nrow(Spider)
mse_loo <- numeric(n)

for (i in 1:n) {
  train <- Spider[-i, ]
  test <- Spider[i, , drop = FALSE]

  model_loo <- glm_model_x <- glmTMB(
```

```

Abundance ~ appearance:PC1 + appearance:PC2 + PC2 + (1 | Site) + (1 | Specie),
family = nbinom1(),
  data = train
)

pred <- predict(model_loo, newdata = test, type = "response")
obs <- test$Abundance
mse_loo[i] <- (obs - pred)^2
}

rmse_loo <- sqrt(mean(mse_loo))
cat("RMSE modelo NB1 LOOCV:", round(rmse_loo, 2), "\n")

# Gráfico final del modelo ajustado completo
glmm_model_pois <- glmm_model_x <- glmmTMB(
  Abundance ~ appearance:PC1 + appearance:PC2 + PC2 + (1 | Site) + (1 | Specie),
  family = nbinom1(),
  data = Spider
)

pred_pois <- predict(glmm_model_pois, type = "response")

plot(pred_pois, Spider$Abundance,
  xlab = "Predicción", ylab = "Observado",
  main = "Predicción vs Observado (modelo NB1 bio)")
abline(0, 1, col = "red")

```

## MODELOS GAM

### Modelo aparición y longitud paramétricos:

$$\text{Abundance}_i \sim \text{NB}(\mu_i, \theta)$$

$$\log(\mu_i) = \beta_0 + \sum_{j=1}^3 \beta_{1j} \cdot \text{appearance}_{ij} + \beta_2 \cdot \text{length}_i \\ + f_1^{(fs)}(\text{length}_i, \text{Site}_i) + f_2^{(fs)}(\text{PC1}_i, \text{Specie}_i) + f_3^{(fs)}(\text{PC2}_i, \text{Specie}_i)$$

```
mgam11 <- gam(formula = Abundance ~ appearance + length +  
  s(length, Site, bs = "fs") +  
  s(PC1, Specie, bs = "fs") +  
  s(PC2, Specie, bs = "fs"),  
  family = nb, data = Spider, method = "REML")
```

```
## Warning in gam.side(sm, X, tol = .Machine$double.eps^0.5): model has repeated  
## 1-d smooths of same variable.
```

```
summary(mgam11)
```

```
##  
## Family: Negative Binomial(1.824)  
## Link function: log  
##  
## Formula:  
## Abundance ~ appearance + length + s(length, Site, bs = "fs") +  
##      s(PC1, Specie, bs = "fs") + s(PC2, Specie, bs = "fs")  
##  
## Parametric coefficients:  
##              Estimate Std. Error z value Pr(>|z|)  
## (Intercept)      1.3643     2.8341   0.481   0.630  
## appearancestripes_dark  0.7956     1.5066   0.528   0.597  
## appearancespots_yellow -0.2338     1.9190  -0.122   0.903  
## appearancestripes_yellow  1.4092     1.5840   0.890   0.374  
## length           -1.0674     1.7620  -0.606   0.545  
##  
## Approximate significance of smooth terms:  
##              edf Ref.df Chi.sq p-value  
## s(length,Site) 30.97   277  71.33 <2e-16 ***  
## s(PC1,Specie)  30.38   115 209.48 <2e-16 ***  
## s(PC2,Specie)  22.66   115 305.21 <2e-16 ***  
## ---  
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1  
##  
## R-sq.(adj) = 0.707   Deviance explained = 88.5%  
## -REML = 753.38   Scale est. = 1           n = 336
```

### Modelo interacción aleatorio curvas y constante PCA y especie, sitio aleatorio:

$$\text{Abundance}_i \sim \text{NB}(\mu_i, \theta = 6)$$

$$\log(\mu_i) = \beta_0 + f_1^{(fs)}(\text{PC1}_i, \text{Specie}_i) + f_2^{(fs)}(\text{PC2}_i, \text{Specie}_i) + f_3^{(re)}(\text{Site}_i)$$

```
mgam13 <- gam(Abundance ~ s(PC1, Specie, bs="fs")+s(PC2, Specie, bs="fs")+
              s(Site, bs="re"),
              data = Spider,
              family = negbin(theta = 6),
              method="REML")
```

```
## Warning in gam.side(sm, X, tol = .Machine$double.eps^0.5): model has repeated
## 1-d smooths of same variable.
```

```
summary(mgam13)
```

```
##
## Family: Negative Binomial(6)
## Link function: log
##
## Formula:
## Abundance ~ s(PC1, Specie, bs = "fs") + s(PC2, Specie, bs = "fs") +
##      s(Site, bs = "re")
##
## Parametric coefficients:
##              Estimate Std. Error z value Pr(>|z|)
## (Intercept)  0.08022    0.47902   0.167   0.867
##
## Approximate significance of smooth terms:
##              edf Ref.df  Chi.sq p-value
## s(PC1,Specie) 42.09    119  427.28 7.5e-06 ***
## s(PC2,Specie) 40.86    119 1064.22 < 2e-16 ***
## s(Site)       18.34     27   88.21 < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## R-sq.(adj) =  0.843   Deviance explained = 91.8%
## -REML = 778.99   Scale est. = 1           n = 336
```

Modelo apariencia parametrica, interacción aleatoria en las curvas apariencia PC1, Site y especie aleatoria:

$Abundance_i \sim NB(\mu_i, \theta = 6)$

$$\log(\mu_i) = \beta_0 + \sum_{j=1}^3 \beta_{1j} \cdot appearance_{ij} + f_1(length_i) + f_2^{(fs)}(PC1_i, appearance_i) + f_3^{(re)}(Site_i) + f_4^{(re)}(Specie_i)$$

```
mgam14 <- gam(Abundance ~ s(length)+appearance +
              s(appearance, PC1, bs="fs")+
              s(Site, bs="re")+s(Specie, bs="re"),
              data = Spider, family=negbin(theta=6))
summary(mgam14)
```

```
##
## Family: Negative Binomial(6)
```

```
## Link function: log
##
## Formula:
## Abundance ~ s(length) + appearance + s(appearance, PC1, bs = "fs") +
##      s(Site, bs = "re") + s(Specie, bs = "re")
##
## Parametric coefficients:
##              Estimate Std. Error z value Pr(>|z|)
## (Intercept)    -0.5149     1.1383  -0.452   0.6511
## appearancestripes_dark    1.6246     1.2995   1.250   0.2113
## appearancespots_yellow   -0.3137     1.7305  -0.181   0.8561
## appearancestripes_yellow    2.4230     1.3583   1.784   0.0744 .
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Approximate significance of smooth terms:
##              edf Ref.df   Chi.sq  p-value
## s(length)         1.001  1.001    0.244    0.622
## s(appearance,PC1) 26.139 36.000 4585.518 1.36e-06 ***
## s(Site)           18.959 27.000  204.070 < 2e-16 ***
## s(Specie)          6.923  7.000  469.265 < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## R-sq.(adj) =  0.567   Deviance explained = 67.2%
## UBRE = 2.6708   Scale est. = 1         n = 336
```

#### Modelo 14. Leave-One-Out Cross-Validation (LOOCV):

```
set.seed(123)
n <- nrow(Spider)
mse_loo <- numeric(n)

for (i in 1:n) {
  train <- Spider[-i, ]
  test <- Spider[i, , drop = FALSE]

  mgam14_loo <- gam(Abundance ~ s(length)+appearance +
                    s(appearance, PC1, bs="fs")+
                    s(Site, bs="re")+s(Specie, bs="re"),
                    data = train, family=negbin(theta=6))

  pred <- predict(mgam14_loo, newdata = test, type = "response")
  obs <- test$Abundance
  mse_loo[i] <- (obs - pred)^2
}

rmse_loo <- sqrt(mean(mse_loo))
cat("RMSE modelo mgam 14 LOOCV:", round(rmse_loo, 2), "\n")
```

## MODELOS BAYESIANA (JAGS)

### Modelo final

El modelo asumido es:

$$\text{Abundance}_i \sim \text{Poisson}(\mu_i)$$

$$\log(\mu_i) = \eta_i + \varepsilon_i$$

$$\eta_i = \beta_0 + \beta_{\text{PC2}} \cdot \text{PC2}_i + \beta_{a_i}^{(\text{PC1})} \cdot \text{PC1}_i + \beta_{a_i}^{(\text{PC2})} \cdot \text{PC2}_i + u_{\text{Site}[i]} + v_{\text{Specie}[i]}$$

```
#Modelo
cat(file = "Modelo", "model {

#Capa verosimilitud
  for (i in 1:N) {
    Abundance[i] ~ dpois(mu[i])
    log(mu[i]) <- eta[i] + ea[i]
    eta[i] <- beta0 +
      beta_PC2 * PC2[i] +
      beta3[appearance[i]] * PC1[i] +
      beta4[appearance[i]] * PC2[i] +
      specie_effect[specie[i]] +
      site_effect[Site[i]]
  }

#Distribuciones previas
  beta0 ~ dnorm(0, 0.0001)
  beta_PC2 ~ dnorm(0, 0.0001)

#Restricción interacción appearance:PC1 y appearance:PC2
  for (i in 1:3) {
    beta3[i] ~ dnorm(0, 0.0001)
    beta4[i] ~ dnorm(0, 0.0001)
  }
  beta3[4] <- -sum(beta3[1:3])
  beta4[4] <- -sum(beta4[1:3])

#Efecto aleatorio de sitio
  for (i in 1:n_site) {
    site_effect[i] ~ dnorm(0, tau_site)
  }
  tau_site <- pow(sigma_site, -2)
  sigma_site ~ dunif(0, 100)

#Efecto aleatorio de especie
  for (i in 1:n_specie) {
    specie_effect[i] ~ dnorm(0, tau_specie)
  }
  tau_specie <- pow(sigma_specie, -2)
  sigma_specie ~ dunif(0, 100)

#Parámetro de dispersión: lineal con predictor lineal
  for (i in 1:N){
    ea[i] ~ dnorm(0, tau_ea[i])
  }
}
```

```

    tau_ea[i] <- pow(sigma_ea[i], -2)
    sigma_ea[i] <- max(alfa_sd + beta_sd * eta[i], 0.001)
  }
  alfa_sd ~ dnorm(0, 0.0001)
  beta_sd ~ dnorm(0, 0.0001)

# Residuos
for (i in 1:N){
  Abundance_pred[i]~dpois(mu[i])
  resid[i]<-Abundance_pred[i]- Abundance[i]
  resid2[i]<-pow(resid[i], 2)
  P.resid[i] <- step(resid[i]) - 0.5 * equals(resid[i], 0)
}

})

# Datos
#Cambiamos factores por numeric
Spider$appearance_num <- as.numeric(Spider$appearance)

#Creamos vector de datos
datos <- list(
  Abundance = Spider$Abundance,
  appearance = Spider$appearance_num,
  length = Spider$length,
  PC1 = Spider$PC1,
  PC2 = Spider$PC2,
  length.PC1=Spider$length*Spider$PC1,
  length.PC2=Spider$length*Spider$PC2,
  Site = as.numeric(as.factor(Spider$Site)),
  N = nrow(Spider),
  n_site = length(unique(Spider$Site)),
  n_specie = length(unique(Spider$Specie)),
  specie = as.numeric(as.factor(Spider$Specie))
)

#Iniciales
inits <- function() {
  list(
    beta0 = rnorm(1),
    beta_PC2 = rnorm(1),
    beta3 = c(rnorm(1), rnorm(1), rnorm(1), NA),
    beta4 = c(rnorm(1), rnorm(1), rnorm(1), NA),
    sigma_site = runif(1, 0, 10),
    sigma_specie = runif(1, 0, 10),
    alfa_sd= rnorm(1),
    beta_sd = rnorm(1),
    site_effect = rnorm(datos$n_site, 0, 1),
    ea = rnorm(datos$N, 0, 1),
    specie_effect=rnorm(datos$n_specie, 0, 1)
  )
}

```

```

}

#Parámetros
params <- c("beta0", "beta_PC2", "beta3", "beta4", "sigma_site", "sigma_specie", "sigma_ea", "alfa_sd")

#Corremos modelo
model_fitb2<- jags(
  data = datos,
  inits = inits,
  parameters.to.save = params,
  model.file = "Modelo",
  n.chains = 3,
  n.iter = 100000,
  n.burnin = 20000,
  n.thin = 5,
  parallel = TRUE
)

model_fitb2$Rhat
model_fitb2$DIC
model_fitb2

#save(model_fitb2, file = "modelo_biologicoFINAL.RData")

load("modelo_biologicoFINAL.RData")
model_fitb2

```

```

## JAGS output for model 'Modelo', generated by jagsUI.
## Estimates based on 3 chains of 1e+05 iterations,
## adaptation = 100 iterations (sufficient),
## burn-in = 20000 iterations and thin rate = 5,
## yielding 48000 total samples from the joint posterior.
## MCMC ran in parallel for 5.975 minutes at time 2025-06-10 15:59:49.27892.
##
##          mean      sd    2.5%    50%   97.5% overlap0    f  Rhat n.eff
## beta0      -0.700  0.642  -2.140  -0.640   0.393     TRUE 0.875 1.079   34
## beta_PC2    1.303  0.198   0.937   1.296   1.716    FALSE 1.000 1.030   78
## beta3[1]    0.386  0.191  -0.001   0.387   0.756     TRUE 0.975 1.007  570
## beta3[2]    0.447  0.198   0.081   0.442   0.856    FALSE 0.992 1.005  469
## beta3[3]   -1.605  0.293  -2.246  -1.595  -1.071    FALSE 1.000 1.002 26710
## beta3[4]    0.773  0.126   0.531   0.772   1.027    FALSE 1.000 1.001  6192
## beta4[1]    1.324  0.232   0.891   1.310   1.800    FALSE 1.000 1.044   62
## beta4[2]   -0.186  0.191  -0.557  -0.189   0.204     TRUE 0.837 1.006  1087
## beta4[3]   -1.172  0.253  -1.702  -1.164  -0.700    FALSE 1.000 1.028   99
## beta4[4]    0.034  0.156  -0.269   0.034   0.342     TRUE 0.587 1.007  461
## sigma_site  0.810  0.181   0.513   0.790   1.221    FALSE 1.000 1.001  6137
## sigma_specie 1.920  0.548   1.147   1.823   3.261    FALSE 1.000 1.004  665
## sigma_ea[1]  0.744  0.235   0.352   0.720   1.268    FALSE 1.000 1.007  415
## sigma_ea[2]  1.059  0.212   0.697   1.042   1.519    FALSE 1.000 1.002  1079
## sigma_ea[3]  2.427  0.418   1.773   2.378   3.385    FALSE 1.000 1.003  5415
## sigma_ea[4]  2.094  0.383   1.468   2.053   2.944    FALSE 1.000 1.003   815
## sigma_ea[5]  1.908  0.377   1.309   1.860   2.790    FALSE 1.000 1.001  1714

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## sigma_ea[6]	1.207	0.215	0.862	1.181	1.694	FALSE	1.000	1.001	1683
## sigma_ea[7]	1.617	0.267	1.160	1.593	2.204	FALSE	1.000	1.000	6219
## sigma_ea[8]	0.926	0.246	0.502	0.906	1.468	FALSE	1.000	1.006	381
## sigma_ea[9]	1.011	0.217	0.673	0.982	1.517	FALSE	1.000	1.002	1093
## sigma_ea[10]	0.488	0.218	0.121	0.466	0.964	FALSE	1.000	1.004	615
## sigma_ea[11]	0.259	0.158	0.001	0.239	0.624	FALSE	1.000	1.001	1702
## sigma_ea[12]	1.033	0.178	0.741	1.014	1.431	FALSE	1.000	1.002	1440
## sigma_ea[13]	2.619	0.391	1.960	2.585	3.497	FALSE	1.000	1.004	803
## sigma_ea[14]	1.237	0.185	0.917	1.223	1.639	FALSE	1.000	1.000	37196
## sigma_ea[15]	2.328	0.406	1.703	2.274	3.257	FALSE	1.000	1.005	3525
## sigma_ea[16]	2.272	0.378	1.661	2.230	3.122	FALSE	1.000	1.001	3537
## sigma_ea[17]	3.783	0.530	2.900	3.731	4.978	FALSE	1.000	1.003	2085
## sigma_ea[18]	1.174	0.173	0.888	1.156	1.558	FALSE	1.000	1.002	951
## sigma_ea[19]	1.794	0.255	1.359	1.769	2.358	FALSE	1.000	1.002	3060
## sigma_ea[20]	1.104	0.167	0.824	1.087	1.481	FALSE	1.000	1.002	864
## sigma_ea[21]	0.912	0.196	0.601	0.887	1.365	FALSE	1.000	1.002	1415
## sigma_ea[22]	0.455	0.147	0.169	0.448	0.766	FALSE	1.000	1.010	238
## sigma_ea[23]	0.165	0.123	0.001	0.149	0.451	FALSE	1.000	1.003	814
## sigma_ea[24]	0.933	0.157	0.667	0.919	1.280	FALSE	1.000	1.002	1130
## sigma_ea[25]	1.194	0.237	0.799	1.170	1.733	FALSE	1.000	1.009	270
## sigma_ea[26]	1.048	0.178	0.744	1.034	1.440	FALSE	1.000	1.001	1747
## sigma_ea[27]	2.336	0.411	1.699	2.285	3.281	FALSE	1.000	1.004	4095
## sigma_ea[28]	2.083	0.372	1.485	2.037	2.925	FALSE	1.000	1.002	1139
## sigma_ea[29]	2.357	0.392	1.732	2.308	3.268	FALSE	1.000	1.003	1073
## sigma_ea[30]	1.017	0.165	0.743	1.000	1.389	FALSE	1.000	1.001	5720
## sigma_ea[31]	1.605	0.243	1.194	1.581	2.147	FALSE	1.000	1.001	10326
## sigma_ea[32]	0.915	0.206	0.568	0.895	1.373	FALSE	1.000	1.006	408
## sigma_ea[33]	0.920	0.198	0.606	0.894	1.378	FALSE	1.000	1.002	1327
## sigma_ea[34]	0.299	0.151	0.005	0.288	0.630	FALSE	1.000	1.003	577
## sigma_ea[35]	0.170	0.115	0.001	0.158	0.433	FALSE	1.000	1.003	818
## sigma_ea[36]	0.941	0.146	0.692	0.929	1.259	FALSE	1.000	1.002	1114
## sigma_ea[37]	1.156	0.240	0.755	1.132	1.703	FALSE	1.000	1.014	185
## sigma_ea[38]	0.916	0.168	0.621	0.905	1.279	FALSE	1.000	1.002	948
## sigma_ea[39]	2.188	0.395	1.579	2.139	3.090	FALSE	1.000	1.004	1828
## sigma_ea[40]	1.952	0.361	1.370	1.910	2.773	FALSE	1.000	1.002	1121
## sigma_ea[41]	2.320	0.388	1.700	2.272	3.220	FALSE	1.000	1.004	655
## sigma_ea[42]	0.849	0.182	0.547	0.831	1.263	FALSE	1.000	1.002	2085
## sigma_ea[43]	1.474	0.232	1.082	1.450	1.995	FALSE	1.000	1.002	2080
## sigma_ea[44]	0.783	0.179	0.484	0.766	1.189	FALSE	1.000	1.007	331
## sigma_ea[45]	0.772	0.195	0.463	0.747	1.236	FALSE	1.000	1.001	2380
## sigma_ea[46]	0.157	0.156	0.001	0.126	0.530	FALSE	1.000	1.005	538
## sigma_ea[47]	0.066	0.095	0.001	0.021	0.331	FALSE	1.000	1.012	466
## sigma_ea[48]	0.793	0.165	0.506	0.778	1.161	FALSE	1.000	1.004	665
## sigma_ea[49]	2.591	0.397	1.923	2.555	3.494	FALSE	1.000	1.006	444
## sigma_ea[50]	1.126	0.189	0.785	1.117	1.525	FALSE	1.000	1.000	23751
## sigma_ea[51]	2.192	0.395	1.582	2.141	3.098	FALSE	1.000	1.004	2918
## sigma_ea[52]	2.161	0.380	1.542	2.121	3.019	FALSE	1.000	1.001	3000
## sigma_ea[53]	3.755	0.525	2.880	3.703	4.935	FALSE	1.000	1.004	1009
## sigma_ea[54]	0.776	0.140	0.541	0.764	1.089	FALSE	1.000	1.001	20654
## sigma_ea[55]	1.683	0.249	1.252	1.662	2.231	FALSE	1.000	1.002	3425
## sigma_ea[56]	0.993	0.169	0.706	0.977	1.366	FALSE	1.000	1.003	746
## sigma_ea[57]	0.776	0.186	0.481	0.753	1.208	FALSE	1.000	1.002	1187
## sigma_ea[58]	0.082	0.084	0.001	0.065	0.290	FALSE	1.000	1.004	554
## sigma_ea[59]	0.058	0.078	0.001	0.024	0.266	FALSE	1.000	1.005	590

## sigma_ea[60]	0.798	0.145	0.546	0.786	1.116	FALSE	1.000	1.003	723
## sigma_ea[61]	2.418	0.413	1.712	2.387	3.334	FALSE	1.000	1.001	2936
## sigma_ea[62]	1.177	0.196	0.834	1.163	1.604	FALSE	1.000	1.000	26733
## sigma_ea[63]	2.317	0.411	1.680	2.263	3.263	FALSE	1.000	1.004	3065
## sigma_ea[64]	2.212	0.382	1.580	2.172	3.076	FALSE	1.000	1.001	2136
## sigma_ea[65]	3.581	0.566	2.651	3.523	4.858	FALSE	1.000	1.002	5211
## sigma_ea[66]	1.794	0.262	1.343	1.771	2.368	FALSE	1.000	1.017	132
## sigma_ea[67]	1.734	0.275	1.259	1.711	2.337	FALSE	1.000	1.001	9716
## sigma_ea[68]	1.043	0.182	0.727	1.027	1.448	FALSE	1.000	1.004	584
## sigma_ea[69]	0.901	0.201	0.584	0.875	1.367	FALSE	1.000	1.003	777
## sigma_ea[70]	1.074	0.234	0.670	1.051	1.579	FALSE	1.000	1.032	79
## sigma_ea[71]	0.154	0.114	0.001	0.141	0.426	FALSE	1.000	1.006	416
## sigma_ea[72]	0.923	0.161	0.652	0.907	1.282	FALSE	1.000	1.004	558
## sigma_ea[73]	2.295	0.367	1.681	2.259	3.131	FALSE	1.000	1.008	360
## sigma_ea[74]	0.978	0.178	0.656	0.968	1.353	FALSE	1.000	1.000	8367
## sigma_ea[75]	2.068	0.390	1.472	2.016	2.963	FALSE	1.000	1.004	2456
## sigma_ea[76]	2.013	0.373	1.408	1.973	2.851	FALSE	1.000	1.001	2583
## sigma_ea[77]	3.458	0.497	2.639	3.406	4.583	FALSE	1.000	1.004	855
## sigma_ea[78]	0.638	0.136	0.406	0.627	0.939	FALSE	1.000	1.001	8266
## sigma_ea[79]	1.535	0.238	1.126	1.512	2.068	FALSE	1.000	1.002	3022
## sigma_ea[80]	0.844	0.165	0.562	0.830	1.212	FALSE	1.000	1.004	646
## sigma_ea[81]	0.652	0.182	0.362	0.629	1.078	FALSE	1.000	1.002	1313
## sigma_ea[82]	0.016	0.040	0.001	0.001	0.142	FALSE	1.000	1.012	714
## sigma_ea[83]	0.012	0.036	0.001	0.001	0.131	FALSE	1.000	1.015	649
## sigma_ea[84]	0.673	0.140	0.425	0.663	0.976	FALSE	1.000	1.004	609
## sigma_ea[85]	2.884	0.482	2.059	2.843	3.957	FALSE	1.000	1.001	15250
## sigma_ea[86]	1.564	0.254	1.125	1.544	2.117	FALSE	1.000	1.001	4884
## sigma_ea[87]	2.700	0.442	1.996	2.648	3.711	FALSE	1.000	1.004	4164
## sigma_ea[88]	2.599	0.413	1.912	2.558	3.524	FALSE	1.000	1.001	10505
## sigma_ea[89]	4.047	0.629	3.004	3.987	5.458	FALSE	1.000	1.002	11496
## sigma_ea[90]	2.371	0.321	1.813	2.348	3.069	FALSE	1.000	1.012	184
## sigma_ea[91]	2.122	0.326	1.549	2.097	2.826	FALSE	1.000	1.002	2040
## sigma_ea[92]	1.431	0.233	1.029	1.412	1.947	FALSE	1.000	1.001	4006
## sigma_ea[93]	1.284	0.231	0.904	1.259	1.818	FALSE	1.000	1.001	3032
## sigma_ea[94]	1.651	0.287	1.158	1.628	2.282	FALSE	1.000	1.022	111
## sigma_ea[95]	0.527	0.188	0.210	0.508	0.944	FALSE	1.000	1.001	2925
## sigma_ea[96]	1.305	0.206	0.962	1.285	1.769	FALSE	1.000	1.001	3667
## sigma_ea[97]	1.335	0.254	0.904	1.312	1.904	FALSE	1.000	1.000	6257
## sigma_ea[98]	2.247	0.358	1.651	2.211	3.056	FALSE	1.000	1.003	1571
## sigma_ea[99]	3.733	0.551	2.840	3.671	5.006	FALSE	1.000	1.003	9468
## sigma_ea[100]	3.282	0.508	2.440	3.226	4.423	FALSE	1.000	1.004	1006
## sigma_ea[101]	2.498	0.439	1.787	2.448	3.525	FALSE	1.000	1.000	28500
## sigma_ea[102]	2.980	0.371	2.345	2.950	3.781	FALSE	1.000	1.005	441
## sigma_ea[103]	2.804	0.425	2.088	2.764	3.752	FALSE	1.000	1.001	5606
## sigma_ea[104]	2.113	0.396	1.446	2.073	2.993	FALSE	1.000	1.004	677
## sigma_ea[105]	2.317	0.350	1.746	2.281	3.124	FALSE	1.000	1.001	2081
## sigma_ea[106]	2.260	0.333	1.692	2.230	2.981	FALSE	1.000	1.009	251
## sigma_ea[107]	1.560	0.274	1.098	1.537	2.179	FALSE	1.000	1.001	4659
## sigma_ea[108]	2.338	0.313	1.809	2.309	3.039	FALSE	1.000	1.001	2996
## sigma_ea[109]	1.521	0.292	1.018	1.497	2.161	FALSE	1.000	1.001	3878
## sigma_ea[110]	2.338	0.373	1.704	2.305	3.169	FALSE	1.000	1.003	1340
## sigma_ea[111]	3.813	0.567	2.892	3.753	5.099	FALSE	1.000	1.004	4700
## sigma_ea[112]	3.373	0.519	2.508	3.324	4.528	FALSE	1.000	1.004	956
## sigma_ea[113]	2.684	0.465	1.923	2.631	3.756	FALSE	1.000	1.001	12106

## sigma_ea[114]	3.173	0.394	2.485	3.144	4.018	FALSE	1.000	1.007	309
## sigma_ea[115]	2.895	0.441	2.150	2.852	3.881	FALSE	1.000	1.002	3667
## sigma_ea[116]	2.204	0.409	1.516	2.170	3.101	FALSE	1.000	1.004	658
## sigma_ea[117]	2.397	0.368	1.785	2.361	3.213	FALSE	1.000	1.002	2223
## sigma_ea[118]	2.453	0.354	1.826	2.429	3.216	FALSE	1.000	1.011	187
## sigma_ea[119]	1.640	0.297	1.137	1.614	2.292	FALSE	1.000	1.001	2099
## sigma_ea[120]	2.418	0.334	1.852	2.387	3.159	FALSE	1.000	1.001	1809
## sigma_ea[121]	1.033	0.263	0.571	1.016	1.593	FALSE	1.000	1.002	1200
## sigma_ea[122]	1.989	0.330	1.420	1.963	2.711	FALSE	1.000	1.003	900
## sigma_ea[123]	3.476	0.523	2.618	3.417	4.665	FALSE	1.000	1.004	4313
## sigma_ea[124]	3.024	0.481	2.226	2.978	4.093	FALSE	1.000	1.005	746
## sigma_ea[125]	2.196	0.420	1.519	2.146	3.149	FALSE	1.000	1.001	5558
## sigma_ea[126]	2.577	0.334	1.995	2.550	3.314	FALSE	1.000	1.005	429
## sigma_ea[127]	2.546	0.392	1.879	2.510	3.408	FALSE	1.000	1.002	2376
## sigma_ea[128]	1.855	0.369	1.216	1.828	2.660	FALSE	1.000	1.005	485
## sigma_ea[129]	2.060	0.318	1.529	2.031	2.761	FALSE	1.000	1.002	1668
## sigma_ea[130]	1.857	0.307	1.331	1.830	2.532	FALSE	1.000	1.010	245
## sigma_ea[131]	1.303	0.255	0.869	1.282	1.862	FALSE	1.000	1.001	1684
## sigma_ea[132]	2.081	0.286	1.596	2.057	2.720	FALSE	1.000	1.002	1410
## sigma_ea[133]	0.982	0.265	0.528	0.961	1.559	FALSE	1.000	1.002	1080
## sigma_ea[134]	1.715	0.309	1.184	1.690	2.392	FALSE	1.000	1.001	4985
## sigma_ea[135]	3.159	0.494	2.348	3.105	4.267	FALSE	1.000	1.004	6320
## sigma_ea[136]	2.750	0.456	1.985	2.706	3.757	FALSE	1.000	1.002	1641
## sigma_ea[137]	2.146	0.412	1.476	2.102	3.086	FALSE	1.000	1.001	5714
## sigma_ea[138]	2.124	0.303	1.607	2.098	2.784	FALSE	1.000	1.001	1969
## sigma_ea[139]	2.272	0.362	1.654	2.242	3.068	FALSE	1.000	1.001	29328
## sigma_ea[140]	1.581	0.347	0.985	1.550	2.337	FALSE	1.000	1.003	1100
## sigma_ea[141]	1.743	0.294	1.251	1.714	2.398	FALSE	1.000	1.001	3934
## sigma_ea[142]	1.404	0.281	0.921	1.381	2.012	FALSE	1.000	1.003	716
## sigma_ea[143]	0.986	0.232	0.590	0.967	1.496	FALSE	1.000	1.000	7659
## sigma_ea[144]	1.765	0.257	1.327	1.742	2.329	FALSE	1.000	1.000	15371
## sigma_ea[145]	3.001	0.473	2.205	2.958	4.071	FALSE	1.000	1.004	841
## sigma_ea[146]	1.097	0.211	0.705	1.089	1.535	FALSE	1.000	1.001	7547
## sigma_ea[147]	2.100	0.391	1.497	2.048	3.002	FALSE	1.000	1.004	2629
## sigma_ea[148]	2.132	0.390	1.485	2.095	2.997	FALSE	1.000	1.001	6472
## sigma_ea[149]	4.164	0.596	3.170	4.108	5.484	FALSE	1.000	1.003	1775
## sigma_ea[150]	0.898	0.162	0.622	0.883	1.257	FALSE	1.000	1.002	1040
## sigma_ea[151]	1.654	0.268	1.184	1.634	2.242	FALSE	1.000	1.003	1922
## sigma_ea[152]	0.963	0.177	0.646	0.951	1.349	FALSE	1.000	1.001	1804
## sigma_ea[153]	0.684	0.182	0.392	0.662	1.109	FALSE	1.000	1.002	1277
## sigma_ea[154]	0.186	0.121	0.001	0.181	0.441	FALSE	1.000	1.013	179
## sigma_ea[155]	0.019	0.040	0.001	0.001	0.140	FALSE	1.000	1.007	685
## sigma_ea[156]	0.705	0.144	0.442	0.697	1.011	FALSE	1.000	1.003	685
## sigma_ea[157]	1.816	0.294	1.319	1.787	2.484	FALSE	1.000	1.009	287
## sigma_ea[158]	1.018	0.162	0.736	1.007	1.369	FALSE	1.000	1.001	3551
## sigma_ea[159]	2.196	0.396	1.581	2.146	3.109	FALSE	1.000	1.004	2853
## sigma_ea[160]	2.053	0.364	1.465	2.011	2.877	FALSE	1.000	1.002	1659
## sigma_ea[161]	2.979	0.437	2.266	2.929	3.982	FALSE	1.000	1.004	852
## sigma_ea[162]	0.813	0.143	0.571	0.800	1.135	FALSE	1.000	1.000	9647
## sigma_ea[163]	1.575	0.230	1.188	1.552	2.093	FALSE	1.000	1.002	4906
## sigma_ea[164]	0.885	0.170	0.604	0.867	1.271	FALSE	1.000	1.006	440
## sigma_ea[165]	0.780	0.186	0.489	0.754	1.219	FALSE	1.000	1.002	1369
## sigma_ea[166]	0.115	0.108	0.001	0.097	0.379	FALSE	1.000	1.004	549
## sigma_ea[167]	0.063	0.087	0.001	0.022	0.304	FALSE	1.000	1.005	639

## sigma_ea[168]	0.801	0.150	0.543	0.788	1.133	FALSE	1.000	1.003	832
## sigma_ea[169]	3.842	0.648	2.756	3.783	5.291	FALSE	1.000	1.002	5483
## sigma_ea[170]	1.895	0.303	1.370	1.869	2.565	FALSE	1.000	1.001	8107
## sigma_ea[171]	2.930	0.476	2.166	2.879	3.999	FALSE	1.000	1.004	2184
## sigma_ea[172]	2.930	0.453	2.164	2.887	3.943	FALSE	1.000	1.001	9136
## sigma_ea[173]	5.006	0.774	3.722	4.933	6.735	FALSE	1.000	1.003	6862
## sigma_ea[174]	2.679	0.377	2.033	2.644	3.513	FALSE	1.000	1.014	157
## sigma_ea[175]	2.452	0.375	1.799	2.425	3.264	FALSE	1.000	1.001	3030
## sigma_ea[176]	1.761	0.283	1.287	1.734	2.396	FALSE	1.000	1.001	5373
## sigma_ea[177]	1.514	0.269	1.072	1.486	2.125	FALSE	1.000	1.002	1859
## sigma_ea[178]	1.959	0.341	1.381	1.925	2.712	FALSE	1.000	1.022	103
## sigma_ea[179]	0.757	0.249	0.340	0.734	1.310	FALSE	1.000	1.002	1063
## sigma_ea[180]	1.536	0.261	1.107	1.509	2.118	FALSE	1.000	1.002	967
## sigma_ea[181]	3.362	0.697	2.162	3.305	4.877	FALSE	1.000	1.004	895
## sigma_ea[182]	1.965	0.407	1.283	1.927	2.870	FALSE	1.000	1.001	4204
## sigma_ea[183]	3.132	0.549	2.237	3.072	4.389	FALSE	1.000	1.006	1535
## sigma_ea[184]	3.000	0.526	2.115	2.952	4.177	FALSE	1.000	1.002	1662
## sigma_ea[185]	4.525	0.837	3.108	4.455	6.347	FALSE	1.000	1.004	1074
## sigma_ea[186]	3.869	0.594	2.846	3.823	5.166	FALSE	1.000	1.023	96
## sigma_ea[187]	2.522	0.476	1.710	2.481	3.571	FALSE	1.000	1.001	15013
## sigma_ea[188]	1.831	0.389	1.186	1.794	2.709	FALSE	1.000	1.002	1041
## sigma_ea[189]	1.716	0.361	1.121	1.681	2.512	FALSE	1.000	1.003	657
## sigma_ea[190]	3.149	0.566	2.171	3.111	4.375	FALSE	1.000	1.029	78
## sigma_ea[191]	0.959	0.358	0.360	0.929	1.739	FALSE	1.000	1.003	726
## sigma_ea[192]	1.738	0.367	1.137	1.701	2.560	FALSE	1.000	1.003	612
## sigma_ea[193]	3.931	0.658	2.827	3.873	5.416	FALSE	1.000	1.002	6076
## sigma_ea[194]	1.923	0.308	1.396	1.897	2.604	FALSE	1.000	1.001	8372
## sigma_ea[195]	2.948	0.476	2.186	2.892	4.034	FALSE	1.000	1.005	2558
## sigma_ea[196]	2.958	0.456	2.190	2.913	3.975	FALSE	1.000	1.001	12462
## sigma_ea[197]	5.094	0.785	3.796	5.025	6.860	FALSE	1.000	1.003	7255
## sigma_ea[198]	2.696	0.378	2.060	2.661	3.543	FALSE	1.000	1.013	166
## sigma_ea[199]	2.480	0.376	1.826	2.450	3.292	FALSE	1.000	1.002	2878
## sigma_ea[200]	1.789	0.285	1.313	1.761	2.426	FALSE	1.000	1.001	7399
## sigma_ea[201]	1.532	0.268	1.093	1.504	2.134	FALSE	1.000	1.002	2084
## sigma_ea[202]	1.976	0.341	1.403	1.941	2.741	FALSE	1.000	1.021	108
## sigma_ea[203]	0.775	0.247	0.364	0.751	1.331	FALSE	1.000	1.002	1308
## sigma_ea[204]	1.554	0.260	1.123	1.526	2.142	FALSE	1.000	1.002	1171
## sigma_ea[205]	4.051	0.683	2.904	3.992	5.598	FALSE	1.000	1.001	7184
## sigma_ea[206]	1.943	0.320	1.392	1.913	2.653	FALSE	1.000	1.001	6254
## sigma_ea[207]	2.953	0.480	2.178	2.898	4.035	FALSE	1.000	1.005	2954
## sigma_ea[208]	2.978	0.466	2.187	2.934	4.011	FALSE	1.000	1.001	21423
## sigma_ea[209]	5.215	0.810	3.868	5.141	7.026	FALSE	1.000	1.002	8056
## sigma_ea[210]	2.712	0.389	2.055	2.674	3.575	FALSE	1.000	1.012	183
## sigma_ea[211]	2.500	0.390	1.818	2.468	3.349	FALSE	1.000	1.002	2527
## sigma_ea[212]	1.810	0.297	1.315	1.777	2.478	FALSE	1.000	1.001	13310
## sigma_ea[213]	1.536	0.277	1.086	1.503	2.159	FALSE	1.000	1.002	2668
## sigma_ea[214]	1.992	0.351	1.407	1.957	2.783	FALSE	1.000	1.020	118
## sigma_ea[215]	0.780	0.250	0.359	0.757	1.340	FALSE	1.000	1.001	1675
## sigma_ea[216]	1.558	0.262	1.125	1.530	2.148	FALSE	1.000	1.002	1468
## sigma_ea[217]	3.094	0.598	2.070	3.046	4.406	FALSE	1.000	1.004	988
## sigma_ea[218]	2.008	0.365	1.381	1.980	2.797	FALSE	1.000	1.001	9196
## sigma_ea[219]	3.212	0.523	2.354	3.158	4.396	FALSE	1.000	1.003	4679
## sigma_ea[220]	3.043	0.495	2.204	2.999	4.141	FALSE	1.000	1.002	2046
## sigma_ea[221]	4.257	0.739	3.012	4.189	5.913	FALSE	1.000	1.004	1186

## sigma_ea[222]	3.601	0.520	2.703	3.557	4.722	FALSE	1.000	1.018	124
## sigma_ea[223]	2.565	0.438	1.804	2.530	3.520	FALSE	1.000	1.001	48000
## sigma_ea[224]	1.875	0.358	1.272	1.842	2.665	FALSE	1.000	1.002	1198
## sigma_ea[225]	1.796	0.337	1.229	1.765	2.552	FALSE	1.000	1.002	987
## sigma_ea[226]	2.881	0.490	2.030	2.842	3.935	FALSE	1.000	1.025	96
## sigma_ea[227]	1.039	0.323	0.478	1.017	1.729	FALSE	1.000	1.001	1953
## sigma_ea[228]	1.818	0.336	1.250	1.787	2.558	FALSE	1.000	1.002	1331
## sigma_ea[229]	3.599	0.723	2.369	3.544	5.185	FALSE	1.000	1.003	1043
## sigma_ea[230]	2.142	0.419	1.428	2.105	3.062	FALSE	1.000	1.000	38914
## sigma_ea[231]	3.299	0.549	2.385	3.245	4.513	FALSE	1.000	1.003	2897
## sigma_ea[232]	3.177	0.536	2.265	3.125	4.361	FALSE	1.000	1.001	3347
## sigma_ea[233]	4.762	0.861	3.310	4.696	6.644	FALSE	1.000	1.004	1203
## sigma_ea[234]	4.023	0.598	2.989	3.972	5.332	FALSE	1.000	1.019	113
## sigma_ea[235]	2.699	0.489	1.853	2.664	3.757	FALSE	1.000	1.001	48000
## sigma_ea[236]	2.008	0.402	1.336	1.969	2.892	FALSE	1.000	1.002	2206
## sigma_ea[237]	1.883	0.365	1.273	1.846	2.706	FALSE	1.000	1.002	1171
## sigma_ea[238]	3.303	0.566	2.329	3.256	4.530	FALSE	1.000	1.025	90
## sigma_ea[239]	1.126	0.354	0.515	1.099	1.908	FALSE	1.000	1.001	1487
## sigma_ea[240]	1.904	0.367	1.289	1.871	2.718	FALSE	1.000	1.002	1159
## sigma_ea[241]	3.456	0.646	2.348	3.402	4.863	FALSE	1.000	1.003	1232
## sigma_ea[242]	1.922	0.334	1.352	1.893	2.655	FALSE	1.000	1.001	10343
## sigma_ea[243]	3.049	0.490	2.255	2.992	4.149	FALSE	1.000	1.003	3189
## sigma_ea[244]	2.957	0.472	2.150	2.915	4.012	FALSE	1.000	1.002	2056
## sigma_ea[245]	4.619	0.782	3.304	4.546	6.353	FALSE	1.000	1.004	1433
## sigma_ea[246]	3.354	0.481	2.522	3.312	4.408	FALSE	1.000	1.019	112
## sigma_ea[247]	2.479	0.409	1.771	2.446	3.364	FALSE	1.000	1.001	48000
## sigma_ea[248]	1.789	0.321	1.248	1.758	2.504	FALSE	1.000	1.004	1070
## sigma_ea[249]	1.633	0.285	1.156	1.605	2.269	FALSE	1.000	1.004	618
## sigma_ea[250]	2.634	0.448	1.862	2.596	3.621	FALSE	1.000	1.027	84
## sigma_ea[251]	0.876	0.262	0.432	0.853	1.450	FALSE	1.000	1.002	972
## sigma_ea[252]	1.654	0.277	1.191	1.628	2.274	FALSE	1.000	1.004	728
## sigma_ea[253]	0.942	0.279	0.518	0.900	1.614	FALSE	1.000	1.004	555
## sigma_ea[254]	3.263	0.587	2.287	3.201	4.530	FALSE	1.000	1.007	493
## sigma_ea[255]	5.031	0.716	3.825	4.961	6.617	FALSE	1.000	1.007	1038
## sigma_ea[256]	4.298	0.696	3.133	4.232	5.845	FALSE	1.000	1.007	480
## sigma_ea[257]	2.105	0.488	1.315	2.048	3.232	FALSE	1.000	1.002	1260
## sigma_ea[258]	5.458	0.676	4.266	5.409	6.890	FALSE	1.000	1.018	120
## sigma_ea[259]	3.820	0.651	2.732	3.757	5.235	FALSE	1.000	1.006	728
## sigma_ea[260]	3.129	0.619	2.097	3.068	4.459	FALSE	1.000	1.008	404
## sigma_ea[261]	3.614	0.521	2.720	3.564	4.776	FALSE	1.000	1.006	799
## sigma_ea[262]	4.738	0.638	3.605	4.694	6.090	FALSE	1.000	1.023	96
## sigma_ea[263]	2.857	0.464	2.058	2.816	3.892	FALSE	1.000	1.006	507
## sigma_ea[264]	3.636	0.498	2.781	3.591	4.744	FALSE	1.000	1.006	529
## sigma_ea[265]	0.663	0.203	0.339	0.638	1.129	FALSE	1.000	1.001	2857
## sigma_ea[266]	2.471	0.438	1.743	2.424	3.435	FALSE	1.000	1.005	774
## sigma_ea[267]	4.112	0.607	3.123	4.046	5.496	FALSE	1.000	1.004	4527
## sigma_ea[268]	3.506	0.575	2.555	3.447	4.794	FALSE	1.000	1.005	657
## sigma_ea[269]	1.827	0.425	1.141	1.778	2.800	FALSE	1.000	1.000	8217
## sigma_ea[270]	3.531	0.441	2.755	3.499	4.502	FALSE	1.000	1.007	284
## sigma_ea[271]	3.028	0.505	2.191	2.974	4.137	FALSE	1.000	1.003	1610
## sigma_ea[272]	2.337	0.483	1.539	2.287	3.404	FALSE	1.000	1.006	502
## sigma_ea[273]	2.695	0.399	2.030	2.655	3.594	FALSE	1.000	1.003	1635
## sigma_ea[274]	2.811	0.401	2.110	2.782	3.688	FALSE	1.000	1.011	184
## sigma_ea[275]	1.939	0.317	1.399	1.910	2.655	FALSE	1.000	1.002	1581

## sigma_ea[276]	2.717	0.360	2.103	2.684	3.533	FALSE	1.000	1.002	1412
## sigma_ea[277]	0.987	0.268	0.540	0.961	1.573	FALSE	1.000	1.000	24274
## sigma_ea[278]	2.473	0.418	1.775	2.431	3.380	FALSE	1.000	1.003	1640
## sigma_ea[279]	4.061	0.597	3.079	3.997	5.427	FALSE	1.000	1.003	12175
## sigma_ea[280]	3.508	0.559	2.582	3.451	4.768	FALSE	1.000	1.004	1043
## sigma_ea[281]	2.151	0.461	1.403	2.099	3.213	FALSE	1.000	1.000	11225
## sigma_ea[282]	3.503	0.440	2.746	3.469	4.461	FALSE	1.000	1.005	395
## sigma_ea[283]	3.030	0.484	2.220	2.983	4.086	FALSE	1.000	1.002	4810
## sigma_ea[284]	2.339	0.457	1.576	2.293	3.333	FALSE	1.000	1.004	768
## sigma_ea[285]	2.645	0.396	1.988	2.607	3.545	FALSE	1.000	1.002	2880
## sigma_ea[286]	2.783	0.403	2.091	2.751	3.663	FALSE	1.000	1.008	250
## sigma_ea[287]	1.888	0.323	1.348	1.859	2.618	FALSE	1.000	1.001	8283
## sigma_ea[288]	2.667	0.362	2.053	2.633	3.486	FALSE	1.000	1.001	4819
## sigma_ea[289]	1.579	0.261	1.141	1.553	2.166	FALSE	1.000	1.003	736
## sigma_ea[290]	1.577	0.240	1.172	1.556	2.113	FALSE	1.000	1.001	8415
## sigma_ea[291]	2.900	0.471	2.156	2.843	3.981	FALSE	1.000	1.004	4472
## sigma_ea[292]	2.612	0.418	1.935	2.563	3.560	FALSE	1.000	1.002	2103
## sigma_ea[293]	2.743	0.432	2.051	2.690	3.739	FALSE	1.000	1.001	3781
## sigma_ea[294]	1.860	0.241	1.452	1.838	2.392	FALSE	1.000	1.002	1050
## sigma_ea[295]	2.134	0.311	1.605	2.104	2.823	FALSE	1.000	1.001	11575
## sigma_ea[296]	1.444	0.272	0.988	1.418	2.051	FALSE	1.000	1.003	1073
## sigma_ea[297]	1.484	0.263	1.060	1.453	2.082	FALSE	1.000	1.001	4461
## sigma_ea[298]	1.140	0.203	0.790	1.122	1.587	FALSE	1.000	1.006	330
## sigma_ea[299]	0.727	0.182	0.420	0.710	1.133	FALSE	1.000	1.001	2632
## sigma_ea[300]	1.506	0.219	1.137	1.484	1.995	FALSE	1.000	1.000	4331
## sigma_ea[301]	1.407	0.327	0.858	1.372	2.142	FALSE	1.000	1.003	748
## sigma_ea[302]	2.732	0.458	1.963	2.689	3.740	FALSE	1.000	1.004	1070
## sigma_ea[303]	4.317	0.632	3.262	4.260	5.753	FALSE	1.000	1.003	4801
## sigma_ea[304]	3.767	0.587	2.776	3.717	5.075	FALSE	1.000	1.005	789
## sigma_ea[305]	2.570	0.524	1.695	2.517	3.746	FALSE	1.000	1.002	1317
## sigma_ea[306]	4.315	0.537	3.363	4.277	5.471	FALSE	1.000	1.012	178
## sigma_ea[307]	3.289	0.527	2.403	3.239	4.445	FALSE	1.000	1.003	2462
## sigma_ea[308]	2.598	0.486	1.793	2.551	3.660	FALSE	1.000	1.006	586
## sigma_ea[309]	2.901	0.429	2.167	2.864	3.846	FALSE	1.000	1.002	1420
## sigma_ea[310]	3.595	0.499	2.706	3.562	4.659	FALSE	1.000	1.017	131
## sigma_ea[311]	2.144	0.371	1.504	2.113	2.964	FALSE	1.000	1.002	1826
## sigma_ea[312]	2.923	0.405	2.221	2.890	3.813	FALSE	1.000	1.002	1489
## sigma_ea[313]	0.634	0.249	0.241	0.600	1.200	FALSE	1.000	1.001	5876
## sigma_ea[314]	2.521	0.440	1.793	2.473	3.502	FALSE	1.000	1.005	802
## sigma_ea[315]	4.173	0.608	3.167	4.107	5.558	FALSE	1.000	1.003	6629
## sigma_ea[316]	3.556	0.574	2.604	3.495	4.861	FALSE	1.000	1.005	656
## sigma_ea[317]	1.797	0.429	1.112	1.748	2.783	FALSE	1.000	1.000	7821
## sigma_ea[318]	3.554	0.448	2.778	3.516	4.548	FALSE	1.000	1.006	338
## sigma_ea[319]	3.078	0.504	2.249	3.022	4.179	FALSE	1.000	1.002	1713
## sigma_ea[320]	2.387	0.481	1.593	2.337	3.452	FALSE	1.000	1.006	497
## sigma_ea[321]	2.757	0.406	2.084	2.716	3.678	FALSE	1.000	1.002	1588
## sigma_ea[322]	2.834	0.412	2.120	2.798	3.736	FALSE	1.000	1.010	222
## sigma_ea[323]	2.000	0.332	1.441	1.966	2.754	FALSE	1.000	1.002	2302
## sigma_ea[324]	2.779	0.371	2.153	2.742	3.617	FALSE	1.000	1.002	1788
## sigma_ea[325]	0.727	0.215	0.379	0.703	1.217	FALSE	1.000	1.001	3581
## sigma_ea[326]	2.568	0.448	1.829	2.522	3.564	FALSE	1.000	1.004	919
## sigma_ea[327]	4.213	0.617	3.198	4.145	5.608	FALSE	1.000	1.004	3979
## sigma_ea[328]	3.603	0.582	2.644	3.545	4.918	FALSE	1.000	1.005	763
## sigma_ea[329]	1.891	0.411	1.233	1.839	2.838	FALSE	1.000	1.000	28924

```
## sigma_ea[330]    3.592  0.453   2.817   3.554   4.591   FALSE 1.000 1.006   341
## sigma_ea[331]    3.126  0.511   2.278   3.075   4.247   FALSE 1.000 1.002  1819
## sigma_ea[332]    2.435  0.490   1.626   2.386   3.515   FALSE 1.000 1.005   590
## sigma_ea[333]    2.797  0.414   2.112   2.752   3.711   FALSE 1.000 1.002  2805
## sigma_ea[334]    2.872  0.415   2.162   2.838   3.792   FALSE 1.000 1.010   219
## sigma_ea[335]    2.040  0.336   1.475   2.008   2.789   FALSE 1.000 1.002  1861
## sigma_ea[336]    2.818  0.378   2.179   2.783   3.669   FALSE 1.000 1.002  1784
## alfa_sd          1.882  0.118   1.666   1.875   2.132   FALSE 1.000 1.003   932
## beta_sd          -0.419  0.042  -0.510  -0.416  -0.347   FALSE 1.000 1.006  1080
## deviance         951.981 22.046 910.551 951.407 996.560   FALSE 1.000 1.001  3516
##
## Successful convergence based on Rhat values (all < 1.1).
## Rhat is the potential scale reduction factor (at convergence, Rhat=1).
## For each parameter, n.eff is a crude measure of effective sample size.
##
## overlap0 checks if 0 falls in the parameter's 95% credible interval.
## f is the proportion of the posterior with the same sign as the mean;
## i.e., our confidence that the parameter is positive or negative.
##
## DIC info: (pD = var(deviance)/2)
## pD = 242.9 and DIC = 1194.865
## DIC is an estimate of expected predictive error (lower is better).
```

## Modelo final con spline

El modelo especificado es:

$$\text{Abundance}_i \sim \text{Poisson}(\mu_i)$$

$$\log(\mu_i) = \eta_i + \varepsilon_i$$

$$\eta_i = \beta_0 + \sum_{j=1}^k \beta_{j,a_i}^{(PC1)} \cdot B_j^{(PC1)}(\text{PC1}_i) + \sum_{j=1}^k \beta_{j,a_i}^{(PC2)} \cdot B_j^{(PC2)}(\text{PC2}_i) + u_{\text{Site}[i]} + v_{\text{Specie}[i]}$$

```
# Bases para los splines
k <- 6
base_PC1 <- bs(Spider$PC1, df = k)
base_PC2 <- bs(Spider$PC2, df = k)

#Modelo
cat(file = "Modelo", "model {

#Capa verosimilitud
  for (i in 1:N) {
    Abundance[i] ~ dpois(mu[i])
    log(mu[i]) <- eta[i] + ea[i]
    eta[i] <- beta0 +
      inprod(beta_PC1[, appearance[i]], base_PC1[i,]) +
      inprod(beta_PC2[, appearance[i]], base_PC2[i,]) +
      specie_effect[specie[i]] +
      site_effect[Site[i]]
  }

#Distribuciones previas
  beta0 ~ dnorm(0, 0.001)
```

```

beta2 ~ dnorm(0, 0.001)

# Splines
for (a in 1:4){
  for (j in 1:6) {
    beta_PC1[j, a] ~ dnorm(0, tau_spline1[a])
    beta_PC2[j, a] ~ dnorm(0, tau_spline2[a])
  }

  tau_spline1[a] <- pow(sigma_spline1[a], -2)
  sigma_spline1[a] ~ dunif(0, 100)
  tau_spline2[a] <- pow(sigma_spline2[a], -2)
  sigma_spline2[a] ~ dunif(0, 100)
}

#Efecto aleatorio de sitio
for (i in 1:n_site) {
  site_effect[i] ~ dnorm(0, tau_site)
}
tau_site <- pow(sigma_site, -2)
sigma_site ~ dunif(0, 100)

#Efecto aleatorio de especie
for (i in 1:n_specie) {
  specie_effect[i] ~ dnorm(0, tau_specie)
}
tau_specie <- pow(sigma_specie, -2)
sigma_specie ~ dunif(0, 100)

#Parámetro de dispersión: lineal con predictor lineal
for (i in 1:N){
  ea[i] ~ dnorm(0, tau_ea[i])
  tau_ea[i] <- pow(sigma_ea[i], -2)
  sigma_ea[i] <- max(alfa_sd + beta_sd * eta[i], 0.001)
}
alfa_sd ~ dnorm(0, 0.001)
beta_sd ~ dnorm(0, 0.001)

# Residuos
for (i in 1:N){
  Abundance_pred[i]~dpois(mu[i])
  resid[i]<-Abundance_pred[i]- Abundance[i]
  resid2[i]<-pow(resid[i], 2)
  P.resid[i] <- step(resid[i]) - 0.5 * equals(resid[i], 0)
}
})

# Datos
#Cambiamos factores por numeric
Spider$appearance_num <- as.numeric(as.factor(Spider$appearance))

#Creamos vector de datos

```



```

datos <- list(
  Abundance = Spider$Abundance,
  appearance = Spider$appearance_num,
  base_PC1 = base_PC1,
  base_PC2 = base_PC2,
  Site = as.numeric(as.factor(Spider$Site)),
  N = nrow(Spider),
  n_site = length(unique(Spider$Site)),
  n_specie = length(unique(Spider$Specie)),
  specie = as.numeric(as.factor(Spider$Specie))
)

#Iniciales
inits <- function() {
  list(
    beta0 = rnorm(1),
    beta_PC1 = matrix(rnorm(6 * length(unique(Spider$appearance))), nrow = 6, ncol = length(unique(Spider$appearance))),
    beta_PC2 = matrix(rnorm(6 * length(unique(Spider$appearance))), nrow = 6, ncol = length(unique(Spider$appearance))),
    sigma_site = runif(1, 0, 10),
    sigma_spline1 = runif(4, 0, 10),
    sigma_spline2 = runif(4, 0, 10),
    site_effect = rnorm(datos$n_site, 0, 1),
    specie_effect = rnorm(datos$n_specie, 0, 1),
    ea = rnorm(datos$N, 0, 1),
    alfa_sd = rnorm(1),
    beta_sd = rnorm(1)
  )
}

#Parámetros
params <- c("beta0", "beta_PC1", "beta_PC2", "sigma_site", "sigma_ea", "sigma_spline1", "sigma_spline2")

#Corremos modelo
model_splines_specieb <- jags(
  data = datos,
  inits = inits,
  parameters.to.save = params,
  model.file = "Modelo",
  n.chains = 3,
  n.iter = 200000,
  n.burnin = 30000,
  n.thin = 5,
  parallel = TRUE
)

#traceplot(model_splines_specieb)
model_splines_specieb
model_splines_specieb$DIC

#save(model_splines_specieb, file = "modelo_biologicoFINAL_splines.RData")
#load("modelo_biologicoFINAL_splines.RData")

```

```
load("modelo_biologicoFINAL_splines.RData")
model_splines_specieb
```

```
## JAGS output for model 'Modelo', generated by jagsUI.
## Estimates based on 3 chains of 2e+05 iterations,
## adaptation = 100 iterations (sufficient),
## burn-in = 30000 iterations and thin rate = 5,
## yielding 102000 total samples from the joint posterior.
## MCMC ran in parallel for 21.008 minutes at time 2025-06-10 17:54:55.531987.
##
##
```

	mean	sd	2.5%	50%	97.5%	overlap0	f	Rhat
## beta0	-0.397	0.805	-2.156	-0.333	1.077	TRUE	0.688	1.081
## beta_PC1[1,1]	-1.947	2.981	-9.596	-0.980	1.970	TRUE	0.737	1.013
## beta_PC1[2,1]	1.942	2.463	-1.346	1.269	7.820	TRUE	0.779	1.007
## beta_PC1[3,1]	0.682	1.704	-2.640	0.419	4.581	TRUE	0.666	1.005
## beta_PC1[4,1]	2.563	2.799	-0.817	1.804	8.978	TRUE	0.843	1.006
## beta_PC1[5,1]	-0.998	2.303	-6.811	-0.424	2.786	TRUE	0.649	1.008
## beta_PC1[6,1]	-2.765	3.990	-13.468	-1.496	1.572	TRUE	0.800	1.006
## beta_PC1[1,2]	-0.464	1.168	-3.371	-0.174	1.309	TRUE	0.645	1.002
## beta_PC1[2,2]	0.182	0.910	-1.461	0.047	2.390	TRUE	0.556	1.008
## beta_PC1[3,2]	0.336	1.145	-1.780	0.119	3.095	TRUE	0.607	1.006
## beta_PC1[4,2]	0.605	1.005	-0.932	0.330	3.084	TRUE	0.726	1.003
## beta_PC1[5,2]	-0.043	0.946	-2.193	-0.006	1.932	TRUE	0.510	1.004
## beta_PC1[6,2]	-0.327	0.875	-2.464	-0.155	1.213	TRUE	0.642	1.001
## beta_PC1[1,3]	0.429	1.936	-3.388	0.430	4.242	TRUE	0.590	1.000
## beta_PC1[2,3]	-0.772	1.961	-4.636	-0.782	3.138	TRUE	0.666	1.004
## beta_PC1[3,3]	-3.122	4.017	-12.193	-2.803	3.879	TRUE	0.799	1.002
## beta_PC1[4,3]	-6.052	5.623	-18.836	-5.455	3.317	TRUE	0.898	1.004
## beta_PC1[5,3]	-10.694	8.342	-32.202	-8.972	0.626	TRUE	0.966	1.002
## beta_PC1[6,3]	-13.702	10.651	-42.022	-10.914	-2.445	FALSE	0.998	1.001
## beta_PC1[1,4]	-1.934	1.618	-5.536	-1.789	0.896	TRUE	0.908	1.002
## beta_PC1[2,4]	-0.014	1.287	-2.408	-0.090	2.759	TRUE	0.530	1.023
## beta_PC1[3,4]	2.389	1.428	-0.131	2.283	5.341	TRUE	0.968	1.033
## beta_PC1[4,4]	1.832	1.352	-0.468	1.714	4.831	TRUE	0.931	1.040
## beta_PC1[5,4]	1.559	1.271	-0.837	1.518	4.140	TRUE	0.900	1.026
## beta_PC1[6,4]	0.908	1.137	-1.251	0.852	3.310	TRUE	0.794	1.028
## beta_PC2[1,1]	-4.606	5.766	-18.640	-3.636	3.855	TRUE	0.834	1.001
## beta_PC2[2,1]	-6.109	4.600	-17.242	-5.386	0.802	TRUE	0.954	1.001
## beta_PC2[3,1]	-0.031	2.186	-4.229	-0.093	4.458	TRUE	0.519	1.008
## beta_PC2[4,1]	2.101	2.566	-3.264	2.269	6.572	TRUE	0.791	1.006
## beta_PC2[5,1]	3.745	1.662	0.297	3.825	6.895	FALSE	0.983	1.026
## beta_PC2[6,1]	3.265	1.805	-0.499	3.396	6.532	TRUE	0.954	1.024
## beta_PC2[1,2]	-0.766	1.511	-4.163	-0.592	2.038	TRUE	0.706	1.002
## beta_PC2[2,2]	-1.163	1.425	-4.434	-0.986	1.239	TRUE	0.813	1.001
## beta_PC2[3,2]	-0.224	0.986	-2.271	-0.186	1.793	TRUE	0.600	1.001
## beta_PC2[4,2]	1.003	1.416	-1.467	0.840	4.063	TRUE	0.768	1.002
## beta_PC2[5,2]	1.038	1.086	-0.867	0.956	3.357	TRUE	0.839	1.001
## beta_PC2[6,2]	1.059	0.971	-0.613	0.991	3.102	TRUE	0.871	1.005
## beta_PC2[1,3]	-0.188	2.267	-5.899	-0.003	4.071	TRUE	0.503	1.014
## beta_PC2[2,3]	1.175	1.905	-1.365	0.606	6.317	TRUE	0.734	1.020
## beta_PC2[3,3]	-0.575	1.466	-4.276	-0.246	1.813	TRUE	0.639	1.014
## beta_PC2[4,3]	1.214	2.023	-1.672	0.599	6.332	TRUE	0.722	1.007
## beta_PC2[5,3]	-0.421	2.070	-5.467	-0.115	3.426	TRUE	0.572	1.010

## beta_PC2[6,3]	0.774	2.048	-2.597	0.290	6.008	TRUE	0.641	1.006
## beta_PC2[1,4]	0.599	1.753	-2.262	0.287	4.909	TRUE	0.596	1.001
## beta_PC2[2,4]	-2.159	1.657	-6.061	-1.949	0.343	TRUE	0.938	1.017
## beta_PC2[3,4]	-0.409	0.971	-2.237	-0.440	1.774	TRUE	0.708	1.003
## beta_PC2[4,4]	1.341	1.269	-0.803	1.220	4.091	TRUE	0.869	1.004
## beta_PC2[5,4]	0.892	1.010	-0.964	0.813	3.199	TRUE	0.834	1.002
## beta_PC2[6,4]	0.739	0.989	-1.050	0.641	2.953	TRUE	0.782	1.011
## sigma_site	0.564	0.186	0.270	0.541	0.996	FALSE	1.000	1.003
## sigma_ea[1]	0.952	0.411	0.353	0.889	1.916	FALSE	1.000	1.003
## sigma_ea[2]	1.103	0.310	0.589	1.072	1.789	FALSE	1.000	1.001
## sigma_ea[3]	2.480	0.409	1.799	2.436	3.393	FALSE	1.000	1.005
## sigma_ea[4]	2.189	0.452	1.446	2.139	3.220	FALSE	1.000	1.001
## sigma_ea[5]	2.214	0.514	1.373	2.157	3.389	FALSE	1.000	1.001
## sigma_ea[6]	1.150	0.228	0.796	1.118	1.680	FALSE	1.000	1.001
## sigma_ea[7]	1.690	0.325	1.134	1.662	2.407	FALSE	1.000	1.000
## sigma_ea[8]	0.913	0.330	0.322	0.892	1.620	FALSE	1.000	1.001
## sigma_ea[9]	1.108	0.251	0.709	1.077	1.680	FALSE	1.000	1.001
## sigma_ea[10]	0.460	0.228	0.110	0.426	0.996	FALSE	1.000	1.001
## sigma_ea[11]	0.381	0.212	0.028	0.354	0.862	FALSE	1.000	1.001
## sigma_ea[12]	1.135	0.221	0.784	1.107	1.641	FALSE	1.000	1.001
## sigma_ea[13]	3.357	1.114	1.839	3.148	6.128	FALSE	1.000	1.006
## sigma_ea[14]	1.398	0.245	0.967	1.381	1.928	FALSE	1.000	1.001
## sigma_ea[15]	2.272	0.379	1.662	2.226	3.138	FALSE	1.000	1.004
## sigma_ea[16]	2.484	0.432	1.775	2.438	3.459	FALSE	1.000	1.001
## sigma_ea[17]	4.620	1.188	2.889	4.433	7.473	FALSE	1.000	1.005
## sigma_ea[18]	1.087	0.203	0.759	1.062	1.554	FALSE	1.000	1.003
## sigma_ea[19]	1.985	0.303	1.464	1.960	2.650	FALSE	1.000	1.004
## sigma_ea[20]	1.208	0.220	0.832	1.189	1.692	FALSE	1.000	1.001
## sigma_ea[21]	0.900	0.190	0.593	0.879	1.327	FALSE	1.000	1.001
## sigma_ea[22]	0.397	0.163	0.141	0.373	0.787	FALSE	1.000	1.002
## sigma_ea[23]	0.178	0.128	0.001	0.162	0.478	FALSE	1.000	1.002
## sigma_ea[24]	0.927	0.162	0.660	0.911	1.294	FALSE	1.000	1.001
## sigma_ea[25]	1.588	0.467	0.921	1.509	2.730	FALSE	1.000	1.001
## sigma_ea[26]	1.184	0.224	0.803	1.164	1.675	FALSE	1.000	1.001
## sigma_ea[27]	2.315	0.380	1.695	2.271	3.183	FALSE	1.000	1.004
## sigma_ea[28]	2.269	0.414	1.605	2.220	3.229	FALSE	1.000	1.001
## sigma_ea[29]	2.851	0.582	1.928	2.775	4.207	FALSE	1.000	1.001
## sigma_ea[30]	0.957	0.155	0.698	0.941	1.306	FALSE	1.000	1.000
## sigma_ea[31]	1.771	0.274	1.302	1.748	2.376	FALSE	1.000	1.001
## sigma_ea[32]	0.994	0.233	0.600	0.971	1.513	FALSE	1.000	1.001
## sigma_ea[33]	0.943	0.192	0.627	0.922	1.372	FALSE	1.000	1.000
## sigma_ea[34]	0.268	0.137	0.031	0.252	0.590	FALSE	1.000	1.002
## sigma_ea[35]	0.217	0.123	0.001	0.209	0.485	FALSE	1.000	1.001
## sigma_ea[36]	0.970	0.150	0.714	0.958	1.304	FALSE	1.000	1.000
## sigma_ea[37]	1.549	0.494	0.857	1.462	2.772	FALSE	1.000	1.002
## sigma_ea[38]	1.033	0.203	0.687	1.016	1.480	FALSE	1.000	1.001
## sigma_ea[39]	2.130	0.363	1.543	2.087	2.961	FALSE	1.000	1.004
## sigma_ea[40]	2.119	0.400	1.481	2.071	3.042	FALSE	1.000	1.001
## sigma_ea[41]	2.812	0.603	1.865	2.731	4.222	FALSE	1.000	1.001
## sigma_ea[42]	0.771	0.168	0.497	0.752	1.157	FALSE	1.000	1.001
## sigma_ea[43]	1.621	0.261	1.177	1.598	2.199	FALSE	1.000	1.001
## sigma_ea[44]	0.844	0.203	0.515	0.820	1.305	FALSE	1.000	1.001
## sigma_ea[45]	0.758	0.178	0.466	0.739	1.158	FALSE	1.000	1.000
## sigma_ea[46]	0.112	0.140	0.001	0.060	0.486	FALSE	1.000	1.003

## sigma_ea[47]	0.069	0.093	0.001	0.031	0.320	FALSE	1.000	1.002
## sigma_ea[48]	0.785	0.155	0.521	0.772	1.131	FALSE	1.000	1.001
## sigma_ea[49]	2.715	0.977	1.385	2.535	5.113	FALSE	1.000	1.003
## sigma_ea[50]	1.145	0.250	0.716	1.123	1.696	FALSE	1.000	1.001
## sigma_ea[51]	2.137	0.363	1.549	2.094	2.975	FALSE	1.000	1.005
## sigma_ea[52]	2.231	0.436	1.519	2.184	3.219	FALSE	1.000	1.001
## sigma_ea[53]	3.978	1.067	2.416	3.810	6.487	FALSE	1.000	1.002
## sigma_ea[54]	0.796	0.147	0.553	0.781	1.126	FALSE	1.000	1.000
## sigma_ea[55]	1.732	0.293	1.237	1.705	2.385	FALSE	1.000	1.001
## sigma_ea[56]	0.955	0.214	0.608	0.931	1.440	FALSE	1.000	1.001
## sigma_ea[57]	0.765	0.177	0.473	0.747	1.159	FALSE	1.000	1.000
## sigma_ea[58]	0.122	0.122	0.001	0.097	0.430	FALSE	1.000	1.002
## sigma_ea[59]	0.070	0.091	0.001	0.034	0.310	FALSE	1.000	1.000
## sigma_ea[60]	0.792	0.149	0.540	0.778	1.126	FALSE	1.000	1.000
## sigma_ea[61]	3.446	1.312	1.709	3.181	6.738	FALSE	1.000	1.007
## sigma_ea[62]	1.353	0.303	0.839	1.324	2.018	FALSE	1.000	1.003
## sigma_ea[63]	2.295	0.384	1.670	2.251	3.176	FALSE	1.000	1.004
## sigma_ea[64]	2.438	0.473	1.648	2.391	3.503	FALSE	1.000	1.003
## sigma_ea[65]	4.708	1.369	2.793	4.460	8.050	FALSE	1.000	1.006
## sigma_ea[66]	1.989	0.569	1.104	1.922	3.251	FALSE	1.000	1.002
## sigma_ea[67]	1.940	0.359	1.326	1.911	2.725	FALSE	1.000	1.006
## sigma_ea[68]	1.163	0.301	0.667	1.132	1.838	FALSE	1.000	1.003
## sigma_ea[69]	0.923	0.211	0.591	0.896	1.412	FALSE	1.000	1.000
## sigma_ea[70]	1.300	0.536	0.471	1.236	2.500	FALSE	1.000	1.002
## sigma_ea[71]	0.199	0.152	0.001	0.173	0.580	FALSE	1.000	1.002
## sigma_ea[72]	0.950	0.189	0.659	0.924	1.401	FALSE	1.000	1.001
## sigma_ea[73]	2.432	0.861	1.258	2.271	4.551	FALSE	1.000	1.002
## sigma_ea[74]	1.016	0.232	0.626	0.995	1.529	FALSE	1.000	1.001
## sigma_ea[75]	1.996	0.357	1.420	1.953	2.823	FALSE	1.000	1.005
## sigma_ea[76]	2.102	0.426	1.409	2.056	3.071	FALSE	1.000	1.001
## sigma_ea[77]	3.695	0.960	2.273	3.547	5.959	FALSE	1.000	1.001
## sigma_ea[78]	0.663	0.139	0.428	0.649	0.973	FALSE	1.000	1.000
## sigma_ea[79]	1.604	0.284	1.125	1.578	2.229	FALSE	1.000	1.001
## sigma_ea[80]	0.827	0.202	0.489	0.806	1.276	FALSE	1.000	1.000
## sigma_ea[81]	0.624	0.169	0.342	0.607	1.002	FALSE	1.000	1.000
## sigma_ea[82]	0.040	0.082	0.001	0.001	0.282	FALSE	1.000	1.005
## sigma_ea[83]	0.014	0.040	0.001	0.001	0.143	FALSE	1.000	1.002
## sigma_ea[84]	0.651	0.141	0.408	0.640	0.963	FALSE	1.000	1.001
## sigma_ea[85]	4.014	1.529	2.043	3.681	7.958	FALSE	1.000	1.006
## sigma_ea[86]	1.678	0.324	1.106	1.655	2.378	FALSE	1.000	1.002
## sigma_ea[87]	2.712	0.421	2.014	2.667	3.663	FALSE	1.000	1.003
## sigma_ea[88]	2.764	0.490	1.941	2.717	3.859	FALSE	1.000	1.003
## sigma_ea[89]	5.276	1.585	3.122	4.965	9.291	FALSE	1.000	1.005
## sigma_ea[90]	2.790	0.642	1.753	2.719	4.218	FALSE	1.000	1.002
## sigma_ea[91]	2.266	0.392	1.584	2.236	3.103	FALSE	1.000	1.005
## sigma_ea[92]	1.488	0.315	0.958	1.459	2.181	FALSE	1.000	1.004
## sigma_ea[93]	1.341	0.243	0.940	1.315	1.886	FALSE	1.000	1.000
## sigma_ea[94]	2.100	0.603	1.141	2.031	3.459	FALSE	1.000	1.002
## sigma_ea[95]	0.612	0.211	0.260	0.590	1.087	FALSE	1.000	1.000
## sigma_ea[96]	1.368	0.233	0.986	1.341	1.899	FALSE	1.000	1.000
## sigma_ea[97]	1.375	0.336	0.851	1.330	2.159	FALSE	1.000	1.007
## sigma_ea[98]	2.009	0.357	1.395	1.978	2.798	FALSE	1.000	1.002
## sigma_ea[99]	3.766	0.527	2.879	3.715	4.955	FALSE	1.000	1.005
## sigma_ea[100]	3.094	0.516	2.235	3.043	4.253	FALSE	1.000	1.002

## sigma_ea[101]	2.637	0.518	1.798	2.577	3.816	FALSE	1.000	1.005
## sigma_ea[102]	3.100	0.594	2.129	3.036	4.441	FALSE	1.000	1.001
## sigma_ea[103]	2.596	0.420	1.882	2.559	3.523	FALSE	1.000	1.005
## sigma_ea[104]	1.819	0.387	1.141	1.790	2.670	FALSE	1.000	1.004
## sigma_ea[105]	2.394	0.362	1.781	2.362	3.193	FALSE	1.000	1.002
## sigma_ea[106]	2.410	0.562	1.492	2.348	3.682	FALSE	1.000	1.001
## sigma_ea[107]	1.666	0.312	1.133	1.638	2.354	FALSE	1.000	1.003
## sigma_ea[108]	2.422	0.336	1.847	2.393	3.161	FALSE	1.000	1.002
## sigma_ea[109]	1.545	0.392	0.925	1.494	2.453	FALSE	1.000	1.002
## sigma_ea[110]	2.091	0.368	1.443	2.065	2.888	FALSE	1.000	1.001
## sigma_ea[111]	3.742	0.541	2.830	3.686	4.967	FALSE	1.000	1.003
## sigma_ea[112]	3.177	0.530	2.280	3.128	4.358	FALSE	1.000	1.001
## sigma_ea[113]	2.807	0.557	1.906	2.741	4.076	FALSE	1.000	1.002
## sigma_ea[114]	3.305	0.727	2.107	3.236	4.922	FALSE	1.000	1.001
## sigma_ea[115]	2.679	0.438	1.919	2.643	3.638	FALSE	1.000	1.003
## sigma_ea[116]	1.901	0.395	1.201	1.874	2.757	FALSE	1.000	1.002
## sigma_ea[117]	2.370	0.377	1.729	2.335	3.210	FALSE	1.000	1.001
## sigma_ea[118]	2.615	0.692	1.470	2.550	4.161	FALSE	1.000	1.001
## sigma_ea[119]	1.641	0.328	1.080	1.612	2.367	FALSE	1.000	1.002
## sigma_ea[120]	2.397	0.355	1.792	2.366	3.184	FALSE	1.000	1.001
## sigma_ea[121]	1.107	0.362	0.556	1.054	1.976	FALSE	1.000	1.007
## sigma_ea[122]	1.814	0.348	1.219	1.784	2.589	FALSE	1.000	1.001
## sigma_ea[123]	3.633	0.531	2.730	3.585	4.799	FALSE	1.000	1.006
## sigma_ea[124]	2.900	0.503	2.059	2.851	4.033	FALSE	1.000	1.001
## sigma_ea[125]	2.369	0.525	1.523	2.303	3.567	FALSE	1.000	1.004
## sigma_ea[126]	2.781	0.528	1.927	2.719	3.979	FALSE	1.000	1.002
## sigma_ea[127]	2.402	0.402	1.716	2.366	3.296	FALSE	1.000	1.002
## sigma_ea[128]	1.624	0.378	0.961	1.593	2.463	FALSE	1.000	1.001
## sigma_ea[129]	2.262	0.367	1.636	2.231	3.066	FALSE	1.000	1.004
## sigma_ea[130]	2.092	0.506	1.279	2.031	3.254	FALSE	1.000	1.003
## sigma_ea[131]	1.533	0.324	0.972	1.507	2.242	FALSE	1.000	1.004
## sigma_ea[132]	2.289	0.343	1.698	2.261	3.035	FALSE	1.000	1.003
## sigma_ea[133]	1.054	0.360	0.509	1.003	1.900	FALSE	1.000	1.005
## sigma_ea[134]	1.582	0.353	0.964	1.557	2.358	FALSE	1.000	1.001
## sigma_ea[135]	3.232	0.487	2.406	3.185	4.307	FALSE	1.000	1.006
## sigma_ea[136]	2.668	0.495	1.837	2.619	3.784	FALSE	1.000	1.001
## sigma_ea[137]	2.316	0.501	1.506	2.257	3.465	FALSE	1.000	1.003
## sigma_ea[138]	2.138	0.401	1.480	2.095	3.046	FALSE	1.000	1.001
## sigma_ea[139]	2.170	0.383	1.501	2.140	3.006	FALSE	1.000	1.001
## sigma_ea[140]	1.392	0.377	0.710	1.368	2.201	FALSE	1.000	1.001
## sigma_ea[141]	1.860	0.325	1.306	1.834	2.568	FALSE	1.000	1.004
## sigma_ea[142]	1.448	0.384	0.818	1.407	2.318	FALSE	1.000	1.002
## sigma_ea[143]	1.132	0.281	0.647	1.112	1.747	FALSE	1.000	1.005
## sigma_ea[144]	1.888	0.299	1.378	1.863	2.543	FALSE	1.000	1.004
## sigma_ea[145]	3.782	1.483	1.776	3.490	7.562	FALSE	1.000	1.006
## sigma_ea[146]	1.108	0.314	0.524	1.094	1.766	FALSE	1.000	1.001
## sigma_ea[147]	2.078	0.361	1.492	2.034	2.909	FALSE	1.000	1.005
## sigma_ea[148]	2.194	0.462	1.429	2.147	3.236	FALSE	1.000	1.001
## sigma_ea[149]	5.044	1.540	2.864	4.772	8.877	FALSE	1.000	1.005
## sigma_ea[150]	0.805	0.156	0.549	0.789	1.153	FALSE	1.000	1.001
## sigma_ea[151]	1.696	0.333	1.122	1.669	2.421	FALSE	1.000	1.000
## sigma_ea[152]	0.918	0.270	0.442	0.901	1.500	FALSE	1.000	1.002
## sigma_ea[153]	0.706	0.175	0.414	0.688	1.097	FALSE	1.000	1.000
## sigma_ea[154]	0.128	0.116	0.001	0.110	0.404	FALSE	1.000	1.003

## sigma_ea[155]	0.038	0.067	0.001	0.001	0.229	FALSE	1.000	1.001
## sigma_ea[156]	0.733	0.147	0.480	0.721	1.056	FALSE	1.000	1.000
## sigma_ea[157]	2.265	0.649	1.327	2.159	3.835	FALSE	1.000	1.002
## sigma_ea[158]	1.178	0.220	0.796	1.161	1.658	FALSE	1.000	1.000
## sigma_ea[159]	2.128	0.365	1.538	2.084	2.970	FALSE	1.000	1.005
## sigma_ea[160]	2.263	0.423	1.569	2.219	3.227	FALSE	1.000	1.002
## sigma_ea[161]	3.528	0.763	2.327	3.430	5.290	FALSE	1.000	1.002
## sigma_ea[162]	0.833	0.150	0.581	0.818	1.169	FALSE	1.000	1.000
## sigma_ea[163]	1.765	0.297	1.253	1.741	2.419	FALSE	1.000	1.003
## sigma_ea[164]	0.988	0.211	0.622	0.972	1.448	FALSE	1.000	1.001
## sigma_ea[165]	0.757	0.178	0.471	0.736	1.162	FALSE	1.000	1.000
## sigma_ea[166]	0.155	0.137	0.001	0.129	0.494	FALSE	1.000	1.001
## sigma_ea[167]	0.070	0.099	0.001	0.021	0.343	FALSE	1.000	1.001
## sigma_ea[168]	0.784	0.162	0.515	0.767	1.152	FALSE	1.000	1.001
## sigma_ea[169]	5.868	2.792	2.649	5.170	13.321	FALSE	1.000	1.001
## sigma_ea[170]	2.033	0.346	1.443	2.003	2.802	FALSE	1.000	1.001
## sigma_ea[171]	3.050	0.481	2.251	3.002	4.124	FALSE	1.000	1.001
## sigma_ea[172]	3.119	0.508	2.270	3.069	4.258	FALSE	1.000	1.002
## sigma_ea[173]	7.130	2.826	3.780	6.449	14.597	FALSE	1.000	1.001
## sigma_ea[174]	3.850	0.942	2.525	3.682	6.151	FALSE	1.000	1.004
## sigma_ea[175]	2.621	0.421	1.903	2.584	3.558	FALSE	1.000	1.004
## sigma_ea[176]	1.844	0.341	1.270	1.812	2.604	FALSE	1.000	1.001
## sigma_ea[177]	1.678	0.314	1.166	1.642	2.387	FALSE	1.000	1.006
## sigma_ea[178]	3.160	0.926	1.883	2.987	5.421	FALSE	1.000	1.005
## sigma_ea[179]	0.950	0.319	0.419	0.918	1.663	FALSE	1.000	1.006
## sigma_ea[180]	1.705	0.325	1.173	1.670	2.438	FALSE	1.000	1.005
## sigma_ea[181]	6.379	3.926	2.412	5.310	16.897	FALSE	1.000	1.001
## sigma_ea[182]	2.090	0.442	1.361	2.045	3.094	FALSE	1.000	1.000
## sigma_ea[183]	2.852	0.461	2.093	2.802	3.889	FALSE	1.000	1.003
## sigma_ea[184]	3.176	0.571	2.229	3.115	4.473	FALSE	1.000	1.001
## sigma_ea[185]	7.641	3.960	3.536	6.596	18.202	FALSE	1.000	1.001
## sigma_ea[186]	5.274	1.882	2.855	4.872	10.066	FALSE	1.000	1.001
## sigma_ea[187]	2.678	0.517	1.824	2.624	3.853	FALSE	1.000	1.001
## sigma_ea[188]	1.901	0.422	1.219	1.852	2.887	FALSE	1.000	1.000
## sigma_ea[189]	1.480	0.298	1.010	1.444	2.162	FALSE	1.000	1.002
## sigma_ea[190]	4.584	1.869	2.192	4.182	9.342	FALSE	1.000	1.001
## sigma_ea[191]	0.752	0.295	0.297	0.712	1.434	FALSE	1.000	1.001
## sigma_ea[192]	1.508	0.303	1.036	1.466	2.214	FALSE	1.000	1.001
## sigma_ea[193]	6.085	2.966	2.766	5.336	14.002	FALSE	1.000	1.001
## sigma_ea[194]	2.059	0.346	1.470	2.027	2.822	FALSE	1.000	1.002
## sigma_ea[195]	3.082	0.479	2.276	3.035	4.154	FALSE	1.000	1.001
## sigma_ea[196]	3.144	0.511	2.294	3.094	4.290	FALSE	1.000	1.003
## sigma_ea[197]	7.348	3.000	3.894	6.616	15.288	FALSE	1.000	1.001
## sigma_ea[198]	3.954	1.067	2.528	3.742	6.633	FALSE	1.000	1.005
## sigma_ea[199]	2.646	0.422	1.934	2.609	3.588	FALSE	1.000	1.004
## sigma_ea[200]	1.869	0.342	1.288	1.837	2.631	FALSE	1.000	1.002
## sigma_ea[201]	1.710	0.309	1.196	1.680	2.403	FALSE	1.000	1.005
## sigma_ea[202]	3.264	1.054	1.882	3.045	5.916	FALSE	1.000	1.005
## sigma_ea[203]	0.982	0.312	0.454	0.953	1.677	FALSE	1.000	1.005
## sigma_ea[204]	1.737	0.318	1.209	1.706	2.447	FALSE	1.000	1.004
## sigma_ea[205]	6.500	3.590	2.757	5.550	16.062	FALSE	1.000	1.001
## sigma_ea[206]	2.101	0.377	1.467	2.065	2.949	FALSE	1.000	1.002
## sigma_ea[207]	3.156	0.496	2.331	3.106	4.264	FALSE	1.000	1.002
## sigma_ea[208]	3.187	0.534	2.298	3.134	4.384	FALSE	1.000	1.003

## sigma_ea[209]	7.762	3.620	3.896	6.829	17.353	FALSE	1.000	1.001
## sigma_ea[210]	4.190	1.397	2.505	3.857	7.843	FALSE	1.000	1.004
## sigma_ea[211]	2.689	0.453	1.929	2.646	3.703	FALSE	1.000	1.004
## sigma_ea[212]	1.912	0.376	1.286	1.874	2.759	FALSE	1.000	1.002
## sigma_ea[213]	1.784	0.330	1.232	1.753	2.518	FALSE	1.000	1.001
## sigma_ea[214]	3.500	1.388	1.849	3.160	7.125	FALSE	1.000	1.005
## sigma_ea[215]	1.055	0.332	0.486	1.028	1.789	FALSE	1.000	1.001
## sigma_ea[216]	1.811	0.337	1.249	1.779	2.562	FALSE	1.000	1.001
## sigma_ea[217]	4.586	2.134	1.950	4.084	10.211	FALSE	1.000	1.003
## sigma_ea[218]	2.087	0.407	1.390	2.053	2.982	FALSE	1.000	1.000
## sigma_ea[219]	2.937	0.469	2.161	2.887	3.985	FALSE	1.000	1.001
## sigma_ea[220]	3.173	0.547	2.249	3.123	4.403	FALSE	1.000	1.001
## sigma_ea[221]	5.848	2.188	3.030	5.360	11.553	FALSE	1.000	1.003
## sigma_ea[222]	4.688	1.472	2.597	4.442	8.249	FALSE	1.000	1.002
## sigma_ea[223]	2.674	0.480	1.852	2.633	3.740	FALSE	1.000	1.001
## sigma_ea[224]	1.897	0.387	1.247	1.861	2.758	FALSE	1.000	1.000
## sigma_ea[225]	1.566	0.309	1.069	1.530	2.273	FALSE	1.000	1.004
## sigma_ea[226]	3.998	1.446	1.963	3.748	7.522	FALSE	1.000	1.002
## sigma_ea[227]	0.837	0.292	0.376	0.800	1.502	FALSE	1.000	1.004
## sigma_ea[228]	1.593	0.310	1.106	1.552	2.301	FALSE	1.000	1.003
## sigma_ea[229]	6.698	4.532	2.150	5.470	18.813	FALSE	1.000	1.002
## sigma_ea[230]	2.232	0.483	1.451	2.175	3.355	FALSE	1.000	1.001
## sigma_ea[231]	3.026	0.494	2.213	2.976	4.139	FALSE	1.000	1.005
## sigma_ea[232]	3.318	0.608	2.323	3.249	4.706	FALSE	1.000	1.001
## sigma_ea[233]	7.961	4.563	3.289	6.748	20.117	FALSE	1.000	1.002
## sigma_ea[234]	5.569	2.072	2.950	5.114	10.884	FALSE	1.000	1.001
## sigma_ea[235]	2.820	0.558	1.910	2.758	4.112	FALSE	1.000	1.002
## sigma_ea[236]	2.043	0.468	1.306	1.981	3.147	FALSE	1.000	1.001
## sigma_ea[237]	1.655	0.335	1.124	1.614	2.421	FALSE	1.000	1.002
## sigma_ea[238]	4.879	2.060	2.292	4.421	10.158	FALSE	1.000	1.001
## sigma_ea[239]	0.926	0.332	0.412	0.881	1.690	FALSE	1.000	1.002
## sigma_ea[240]	1.682	0.339	1.156	1.637	2.470	FALSE	1.000	1.002
## sigma_ea[241]	5.514	2.817	2.288	4.812	13.082	FALSE	1.000	1.001
## sigma_ea[242]	2.133	0.394	1.458	2.101	3.009	FALSE	1.000	1.001
## sigma_ea[243]	3.128	0.497	2.298	3.079	4.239	FALSE	1.000	1.000
## sigma_ea[244]	3.219	0.541	2.309	3.169	4.437	FALSE	1.000	1.001
## sigma_ea[245]	6.776	2.862	3.379	6.089	14.338	FALSE	1.000	1.001
## sigma_ea[246]	5.258	1.510	3.151	4.988	8.955	FALSE	1.000	1.001
## sigma_ea[247]	2.721	0.477	1.909	2.678	3.781	FALSE	1.000	1.002
## sigma_ea[248]	1.943	0.380	1.293	1.910	2.792	FALSE	1.000	1.001
## sigma_ea[249]	1.756	0.335	1.213	1.716	2.519	FALSE	1.000	1.003
## sigma_ea[250]	4.568	1.488	2.511	4.295	8.220	FALSE	1.000	1.002
## sigma_ea[251]	1.028	0.325	0.496	0.991	1.765	FALSE	1.000	1.003
## sigma_ea[252]	1.783	0.339	1.234	1.744	2.556	FALSE	1.000	1.003
## sigma_ea[253]	1.070	0.348	0.567	1.010	1.918	FALSE	1.000	1.005
## sigma_ea[254]	2.042	0.401	1.375	2.003	2.946	FALSE	1.000	1.002
## sigma_ea[255]	3.935	0.626	2.888	3.869	5.311	FALSE	1.000	1.011
## sigma_ea[256]	3.128	0.540	2.235	3.071	4.362	FALSE	1.000	1.004
## sigma_ea[257]	2.332	0.564	1.419	2.267	3.610	FALSE	1.000	1.002
## sigma_ea[258]	3.302	0.797	2.104	3.176	5.235	FALSE	1.000	1.003
## sigma_ea[259]	2.630	0.457	1.866	2.587	3.654	FALSE	1.000	1.005
## sigma_ea[260]	1.852	0.414	1.175	1.808	2.783	FALSE	1.000	1.004
## sigma_ea[261]	2.563	0.489	1.766	2.510	3.664	FALSE	1.000	1.018
## sigma_ea[262]	2.612	0.786	1.446	2.478	4.524	FALSE	1.000	1.003

## sigma_ea[263]	1.835	0.452	1.100	1.785	2.858	FALSE	1.000	1.019
## sigma_ea[264]	2.591	0.470	1.816	2.540	3.651	FALSE	1.000	1.017
## sigma_ea[265]	0.712	0.230	0.364	0.678	1.259	FALSE	1.000	1.002
## sigma_ea[266]	2.148	0.375	1.512	2.113	2.974	FALSE	1.000	1.003
## sigma_ea[267]	4.068	0.602	3.057	4.007	5.385	FALSE	1.000	1.008
## sigma_ea[268]	3.234	0.535	2.350	3.180	4.433	FALSE	1.000	1.003
## sigma_ea[269]	1.974	0.501	1.163	1.914	3.132	FALSE	1.000	1.001
## sigma_ea[270]	4.569	1.093	2.957	4.397	7.220	FALSE	1.000	1.001
## sigma_ea[271]	2.735	0.459	1.966	2.690	3.755	FALSE	1.000	1.006
## sigma_ea[272]	1.958	0.397	1.292	1.920	2.829	FALSE	1.000	1.004
## sigma_ea[273]	2.696	0.437	1.967	2.652	3.662	FALSE	1.000	1.010
## sigma_ea[274]	3.879	1.066	2.325	3.706	6.466	FALSE	1.000	1.001
## sigma_ea[275]	1.967	0.388	1.318	1.931	2.813	FALSE	1.000	1.011
## sigma_ea[276]	2.723	0.414	2.026	2.686	3.623	FALSE	1.000	1.009
## sigma_ea[277]	0.881	0.274	0.465	0.840	1.535	FALSE	1.000	1.001
## sigma_ea[278]	2.272	0.417	1.588	2.226	3.213	FALSE	1.000	1.002
## sigma_ea[279]	4.382	0.648	3.287	4.321	5.813	FALSE	1.000	1.005
## sigma_ea[280]	3.358	0.564	2.431	3.298	4.633	FALSE	1.000	1.003
## sigma_ea[281]	2.143	0.554	1.262	2.071	3.431	FALSE	1.000	1.003
## sigma_ea[282]	4.606	1.092	2.962	4.441	7.241	FALSE	1.000	1.001
## sigma_ea[283]	2.860	0.489	2.058	2.809	3.972	FALSE	1.000	1.005
## sigma_ea[284]	2.082	0.443	1.361	2.033	3.083	FALSE	1.000	1.003
## sigma_ea[285]	3.010	0.495	2.184	2.961	4.114	FALSE	1.000	1.004
## sigma_ea[286]	3.917	1.067	2.321	3.751	6.502	FALSE	1.000	1.001
## sigma_ea[287]	2.281	0.452	1.524	2.238	3.289	FALSE	1.000	1.004
## sigma_ea[288]	3.037	0.475	2.236	2.992	4.087	FALSE	1.000	1.003
## sigma_ea[289]	1.871	0.612	0.891	1.794	3.303	FALSE	1.000	1.002
## sigma_ea[290]	1.629	0.292	1.126	1.605	2.272	FALSE	1.000	1.001
## sigma_ea[291]	2.693	0.415	2.009	2.646	3.635	FALSE	1.000	1.003
## sigma_ea[292]	2.715	0.467	1.933	2.669	3.775	FALSE	1.000	1.002
## sigma_ea[293]	3.133	0.704	1.962	3.056	4.721	FALSE	1.000	1.002
## sigma_ea[294]	1.830	0.264	1.375	1.807	2.408	FALSE	1.000	1.002
## sigma_ea[295]	2.217	0.355	1.610	2.188	2.996	FALSE	1.000	1.003
## sigma_ea[296]	1.440	0.318	0.884	1.417	2.130	FALSE	1.000	1.001
## sigma_ea[297]	1.321	0.230	0.941	1.297	1.835	FALSE	1.000	1.001
## sigma_ea[298]	1.140	0.224	0.760	1.120	1.636	FALSE	1.000	1.003
## sigma_ea[299]	0.592	0.164	0.323	0.575	0.961	FALSE	1.000	1.000
## sigma_ea[300]	1.348	0.198	1.019	1.328	1.795	FALSE	1.000	1.000
## sigma_ea[301]	1.449	0.435	0.785	1.389	2.475	FALSE	1.000	1.004
## sigma_ea[302]	2.282	0.413	1.579	2.243	3.202	FALSE	1.000	1.000
## sigma_ea[303]	3.688	0.538	2.779	3.636	4.896	FALSE	1.000	1.004
## sigma_ea[304]	3.368	0.556	2.429	3.316	4.610	FALSE	1.000	1.001
## sigma_ea[305]	2.711	0.623	1.677	2.643	4.128	FALSE	1.000	1.003
## sigma_ea[306]	4.450	1.468	2.366	4.213	8.002	FALSE	1.000	1.001
## sigma_ea[307]	2.870	0.486	2.042	2.827	3.951	FALSE	1.000	1.002
## sigma_ea[308]	2.093	0.418	1.376	2.056	3.010	FALSE	1.000	1.001
## sigma_ea[309]	2.316	0.378	1.677	2.282	3.155	FALSE	1.000	1.001
## sigma_ea[310]	3.760	1.442	1.730	3.524	7.255	FALSE	1.000	1.001
## sigma_ea[311]	1.588	0.332	1.027	1.556	2.326	FALSE	1.000	1.001
## sigma_ea[312]	2.344	0.357	1.741	2.311	3.139	FALSE	1.000	1.001
## sigma_ea[313]	0.859	0.381	0.315	0.795	1.780	FALSE	1.000	1.001
## sigma_ea[314]	2.165	0.367	1.532	2.135	2.976	FALSE	1.000	1.002
## sigma_ea[315]	3.895	0.589	2.920	3.833	5.198	FALSE	1.000	1.012
## sigma_ea[316]	3.251	0.527	2.369	3.198	4.432	FALSE	1.000	1.002



## sigma_ea[317]	2.122	0.543	1.243	2.057	3.375	FALSE	1.000	1.001
## sigma_ea[318]	4.358	1.034	2.791	4.209	6.824	FALSE	1.000	1.001
## sigma_ea[319]	2.753	0.450	1.982	2.713	3.741	FALSE	1.000	1.004
## sigma_ea[320]	1.975	0.380	1.331	1.941	2.817	FALSE	1.000	1.003
## sigma_ea[321]	2.523	0.428	1.818	2.480	3.470	FALSE	1.000	1.015
## sigma_ea[322]	3.668	1.004	2.155	3.523	6.067	FALSE	1.000	1.001
## sigma_ea[323]	1.794	0.379	1.167	1.756	2.627	FALSE	1.000	1.016
## sigma_ea[324]	2.550	0.405	1.876	2.512	3.434	FALSE	1.000	1.014
## sigma_ea[325]	0.810	0.267	0.414	0.768	1.459	FALSE	1.000	1.002
## sigma_ea[326]	2.160	0.362	1.537	2.130	2.951	FALSE	1.000	1.003
## sigma_ea[327]	3.979	0.589	3.001	3.918	5.280	FALSE	1.000	1.011
## sigma_ea[328]	3.245	0.525	2.368	3.193	4.416	FALSE	1.000	1.003
## sigma_ea[329]	2.073	0.489	1.287	2.014	3.212	FALSE	1.000	1.002
## sigma_ea[330]	4.416	1.016	2.902	4.261	6.863	FALSE	1.000	1.001
## sigma_ea[331]	2.747	0.446	1.994	2.707	3.734	FALSE	1.000	1.005
## sigma_ea[332]	1.970	0.381	1.316	1.937	2.804	FALSE	1.000	1.004
## sigma_ea[333]	2.607	0.425	1.900	2.566	3.538	FALSE	1.000	1.014
## sigma_ea[334]	3.726	0.986	2.266	3.572	6.107	FALSE	1.000	1.001
## sigma_ea[335]	1.878	0.375	1.253	1.843	2.692	FALSE	1.000	1.016
## sigma_ea[336]	2.634	0.401	1.960	2.597	3.506	FALSE	1.000	1.013
## sigma_spline1[1]	3.434	3.293	0.086	2.581	11.933	FALSE	1.000	1.009
## sigma_spline1[2]	1.116	1.069	0.037	0.855	3.734	FALSE	1.000	1.005
## sigma_spline1[3]	11.385	7.848	3.296	9.273	32.225	FALSE	1.000	1.001
## sigma_spline1[4]	2.585	1.445	0.795	2.273	6.222	FALSE	1.000	1.020
## sigma_spline2[1]	6.095	3.851	1.672	5.185	15.961	FALSE	1.000	1.002
## sigma_spline2[2]	1.827	1.221	0.154	1.608	4.849	FALSE	1.000	1.001
## sigma_spline2[3]	2.114	2.127	0.063	1.506	7.640	FALSE	1.000	1.018
## sigma_spline2[4]	2.048	1.410	0.344	1.722	5.644	FALSE	1.000	1.003
## alfa_sd	1.904	0.118	1.686	1.898	2.151	FALSE	1.000	1.002
## beta_sd	-0.420	0.041	-0.508	-0.417	-0.346	FALSE	1.000	1.002
## P.resid[1]	0.443	0.483	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[2]	0.455	0.476	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[3]	0.585	0.188	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[4]	0.616	0.211	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[5]	0.616	0.211	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[6]	0.500	0.463	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[7]	0.689	0.242	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[8]	0.410	0.482	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[9]	0.438	0.475	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[10]	0.457	0.487	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[11]	0.427	0.485	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[12]	0.503	0.463	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[13]	0.552	0.153	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[14]	0.487	0.447	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[15]	0.603	0.203	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[16]	0.585	0.188	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[17]	0.521	0.101	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[18]	0.412	0.479	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[19]	0.410	0.417	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[20]	0.632	0.411	0.000	1.000	1.000	TRUE	1.000	1.000
## P.resid[21]	0.455	0.479	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[22]	0.528	0.487	0.000	1.000	1.000	TRUE	1.000	1.000
## P.resid[23]	0.528	0.490	0.000	1.000	1.000	TRUE	1.000	1.000
## P.resid[24]	0.484	0.475	0.000	0.500	1.000	TRUE	1.000	1.000

## P.resid[25]	0.412	0.474	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[26]	0.418	0.477	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[27]	0.362	0.429	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[28]	0.365	0.430	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[29]	0.565	0.168	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[30]	0.476	0.475	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[31]	0.448	0.422	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[32]	0.417	0.480	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[33]	0.433	0.479	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[34]	0.592	0.481	0.000	1.000	1.000	TRUE	1.000	1.000
## P.resid[35]	0.422	0.485	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[36]	0.748	0.368	0.000	1.000	1.000	TRUE	1.000	1.000
## P.resid[37]	0.476	0.447	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[38]	0.494	0.470	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[39]	0.618	0.213	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[40]	0.392	0.414	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[41]	0.568	0.171	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[42]	0.438	0.482	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[43]	0.484	0.424	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[44]	0.560	0.469	0.000	1.000	1.000	TRUE	1.000	1.000
## P.resid[45]	0.428	0.481	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[46]	0.326	0.461	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[47]	0.588	0.484	0.000	1.000	1.000	TRUE	1.000	1.000
## P.resid[48]	0.428	0.480	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[49]	0.359	0.408	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[50]	0.419	0.477	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[51]	0.618	0.212	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[52]	0.373	0.433	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[53]	0.531	0.120	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[54]	0.533	0.475	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[55]	0.459	0.423	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[56]	0.680	0.418	0.000	1.000	1.000	TRUE	1.000	1.000
## P.resid[57]	0.395	0.483	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[58]	0.503	0.491	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[59]	0.432	0.487	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[60]	0.457	0.480	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[61]	0.555	0.156	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[62]	0.436	0.466	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[63]	0.602	0.202	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[64]	0.386	0.458	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[65]	0.521	0.099	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[66]	0.399	0.460	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[67]	0.644	0.227	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[68]	0.439	0.474	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[69]	0.419	0.479	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[70]	0.427	0.480	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[71]	0.532	0.490	0.000	1.000	1.000	TRUE	1.000	1.000
## P.resid[72]	0.411	0.480	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[73]	0.373	0.432	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[74]	0.490	0.472	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[75]	0.636	0.223	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[76]	0.406	0.471	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[77]	0.536	0.130	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[78]	0.513	0.481	0.000	0.500	1.000	TRUE	1.000	1.000

## P.resid[79]	0.490	0.424	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[80]	0.421	0.481	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[81]	0.372	0.476	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[82]	0.422	0.487	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[83]	0.539	0.492	0.000	1.000	1.000	TRUE	1.000	1.000
## P.resid[84]	0.519	0.481	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[85]	0.537	0.132	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[86]	0.407	0.470	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[87]	0.568	0.171	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[88]	0.567	0.170	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[89]	0.516	0.087	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[90]	0.392	0.462	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[91]	0.441	0.487	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[92]	0.471	0.447	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[93]	0.508	0.447	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[94]	0.415	0.420	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[95]	0.462	0.485	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[96]	0.463	0.455	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[97]	0.573	0.422	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[98]	0.408	0.416	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[99]	0.530	0.118	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[100]	0.549	0.149	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[101]	0.576	0.180	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[102]	0.552	0.153	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[103]	0.575	0.179	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[104]	0.422	0.480	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[105]	0.360	0.406	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[106]	0.366	0.409	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[107]	0.430	0.443	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[108]	0.588	0.190	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[109]	0.440	0.454	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[110]	0.625	0.216	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[111]	0.301	0.389	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[112]	0.547	0.146	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[113]	0.566	0.170	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[114]	0.546	0.145	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[115]	0.571	0.174	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[116]	0.420	0.478	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[117]	0.595	0.196	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[118]	0.587	0.190	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[119]	0.483	0.426	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[120]	0.591	0.193	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[121]	0.439	0.478	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[122]	0.445	0.421	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[123]	0.336	0.422	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[124]	0.559	0.161	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[125]	0.599	0.199	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[126]	0.333	0.399	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[127]	0.592	0.194	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[128]	0.441	0.489	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[129]	0.604	0.203	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[130]	0.403	0.417	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[131]	0.425	0.457	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[132]	0.600	0.200	0.500	0.500	1.000	FALSE	1.000	1.000

## P.resid[133]	0.441	0.478	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[134]	0.409	0.472	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[135]	0.545	0.143	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[136]	0.572	0.176	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[137]	0.604	0.203	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[138]	0.619	0.213	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[139]	0.614	0.210	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[140]	0.432	0.488	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[141]	0.432	0.420	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[142]	0.422	0.468	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[143]	0.434	0.476	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[144]	0.650	0.229	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[145]	0.365	0.440	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[146]	0.417	0.482	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[147]	0.397	0.415	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[148]	0.374	0.432	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[149]	0.518	0.094	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[150]	0.451	0.481	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[151]	0.472	0.424	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[152]	0.431	0.480	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[153]	0.397	0.480	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[154]	0.551	0.489	0.000	1.000	1.000	TRUE	1.000	1.000
## P.resid[155]	0.567	0.488	0.000	1.000	1.000	TRUE	1.000	1.000
## P.resid[156]	0.448	0.482	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[157]	0.618	0.212	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[158]	0.564	0.444	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[159]	0.618	0.213	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[160]	0.378	0.412	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[161]	0.538	0.133	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[162]	0.641	0.444	0.000	1.000	1.000	TRUE	1.000	1.000
## P.resid[163]	0.401	0.448	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[164]	0.444	0.478	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[165]	0.491	0.481	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[166]	0.498	0.491	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[167]	0.436	0.488	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[168]	0.416	0.480	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[169]	0.517	0.091	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[170]	0.631	0.220	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[171]	0.552	0.152	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[172]	0.550	0.149	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[173]	0.509	0.065	0.500	0.500	0.500	FALSE	1.000	1.000
## P.resid[174]	0.532	0.122	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[175]	0.390	0.459	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[176]	0.660	0.233	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[177]	0.693	0.243	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[178]	0.557	0.159	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[179]	0.427	0.481	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[180]	0.411	0.449	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[181]	0.519	0.096	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[182]	0.381	0.443	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[183]	0.562	0.165	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[184]	0.548	0.147	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[185]	0.509	0.066	0.500	0.500	0.500	FALSE	1.000	1.001
## P.resid[186]	0.518	0.093	0.500	0.500	1.000	FALSE	1.000	1.000

## P.resid[187]	0.384	0.457	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[188]	0.656	0.232	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[189]	0.471	0.446	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[190]	0.529	0.117	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[191]	0.451	0.484	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[192]	0.423	0.457	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[193]	0.516	0.087	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[194]	0.627	0.217	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[195]	0.551	0.151	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[196]	0.547	0.146	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[197]	0.508	0.063	0.500	0.500	0.500	FALSE	1.000	1.000
## P.resid[198]	0.531	0.120	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[199]	0.349	0.426	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[200]	0.656	0.232	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[201]	0.684	0.241	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[202]	0.555	0.156	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[203]	0.428	0.479	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[204]	0.416	0.441	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[205]	0.515	0.085	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[206]	0.395	0.414	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[207]	0.547	0.146	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[208]	0.547	0.145	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[209]	0.508	0.063	0.500	0.500	0.500	FALSE	1.000	1.000
## P.resid[210]	0.530	0.118	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[211]	0.382	0.454	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[212]	0.651	0.230	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[213]	0.671	0.237	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[214]	0.552	0.152	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[215]	0.424	0.480	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[216]	0.666	0.236	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[217]	0.534	0.126	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[218]	0.397	0.415	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[219]	0.556	0.158	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[220]	0.548	0.147	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[221]	0.514	0.083	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[222]	0.522	0.103	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[223]	0.412	0.471	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[224]	0.655	0.231	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[225]	0.504	0.424	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[226]	0.537	0.131	0.500	0.500	1.000	FALSE	1.000	1.001
## P.resid[227]	0.451	0.482	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[228]	0.422	0.451	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[229]	0.521	0.100	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[230]	0.374	0.433	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[231]	0.553	0.154	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[232]	0.543	0.141	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[233]	0.510	0.069	0.500	0.500	0.500	FALSE	1.000	1.000
## P.resid[234]	0.516	0.087	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[235]	0.414	0.473	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[236]	0.635	0.222	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[237]	0.696	0.244	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[238]	0.525	0.110	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[239]	0.440	0.481	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[240]	0.429	0.442	0.000	0.500	1.000	TRUE	1.000	1.000

## P.resid[241]	0.522	0.103	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[242]	0.391	0.414	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[243]	0.548	0.148	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[244]	0.545	0.144	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[245]	0.510	0.072	0.500	0.500	0.500	FALSE	1.000	1.000
## P.resid[246]	0.516	0.087	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[247]	0.423	0.476	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[248]	0.423	0.420	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[249]	0.677	0.239	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[250]	0.303	0.390	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[251]	0.437	0.479	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[252]	0.411	0.440	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[253]	0.493	0.473	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[254]	0.633	0.221	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[255]	0.430	0.477	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[256]	0.548	0.148	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[257]	0.375	0.449	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[258]	0.548	0.147	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[259]	0.575	0.178	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[260]	0.411	0.440	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[261]	0.581	0.184	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[262]	0.590	0.192	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[263]	0.449	0.423	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[264]	0.578	0.181	0.500	0.500	1.000	FALSE	1.000	1.001
## P.resid[265]	0.506	0.483	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[266]	0.617	0.212	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[267]	0.429	0.477	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[268]	0.545	0.143	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[269]	0.400	0.462	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[270]	0.521	0.100	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[271]	0.348	0.425	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[272]	0.394	0.459	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[273]	0.569	0.172	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[274]	0.533	0.124	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[275]	0.417	0.418	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[276]	0.568	0.171	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[277]	0.501	0.478	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[278]	0.605	0.204	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[279]	0.440	0.481	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[280]	0.541	0.137	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[281]	0.390	0.456	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[282]	0.520	0.098	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[283]	0.561	0.164	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[284]	0.379	0.444	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[285]	0.552	0.153	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[286]	0.533	0.124	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[287]	0.604	0.203	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[288]	0.552	0.153	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[289]	0.409	0.468	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[290]	0.487	0.424	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[291]	0.401	0.466	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[292]	0.569	0.173	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[293]	0.553	0.155	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[294]	0.403	0.438	0.000	0.500	1.000	TRUE	1.000	1.000

## P.resid[295]	0.378	0.411	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[296]	0.416	0.471	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[297]	0.434	0.466	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[298]	0.830	0.237	0.500	1.000	1.000	FALSE	1.000	1.000
## P.resid[299]	0.564	0.478	0.000	1.000	1.000	TRUE	1.000	1.000
## P.resid[300]	0.427	0.465	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[301]	0.468	0.457	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[302]	0.605	0.203	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[303]	0.393	0.459	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[304]	0.541	0.137	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[305]	0.419	0.477	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[306]	0.526	0.112	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[307]	0.561	0.163	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[308]	0.628	0.218	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[309]	0.599	0.199	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[310]	0.547	0.145	0.500	0.500	1.000	FALSE	1.000	1.001
## P.resid[311]	0.500	0.425	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[312]	0.595	0.196	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[313]	0.440	0.483	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[314]	0.616	0.211	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[315]	0.418	0.471	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[316]	0.544	0.142	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[317]	0.389	0.451	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[318]	0.523	0.105	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[319]	0.567	0.170	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[320]	0.415	0.419	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[321]	0.582	0.185	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[322]	0.539	0.135	0.500	0.500	1.000	FALSE	1.000	1.001
## P.resid[323]	0.671	0.237	0.500	0.500	1.000	FALSE	1.000	1.001
## P.resid[324]	0.580	0.183	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[325]	0.490	0.481	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[326]	0.615	0.211	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[327]	0.426	0.476	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[328]	0.544	0.142	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[329]	0.408	0.418	0.000	0.500	1.000	TRUE	1.000	1.000
## P.resid[330]	0.522	0.103	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[331]	0.567	0.171	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[332]	0.392	0.459	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[333]	0.575	0.179	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[334]	0.536	0.130	0.500	0.500	1.000	FALSE	1.000	1.000
## P.resid[335]	0.403	0.438	0.000	0.000	1.000	TRUE	1.000	1.000
## P.resid[336]	0.573	0.177	0.500	0.500	1.000	FALSE	1.000	1.000
## resid2[1]	48.431	70.592	0.000	25.000	225.000	TRUE	1.000	1.000
## resid2[2]	19.661	31.895	0.000	9.000	100.000	TRUE	1.000	1.001
## resid2[3]	0.464	2.180	0.000	0.000	4.000	TRUE	1.000	1.000
## resid2[4]	0.726	2.929	0.000	0.000	9.000	TRUE	1.000	1.003
## resid2[5]	0.754	3.073	0.000	0.000	9.000	TRUE	1.000	1.001
## resid2[6]	8.737	17.364	0.000	4.000	49.000	TRUE	1.000	1.001
## resid2[7]	1.572	5.173	0.000	0.000	16.000	TRUE	1.000	1.000
## resid2[8]	118.247	161.843	0.000	49.000	576.000	TRUE	1.000	1.000
## resid2[9]	22.732	35.255	0.000	9.000	100.525	TRUE	1.000	1.001
## resid2[10]	86.735	124.736	0.000	36.000	441.000	TRUE	1.000	1.000
## resid2[11]	108.542	152.382	0.000	49.000	529.000	TRUE	1.000	1.000
## resid2[12]	8.659	16.897	0.000	4.000	49.000	TRUE	1.000	1.001

## resid2[13]	0.279	1.716	0.000	0.000	4.000	TRUE	1.000	1.000
## resid2[14]	4.492	10.115	0.000	1.000	36.000	TRUE	1.000	1.001
## resid2[15]	0.594	2.642	0.000	0.000	4.000	TRUE	1.000	1.005
## resid2[16]	0.466	2.217	0.000	0.000	4.000	TRUE	1.000	1.001
## resid2[17]	0.096	0.915	0.000	0.000	1.000	TRUE	1.000	1.001
## resid2[18]	57.897	80.976	0.000	25.000	289.000	TRUE	1.000	1.001
## resid2[19]	1.942	5.379	0.000	1.000	16.000	TRUE	1.000	1.000
## resid2[20]	4.598	11.104	0.000	1.000	36.000	TRUE	1.000	1.000
## resid2[21]	28.686	44.748	0.000	16.000	144.000	TRUE	1.000	1.000
## resid2[22]	75.836	115.498	0.000	36.000	400.000	TRUE	1.000	1.001
## resid2[23]	130.253	193.765	0.000	64.000	676.000	TRUE	1.000	1.000
## resid2[24]	17.678	29.937	0.000	9.000	100.000	TRUE	1.000	1.000
## resid2[25]	28.449	41.280	0.000	16.000	144.000	TRUE	1.000	1.000
## resid2[26]	38.385	55.321	0.000	16.000	196.000	TRUE	1.000	1.000
## resid2[27]	3.454	7.698	0.000	1.000	16.000	TRUE	1.000	1.001
## resid2[28]	3.467	7.615	0.000	1.000	25.000	TRUE	1.000	1.001
## resid2[29]	0.343	1.869	0.000	0.000	4.000	TRUE	1.000	1.002
## resid2[30]	17.746	29.778	0.000	9.000	100.000	TRUE	1.000	1.000
## resid2[31]	2.237	6.303	0.000	1.000	16.000	TRUE	1.000	1.002
## resid2[32]	55.894	78.789	0.000	25.000	256.000	TRUE	1.000	1.000
## resid2[33]	34.206	50.419	0.000	16.000	169.000	TRUE	1.000	1.000
## resid2[34]	102.033	156.603	0.000	49.000	529.000	TRUE	1.000	1.000
## resid2[35]	122.749	170.250	0.000	64.000	576.000	TRUE	1.000	1.000
## resid2[36]	7.406	15.026	0.000	1.000	49.000	TRUE	1.000	1.001
## resid2[37]	4.636	10.961	0.000	1.000	36.000	TRUE	1.000	1.000
## resid2[38]	12.255	22.283	0.000	4.000	64.000	TRUE	1.000	1.000
## resid2[39]	0.732	3.035	0.000	0.000	9.000	TRUE	1.000	1.002
## resid2[40]	1.893	5.385	0.000	1.000	16.000	TRUE	1.000	1.002
## resid2[41]	0.359	1.908	0.000	0.000	4.000	TRUE	1.000	1.002
## resid2[42]	45.783	65.443	0.000	25.000	225.000	TRUE	1.000	1.000
## resid2[43]	2.534	6.953	0.000	1.000	16.000	TRUE	1.000	1.000
## resid2[44]	16.749	30.221	0.000	9.000	100.000	TRUE	1.000	1.000
## resid2[45]	55.674	79.285	0.000	25.000	256.000	TRUE	1.000	1.000
## resid2[46]	194.391	256.313	0.000	100.000	900.000	TRUE	1.000	1.000
## resid2[47]	185.869	280.393	0.000	81.000	961.000	TRUE	1.000	1.000
## resid2[48]	47.302	68.002	0.000	25.000	225.000	TRUE	1.000	1.000
## resid2[49]	1.758	4.964	0.000	1.000	9.000	TRUE	1.000	1.003
## resid2[50]	38.015	54.825	0.000	16.000	169.000	TRUE	1.000	1.000
## resid2[51]	0.723	2.923	0.000	0.000	9.000	TRUE	1.000	1.000
## resid2[52]	3.501	7.567	0.000	1.000	25.000	TRUE	1.000	1.000
## resid2[53]	0.149	1.179	0.000	0.000	1.000	TRUE	1.000	1.007
## resid2[54]	19.192	32.882	0.000	9.000	100.000	TRUE	1.000	1.000
## resid2[55]	2.311	6.380	0.000	1.000	16.000	TRUE	1.000	1.000
## resid2[56]	9.407	19.633	0.000	4.000	64.000	TRUE	1.000	1.001
## resid2[57]	278.597	382.228	1.000	121.000	1369.000	FALSE	1.000	1.000
## resid2[58]	138.211	200.763	0.000	64.000	676.000	TRUE	1.000	1.000
## resid2[59]	165.204	231.343	0.000	81.000	784.000	TRUE	1.000	1.000
## resid2[60]	32.308	49.819	0.000	16.000	169.000	TRUE	1.000	1.001
## resid2[61]	0.306	1.819	0.000	0.000	4.000	TRUE	1.000	1.005
## resid2[62]	11.420	19.376	0.000	4.000	64.000	TRUE	1.000	1.000
## resid2[63]	0.596	2.520	0.000	0.000	4.000	TRUE	1.000	1.000
## resid2[64]	11.089	17.915	0.000	4.000	49.000	TRUE	1.000	1.000
## resid2[65]	0.098	0.959	0.000	0.000	1.000	TRUE	1.000	1.028
## resid2[66]	11.088	18.045	0.000	4.000	49.000	TRUE	1.000	1.000



## resid2[67]	1.012	3.688	0.000	0.000	9.000	TRUE	1.000	1.002
## resid2[68]	21.073	33.524	0.000	9.000	100.000	TRUE	1.000	1.000
## resid2[69]	51.593	73.205	0.000	25.000	256.000	TRUE	1.000	1.000
## resid2[70]	46.298	66.237	0.000	25.000	225.000	TRUE	1.000	1.000
## resid2[71]	131.392	195.799	0.000	64.000	676.000	TRUE	1.000	1.001
## resid2[72]	66.424	92.127	0.000	36.000	324.000	TRUE	1.000	1.000
## resid2[73]	3.559	7.812	0.000	1.000	25.000	TRUE	1.000	1.001
## resid2[74]	14.348	25.514	0.000	4.000	81.000	TRUE	1.000	1.001
## resid2[75]	0.898	3.366	0.000	0.000	9.000	TRUE	1.000	1.000
## resid2[76]	22.794	33.761	0.000	9.000	100.000	TRUE	1.000	1.000
## resid2[77]	0.176	1.287	0.000	0.000	1.000	TRUE	1.000	1.009
## resid2[78]	32.102	50.983	0.000	16.000	169.000	TRUE	1.000	1.000
## resid2[79]	2.603	6.981	0.000	1.000	16.000	TRUE	1.000	1.000
## resid2[80]	57.293	80.514	0.000	25.000	289.000	TRUE	1.000	1.000
## resid2[81]	182.887	247.370	0.000	81.000	900.000	TRUE	1.000	1.000
## resid2[82]	188.442	264.505	0.000	81.000	900.000	TRUE	1.000	1.000
## resid2[83]	223.672	326.316	0.000	100.000	1156.000	TRUE	1.000	1.000
## resid2[84]	32.589	51.716	0.000	16.000	169.000	TRUE	1.000	1.000
## resid2[85]	0.190	1.420	0.000	0.000	1.000	TRUE	1.000	1.004
## resid2[86]	20.824	31.545	0.000	9.000	100.000	TRUE	1.000	1.000
## resid2[87]	0.362	1.959	0.000	0.000	4.000	TRUE	1.000	1.006
## resid2[88]	0.357	1.904	0.000	0.000	4.000	TRUE	1.000	1.000
## resid2[89]	0.079	0.902	0.000	0.000	1.000	TRUE	1.000	1.015
## resid2[90]	13.109	20.533	0.000	9.000	64.000	TRUE	1.000	1.000
## resid2[91]	108.811	154.487	0.000	49.000	529.000	TRUE	1.000	1.000
## resid2[92]	4.462	10.150	0.000	1.000	36.000	TRUE	1.000	1.000
## resid2[93]	4.736	10.763	0.000	1.000	36.000	TRUE	1.000	1.000
## resid2[94]	2.096	5.954	0.000	1.000	16.000	TRUE	1.000	1.002
## resid2[95]	57.862	84.908	0.000	25.000	289.000	TRUE	1.000	1.000
## resid2[96]	6.135	12.795	0.000	4.000	36.000	TRUE	1.000	1.000
## resid2[97]	3.795	9.547	0.000	1.000	25.000	TRUE	1.000	1.002
## resid2[98]	1.963	5.432	0.000	1.000	16.000	TRUE	1.000	1.001
## resid2[99]	0.133	1.002	0.000	0.000	1.000	TRUE	1.000	1.002
## resid2[100]	0.242	1.544	0.000	0.000	1.000	TRUE	1.000	1.004
## resid2[101]	0.416	2.129	0.000	0.000	4.000	TRUE	1.000	1.003
## resid2[102]	0.268	1.672	0.000	0.000	4.000	TRUE	1.000	1.002
## resid2[103]	0.404	2.061	0.000	0.000	4.000	TRUE	1.000	1.002
## resid2[104]	50.617	72.325	0.000	25.000	256.000	TRUE	1.000	1.000
## resid2[105]	1.704	4.830	0.000	1.000	9.000	TRUE	1.000	1.001
## resid2[106]	1.757	5.091	0.000	1.000	9.000	TRUE	1.000	1.002
## resid2[107]	3.895	8.757	0.000	1.000	25.000	TRUE	1.000	1.001
## resid2[108]	0.475	2.195	0.000	0.000	4.000	TRUE	1.000	1.000
## resid2[109]	5.880	11.959	0.000	4.000	36.000	TRUE	1.000	1.000
## resid2[110]	0.801	3.181	0.000	0.000	9.000	TRUE	1.000	1.004
## resid2[111]	1.512	4.253	0.000	1.000	9.000	TRUE	1.000	1.000
## resid2[112]	0.231	1.570	0.000	0.000	1.000	TRUE	1.000	1.008
## resid2[113]	0.354	1.987	0.000	0.000	4.000	TRUE	1.000	1.005
## resid2[114]	0.236	1.548	0.000	0.000	1.000	TRUE	1.000	1.001
## resid2[115]	0.367	1.937	0.000	0.000	4.000	TRUE	1.000	1.006
## resid2[116]	42.406	61.070	0.000	16.000	196.000	TRUE	1.000	1.000
## resid2[117]	0.536	2.499	0.000	0.000	4.000	TRUE	1.000	1.002
## resid2[118]	0.516	2.499	0.000	0.000	4.000	TRUE	1.000	1.000
## resid2[119]	2.599	7.047	0.000	1.000	16.000	TRUE	1.000	1.003
## resid2[120]	0.516	2.436	0.000	0.000	4.000	TRUE	1.000	1.002

## resid2[121]	28.665	43.159	0.000	16.000	144.000	TRUE	1.000	1.000
## resid2[122]	2.220	6.176	0.000	1.000	16.000	TRUE	1.000	1.002
## resid2[123]	3.386	7.061	0.000	1.000	16.000	TRUE	1.000	1.000
## resid2[124]	0.302	1.728	0.000	0.000	4.000	TRUE	1.000	1.001
## resid2[125]	0.599	2.625	0.000	0.000	4.000	TRUE	1.000	1.000
## resid2[126]	1.620	4.698	0.000	1.000	9.000	TRUE	1.000	1.000
## resid2[127]	0.519	2.408	0.000	0.000	4.000	TRUE	1.000	1.004
## resid2[128]	189.999	267.062	0.000	81.000	961.000	TRUE	1.000	1.000
## resid2[129]	0.605	2.556	0.000	0.000	4.000	TRUE	1.000	1.001
## resid2[130]	2.011	5.791	0.000	1.000	16.000	TRUE	1.000	1.000
## resid2[131]	7.530	13.893	0.000	4.000	49.000	TRUE	1.000	1.000
## resid2[132]	0.587	2.669	0.000	0.000	4.000	TRUE	1.000	1.001
## resid2[133]	30.833	46.744	0.000	16.000	144.000	TRUE	1.000	1.000
## resid2[134]	24.587	36.199	0.000	9.000	121.000	TRUE	1.000	1.000
## resid2[135]	0.218	1.456	0.000	0.000	1.000	TRUE	1.000	1.002
## resid2[136]	0.393	2.142	0.000	0.000	4.000	TRUE	1.000	1.008
## resid2[137]	0.632	2.723	0.000	0.000	4.000	TRUE	1.000	1.007
## resid2[138]	0.750	3.021	0.000	0.000	9.000	TRUE	1.000	1.006
## resid2[139]	0.695	2.779	0.000	0.000	4.000	TRUE	1.000	1.000
## resid2[140]	191.875	268.962	0.000	81.000	961.000	TRUE	1.000	1.000
## resid2[141]	2.143	5.981	0.000	1.000	16.000	TRUE	1.000	1.000
## resid2[142]	15.155	24.284	0.000	9.000	81.000	TRUE	1.000	1.000
## resid2[143]	24.748	37.861	0.000	9.000	121.000	TRUE	1.000	1.000
## resid2[144]	1.030	3.622	0.000	0.000	9.000	TRUE	1.000	1.000
## resid2[145]	5.371	10.395	0.000	4.000	25.000	TRUE	1.000	1.001
## resid2[146]	84.173	116.813	0.000	36.000	400.000	TRUE	1.000	1.000
## resid2[147]	1.904	5.326	0.000	1.000	16.000	TRUE	1.000	1.002
## resid2[148]	3.523	7.748	0.000	1.000	25.000	TRUE	1.000	1.000
## resid2[149]	0.083	0.809	0.000	0.000	1.000	TRUE	1.000	1.005
## resid2[150]	34.288	51.258	0.000	16.000	169.000	TRUE	1.000	1.000
## resid2[151]	2.451	6.688	0.000	1.000	16.000	TRUE	1.000	1.001
## resid2[152]	45.811	66.588	0.000	25.000	225.000	TRUE	1.000	1.000
## resid2[153]	104.580	142.809	0.000	49.000	484.000	TRUE	1.000	1.000
## resid2[154]	149.367	223.228	0.000	64.000	784.000	TRUE	1.000	1.000
## resid2[155]	204.332	303.072	0.000	100.000	1024.000	TRUE	1.000	1.000
## resid2[156]	41.477	61.046	0.000	16.000	196.000	TRUE	1.000	1.000
## resid2[157]	0.795	3.204	0.000	0.000	9.000	TRUE	1.000	1.005
## resid2[158]	5.731	12.888	0.000	1.000	36.000	TRUE	1.000	1.000
## resid2[159]	0.732	2.891	0.000	0.000	9.000	TRUE	1.000	1.001
## resid2[160]	1.827	5.149	0.000	1.000	16.000	TRUE	1.000	1.001
## resid2[161]	0.189	1.344	0.000	0.000	1.000	TRUE	1.000	1.003
## resid2[162]	12.931	24.740	0.000	4.000	81.000	TRUE	1.000	1.000
## resid2[163]	5.486	10.803	0.000	4.000	36.000	TRUE	1.000	1.000
## resid2[164]	26.709	40.935	0.000	16.000	121.000	TRUE	1.000	1.000
## resid2[165]	30.007	48.062	0.000	16.000	144.000	TRUE	1.000	1.000
## resid2[166]	136.773	198.126	0.000	64.000	676.000	TRUE	1.000	1.000
## resid2[167]	178.137	251.245	0.000	81.000	900.000	TRUE	1.000	1.000
## resid2[168]	61.587	86.016	0.000	25.000	289.000	TRUE	1.000	1.000
## resid2[169]	0.083	0.883	0.000	0.000	1.000	TRUE	1.000	1.004
## resid2[170]	0.851	3.235	0.000	0.000	9.000	TRUE	1.000	1.000
## resid2[171]	0.253	1.552	0.000	0.000	4.000	TRUE	1.000	1.006
## resid2[172]	0.253	1.561	0.000	0.000	1.000	TRUE	1.000	1.002
## resid2[173]	0.042	0.663	0.000	0.000	0.000	TRUE	1.000	1.015
## resid2[174]	0.150	1.208	0.000	0.000	1.000	TRUE	1.000	1.010

## resid2[175]	11.167	18.326	0.000	4.000	49.000	TRUE	1.000	1.000
## resid2[176]	1.180	3.991	0.000	0.000	9.000	TRUE	1.000	1.001
## resid2[177]	1.579	4.897	0.000	0.000	16.000	TRUE	1.000	1.004
## resid2[178]	0.302	1.736	0.000	0.000	4.000	TRUE	1.000	1.007
## resid2[179]	47.941	69.699	0.000	25.000	225.000	TRUE	1.000	1.000
## resid2[180]	5.557	11.182	0.000	4.000	36.000	TRUE	1.000	1.000
## resid2[181]	0.092	0.907	0.000	0.000	1.000	TRUE	1.000	1.003
## resid2[182]	5.358	10.348	0.000	4.000	25.000	TRUE	1.000	1.000
## resid2[183]	0.321	1.798	0.000	0.000	4.000	TRUE	1.000	1.005
## resid2[184]	0.249	1.745	0.000	0.000	1.000	TRUE	1.000	1.010
## resid2[185]	0.042	0.651	0.000	0.000	0.000	TRUE	1.000	1.006
## resid2[186]	0.088	0.942	0.000	0.000	1.000	TRUE	1.000	1.014
## resid2[187]	11.113	17.876	0.000	4.000	49.000	TRUE	1.000	1.001
## resid2[188]	1.162	4.167	0.000	0.000	9.000	TRUE	1.000	1.002
## resid2[189]	4.287	9.614	0.000	1.000	25.000	TRUE	1.000	1.002
## resid2[190]	0.142	1.227	0.000	0.000	1.000	TRUE	1.000	1.015
## resid2[191]	53.975	78.815	0.000	25.000	256.000	TRUE	1.000	1.000
## resid2[192]	7.478	13.985	0.000	4.000	36.000	TRUE	1.000	1.002
## resid2[193]	0.078	0.894	0.000	0.000	1.000	TRUE	1.000	1.014
## resid2[194]	0.805	3.111	0.000	0.000	9.000	TRUE	1.000	1.000
## resid2[195]	0.244	1.447	0.000	0.000	1.000	TRUE	1.000	1.001
## resid2[196]	0.230	1.478	0.000	0.000	1.000	TRUE	1.000	1.005
## resid2[197]	0.035	0.539	0.000	0.000	0.000	TRUE	1.000	1.028
## resid2[198]	0.142	1.067	0.000	0.000	1.000	TRUE	1.000	1.002
## resid2[199]	3.376	7.362	0.000	1.000	16.000	TRUE	1.000	1.001
## resid2[200]	1.111	3.873	0.000	0.000	9.000	TRUE	1.000	1.001
## resid2[201]	1.464	4.726	0.000	0.000	9.000	TRUE	1.000	1.002
## resid2[202]	0.291	1.715	0.000	0.000	4.000	TRUE	1.000	1.000
## resid2[203]	44.088	63.463	0.000	25.000	225.000	TRUE	1.000	1.000
## resid2[204]	3.857	8.852	0.000	1.000	25.000	TRUE	1.000	1.001
## resid2[205]	0.074	0.862	0.000	0.000	1.000	TRUE	1.000	1.013
## resid2[206]	1.852	5.093	0.000	1.000	16.000	TRUE	1.000	1.000
## resid2[207]	0.238	1.602	0.000	0.000	1.000	TRUE	1.000	1.005
## resid2[208]	0.230	1.480	0.000	0.000	1.000	TRUE	1.000	1.003
## resid2[209]	0.036	0.576	0.000	0.000	0.000	TRUE	1.000	1.009
## resid2[210]	0.142	1.386	0.000	0.000	1.000	TRUE	1.000	1.054
## resid2[211]	9.192	15.426	0.000	4.000	49.000	TRUE	1.000	1.001
## resid2[212]	1.075	3.838	0.000	0.000	9.000	TRUE	1.000	1.000
## resid2[213]	1.272	4.160	0.000	0.000	9.000	TRUE	1.000	1.001
## resid2[214]	0.270	1.689	0.000	0.000	4.000	TRUE	1.000	1.001
## resid2[215]	47.995	68.878	0.000	25.000	225.000	TRUE	1.000	1.000
## resid2[216]	1.222	4.191	0.000	0.000	9.000	TRUE	1.000	1.000
## resid2[217]	0.178	1.454	0.000	0.000	1.000	TRUE	1.000	1.001
## resid2[218]	1.922	5.293	0.000	1.000	16.000	TRUE	1.000	1.000
## resid2[219]	0.289	1.768	0.000	0.000	4.000	TRUE	1.000	1.002
## resid2[220]	0.239	1.604	0.000	0.000	1.000	TRUE	1.000	1.002
## resid2[221]	0.067	0.807	0.000	0.000	1.000	TRUE	1.000	1.008
## resid2[222]	0.105	1.002	0.000	0.000	1.000	TRUE	1.000	1.010
## resid2[223]	22.747	34.014	0.000	9.000	100.000	TRUE	1.000	1.000
## resid2[224]	1.122	3.933	0.000	0.000	9.000	TRUE	1.000	1.000
## resid2[225]	2.764	7.304	0.000	1.000	25.000	TRUE	1.000	1.000
## resid2[226]	0.193	1.415	0.000	0.000	1.000	TRUE	1.000	1.004
## resid2[227]	42.637	63.441	0.000	16.000	196.000	TRUE	1.000	1.000
## resid2[228]	5.638	11.218	0.000	4.000	36.000	TRUE	1.000	1.000

## resid2[229]	0.108	1.054	0.000	0.000	1.000	TRUE	1.000	1.003
## resid2[230]	3.539	7.799	0.000	1.000	25.000	TRUE	1.000	1.000
## resid2[231]	0.261	1.619	0.000	0.000	4.000	TRUE	1.000	1.004
## resid2[232]	0.208	1.376	0.000	0.000	1.000	TRUE	1.000	1.000
## resid2[233]	0.045	0.717	0.000	0.000	0.000	TRUE	1.000	1.022
## resid2[234]	0.073	0.845	0.000	0.000	1.000	TRUE	1.000	1.011
## resid2[235]	25.111	37.383	0.000	9.000	121.000	TRUE	1.000	1.000
## resid2[236]	0.947	3.676	0.000	0.000	9.000	TRUE	1.000	1.001
## resid2[237]	1.656	5.049	0.000	0.000	16.000	TRUE	1.000	1.000
## resid2[238]	0.125	1.104	0.000	0.000	1.000	TRUE	1.000	1.001
## resid2[239]	42.328	62.967	0.000	16.000	196.000	TRUE	1.000	1.000
## resid2[240]	3.864	8.704	0.000	1.000	25.000	TRUE	1.000	1.000
## resid2[241]	0.110	1.051	0.000	0.000	1.000	TRUE	1.000	1.004
## resid2[242]	1.881	5.377	0.000	1.000	16.000	TRUE	1.000	1.000
## resid2[243]	0.237	1.528	0.000	0.000	1.000	TRUE	1.000	1.010
## resid2[244]	0.227	1.513	0.000	0.000	1.000	TRUE	1.000	1.002
## resid2[245]	0.051	0.754	0.000	0.000	0.000	TRUE	1.000	1.010
## resid2[246]	0.075	0.922	0.000	0.000	1.000	TRUE	1.000	1.007
## resid2[247]	30.904	45.723	0.000	16.000	144.000	TRUE	1.000	1.000
## resid2[248]	2.097	5.865	0.000	1.000	16.000	TRUE	1.000	1.001
## resid2[249]	1.373	4.463	0.000	0.000	9.000	TRUE	1.000	1.000
## resid2[250]	1.507	4.204	0.000	1.000	9.000	TRUE	1.000	1.000
## resid2[251]	34.417	50.830	0.000	16.000	169.000	TRUE	1.000	1.000
## resid2[252]	3.745	8.529	0.000	1.000	25.000	TRUE	1.000	1.000
## resid2[253]	14.884	26.530	0.000	4.000	81.000	TRUE	1.000	1.000
## resid2[254]	0.877	3.367	0.000	0.000	9.000	TRUE	1.000	1.004
## resid2[255]	31.091	46.394	0.000	16.000	144.000	TRUE	1.000	1.000
## resid2[256]	0.238	1.581	0.000	0.000	1.000	TRUE	1.000	1.013
## resid2[257]	7.150	12.363	0.000	4.000	36.000	TRUE	1.000	1.000
## resid2[258]	0.242	1.636	0.000	0.000	1.000	TRUE	1.000	1.004
## resid2[259]	0.401	1.995	0.000	0.000	4.000	TRUE	1.000	1.001
## resid2[260]	3.787	8.561	0.000	1.000	25.000	TRUE	1.000	1.000
## resid2[261]	0.447	2.312	0.000	0.000	4.000	TRUE	1.000	1.001
## resid2[262]	0.557	2.708	0.000	0.000	4.000	TRUE	1.000	1.002
## resid2[263]	2.364	6.773	0.000	1.000	16.000	TRUE	1.000	1.003
## resid2[264]	0.425	2.117	0.000	0.000	4.000	TRUE	1.000	1.006
## resid2[265]	35.037	55.736	0.000	16.000	196.000	TRUE	1.000	1.000
## resid2[266]	0.712	2.809	0.000	0.000	9.000	TRUE	1.000	1.002
## resid2[267]	29.162	43.506	0.000	16.000	144.000	TRUE	1.000	1.000
## resid2[268]	0.216	1.496	0.000	0.000	1.000	TRUE	1.000	1.015
## resid2[269]	13.049	20.963	0.000	9.000	64.000	TRUE	1.000	1.000
## resid2[270]	0.099	1.041	0.000	0.000	1.000	TRUE	1.000	1.007
## resid2[271]	3.394	7.322	0.000	1.000	16.000	TRUE	1.000	1.000
## resid2[272]	11.062	18.128	0.000	4.000	49.000	TRUE	1.000	1.001
## resid2[273]	0.356	1.834	0.000	0.000	4.000	TRUE	1.000	1.004
## resid2[274]	0.159	1.297	0.000	0.000	1.000	TRUE	1.000	1.013
## resid2[275]	2.057	5.773	0.000	1.000	16.000	TRUE	1.000	1.002
## resid2[276]	0.355	1.973	0.000	0.000	4.000	TRUE	1.000	1.000
## resid2[277]	22.984	38.376	0.000	9.000	121.000	TRUE	1.000	1.001
## resid2[278]	0.621	2.719	0.000	0.000	4.000	TRUE	1.000	1.000
## resid2[279]	39.152	57.404	0.000	16.000	196.000	TRUE	1.000	1.000
## resid2[280]	0.198	1.340	0.000	0.000	1.000	TRUE	1.000	1.006
## resid2[281]	9.193	15.380	0.000	4.000	49.000	TRUE	1.000	1.000
## resid2[282]	0.090	1.044	0.000	0.000	1.000	TRUE	1.000	1.017

## resid2[283]	0.318	1.826	0.000	0.000	4.000	TRUE	1.000	1.005
## resid2[284]	5.317	10.022	0.000	4.000	25.000	TRUE	1.000	1.001
## resid2[285]	0.261	1.695	0.000	0.000	4.000	TRUE	1.000	1.005
## resid2[286]	0.159	1.318	0.000	0.000	1.000	TRUE	1.000	1.023
## resid2[287]	0.638	2.751	0.000	0.000	4.000	TRUE	1.000	1.002
## resid2[288]	0.259	1.567	0.000	0.000	4.000	TRUE	1.000	1.009
## resid2[289]	16.947	26.017	0.000	9.000	81.000	TRUE	1.000	1.000
## resid2[290]	2.566	6.859	0.000	1.000	16.000	TRUE	1.000	1.000
## resid2[291]	16.984	26.159	0.000	9.000	81.000	TRUE	1.000	1.000
## resid2[292]	0.360	1.915	0.000	0.000	4.000	TRUE	1.000	1.003
## resid2[293]	0.275	1.628	0.000	0.000	4.000	TRUE	1.000	1.001
## resid2[294]	3.694	8.282	0.000	1.000	25.000	TRUE	1.000	1.002
## resid2[295]	1.806	5.244	0.000	1.000	16.000	TRUE	1.000	1.001
## resid2[296]	20.753	31.012	0.000	9.000	100.000	TRUE	1.000	1.000
## resid2[297]	11.308	19.170	0.000	4.000	64.000	TRUE	1.000	1.000
## resid2[298]	5.071	10.941	0.000	1.000	36.000	TRUE	1.000	1.001
## resid2[299]	36.705	61.279	0.000	16.000	196.000	TRUE	1.000	1.000
## resid2[300]	11.200	19.307	0.000	4.000	64.000	TRUE	1.000	1.000
## resid2[301]	6.448	13.477	0.000	4.000	36.000	TRUE	1.000	1.000
## resid2[302]	0.624	2.694	0.000	0.000	4.000	TRUE	1.000	1.003
## resid2[303]	11.258	18.307	0.000	4.000	49.000	TRUE	1.000	1.000
## resid2[304]	0.197	1.379	0.000	0.000	1.000	TRUE	1.000	1.003
## resid2[305]	35.071	50.506	0.000	16.000	169.000	TRUE	1.000	1.000
## resid2[306]	0.130	1.140	0.000	0.000	1.000	TRUE	1.000	1.022
## resid2[307]	0.316	1.842	0.000	0.000	4.000	TRUE	1.000	1.006
## resid2[308]	0.834	3.464	0.000	0.000	9.000	TRUE	1.000	1.011
## resid2[309]	0.574	2.629	0.000	0.000	4.000	TRUE	1.000	1.001
## resid2[310]	0.255	1.711	0.000	0.000	4.000	TRUE	1.000	1.007
## resid2[311]	2.751	7.511	0.000	1.000	25.000	TRUE	1.000	1.000
## resid2[312]	0.542	2.387	0.000	0.000	4.000	TRUE	1.000	1.003
## resid2[313]	55.965	80.738	0.000	25.000	289.000	TRUE	1.000	1.000
## resid2[314]	0.698	2.755	0.000	0.000	9.000	TRUE	1.000	1.001
## resid2[315]	21.246	32.408	0.000	9.000	100.000	TRUE	1.000	1.000
## resid2[316]	0.215	1.530	0.000	0.000	1.000	TRUE	1.000	1.007
## resid2[317]	7.302	13.176	0.000	4.000	36.000	TRUE	1.000	1.000
## resid2[318]	0.108	0.994	0.000	0.000	1.000	TRUE	1.000	1.014
## resid2[319]	0.365	2.098	0.000	0.000	4.000	TRUE	1.000	1.002
## resid2[320]	2.041	5.546	0.000	1.000	16.000	TRUE	1.000	1.000
## resid2[321]	0.451	2.376	0.000	0.000	4.000	TRUE	1.000	1.000
## resid2[322]	0.195	1.427	0.000	0.000	1.000	TRUE	1.000	1.004
## resid2[323]	1.326	4.301	0.000	0.000	9.000	TRUE	1.000	1.002
## resid2[324]	0.437	2.231	0.000	0.000	4.000	TRUE	1.000	1.011
## resid2[325]	30.250	48.597	0.000	16.000	144.000	TRUE	1.000	1.000
## resid2[326]	0.696	2.762	0.000	0.000	4.000	TRUE	1.000	1.001
## resid2[327]	27.436	41.296	0.000	16.000	144.000	TRUE	1.000	1.000
## resid2[328]	0.215	1.465	0.000	0.000	1.000	TRUE	1.000	1.000
## resid2[329]	2.033	5.600	0.000	1.000	16.000	TRUE	1.000	1.000
## resid2[330]	0.105	1.002	0.000	0.000	1.000	TRUE	1.000	1.002
## resid2[331]	0.353	1.963	0.000	0.000	4.000	TRUE	1.000	1.000
## resid2[332]	11.077	18.220	0.000	4.000	49.000	TRUE	1.000	1.002
## resid2[333]	0.400	1.936	0.000	0.000	4.000	TRUE	1.000	1.000
## resid2[334]	0.181	1.335	0.000	0.000	1.000	TRUE	1.000	1.002
## resid2[335]	3.708	8.437	0.000	1.000	25.000	TRUE	1.000	1.000
## resid2[336]	0.381	1.913	0.000	0.000	4.000	TRUE	1.000	1.001

## deviance	948.728	21.836	907.866	948.023	993.563	FALSE	1.000	1.000
##	n.eff							
## beta0	49							
## beta_PC1[1,1]	257							
## beta_PC1[2,1]	1017							
## beta_PC1[3,1]	952							
## beta_PC1[4,1]	709							
## beta_PC1[5,1]	723							
## beta_PC1[6,1]	649							
## beta_PC1[1,2]	4631							
## beta_PC1[2,2]	452							
## beta_PC1[3,2]	1415							
## beta_PC1[4,2]	857							
## beta_PC1[5,2]	903							
## beta_PC1[6,2]	2408							
## beta_PC1[1,3]	5492							
## beta_PC1[2,3]	1120							
## beta_PC1[3,3]	15084							
## beta_PC1[4,3]	8988							
## beta_PC1[5,3]	12680							
## beta_PC1[6,3]	6101							
## beta_PC1[1,4]	1449							
## beta_PC1[2,4]	118							
## beta_PC1[3,4]	81							
## beta_PC1[4,4]	61							
## beta_PC1[5,4]	108							
## beta_PC1[6,4]	91							
## beta_PC2[1,1]	11185							
## beta_PC2[2,1]	3097							
## beta_PC2[3,1]	265							
## beta_PC2[4,1]	418							
## beta_PC2[5,1]	88							
## beta_PC2[6,1]	118							
## beta_PC2[1,2]	1242							
## beta_PC2[2,2]	1875							
## beta_PC2[3,2]	2857							
## beta_PC2[4,2]	2014							
## beta_PC2[5,2]	1743							
## beta_PC2[6,2]	533							
## beta_PC2[1,3]	515							
## beta_PC2[2,3]	167							
## beta_PC2[3,3]	367							
## beta_PC2[4,3]	600							
## beta_PC2[5,3]	2948							
## beta_PC2[6,3]	1243							
## beta_PC2[1,4]	4063							
## beta_PC2[2,4]	125							
## beta_PC2[3,4]	1170							
## beta_PC2[4,4]	959							
## beta_PC2[5,4]	1715							
## beta_PC2[6,4]	2886							
## sigma_site	4154							
## sigma_ea[1]	6656							
## sigma_ea[2]	2337							

## sigma_ea[3]	585
## sigma_ea[4]	7341
## sigma_ea[5]	4575
## sigma_ea[6]	30501
## sigma_ea[7]	13257
## sigma_ea[8]	3268
## sigma_ea[9]	3215
## sigma_ea[10]	2994
## sigma_ea[11]	3096
## sigma_ea[12]	3592
## sigma_ea[13]	1620
## sigma_ea[14]	1806
## sigma_ea[15]	831
## sigma_ea[16]	1741
## sigma_ea[17]	1449
## sigma_ea[18]	913
## sigma_ea[19]	575
## sigma_ea[20]	2901
## sigma_ea[21]	5947
## sigma_ea[22]	1657
## sigma_ea[23]	1900
## sigma_ea[24]	2396
## sigma_ea[25]	2878
## sigma_ea[26]	2839
## sigma_ea[27]	840
## sigma_ea[28]	4820
## sigma_ea[29]	2431
## sigma_ea[30]	102000
## sigma_ea[31]	2721
## sigma_ea[32]	4412
## sigma_ea[33]	18675
## sigma_ea[34]	2110
## sigma_ea[35]	4768
## sigma_ea[36]	5731
## sigma_ea[37]	2300
## sigma_ea[38]	2737
## sigma_ea[39]	806
## sigma_ea[40]	4080
## sigma_ea[41]	2065
## sigma_ea[42]	26152
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## sigma_ea[44]	3686
## sigma_ea[45]	6518
## sigma_ea[46]	1914
## sigma_ea[47]	2450
## sigma_ea[48]	2874
## sigma_ea[49]	31532
## sigma_ea[50]	3194
## sigma_ea[51]	678
## sigma_ea[52]	6491
## sigma_ea[53]	11591
## sigma_ea[54]	11077
## sigma_ea[55]	2339
## sigma_ea[56]	7367

## sigma_ea[57]	24030
## sigma_ea[58]	3224
## sigma_ea[59]	5845
## sigma_ea[60]	5005
## sigma_ea[61]	816
## sigma_ea[62]	879
## sigma_ea[63]	1029
## sigma_ea[64]	820
## sigma_ea[65]	763
## sigma_ea[66]	956
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## sigma_ea[68]	889
## sigma_ea[69]	5707
## sigma_ea[70]	1099
## sigma_ea[71]	2264
## sigma_ea[72]	3358
## sigma_ea[73]	19419
## sigma_ea[74]	4450
## sigma_ea[75]	683
## sigma_ea[76]	4401
## sigma_ea[77]	6653
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## sigma_ea[81]	10474
## sigma_ea[82]	1976
## sigma_ea[83]	5841
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## sigma_ea[85]	1092
## sigma_ea[86]	1034
## sigma_ea[87]	1161
## sigma_ea[88]	740
## sigma_ea[89]	1017
## sigma_ea[90]	914
## sigma_ea[91]	427
## sigma_ea[92]	796
## sigma_ea[93]	8665
## sigma_ea[94]	1014
## sigma_ea[95]	5033
## sigma_ea[96]	5264
## sigma_ea[97]	412
## sigma_ea[98]	4776
## sigma_ea[99]	527
## sigma_ea[100]	1352
## sigma_ea[101]	569
## sigma_ea[102]	1564
## sigma_ea[103]	877
## sigma_ea[104]	2966
## sigma_ea[105]	1209
## sigma_ea[106]	2114
## sigma_ea[107]	948
## sigma_ea[108]	1159
## sigma_ea[109]	1229
## sigma_ea[110]	8984



## sigma_ea[111]	803
## sigma_ea[112]	2235
## sigma_ea[113]	1235
## sigma_ea[114]	1653
## sigma_ea[115]	1297
## sigma_ea[116]	8586
## sigma_ea[117]	4424
## sigma_ea[118]	2195
## sigma_ea[119]	2466
## sigma_ea[120]	2981
## sigma_ea[121]	643
## sigma_ea[122]	75425
## sigma_ea[123]	439
## sigma_ea[124]	2107
## sigma_ea[125]	721
## sigma_ea[126]	944
## sigma_ea[127]	1756
## sigma_ea[128]	5423
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## sigma_ea[130]	786
## sigma_ea[131]	547
## sigma_ea[132]	635
## sigma_ea[133]	2100
## sigma_ea[134]	16984
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## sigma_ea[137]	1130
## sigma_ea[138]	1743
## sigma_ea[139]	2732
## sigma_ea[140]	4599
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## sigma_ea[142]	1291
## sigma_ea[143]	492
## sigma_ea[144]	578
## sigma_ea[145]	3840
## sigma_ea[146]	1747
## sigma_ea[147]	641
## sigma_ea[148]	4234
## sigma_ea[149]	4465
## sigma_ea[150]	5016
## sigma_ea[151]	27541
## sigma_ea[152]	1200
## sigma_ea[153]	50653
## sigma_ea[154]	1814
## sigma_ea[155]	10311
## sigma_ea[156]	6527
## sigma_ea[157]	1540
## sigma_ea[158]	24743
## sigma_ea[159]	659
## sigma_ea[160]	1472
## sigma_ea[161]	1177
## sigma_ea[162]	70034
## sigma_ea[163]	814
## sigma_ea[164]	2113

## sigma_ea[165]	11751
## sigma_ea[166]	2236
## sigma_ea[167]	4088
## sigma_ea[168]	3687
## sigma_ea[169]	2594
## sigma_ea[170]	1694
## sigma_ea[171]	2129
## sigma_ea[172]	1083
## sigma_ea[173]	2240
## sigma_ea[174]	1066
## sigma_ea[175]	618
## sigma_ea[176]	1516
## sigma_ea[177]	372
## sigma_ea[178]	919
## sigma_ea[179]	430
## sigma_ea[180]	440
## sigma_ea[181]	4891
## sigma_ea[182]	23003
## sigma_ea[183]	938
## sigma_ea[184]	4343
## sigma_ea[185]	3608
## sigma_ea[186]	6025
## sigma_ea[187]	2818
## sigma_ea[188]	59897
## sigma_ea[189]	2076
## sigma_ea[190]	4686
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## sigma_ea[192]	3053
## sigma_ea[193]	2740
## sigma_ea[194]	1210
## sigma_ea[195]	1618
## sigma_ea[196]	864
## sigma_ea[197]	2253
## sigma_ea[198]	970
## sigma_ea[199]	511
## sigma_ea[200]	1036
## sigma_ea[201]	501
## sigma_ea[202]	867
## sigma_ea[203]	595
## sigma_ea[204]	607
## sigma_ea[205]	3404
## sigma_ea[206]	1114
## sigma_ea[207]	1151
## sigma_ea[208]	848
## sigma_ea[209]	2616
## sigma_ea[210]	873
## sigma_ea[211]	516
## sigma_ea[212]	1026
## sigma_ea[213]	2807
## sigma_ea[214]	814
## sigma_ea[215]	4003
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## sigma_ea[217]	2932
## sigma_ea[218]	13578

## sigma_ea[219]	7765
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## sigma_ea[221]	2838
## sigma_ea[222]	1718
## sigma_ea[223]	1545
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## sigma_ea[225]	739
## sigma_ea[226]	1670
## sigma_ea[227]	753
## sigma_ea[228]	811
## sigma_ea[229]	4653
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## sigma_ea[231]	658
## sigma_ea[232]	1935
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## sigma_ea[235]	1162
## sigma_ea[236]	3579
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## sigma_ea[238]	4859
## sigma_ea[239]	1977
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## sigma_ea[241]	7972
## sigma_ea[242]	4720
## sigma_ea[243]	21436
## sigma_ea[244]	2882
## sigma_ea[245]	5425
## sigma_ea[246]	7279
## sigma_ea[247]	1476
## sigma_ea[248]	9721
## sigma_ea[249]	732
## sigma_ea[250]	5072
## sigma_ea[251]	715
## sigma_ea[252]	743
## sigma_ea[253]	633
## sigma_ea[254]	1309
## sigma_ea[255]	214
## sigma_ea[256]	689
## sigma_ea[257]	2078
## sigma_ea[258]	4601
## sigma_ea[259]	525
## sigma_ea[260]	908
## sigma_ea[261]	134
## sigma_ea[262]	3809
## sigma_ea[263]	120
## sigma_ea[264]	130
## sigma_ea[265]	4649
## sigma_ea[266]	1680
## sigma_ea[267]	326
## sigma_ea[268]	1065
## sigma_ea[269]	2458
## sigma_ea[270]	9924
## sigma_ea[271]	666
## sigma_ea[272]	1688

## sigma_ea[273]	284
## sigma_ea[274]	5780
## sigma_ea[275]	237
## sigma_ea[276]	273
## sigma_ea[277]	3180
## sigma_ea[278]	1884
## sigma_ea[279]	625
## sigma_ea[280]	1066
## sigma_ea[281]	1020
## sigma_ea[282]	3699
## sigma_ea[283]	706
## sigma_ea[284]	1789
## sigma_ea[285]	1044
## sigma_ea[286]	2838
## sigma_ea[287]	933
## sigma_ea[288]	1061
## sigma_ea[289]	1647
## sigma_ea[290]	4123
## sigma_ea[291]	1271
## sigma_ea[292]	1575
## sigma_ea[293]	969
## sigma_ea[294]	974
## sigma_ea[295]	760
## sigma_ea[296]	4291
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## sigma_ea[298]	684
## sigma_ea[299]	4226
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## sigma_ea[302]	11367
## sigma_ea[303]	866
## sigma_ea[304]	3193
## sigma_ea[305]	1527
## sigma_ea[306]	1544
## sigma_ea[307]	1864
## sigma_ea[308]	19829
## sigma_ea[309]	3636
## sigma_ea[310]	1625
## sigma_ea[311]	3322
## sigma_ea[312]	4192
## sigma_ea[313]	2820
## sigma_ea[314]	2361
## sigma_ea[315]	231
## sigma_ea[316]	1043
## sigma_ea[317]	5753
## sigma_ea[318]	1817
## sigma_ea[319]	738
## sigma_ea[320]	1644
## sigma_ea[321]	192
## sigma_ea[322]	1717
## sigma_ea[323]	158
## sigma_ea[324]	182
## sigma_ea[325]	2464
## sigma_ea[326]	1555

```

## sigma_ea[327]      243
## sigma_ea[328]      894
## sigma_ea[329]     2401
## sigma_ea[330]     4892
## sigma_ea[331]      603
## sigma_ea[332]     1283
## sigma_ea[333]      198
## sigma_ea[334]     4066
## sigma_ea[335]      162
## sigma_ea[336]      187
## sigma_spline1[1]   519
## sigma_spline1[2]   1602
## sigma_spline1[3]   7203
## sigma_spline1[4]    148
## sigma_spline2[1]   3392
## sigma_spline2[2]  10285
## sigma_spline2[3]    227
## sigma_spline2[4]    838
## alfa_sd            1191
## beta_sd            1154
## P.resid[1]         23246
## P.resid[2]         14658
## P.resid[3]         12591
## P.resid[4]        102000
## P.resid[5]         76668
## P.resid[6]         88704
## P.resid[7]        102000
## P.resid[8]         24521
## P.resid[9]        102000
## P.resid[10]       102000
## P.resid[11]       102000
## P.resid[12]       102000
## P.resid[13]        44891
## P.resid[14]        52840
## P.resid[15]        20739
## P.resid[16]       102000
## P.resid[17]       88979
## P.resid[18]       97678
## P.resid[19]       19620
## P.resid[20]       46589
## P.resid[21]       102000
## P.resid[22]       27717
## P.resid[23]       25048
## P.resid[24]       102000
## P.resid[25]       102000
## P.resid[26]       50419
## P.resid[27]       102000
## P.resid[28]       102000
## P.resid[29]       102000
## P.resid[30]       102000
## P.resid[31]       102000
## P.resid[32]       102000
## P.resid[33]       102000
## P.resid[34]       102000

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## P.resid[35]	81793
## P.resid[36]	72269
## P.resid[37]	70100
## P.resid[38]	102000
## P.resid[39]	27085
## P.resid[40]	19269
## P.resid[41]	102000
## P.resid[42]	102000
## P.resid[43]	71585
## P.resid[44]	40722
## P.resid[45]	47453
## P.resid[46]	19598
## P.resid[47]	24604
## P.resid[48]	102000
## P.resid[49]	15389
## P.resid[50]	83495
## P.resid[51]	12992
## P.resid[52]	60982
## P.resid[53]	102000
## P.resid[54]	66801
## P.resid[55]	102000
## P.resid[56]	19963
## P.resid[57]	102000
## P.resid[58]	102000
## P.resid[59]	28769
## P.resid[60]	102000
## P.resid[61]	47880
## P.resid[62]	102000
## P.resid[63]	25531
## P.resid[64]	32133
## P.resid[65]	102000
## P.resid[66]	102000
## P.resid[67]	13320
## P.resid[68]	102000
## P.resid[69]	102000
## P.resid[70]	53150
## P.resid[71]	31985
## P.resid[72]	102000
## P.resid[73]	102000
## P.resid[74]	51230
## P.resid[75]	14827
## P.resid[76]	102000
## P.resid[77]	102000
## P.resid[78]	61029
## P.resid[79]	17861
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## P.resid[81]	102000
## P.resid[82]	20544
## P.resid[83]	42795
## P.resid[84]	45517
## P.resid[85]	102000
## P.resid[86]	102000
## P.resid[87]	24668
## P.resid[88]	33055

## P.resid[89]	102000
## P.resid[90]	81613
## P.resid[91]	41436
## P.resid[92]	102000
## P.resid[93]	22819
## P.resid[94]	18934
## P.resid[95]	102000
## P.resid[96]	102000
## P.resid[97]	9805
## P.resid[98]	85505
## P.resid[99]	102000
## P.resid[100]	102000
## P.resid[101]	55543
## P.resid[102]	72898
## P.resid[103]	13085
## P.resid[104]	102000
## P.resid[105]	102000
## P.resid[106]	44941
## P.resid[107]	60168
## P.resid[108]	42783
## P.resid[109]	13768
## P.resid[110]	102000
## P.resid[111]	102000
## P.resid[112]	30951
## P.resid[113]	102000
## P.resid[114]	28755
## P.resid[115]	102000
## P.resid[116]	39993
## P.resid[117]	23449
## P.resid[118]	28296
## P.resid[119]	16585
## P.resid[120]	79107
## P.resid[121]	102000
## P.resid[122]	48983
## P.resid[123]	68517
## P.resid[124]	88615
## P.resid[125]	29291
## P.resid[126]	28633
## P.resid[127]	33886
## P.resid[128]	102000
## P.resid[129]	34064
## P.resid[130]	32971
## P.resid[131]	46379
## P.resid[132]	23596
## P.resid[133]	102000
## P.resid[134]	102000
## P.resid[135]	87370
## P.resid[136]	79516
## P.resid[137]	72807
## P.resid[138]	21798
## P.resid[139]	53744
## P.resid[140]	22433
## P.resid[141]	30135
## P.resid[142]	102000

## P.resid[143]	11869
## P.resid[144]	10835
## P.resid[145]	102000
## P.resid[146]	102000
## P.resid[147]	45512
## P.resid[148]	102000
## P.resid[149]	56928
## P.resid[150]	102000
## P.resid[151]	59753
## P.resid[152]	40255
## P.resid[153]	102000
## P.resid[154]	88001
## P.resid[155]	17001
## P.resid[156]	71429
## P.resid[157]	41942
## P.resid[158]	73227
## P.resid[159]	9737
## P.resid[160]	14849
## P.resid[161]	31994
## P.resid[162]	71776
## P.resid[163]	102000
## P.resid[164]	102000
## P.resid[165]	102000
## P.resid[166]	102000
## P.resid[167]	37598
## P.resid[168]	102000
## P.resid[169]	60879
## P.resid[170]	14680
## P.resid[171]	102000
## P.resid[172]	48941
## P.resid[173]	69816
## P.resid[174]	34994
## P.resid[175]	102000
## P.resid[176]	33793
## P.resid[177]	5376
## P.resid[178]	19560
## P.resid[179]	102000
## P.resid[180]	30620
## P.resid[181]	49668
## P.resid[182]	28321
## P.resid[183]	33164
## P.resid[184]	102000
## P.resid[185]	19250
## P.resid[186]	102000
## P.resid[187]	71551
## P.resid[188]	102000
## P.resid[189]	45257
## P.resid[190]	102000
## P.resid[191]	102000
## P.resid[192]	102000
## P.resid[193]	102000
## P.resid[194]	21278
## P.resid[195]	98751
## P.resid[196]	102000



## P.resid[197]	102000
## P.resid[198]	102000
## P.resid[199]	102000
## P.resid[200]	34392
## P.resid[201]	14828
## P.resid[202]	52485
## P.resid[203]	102000
## P.resid[204]	102000
## P.resid[205]	91459
## P.resid[206]	36689
## P.resid[207]	102000
## P.resid[208]	29294
## P.resid[209]	102000
## P.resid[210]	102000
## P.resid[211]	84061
## P.resid[212]	27202
## P.resid[213]	102000
## P.resid[214]	38574
## P.resid[215]	102000
## P.resid[216]	102000
## P.resid[217]	102000
## P.resid[218]	97720
## P.resid[219]	102000
## P.resid[220]	102000
## P.resid[221]	102000
## P.resid[222]	33446
## P.resid[223]	102000
## P.resid[224]	56548
## P.resid[225]	15204
## P.resid[226]	9111
## P.resid[227]	102000
## P.resid[228]	28739
## P.resid[229]	39299
## P.resid[230]	102000
## P.resid[231]	15909
## P.resid[232]	102000
## P.resid[233]	74918
## P.resid[234]	102000
## P.resid[235]	102000
## P.resid[236]	47167
## P.resid[237]	15976
## P.resid[238]	102000
## P.resid[239]	102000
## P.resid[240]	78713
## P.resid[241]	102000
## P.resid[242]	102000
## P.resid[243]	45580
## P.resid[244]	102000
## P.resid[245]	102000
## P.resid[246]	63840
## P.resid[247]	102000
## P.resid[248]	81832
## P.resid[249]	9098
## P.resid[250]	102000

## P.resid[251]	102000
## P.resid[252]	92749
## P.resid[253]	51594
## P.resid[254]	55133
## P.resid[255]	72863
## P.resid[256]	53073
## P.resid[257]	102000
## P.resid[258]	102000
## P.resid[259]	24821
## P.resid[260]	15928
## P.resid[261]	8006
## P.resid[262]	18416
## P.resid[263]	9365
## P.resid[264]	5806
## P.resid[265]	63662
## P.resid[266]	102000
## P.resid[267]	26499
## P.resid[268]	102000
## P.resid[269]	102000
## P.resid[270]	102000
## P.resid[271]	77271
## P.resid[272]	102000
## P.resid[273]	22848
## P.resid[274]	39756
## P.resid[275]	29868
## P.resid[276]	40104
## P.resid[277]	36194
## P.resid[278]	90429
## P.resid[279]	13971
## P.resid[280]	102000
## P.resid[281]	102000
## P.resid[282]	102000
## P.resid[283]	45095
## P.resid[284]	102000
## P.resid[285]	76473
## P.resid[286]	46968
## P.resid[287]	61183
## P.resid[288]	101516
## P.resid[289]	102000
## P.resid[290]	63955
## P.resid[291]	102000
## P.resid[292]	102000
## P.resid[293]	102000
## P.resid[294]	68614
## P.resid[295]	102000
## P.resid[296]	102000
## P.resid[297]	69984
## P.resid[298]	4835
## P.resid[299]	74752
## P.resid[300]	57764
## P.resid[301]	84505
## P.resid[302]	102000
## P.resid[303]	102000
## P.resid[304]	102000

```

## P.resid[305]      102000
## P.resid[306]      29073
## P.resid[307]      30291
## P.resid[308]      44670
## P.resid[309]      102000
## P.resid[310]       4871
## P.resid[311]      67067
## P.resid[312]      102000
## P.resid[313]      102000
## P.resid[314]      72445
## P.resid[315]      35096
## P.resid[316]      102000
## P.resid[317]      60891
## P.resid[318]      32137
## P.resid[319]      90139
## P.resid[320]      43031
## P.resid[321]      38112
## P.resid[322]       7807
## P.resid[323]      1890
## P.resid[324]      9444
## P.resid[325]      98517
## P.resid[326]      24307
## P.resid[327]      102000
## P.resid[328]      102000
## P.resid[329]      102000
## P.resid[330]      102000
## P.resid[331]      22281
## P.resid[332]      56839
## P.resid[333]      11989
## P.resid[334]      20522
## P.resid[335]      27564
## P.resid[336]      18081
## resid2[1]         100644
## resid2[2]          54983
## resid2[3]          27711
## resid2[4]          67192
## resid2[5]         102000
## resid2[6]          83369
## resid2[7]         102000
## resid2[8]          80768
## resid2[9]          59230
## resid2[10]        102000
## resid2[11]        102000
## resid2[12]        102000
## resid2[13]        102000
## resid2[14]         47177
## resid2[15]         60770
## resid2[16]        102000
## resid2[17]        102000
## resid2[18]         48378
## resid2[19]        102000
## resid2[20]         68363
## resid2[21]        102000
## resid2[22]         16316

```

## resid2[23]	102000
## resid2[24]	102000
## resid2[25]	102000
## resid2[26]	81753
## resid2[27]	102000
## resid2[28]	79743
## resid2[29]	99838
## resid2[30]	102000
## resid2[31]	102000
## resid2[32]	66904
## resid2[33]	80969
## resid2[34]	17917
## resid2[35]	74403
## resid2[36]	85270
## resid2[37]	81983
## resid2[38]	102000
## resid2[39]	57857
## resid2[40]	28431
## resid2[41]	102000
## resid2[42]	102000
## resid2[43]	63940
## resid2[44]	101350
## resid2[45]	102000
## resid2[46]	102000
## resid2[47]	102000
## resid2[48]	82641
## resid2[49]	102000
## resid2[50]	102000
## resid2[51]	26114
## resid2[52]	82886
## resid2[53]	71641
## resid2[54]	30687
## resid2[55]	102000
## resid2[56]	21155
## resid2[57]	89322
## resid2[58]	40206
## resid2[59]	90029
## resid2[60]	24608
## resid2[61]	39022
## resid2[62]	102000
## resid2[63]	75075
## resid2[64]	64022
## resid2[65]	20240
## resid2[66]	102000
## resid2[67]	22494
## resid2[68]	102000
## resid2[69]	54916
## resid2[70]	102000
## resid2[71]	40977
## resid2[72]	102000
## resid2[73]	102000
## resid2[74]	89882
## resid2[75]	45146
## resid2[76]	102000

## resid2[77]	62235
## resid2[78]	41023
## resid2[79]	96852
## resid2[80]	102000
## resid2[81]	102000
## resid2[82]	40476
## resid2[83]	102000
## resid2[84]	102000
## resid2[85]	98664
## resid2[86]	102000
## resid2[87]	17664
## resid2[88]	39849
## resid2[89]	63655
## resid2[90]	102000
## resid2[91]	102000
## resid2[92]	102000
## resid2[93]	33403
## resid2[94]	68469
## resid2[95]	102000
## resid2[96]	102000
## resid2[97]	15431
## resid2[98]	29394
## resid2[99]	96094
## resid2[100]	102000
## resid2[101]	77092
## resid2[102]	102000
## resid2[103]	102000
## resid2[104]	51994
## resid2[105]	102000
## resid2[106]	83510
## resid2[107]	54102
## resid2[108]	102000
## resid2[109]	35493
## resid2[110]	102000
## resid2[111]	102000
## resid2[112]	59735
## resid2[113]	102000
## resid2[114]	51516
## resid2[115]	93251
## resid2[116]	64459
## resid2[117]	33344
## resid2[118]	102000
## resid2[119]	13757
## resid2[120]	102000
## resid2[121]	102000
## resid2[122]	54600
## resid2[123]	102000
## resid2[124]	102000
## resid2[125]	102000
## resid2[126]	102000
## resid2[127]	46734
## resid2[128]	81850
## resid2[129]	102000
## resid2[130]	102000

## resid2[131]	102000
## resid2[132]	59993
## resid2[133]	102000
## resid2[134]	84729
## resid2[135]	102000
## resid2[136]	84687
## resid2[137]	30936
## resid2[138]	20578
## resid2[139]	102000
## resid2[140]	98648
## resid2[141]	91169
## resid2[142]	45652
## resid2[143]	102000
## resid2[144]	23939
## resid2[145]	36561
## resid2[146]	102000
## resid2[147]	46654
## resid2[148]	102000
## resid2[149]	102000
## resid2[150]	102000
## resid2[151]	100673
## resid2[152]	102000
## resid2[153]	97954
## resid2[154]	32105
## resid2[155]	102000
## resid2[156]	52834
## resid2[157]	15756
## resid2[158]	102000
## resid2[159]	21696
## resid2[160]	28520
## resid2[161]	102000
## resid2[162]	76304
## resid2[163]	102000
## resid2[164]	102000
## resid2[165]	102000
## resid2[166]	102000
## resid2[167]	102000
## resid2[168]	102000
## resid2[169]	81018
## resid2[170]	73881
## resid2[171]	102000
## resid2[172]	102000
## resid2[173]	53725
## resid2[174]	102000
## resid2[175]	102000
## resid2[176]	57569
## resid2[177]	8652
## resid2[178]	25032
## resid2[179]	102000
## resid2[180]	102000
## resid2[181]	102000
## resid2[182]	52233
## resid2[183]	48155
## resid2[184]	102000

## resid2[185]	98177
## resid2[186]	76228
## resid2[187]	100122
## resid2[188]	102000
## resid2[189]	43633
## resid2[190]	76820
## resid2[191]	102000
## resid2[192]	24456
## resid2[193]	63904
## resid2[194]	102000
## resid2[195]	62061
## resid2[196]	102000
## resid2[197]	59634
## resid2[198]	102000
## resid2[199]	102000
## resid2[200]	102000
## resid2[201]	12069
## resid2[202]	102000
## resid2[203]	102000
## resid2[204]	102000
## resid2[205]	57177
## resid2[206]	102000
## resid2[207]	102000
## resid2[208]	40476
## resid2[209]	102000
## resid2[210]	102000
## resid2[211]	54833
## resid2[212]	76456
## resid2[213]	37500
## resid2[214]	102000
## resid2[215]	102000
## resid2[216]	102000
## resid2[217]	102000
## resid2[218]	92201
## resid2[219]	102000
## resid2[220]	102000
## resid2[221]	102000
## resid2[222]	102000
## resid2[223]	102000
## resid2[224]	47126
## resid2[225]	31771
## resid2[226]	23777
## resid2[227]	74703
## resid2[228]	102000
## resid2[229]	102000
## resid2[230]	46455
## resid2[231]	102000
## resid2[232]	102000
## resid2[233]	96468
## resid2[234]	102000
## resid2[235]	57034
## resid2[236]	102000
## resid2[237]	53777
## resid2[238]	102000

## resid2[239]	102000
## resid2[240]	102000
## resid2[241]	102000
## resid2[242]	102000
## resid2[243]	35055
## resid2[244]	102000
## resid2[245]	102000
## resid2[246]	102000
## resid2[247]	102000
## resid2[248]	102000
## resid2[249]	30609
## resid2[250]	102000
## resid2[251]	55989
## resid2[252]	68731
## resid2[253]	102000
## resid2[254]	43355
## resid2[255]	76463
## resid2[256]	90480
## resid2[257]	102000
## resid2[258]	63335
## resid2[259]	63026
## resid2[260]	60225
## resid2[261]	40245
## resid2[262]	102000
## resid2[263]	16282
## resid2[264]	12223
## resid2[265]	102000
## resid2[266]	102000
## resid2[267]	52819
## resid2[268]	49003
## resid2[269]	75124
## resid2[270]	41789
## resid2[271]	102000
## resid2[272]	102000
## resid2[273]	35143
## resid2[274]	91424
## resid2[275]	102000
## resid2[276]	91946
## resid2[277]	57839
## resid2[278]	102000
## resid2[279]	102000
## resid2[280]	53826
## resid2[281]	59476
## resid2[282]	102000
## resid2[283]	102000
## resid2[284]	41191
## resid2[285]	80368
## resid2[286]	21471
## resid2[287]	102000
## resid2[288]	36980
## resid2[289]	43490
## resid2[290]	43546
## resid2[291]	102000
## resid2[292]	66191



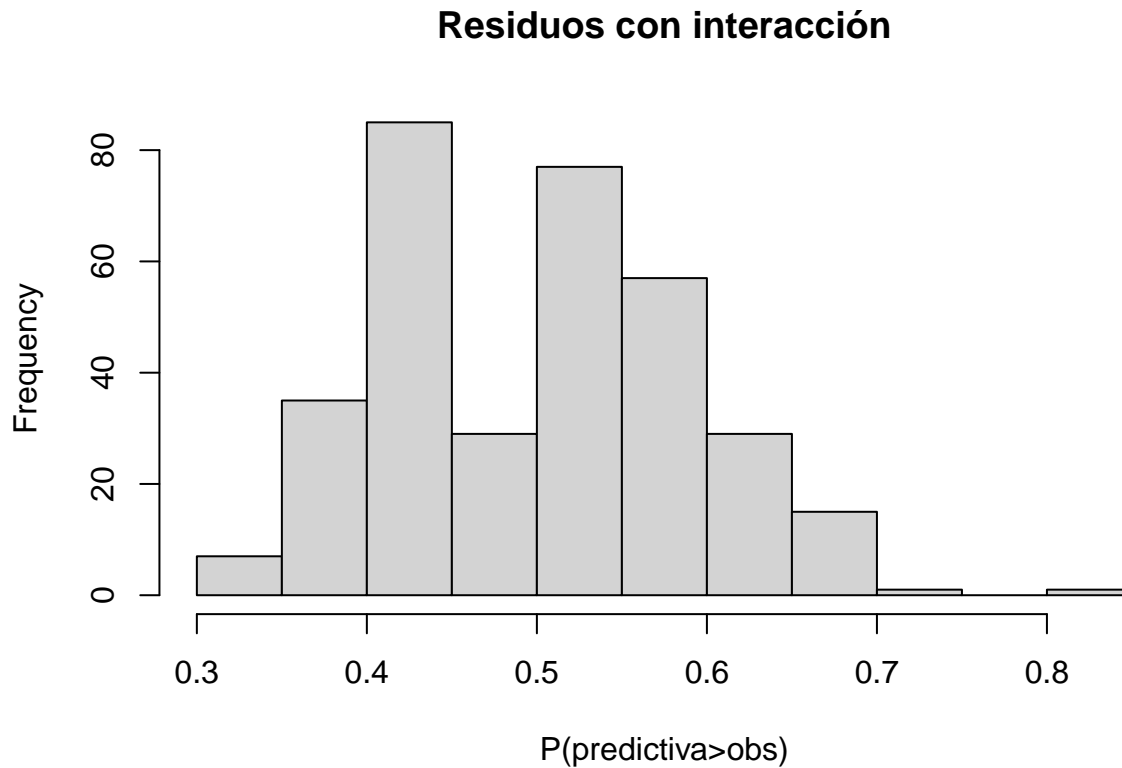
```

## resid2[293]      102000
## resid2[294]      42515
## resid2[295]      63632
## resid2[296]      102000
## resid2[297]      102000
## resid2[298]       6932
## resid2[299]      41374
## resid2[300]      102000
## resid2[301]      102000
## resid2[302]      32239
## resid2[303]      102000
## resid2[304]      69538
## resid2[305]      50211
## resid2[306]      32753
## resid2[307]      40816
## resid2[308]      38848
## resid2[309]      80415
## resid2[310]       9843
## resid2[311]      102000
## resid2[312]      60470
## resid2[313]      87624
## resid2[314]      102000
## resid2[315]      98012
## resid2[316]      102000
## resid2[317]      102000
## resid2[318]      81927
## resid2[319]      102000
## resid2[320]      102000
## resid2[321]      102000
## resid2[322]      30125
## resid2[323]       4493
## resid2[324]      12393
## resid2[325]      102000
## resid2[326]      102000
## resid2[327]      102000
## resid2[328]      102000
## resid2[329]      102000
## resid2[330]      102000
## resid2[331]      102000
## resid2[332]      59330
## resid2[333]      102000
## resid2[334]      102000
## resid2[335]      102000
## resid2[336]      58930
## deviance         4988
##
## Successful convergence based on Rhat values (all < 1.1).
## Rhat is the potential scale reduction factor (at convergence, Rhat=1).
## For each parameter, n.eff is a crude measure of effective sample size.
##
## overlap0 checks if 0 falls in the parameter's 95% credible interval.
## f is the proportion of the posterior with the same sign as the mean;
## i.e., our confidence that the parameter is positive or negative.
##

```

```
## DIC info: (pD = var(deviance)/2)
## pD = 238.3 and DIC = 1187.052
## DIC is an estimate of expected predictive error (lower is better).
```

```
hist(model_splines_specieb$mean$P.resid, xlab = "P(predictiva>obs)", main = "Residuos con interacción")
```



```
rsme<-sqrt(mean(model_splines_specieb$mean$resid2))
```

## GLM

$$Abundance \sim \text{Pois}(\mu)$$

$$\log(\mu) = \text{P.lineal} + ea$$

$$\text{P.lineal} = \beta_o + \beta_1 * \text{appearance} + \beta_2 * \text{length} + \beta_{PC1} * \text{PC1} + \beta_{PC2} * \text{PC2} + \text{Sitio}$$

$$\text{Var}(ea) = \beta_{0,ea} + \beta_{1,ea} * \text{P.lineal}$$

El modelo asumido es:

$$\text{Abundance}_i \sim \text{Poisson}(\mu_i)$$

$$\log(\mu_i) = \eta_i + \varepsilon_i$$

$$\eta_i = \beta_0 + \beta_1[\text{appearance}_i] + \beta_2 \cdot \text{length}_i + \beta_3 \cdot \text{PC1}_i + \beta_4 \cdot \text{PC2}_i + u_{\text{Site}[i]}$$

```
#Modelo
cat(file = "Modelo", "model {

#Capa verosimilitud
  for (i in 1:N) {
    Abundance[i] ~ dpois(mu[i])
    log(mu[i]) <- eta[i] + ea[i]
    eta[i] <- beta0 +
      beta1[appearance[i]] +
      beta2 * length[i] +
      beta_PC1 * PC1[i] +
      beta_PC2 * PC2[i] +
      site_effect[Site[i]]
  }

#Distribuciones previas
  beta0 ~ dnorm(0, 0.001)
  beta2 ~ dnorm(0, 0.001)
  beta_PC1 ~ dnorm(0, 0.001)
  beta_PC2 ~ dnorm(0, 0.001)

#Restricción de efecto fijo appearance
  for (i in 1:3) {
    beta1[i] ~ dnorm(0, 0.001)
  }
  beta1[4] <- -sum(beta1[1:3])

#Efecto aleatorio de sitio
  for (i in 1:n_site) {
    site_effect[i] ~ dnorm(0, tau_site)
  }
  tau_site <- pow(sigma_site, -2)
  sigma_site ~ dunif(0, 100) #Si lo quiero meter como spline necesito poner su base y penalización

#Parámetro de dispersión: lineal con predictor lineal
  for (i in 1:N){
    ea[i] ~ dnorm(0, tau_ea[i])
    tau_ea[i] <- pow(sigma_ea[i], -2)
    sigma_ea[i] <- max(alfa_sd + beta_sd * eta[i], 0.001)
  }
  alfa_sd ~ dnorm(0, 0.001)
  beta_sd ~ dnorm(0, 0.001)
}")

# Datos
#Cambiamos factores por numeric
Spider$appearance_num <- as.numeric(Spider$appearance)
```

```

#Creamos vector de datos
datos <- list(
  Abundance = Spider$Abundance,
  appearance = Spider$appearance_num,
  length = Spider$length,
  PC1 = Spider$PC1,
  PC2 = Spider$PC2,
  Site = as.numeric(as.factor(Spider$Site)),
  N = nrow(Spider),
  n_site = length(unique(Spider$Site)),
  n_specie = length(unique(Spider$Specie))
)

#Iniciales
inits <- function() {
  list(
    beta0 = rnorm(1),
    beta1 = c(rnorm(1), rnorm(1), rnorm(1), NA),
    beta2 = rnorm(1),
    beta_PC1 = rnorm(1),
    beta_PC2 = rnorm(1),
    sigma_site = runif(1, 0, 10),
    alfa_sd= rnorm(1),
    beta_sd = rnorm(1),
    site_effect = rnorm(datos$n_site, 0, 1),
    ea = rnorm(datos$N, 0, 1)
  )
}

#Parámetros
params <- c("beta0", "beta1", "beta2", "beta_PC1", "beta_PC2", "sigma_site", "sigma_ea", "alfa_sd", "be

#Corremos modelo
model_fit2 <- jags(
  data = datos,
  inits = inits,
  parameters.to.save = params,
  model.file = "Modelo",
  n.chains = 3,
  n.iter = 100000,
  n.burnin = 20000,
  n.thin = 5,
  parallel = TRUE
)

model_fit2$Rhat
model_fit2$DIC
model_fit2
#save(model_fit2, file = "modelo_glm2.RData")

load("modelo_glm2.RData")
model_fit2

```

```

## JAGS output for model 'Modelo', generated by jagsUI.
## Estimates based on 3 chains of 1e+05 iterations,
## adaptation = 100 iterations (sufficient),
## burn-in = 20000 iterations and thin rate = 5,
## yielding 48000 total samples from the joint posterior.
## MCMC ran in parallel for 4.789 minutes at time 2025-06-10 11:39:54.62428.
##
##          mean      sd    2.5%    50%    97.5% overlap0      f  Rhat
## beta0      2.161  0.740   0.646   2.159   3.675    FALSE 0.997 1.067
## beta1[1]    0.340  0.373  -0.441   0.352   1.051     TRUE 0.827 1.020
## beta1[2]    0.018  0.273  -0.501   0.020   0.552     TRUE 0.530 1.014
## beta1[3]   -1.409  0.528  -2.503  -1.362  -0.460    FALSE 0.999 1.002
## beta1[4]    1.050  0.257   0.537   1.052   1.551    FALSE 1.000 1.005
## beta2     -1.618  0.420  -2.484  -1.615  -0.781    FALSE 1.000 1.074
## beta_PC1    0.086  0.152  -0.213   0.085   0.393     TRUE 0.717 1.001
## beta_PC2    1.468  0.212   1.038   1.475   1.858    FALSE 1.000 1.013
## sigma_site  0.436  0.277   0.026   0.408   1.040    FALSE 1.000 1.004
## sigma_ea[1] 3.117  0.430   2.377   3.080   4.064    FALSE 1.000 1.005
## sigma_ea[2] 2.343  0.244   1.887   2.332   2.855    FALSE 1.000 1.001
## sigma_ea[3] 2.240  0.259   1.771   2.226   2.793    FALSE 1.000 1.015
## sigma_ea[4] 2.547  0.270   2.054   2.534   3.121    FALSE 1.000 1.005
## sigma_ea[5] 3.000  0.419   2.284   2.963   3.921    FALSE 1.000 1.003
## sigma_ea[6] 1.843  0.271   1.334   1.832   2.407    FALSE 1.000 1.003
## sigma_ea[7] 2.100  0.234   1.654   2.093   2.585    FALSE 1.000 1.005
## sigma_ea[8] 2.054  0.235   1.605   2.046   2.539    FALSE 1.000 1.007
## sigma_ea[9] 1.671  0.224   1.240   1.665   2.132    FALSE 1.000 1.002
## sigma_ea[10] 1.909  0.270   1.402   1.898   2.473    FALSE 1.000 1.004
## sigma_ea[11] 2.013  0.230   1.585   2.005   2.495    FALSE 1.000 1.005
## sigma_ea[12] 1.603  0.229   1.163   1.597   2.073    FALSE 1.000 1.004
## sigma_ea[13] 2.889  0.388   2.238   2.850   3.753    FALSE 1.000 1.011
## sigma_ea[14] 2.114  0.219   1.728   2.099   2.589    FALSE 1.000 1.004
## sigma_ea[15] 2.011  0.247   1.577   1.993   2.547    FALSE 1.000 1.032
## sigma_ea[16] 2.319  0.240   1.898   2.302   2.840    FALSE 1.000 1.013
## sigma_ea[17] 2.772  0.378   2.141   2.733   3.612    FALSE 1.000 1.007
## sigma_ea[18] 1.615  0.280   1.110   1.598   2.202    FALSE 1.000 1.008
## sigma_ea[19] 1.871  0.218   1.480   1.858   2.337    FALSE 1.000 1.001
## sigma_ea[20] 1.825  0.221   1.426   1.813   2.297    FALSE 1.000 1.001
## sigma_ea[21] 1.442  0.232   1.035   1.426   1.945    FALSE 1.000 1.001
## sigma_ea[22] 1.681  0.277   1.184   1.663   2.266    FALSE 1.000 1.011
## sigma_ea[23] 1.785  0.224   1.392   1.768   2.275    FALSE 1.000 1.015
## sigma_ea[24] 1.375  0.239   0.951   1.359   1.888    FALSE 1.000 1.001
## sigma_ea[25] 2.899  0.403   2.212   2.863   3.778    FALSE 1.000 1.006
## sigma_ea[26] 2.125  0.224   1.705   2.118   2.590    FALSE 1.000 1.001
## sigma_ea[27] 2.022  0.240   1.577   2.010   2.527    FALSE 1.000 1.019
## sigma_ea[28] 2.330  0.249   1.869   2.318   2.854    FALSE 1.000 1.005
## sigma_ea[29] 2.782  0.391   2.119   2.747   3.638    FALSE 1.000 1.003
## sigma_ea[30] 1.625  0.266   1.137   1.613   2.184    FALSE 1.000 1.005
## sigma_ea[31] 1.882  0.217   1.468   1.878   2.321    FALSE 1.000 1.005
## sigma_ea[32] 1.836  0.218   1.419   1.832   2.278    FALSE 1.000 1.007
## sigma_ea[33] 1.453  0.210   1.059   1.445   1.891    FALSE 1.000 1.002
## sigma_ea[34] 1.691  0.265   1.207   1.679   2.247    FALSE 1.000 1.007
## sigma_ea[35] 1.795  0.211   1.397   1.787   2.234    FALSE 1.000 1.007
## sigma_ea[36] 1.385  0.217   0.981   1.377   1.837    FALSE 1.000 1.003
## sigma_ea[37] 2.796  0.393   2.123   2.761   3.655    FALSE 1.000 1.006

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## sigma_ea[38]	2.021	0.228	1.576	2.022	2.473	FALSE	1.000	1.000
## sigma_ea[39]	1.918	0.245	1.445	1.914	2.413	FALSE	1.000	1.015
## sigma_ea[40]	2.226	0.244	1.761	2.220	2.727	FALSE	1.000	1.004
## sigma_ea[41]	2.679	0.384	2.019	2.646	3.520	FALSE	1.000	1.003
## sigma_ea[42]	1.522	0.296	0.943	1.520	2.115	FALSE	1.000	1.003
## sigma_ea[43]	1.778	0.232	1.315	1.782	2.229	FALSE	1.000	1.006
## sigma_ea[44]	1.733	0.236	1.261	1.736	2.189	FALSE	1.000	1.008
## sigma_ea[45]	1.349	0.242	0.865	1.352	1.826	FALSE	1.000	1.002
## sigma_ea[46]	1.588	0.292	1.017	1.586	2.175	FALSE	1.000	1.004
## sigma_ea[47]	1.692	0.228	1.239	1.693	2.138	FALSE	1.000	1.004
## sigma_ea[48]	1.282	0.251	0.782	1.283	1.774	FALSE	1.000	1.004
## sigma_ea[49]	2.613	0.371	2.001	2.573	3.447	FALSE	1.000	1.011
## sigma_ea[50]	1.839	0.207	1.478	1.824	2.296	FALSE	1.000	1.004
## sigma_ea[51]	1.736	0.237	1.317	1.719	2.250	FALSE	1.000	1.032
## sigma_ea[52]	2.044	0.226	1.649	2.028	2.545	FALSE	1.000	1.014
## sigma_ea[53]	2.496	0.361	1.900	2.456	3.308	FALSE	1.000	1.007
## sigma_ea[54]	1.339	0.275	0.853	1.320	1.930	FALSE	1.000	1.007
## sigma_ea[55]	1.596	0.210	1.223	1.582	2.046	FALSE	1.000	1.002
## sigma_ea[56]	1.550	0.214	1.169	1.537	2.004	FALSE	1.000	1.003
## sigma_ea[57]	1.167	0.231	0.770	1.149	1.672	FALSE	1.000	1.001
## sigma_ea[58]	1.405	0.272	0.927	1.385	1.993	FALSE	1.000	1.010
## sigma_ea[59]	1.509	0.217	1.133	1.493	1.986	FALSE	1.000	1.014
## sigma_ea[60]	1.099	0.239	0.684	1.082	1.620	FALSE	1.000	1.001
## sigma_ea[61]	3.314	0.495	2.439	3.283	4.355	FALSE	1.000	1.004
## sigma_ea[62]	2.540	0.340	1.853	2.553	3.189	FALSE	1.000	1.003
## sigma_ea[63]	2.437	0.352	1.737	2.443	3.127	FALSE	1.000	1.010
## sigma_ea[64]	2.745	0.361	2.043	2.747	3.459	FALSE	1.000	1.004
## sigma_ea[65]	3.197	0.484	2.339	3.167	4.210	FALSE	1.000	1.002
## sigma_ea[66]	2.040	0.344	1.305	2.065	2.672	FALSE	1.000	1.007
## sigma_ea[67]	2.297	0.330	1.604	2.320	2.904	FALSE	1.000	1.007
## sigma_ea[68]	2.251	0.330	1.555	2.274	2.855	FALSE	1.000	1.009
## sigma_ea[69]	1.868	0.319	1.170	1.903	2.420	FALSE	1.000	1.005
## sigma_ea[70]	2.106	0.344	1.374	2.130	2.741	FALSE	1.000	1.008
## sigma_ea[71]	2.210	0.328	1.526	2.230	2.818	FALSE	1.000	1.005
## sigma_ea[72]	1.800	0.322	1.093	1.836	2.357	FALSE	1.000	1.007
## sigma_ea[73]	2.551	0.363	1.946	2.515	3.363	FALSE	1.000	1.006
## sigma_ea[74]	1.777	0.206	1.406	1.767	2.217	FALSE	1.000	1.001
## sigma_ea[75]	1.674	0.223	1.273	1.663	2.141	FALSE	1.000	1.019
## sigma_ea[76]	1.982	0.221	1.582	1.971	2.450	FALSE	1.000	1.005
## sigma_ea[77]	2.434	0.355	1.840	2.399	3.225	FALSE	1.000	1.003
## sigma_ea[78]	1.277	0.276	0.788	1.257	1.863	FALSE	1.000	1.002
## sigma_ea[79]	1.534	0.214	1.146	1.523	1.989	FALSE	1.000	1.007
## sigma_ea[80]	1.488	0.219	1.091	1.477	1.951	FALSE	1.000	1.010
## sigma_ea[81]	1.105	0.227	0.713	1.088	1.597	FALSE	1.000	1.003
## sigma_ea[82]	1.344	0.271	0.863	1.324	1.921	FALSE	1.000	1.003
## sigma_ea[83]	1.447	0.207	1.082	1.434	1.887	FALSE	1.000	1.006
## sigma_ea[84]	1.037	0.237	0.627	1.021	1.550	FALSE	1.000	1.004
## sigma_ea[85]	3.587	0.496	2.716	3.553	4.649	FALSE	1.000	1.003
## sigma_ea[86]	2.812	0.319	2.209	2.805	3.461	FALSE	1.000	1.001
## sigma_ea[87]	2.709	0.331	2.107	2.695	3.402	FALSE	1.000	1.009
## sigma_ea[88]	3.017	0.347	2.375	3.005	3.740	FALSE	1.000	1.002
## sigma_ea[89]	3.470	0.483	2.623	3.437	4.507	FALSE	1.000	1.002
## sigma_ea[90]	2.313	0.300	1.714	2.312	2.909	FALSE	1.000	1.005
## sigma_ea[91]	2.570	0.301	1.983	2.566	3.170	FALSE	1.000	1.005

## sigma_ea[92]	2.524	0.299	1.936	2.521	3.118	FALSE	1.000	1.006
## sigma_ea[93]	2.141	0.277	1.581	2.146	2.678	FALSE	1.000	1.002
## sigma_ea[94]	2.379	0.303	1.780	2.378	2.983	FALSE	1.000	1.006
## sigma_ea[95]	2.483	0.298	1.917	2.477	3.087	FALSE	1.000	1.003
## sigma_ea[96]	2.073	0.278	1.507	2.080	2.610	FALSE	1.000	1.004
## sigma_ea[97]	3.831	0.518	2.928	3.794	4.960	FALSE	1.000	1.003
## sigma_ea[98]	3.057	0.326	2.487	3.033	3.769	FALSE	1.000	1.001
## sigma_ea[99]	2.954	0.338	2.372	2.925	3.699	FALSE	1.000	1.008
## sigma_ea[100]	3.262	0.358	2.631	3.237	4.035	FALSE	1.000	1.002
## sigma_ea[101]	3.714	0.503	2.841	3.675	4.818	FALSE	1.000	1.001
## sigma_ea[102]	2.557	0.293	2.044	2.535	3.194	FALSE	1.000	1.003
## sigma_ea[103]	2.814	0.301	2.290	2.790	3.478	FALSE	1.000	1.004
## sigma_ea[104]	2.768	0.299	2.248	2.744	3.427	FALSE	1.000	1.005
## sigma_ea[105]	2.385	0.270	1.918	2.361	2.989	FALSE	1.000	1.002
## sigma_ea[106]	2.623	0.297	2.103	2.601	3.272	FALSE	1.000	1.003
## sigma_ea[107]	2.727	0.300	2.214	2.702	3.400	FALSE	1.000	1.002
## sigma_ea[108]	2.317	0.268	1.849	2.294	2.912	FALSE	1.000	1.004
## sigma_ea[109]	3.976	0.539	3.032	3.939	5.143	FALSE	1.000	1.003
## sigma_ea[110]	3.202	0.352	2.597	3.173	3.976	FALSE	1.000	1.000
## sigma_ea[111]	3.099	0.364	2.481	3.064	3.909	FALSE	1.000	1.008
## sigma_ea[112]	3.407	0.385	2.737	3.378	4.247	FALSE	1.000	1.002
## sigma_ea[113]	3.859	0.523	2.948	3.822	5.000	FALSE	1.000	1.002
## sigma_ea[114]	2.702	0.310	2.179	2.674	3.395	FALSE	1.000	1.003
## sigma_ea[115]	2.959	0.325	2.408	2.929	3.685	FALSE	1.000	1.002
## sigma_ea[116]	2.913	0.322	2.370	2.883	3.631	FALSE	1.000	1.003
## sigma_ea[117]	2.530	0.291	2.047	2.499	3.196	FALSE	1.000	1.001
## sigma_ea[118]	2.769	0.315	2.235	2.740	3.471	FALSE	1.000	1.003
## sigma_ea[119]	2.872	0.325	2.326	2.839	3.606	FALSE	1.000	1.003
## sigma_ea[120]	2.462	0.288	1.983	2.431	3.122	FALSE	1.000	1.002
## sigma_ea[121]	3.686	0.502	2.813	3.648	4.780	FALSE	1.000	1.003
## sigma_ea[122]	2.912	0.307	2.377	2.888	3.578	FALSE	1.000	1.001
## sigma_ea[123]	2.809	0.321	2.256	2.782	3.514	FALSE	1.000	1.009
## sigma_ea[124]	3.117	0.340	2.523	3.090	3.847	FALSE	1.000	1.002
## sigma_ea[125]	3.569	0.488	2.726	3.531	4.635	FALSE	1.000	1.002
## sigma_ea[126]	2.412	0.285	1.913	2.391	3.034	FALSE	1.000	1.004
## sigma_ea[127]	2.669	0.283	2.171	2.648	3.287	FALSE	1.000	1.004
## sigma_ea[128]	2.623	0.281	2.126	2.602	3.235	FALSE	1.000	1.006
## sigma_ea[129]	2.240	0.253	1.793	2.220	2.796	FALSE	1.000	1.002
## sigma_ea[130]	2.478	0.288	1.971	2.456	3.106	FALSE	1.000	1.005
## sigma_ea[131]	2.582	0.282	2.094	2.559	3.205	FALSE	1.000	1.003
## sigma_ea[132]	2.172	0.253	1.722	2.153	2.725	FALSE	1.000	1.003
## sigma_ea[133]	3.526	0.488	2.687	3.484	4.599	FALSE	1.000	1.004
## sigma_ea[134]	2.752	0.300	2.240	2.725	3.424	FALSE	1.000	1.001
## sigma_ea[135]	2.649	0.314	2.123	2.617	3.356	FALSE	1.000	1.013
## sigma_ea[136]	2.957	0.332	2.390	2.929	3.690	FALSE	1.000	1.004
## sigma_ea[137]	3.409	0.474	2.599	3.367	4.452	FALSE	1.000	1.003
## sigma_ea[138]	2.252	0.287	1.754	2.230	2.885	FALSE	1.000	1.004
## sigma_ea[139]	2.509	0.279	2.033	2.482	3.142	FALSE	1.000	1.002
## sigma_ea[140]	2.463	0.277	1.988	2.437	3.090	FALSE	1.000	1.004
## sigma_ea[141]	2.080	0.252	1.656	2.054	2.650	FALSE	1.000	1.002
## sigma_ea[142]	2.318	0.290	1.818	2.296	2.961	FALSE	1.000	1.006
## sigma_ea[143]	2.422	0.277	1.965	2.393	3.054	FALSE	1.000	1.006
## sigma_ea[144]	2.012	0.253	1.583	1.987	2.577	FALSE	1.000	1.003
## sigma_ea[145]	2.571	0.366	1.957	2.535	3.380	FALSE	1.000	1.006

## sigma_ea[146]	1.797	0.212	1.392	1.793	2.226	FALSE	1.000	1.000
## sigma_ea[147]	1.694	0.230	1.259	1.689	2.162	FALSE	1.000	1.018
## sigma_ea[148]	2.002	0.225	1.576	1.995	2.463	FALSE	1.000	1.004
## sigma_ea[149]	2.454	0.358	1.848	2.419	3.245	FALSE	1.000	1.004
## sigma_ea[150]	1.297	0.287	0.775	1.283	1.896	FALSE	1.000	1.004
## sigma_ea[151]	1.554	0.222	1.130	1.550	2.006	FALSE	1.000	1.006
## sigma_ea[152]	1.508	0.227	1.074	1.504	1.970	FALSE	1.000	1.008
## sigma_ea[153]	1.125	0.239	0.690	1.114	1.632	FALSE	1.000	1.002
## sigma_ea[154]	1.364	0.282	0.850	1.350	1.950	FALSE	1.000	1.005
## sigma_ea[155]	1.467	0.216	1.059	1.461	1.911	FALSE	1.000	1.005
## sigma_ea[156]	1.057	0.248	0.605	1.045	1.585	FALSE	1.000	1.003
## sigma_ea[157]	2.742	0.383	2.103	2.703	3.589	FALSE	1.000	1.006
## sigma_ea[158]	1.968	0.212	1.585	1.956	2.420	FALSE	1.000	1.000
## sigma_ea[159]	1.865	0.230	1.446	1.853	2.354	FALSE	1.000	1.019
## sigma_ea[160]	2.173	0.229	1.764	2.158	2.662	FALSE	1.000	1.005
## sigma_ea[161]	2.625	0.374	2.003	2.588	3.455	FALSE	1.000	1.004
## sigma_ea[162]	1.468	0.267	0.988	1.454	2.033	FALSE	1.000	1.004
## sigma_ea[163]	1.725	0.217	1.327	1.715	2.181	FALSE	1.000	1.005
## sigma_ea[164]	1.679	0.221	1.271	1.670	2.142	FALSE	1.000	1.007
## sigma_ea[165]	1.296	0.228	0.885	1.282	1.783	FALSE	1.000	1.001
## sigma_ea[166]	1.534	0.263	1.063	1.519	2.089	FALSE	1.000	1.006
## sigma_ea[167]	1.638	0.211	1.258	1.625	2.089	FALSE	1.000	1.006
## sigma_ea[168]	1.228	0.237	0.798	1.215	1.730	FALSE	1.000	1.003
## sigma_ea[169]	3.760	0.512	2.881	3.716	4.871	FALSE	1.000	1.006
## sigma_ea[170]	2.986	0.335	2.418	2.956	3.741	FALSE	1.000	1.002
## sigma_ea[171]	2.883	0.354	2.285	2.850	3.675	FALSE	1.000	1.015
## sigma_ea[172]	3.191	0.365	2.561	3.161	4.007	FALSE	1.000	1.006
## sigma_ea[173]	3.643	0.498	2.798	3.599	4.732	FALSE	1.000	1.004
## sigma_ea[174]	2.486	0.308	1.962	2.459	3.171	FALSE	1.000	1.008
## sigma_ea[175]	2.743	0.313	2.217	2.714	3.454	FALSE	1.000	1.001
## sigma_ea[176]	2.697	0.311	2.175	2.669	3.405	FALSE	1.000	1.001
## sigma_ea[177]	2.314	0.294	1.818	2.283	2.991	FALSE	1.000	1.001
## sigma_ea[178]	2.553	0.311	2.023	2.525	3.244	FALSE	1.000	1.010
## sigma_ea[179]	2.656	0.319	2.122	2.623	3.384	FALSE	1.000	1.008
## sigma_ea[180]	2.246	0.293	1.749	2.216	2.919	FALSE	1.000	1.001
## sigma_ea[181]	4.688	0.698	3.430	4.659	6.149	FALSE	1.000	1.002
## sigma_ea[182]	3.914	0.527	2.949	3.897	4.997	FALSE	1.000	1.001
## sigma_ea[183]	3.811	0.539	2.840	3.786	4.937	FALSE	1.000	1.004
## sigma_ea[184]	4.119	0.558	3.102	4.099	5.271	FALSE	1.000	1.002
## sigma_ea[185]	4.571	0.683	3.341	4.540	6.000	FALSE	1.000	1.001
## sigma_ea[186]	3.414	0.462	2.547	3.401	4.360	FALSE	1.000	1.004
## sigma_ea[187]	3.671	0.499	2.748	3.657	4.693	FALSE	1.000	1.003
## sigma_ea[188]	3.625	0.494	2.709	3.611	4.638	FALSE	1.000	1.003
## sigma_ea[189]	3.242	0.465	2.372	3.231	4.192	FALSE	1.000	1.002
## sigma_ea[190]	3.481	0.469	2.604	3.468	4.441	FALSE	1.000	1.004
## sigma_ea[191]	3.584	0.503	2.673	3.564	4.627	FALSE	1.000	1.002
## sigma_ea[192]	3.174	0.460	2.310	3.164	4.111	FALSE	1.000	1.003
## sigma_ea[193]	3.763	0.512	2.879	3.719	4.891	FALSE	1.000	1.004
## sigma_ea[194]	2.989	0.338	2.418	2.956	3.748	FALSE	1.000	1.001
## sigma_ea[195]	2.886	0.356	2.285	2.851	3.689	FALSE	1.000	1.010
## sigma_ea[196]	3.194	0.368	2.566	3.161	4.012	FALSE	1.000	1.003
## sigma_ea[197]	3.646	0.498	2.794	3.600	4.746	FALSE	1.000	1.003
## sigma_ea[198]	2.489	0.313	1.959	2.460	3.193	FALSE	1.000	1.003
## sigma_ea[199]	2.746	0.316	2.214	2.714	3.462	FALSE	1.000	1.002



## sigma_ea[200]	2.700	0.314	2.173	2.668	3.412	FALSE	1.000	1.002
## sigma_ea[201]	2.317	0.297	1.819	2.287	2.997	FALSE	1.000	1.001
## sigma_ea[202]	2.555	0.316	2.022	2.526	3.268	FALSE	1.000	1.004
## sigma_ea[203]	2.659	0.322	2.122	2.626	3.394	FALSE	1.000	1.004
## sigma_ea[204]	2.249	0.296	1.747	2.220	2.925	FALSE	1.000	1.002
## sigma_ea[205]	3.765	0.518	2.876	3.720	4.902	FALSE	1.000	1.006
## sigma_ea[206]	2.991	0.348	2.410	2.957	3.777	FALSE	1.000	1.001
## sigma_ea[207]	2.888	0.367	2.277	2.850	3.721	FALSE	1.000	1.013
## sigma_ea[208]	3.196	0.377	2.557	3.162	4.041	FALSE	1.000	1.005
## sigma_ea[209]	3.648	0.503	2.793	3.601	4.757	FALSE	1.000	1.004
## sigma_ea[210]	2.491	0.321	1.958	2.459	3.215	FALSE	1.000	1.006
## sigma_ea[211]	2.748	0.326	2.209	2.713	3.493	FALSE	1.000	1.001
## sigma_ea[212]	2.702	0.324	2.169	2.668	3.441	FALSE	1.000	1.001
## sigma_ea[213]	2.319	0.308	1.811	2.284	3.033	FALSE	1.000	1.000
## sigma_ea[214]	2.558	0.324	2.018	2.524	3.293	FALSE	1.000	1.008
## sigma_ea[215]	2.661	0.333	2.113	2.625	3.430	FALSE	1.000	1.006
## sigma_ea[216]	2.251	0.307	1.743	2.218	2.965	FALSE	1.000	1.000
## sigma_ea[217]	4.437	0.631	3.299	4.407	5.763	FALSE	1.000	1.001
## sigma_ea[218]	3.663	0.457	2.828	3.647	4.623	FALSE	1.000	1.001
## sigma_ea[219]	3.560	0.469	2.720	3.535	4.557	FALSE	1.000	1.004
## sigma_ea[220]	3.868	0.489	2.977	3.848	4.895	FALSE	1.000	1.001
## sigma_ea[221]	4.320	0.615	3.212	4.290	5.614	FALSE	1.000	1.001
## sigma_ea[222]	3.163	0.398	2.408	3.153	3.978	FALSE	1.000	1.004
## sigma_ea[223]	3.420	0.428	2.631	3.404	4.310	FALSE	1.000	1.004
## sigma_ea[224]	3.374	0.424	2.590	3.359	4.255	FALSE	1.000	1.005
## sigma_ea[225]	2.991	0.394	2.262	2.977	3.808	FALSE	1.000	1.003
## sigma_ea[226]	3.230	0.404	2.466	3.217	4.059	FALSE	1.000	1.004
## sigma_ea[227]	3.333	0.432	2.553	3.313	4.247	FALSE	1.000	1.002
## sigma_ea[228]	2.923	0.390	2.198	2.911	3.730	FALSE	1.000	1.004
## sigma_ea[229]	4.706	0.689	3.455	4.672	6.148	FALSE	1.000	1.003
## sigma_ea[230]	3.932	0.516	2.981	3.916	5.002	FALSE	1.000	1.001
## sigma_ea[231]	3.829	0.529	2.880	3.805	4.946	FALSE	1.000	1.005
## sigma_ea[232]	4.137	0.549	3.130	4.119	5.280	FALSE	1.000	1.002
## sigma_ea[233]	4.589	0.673	3.371	4.556	5.994	FALSE	1.000	1.002
## sigma_ea[234]	3.432	0.451	2.589	3.417	4.370	FALSE	1.000	1.005
## sigma_ea[235]	3.689	0.486	2.790	3.673	4.700	FALSE	1.000	1.002
## sigma_ea[236]	3.643	0.482	2.751	3.627	4.642	FALSE	1.000	1.003
## sigma_ea[237]	3.260	0.450	2.424	3.245	4.190	FALSE	1.000	1.002
## sigma_ea[238]	3.499	0.459	2.648	3.482	4.456	FALSE	1.000	1.005
## sigma_ea[239]	3.602	0.491	2.712	3.581	4.630	FALSE	1.000	1.003
## sigma_ea[240]	3.192	0.445	2.363	3.177	4.111	FALSE	1.000	1.003
## sigma_ea[241]	4.240	0.595	3.177	4.205	5.498	FALSE	1.000	1.002
## sigma_ea[242]	3.465	0.423	2.698	3.447	4.348	FALSE	1.000	1.001
## sigma_ea[243]	3.362	0.434	2.589	3.335	4.296	FALSE	1.000	1.005
## sigma_ea[244]	3.670	0.454	2.853	3.647	4.625	FALSE	1.000	1.002
## sigma_ea[245]	4.122	0.580	3.087	4.088	5.350	FALSE	1.000	1.001
## sigma_ea[246]	2.966	0.371	2.272	2.954	3.735	FALSE	1.000	1.004
## sigma_ea[247]	3.222	0.396	2.496	3.204	4.047	FALSE	1.000	1.003
## sigma_ea[248]	3.176	0.393	2.454	3.159	3.993	FALSE	1.000	1.004
## sigma_ea[249]	2.793	0.364	2.115	2.780	3.549	FALSE	1.000	1.002
## sigma_ea[250]	3.032	0.376	2.330	3.019	3.817	FALSE	1.000	1.004
## sigma_ea[251]	3.135	0.398	2.419	3.114	3.980	FALSE	1.000	1.002
## sigma_ea[252]	2.725	0.360	2.051	2.713	3.470	FALSE	1.000	1.003
## sigma_ea[253]	5.267	0.783	3.814	5.238	6.873	FALSE	1.000	1.001

## sigma_ea[254]	4.492	0.599	3.371	4.476	5.712	FALSE	1.000	1.002
## sigma_ea[255]	4.389	0.606	3.272	4.364	5.648	FALSE	1.000	1.003
## sigma_ea[256]	4.697	0.634	3.514	4.678	5.996	FALSE	1.000	1.002
## sigma_ea[257]	5.150	0.765	3.731	5.120	6.720	FALSE	1.000	1.001
## sigma_ea[258]	3.993	0.520	3.016	3.977	5.047	FALSE	1.000	1.004
## sigma_ea[259]	4.249	0.565	3.186	4.235	5.400	FALSE	1.000	1.004
## sigma_ea[260]	4.204	0.559	3.151	4.189	5.342	FALSE	1.000	1.004
## sigma_ea[261]	3.820	0.518	2.856	3.806	4.885	FALSE	1.000	1.003
## sigma_ea[262]	4.059	0.529	3.063	4.043	5.135	FALSE	1.000	1.004
## sigma_ea[263]	4.163	0.566	3.118	4.142	5.331	FALSE	1.000	1.002
## sigma_ea[264]	3.753	0.510	2.798	3.739	4.800	FALSE	1.000	1.004
## sigma_ea[265]	4.160	0.585	3.114	4.126	5.405	FALSE	1.000	1.002
## sigma_ea[266]	3.386	0.391	2.678	3.365	4.217	FALSE	1.000	1.001
## sigma_ea[267]	3.283	0.398	2.577	3.254	4.144	FALSE	1.000	1.005
## sigma_ea[268]	3.591	0.424	2.823	3.568	4.484	FALSE	1.000	1.002
## sigma_ea[269]	4.043	0.569	3.027	4.009	5.259	FALSE	1.000	1.001
## sigma_ea[270]	2.886	0.342	2.262	2.866	3.617	FALSE	1.000	1.005
## sigma_ea[271]	3.143	0.363	2.485	3.124	3.916	FALSE	1.000	1.005
## sigma_ea[272]	3.097	0.360	2.446	3.078	3.861	FALSE	1.000	1.006
## sigma_ea[273]	2.714	0.322	2.130	2.695	3.408	FALSE	1.000	1.003
## sigma_ea[274]	2.952	0.348	2.319	2.932	3.696	FALSE	1.000	1.005
## sigma_ea[275]	3.056	0.359	2.414	3.031	3.833	FALSE	1.000	1.002
## sigma_ea[276]	2.646	0.318	2.067	2.628	3.328	FALSE	1.000	1.005
## sigma_ea[277]	4.178	0.585	3.141	4.143	5.438	FALSE	1.000	1.002
## sigma_ea[278]	3.403	0.390	2.714	3.378	4.245	FALSE	1.000	1.000
## sigma_ea[279]	3.300	0.400	2.603	3.271	4.174	FALSE	1.000	1.005
## sigma_ea[280]	3.608	0.424	2.855	3.582	4.520	FALSE	1.000	1.001
## sigma_ea[281]	4.061	0.569	3.058	4.024	5.290	FALSE	1.000	1.001
## sigma_ea[282]	2.904	0.339	2.318	2.878	3.649	FALSE	1.000	1.002
## sigma_ea[283]	3.161	0.361	2.529	3.135	3.954	FALSE	1.000	1.002
## sigma_ea[284]	3.115	0.357	2.492	3.088	3.901	FALSE	1.000	1.003
## sigma_ea[285]	2.731	0.319	2.182	2.706	3.448	FALSE	1.000	1.001
## sigma_ea[286]	2.970	0.345	2.372	2.943	3.731	FALSE	1.000	1.003
## sigma_ea[287]	3.074	0.359	2.451	3.045	3.872	FALSE	1.000	1.002
## sigma_ea[288]	2.664	0.315	2.120	2.639	3.366	FALSE	1.000	1.002
## sigma_ea[289]	3.233	0.437	2.492	3.192	4.194	FALSE	1.000	1.004
## sigma_ea[290]	2.459	0.247	2.002	2.449	2.980	FALSE	1.000	1.000
## sigma_ea[291]	2.356	0.265	1.881	2.340	2.932	FALSE	1.000	1.014
## sigma_ea[292]	2.664	0.274	2.166	2.649	3.250	FALSE	1.000	1.003
## sigma_ea[293]	3.116	0.425	2.398	3.076	4.054	FALSE	1.000	1.003
## sigma_ea[294]	1.959	0.256	1.481	1.948	2.494	FALSE	1.000	1.004
## sigma_ea[295]	2.216	0.234	1.770	2.211	2.705	FALSE	1.000	1.005
## sigma_ea[296]	2.170	0.235	1.722	2.165	2.656	FALSE	1.000	1.007
## sigma_ea[297]	1.787	0.224	1.351	1.783	2.253	FALSE	1.000	1.002
## sigma_ea[298]	2.026	0.256	1.551	2.014	2.562	FALSE	1.000	1.006
## sigma_ea[299]	2.129	0.234	1.696	2.121	2.624	FALSE	1.000	1.005
## sigma_ea[300]	1.719	0.229	1.273	1.716	2.190	FALSE	1.000	1.004
## sigma_ea[301]	4.661	0.658	3.472	4.628	6.042	FALSE	1.000	1.001
## sigma_ea[302]	3.887	0.465	3.035	3.866	4.854	FALSE	1.000	1.001
## sigma_ea[303]	3.784	0.475	2.933	3.755	4.794	FALSE	1.000	1.003
## sigma_ea[304]	4.092	0.500	3.177	4.069	5.129	FALSE	1.000	1.001
## sigma_ea[305]	4.544	0.642	3.390	4.511	5.890	FALSE	1.000	1.000
## sigma_ea[306]	3.387	0.397	2.667	3.368	4.229	FALSE	1.000	1.003
## sigma_ea[307]	3.644	0.433	2.855	3.625	4.551	FALSE	1.000	1.004

## sigma_ea[308]	3.598	0.428	2.817	3.578	4.495	FALSE	1.000	1.005
## sigma_ea[309]	3.215	0.389	2.516	3.195	4.037	FALSE	1.000	1.002
## sigma_ea[310]	3.453	0.405	2.719	3.433	4.312	FALSE	1.000	1.003
## sigma_ea[311]	3.557	0.434	2.781	3.532	4.475	FALSE	1.000	1.001
## sigma_ea[312]	3.147	0.383	2.458	3.128	3.954	FALSE	1.000	1.004
## sigma_ea[313]	4.219	0.593	3.170	4.179	5.495	FALSE	1.000	1.002
## sigma_ea[314]	3.445	0.402	2.742	3.416	4.318	FALSE	1.000	1.000
## sigma_ea[315]	3.342	0.413	2.630	3.308	4.253	FALSE	1.000	1.005
## sigma_ea[316]	3.650	0.436	2.880	3.620	4.586	FALSE	1.000	1.001
## sigma_ea[317]	4.102	0.577	3.088	4.061	5.354	FALSE	1.000	1.001
## sigma_ea[318]	2.945	0.349	2.347	2.915	3.709	FALSE	1.000	1.002
## sigma_ea[319]	3.202	0.373	2.557	3.173	4.020	FALSE	1.000	1.003
## sigma_ea[320]	3.156	0.369	2.519	3.128	3.967	FALSE	1.000	1.003
## sigma_ea[321]	2.773	0.333	2.209	2.742	3.521	FALSE	1.000	1.001
## sigma_ea[322]	3.011	0.356	2.400	2.981	3.790	FALSE	1.000	1.003
## sigma_ea[323]	3.115	0.373	2.480	3.082	3.948	FALSE	1.000	1.002
## sigma_ea[324]	2.705	0.329	2.146	2.674	3.446	FALSE	1.000	1.002
## sigma_ea[325]	4.164	0.583	3.130	4.128	5.414	FALSE	1.000	1.002
## sigma_ea[326]	3.390	0.394	2.689	3.367	4.233	FALSE	1.000	1.001
## sigma_ea[327]	3.287	0.404	2.588	3.255	4.165	FALSE	1.000	1.005
## sigma_ea[328]	3.595	0.428	2.830	3.569	4.507	FALSE	1.000	1.001
## sigma_ea[329]	4.047	0.567	3.048	4.012	5.266	FALSE	1.000	1.001
## sigma_ea[330]	2.890	0.343	2.291	2.864	3.644	FALSE	1.000	1.002
## sigma_ea[331]	3.147	0.365	2.502	3.125	3.935	FALSE	1.000	1.003
## sigma_ea[332]	3.101	0.361	2.465	3.078	3.880	FALSE	1.000	1.004
## sigma_ea[333]	2.718	0.324	2.154	2.695	3.433	FALSE	1.000	1.002
## sigma_ea[334]	2.956	0.349	2.347	2.930	3.725	FALSE	1.000	1.002
## sigma_ea[335]	3.060	0.363	2.434	3.032	3.857	FALSE	1.000	1.002
## sigma_ea[336]	2.650	0.320	2.091	2.629	3.353	FALSE	1.000	1.003
## alfa_sd	2.516	0.146	2.246	2.511	2.819	FALSE	1.000	1.000
## beta_sd	-0.438	0.066	-0.569	-0.438	-0.307	FALSE	1.000	1.001
## deviance	961.785	22.969	918.632	961.044	1008.403	FALSE	1.000	1.000
##	n.eff							
## beta0	37							
## beta1[1]	126							
## beta1[2]	147							
## beta1[3]	48000							
## beta1[4]	447							
## beta2	33							
## beta_PC1	1557							
## beta_PC2	176							
## sigma_site	615							
## sigma_ea[1]	492							
## sigma_ea[2]	48000							
## sigma_ea[3]	151							
## sigma_ea[4]	709							
## sigma_ea[5]	929							
## sigma_ea[6]	777							
## sigma_ea[7]	410							
## sigma_ea[8]	291							
## sigma_ea[9]	1225							
## sigma_ea[10]	539							
## sigma_ea[11]	506							
## sigma_ea[12]	561							

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## sigma_ea[13]      192
## sigma_ea[14]      574
## sigma_ea[15]       69
## sigma_ea[16]      161
## sigma_ea[17]      284
## sigma_ea[18]      345
## sigma_ea[19]     3621
## sigma_ea[20]     1571
## sigma_ea[21]     5172
## sigma_ea[22]      237
## sigma_ea[23]      140
## sigma_ea[24]     9500
## sigma_ea[25]      361
## sigma_ea[26]     7357
## sigma_ea[27]      111
## sigma_ea[28]      439
## sigma_ea[29]      629
## sigma_ea[30]      444
## sigma_ea[31]      457
## sigma_ea[32]      314
## sigma_ea[33]     1710
## sigma_ea[34]      333
## sigma_ea[35]      313
## sigma_ea[36]      691
## sigma_ea[37]      453
## sigma_ea[38]    48000
## sigma_ea[39]      148
## sigma_ea[40]      710
## sigma_ea[41]      898
## sigma_ea[42]      862
## sigma_ea[43]      343
## sigma_ea[44]      256
## sigma_ea[45]     1088
## sigma_ea[46]      626
## sigma_ea[47]      608
## sigma_ea[48]      556
## sigma_ea[49]      195
## sigma_ea[50]      581
## sigma_ea[51]       70
## sigma_ea[52]      163
## sigma_ea[53]      295
## sigma_ea[54]      492
## sigma_ea[55]      983
## sigma_ea[56]      647
## sigma_ea[57]     2194
## sigma_ea[58]      309
## sigma_ea[59]      150
## sigma_ea[60]     1815
## sigma_ea[61]      700
## sigma_ea[62]      826
## sigma_ea[63]      322
## sigma_ea[64]      889
## sigma_ea[65]     1079
## sigma_ea[66]      298

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## sigma_ea[67]      282
## sigma_ea[68]      235
## sigma_ea[69]      421
## sigma_ea[70]      292
## sigma_ea[71]      735
## sigma_ea[72]      318
## sigma_ea[73]      346
## sigma_ea[74]     3012
## sigma_ea[75]      109
## sigma_ea[76]      426
## sigma_ea[77]      645
## sigma_ea[78]     1528
## sigma_ea[79]      307
## sigma_ea[80]      232
## sigma_ea[81]      915
## sigma_ea[82]      814
## sigma_ea[83]      365
## sigma_ea[84]      512
## sigma_ea[85]      719
## sigma_ea[86]     4494
## sigma_ea[87]      274
## sigma_ea[88]     1313
## sigma_ea[89]     1342
## sigma_ea[90]      469
## sigma_ea[91]      461
## sigma_ea[92]      345
## sigma_ea[93]      907
## sigma_ea[94]      412
## sigma_ea[95]      960
## sigma_ea[96]      521
## sigma_ea[97]      804
## sigma_ea[98]    48000
## sigma_ea[99]      285
## sigma_ea[100]     1590
## sigma_ea[101]     1596
## sigma_ea[102]      969
## sigma_ea[103]      560
## sigma_ea[104]      399
## sigma_ea[105]     1275
## sigma_ea[106]      724
## sigma_ea[107]     1097
## sigma_ea[108]      614
## sigma_ea[109]      678
## sigma_ea[110]    31620
## sigma_ea[111]      263
## sigma_ea[112]     1124
## sigma_ea[113]     1214
## sigma_ea[114]     1005
## sigma_ea[115]      977
## sigma_ea[116]      651
## sigma_ea[117]     3007
## sigma_ea[118]      687
## sigma_ea[119]      792
## sigma_ea[120]     1144

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## sigma_ea[121]    667
## sigma_ea[122] 17437
## sigma_ea[123]    232
## sigma_ea[124]   1112
## sigma_ea[125]   1233
## sigma_ea[126]    543
## sigma_ea[127]    556
## sigma_ea[128]    392
## sigma_ea[129]   1321
## sigma_ea[130]    441
## sigma_ea[131]    760
## sigma_ea[132]    622
## sigma_ea[133]    471
## sigma_ea[134]   5252
## sigma_ea[135]    167
## sigma_ea[136]    612
## sigma_ea[137]    790
## sigma_ea[138]    808
## sigma_ea[139]    974
## sigma_ea[140]    625
## sigma_ea[141]   3449
## sigma_ea[142]    518
## sigma_ea[143]    423
## sigma_ea[144]   1242
## sigma_ea[145]    364
## sigma_ea[146] 48000
## sigma_ea[147]    122
## sigma_ea[148]    519
## sigma_ea[149]    699
## sigma_ea[150]    749
## sigma_ea[151]    353
## sigma_ea[152]    261
## sigma_ea[153]   1295
## sigma_ea[154]    532
## sigma_ea[155]    472
## sigma_ea[156]    628
## sigma_ea[157]    362
## sigma_ea[158] 21063
## sigma_ea[159]    110
## sigma_ea[160]    438
## sigma_ea[161]    668
## sigma_ea[162]    771
## sigma_ea[163]    395
## sigma_ea[164]    283
## sigma_ea[165]   1557
## sigma_ea[166]    500
## sigma_ea[167]    370
## sigma_ea[168]    690
## sigma_ea[169]    320
## sigma_ea[170]   1266
## sigma_ea[171]    136
## sigma_ea[172]    357
## sigma_ea[173]    470
## sigma_ea[174]    333

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## sigma_ea[175] 16936
## sigma_ea[176] 4537
## sigma_ea[177] 10619
## sigma_ea[178] 252
## sigma_ea[179] 271
## sigma_ea[180] 48000
## sigma_ea[181] 1294
## sigma_ea[182] 2287
## sigma_ea[183] 696
## sigma_ea[184] 2048
## sigma_ea[185] 2027
## sigma_ea[186] 561
## sigma_ea[187] 730
## sigma_ea[188] 592
## sigma_ea[189] 1037
## sigma_ea[190] 552
## sigma_ea[191] 1668
## sigma_ea[192] 743
## sigma_ea[193] 480
## sigma_ea[194] 4582
## sigma_ea[195] 200
## sigma_ea[196] 661
## sigma_ea[197] 787
## sigma_ea[198] 866
## sigma_ea[199] 1488
## sigma_ea[200] 928
## sigma_ea[201] 5938
## sigma_ea[202] 559
## sigma_ea[203] 501
## sigma_ea[204] 2086
## sigma_ea[205] 354
## sigma_ea[206] 1741
## sigma_ea[207] 157
## sigma_ea[208] 427
## sigma_ea[209] 530
## sigma_ea[210] 428
## sigma_ea[211] 8797
## sigma_ea[212] 3235
## sigma_ea[213] 28876
## sigma_ea[214] 316
## sigma_ea[215] 331
## sigma_ea[216] 36098
## sigma_ea[217] 1478
## sigma_ea[218] 3139
## sigma_ea[219] 706
## sigma_ea[220] 3264
## sigma_ea[221] 2779
## sigma_ea[222] 639
## sigma_ea[223] 585
## sigma_ea[224] 460
## sigma_ea[225] 917
## sigma_ea[226] 635
## sigma_ea[227] 2555
## sigma_ea[228] 598
```

```
## sigma_ea[229]    823
## sigma_ea[230]   1645
## sigma_ea[231]    446
## sigma_ea[232]   1102
## sigma_ea[233]   1178
## sigma_ea[234]    409
## sigma_ea[235]    827
## sigma_ea[236]    682
## sigma_ea[237]   1039
## sigma_ea[238]    388
## sigma_ea[239]    884
## sigma_ea[240]    808
## sigma_ea[241]   1017
## sigma_ea[242]   3580
## sigma_ea[243]    472
## sigma_ea[244]   1943
## sigma_ea[245]   1798
## sigma_ea[246]    541
## sigma_ea[247]    658
## sigma_ea[248]    505
## sigma_ea[249]   1100
## sigma_ea[250]    506
## sigma_ea[251]   1493
## sigma_ea[252]    689
## sigma_ea[253]   2021
## sigma_ea[254]   1873
## sigma_ea[255]   1122
## sigma_ea[256]   2738
## sigma_ea[257]   2939
## sigma_ea[258]    615
## sigma_ea[259]    638
## sigma_ea[260]    531
## sigma_ea[261]    817
## sigma_ea[262]    646
## sigma_ea[263]   2201
## sigma_ea[264]    606
## sigma_ea[265]   1058
## sigma_ea[266]   2370
## sigma_ea[267]    429
## sigma_ea[268]   1806
## sigma_ea[269]   1863
## sigma_ea[270]    434
## sigma_ea[271]    475
## sigma_ea[272]    370
## sigma_ea[273]    695
## sigma_ea[274]    420
## sigma_ea[275]   1294
## sigma_ea[276]    452
## sigma_ea[277]    967
## sigma_ea[278]  48000
## sigma_ea[279]    378
## sigma_ea[280]   1992
## sigma_ea[281]   1867
## sigma_ea[282]   1058
```



```
## sigma_ea[283]    870
## sigma_ea[284]    609
## sigma_ea[285]   2060
## sigma_ea[286]    820
## sigma_ea[287]   1407
## sigma_ea[288]    934
## sigma_ea[289]    497
## sigma_ea[290]  48000
## sigma_ea[291]    155
## sigma_ea[292]    710
## sigma_ea[293]    925
## sigma_ea[294]    535
## sigma_ea[295]    415
## sigma_ea[296]    293
## sigma_ea[297]   1262
## sigma_ea[298]    399
## sigma_ea[299]    510
## sigma_ea[300]    570
## sigma_ea[301]   1947
## sigma_ea[302]   4888
## sigma_ea[303]    843
## sigma_ea[304]   6201
## sigma_ea[305]   4315
## sigma_ea[306]    900
## sigma_ea[307]    615
## sigma_ea[308]    476
## sigma_ea[309]    977
## sigma_ea[310]    903
## sigma_ea[311]   4654
## sigma_ea[312]    604
## sigma_ea[313]   1042
## sigma_ea[314]  48000
## sigma_ea[315]    422
## sigma_ea[316]   2314
## sigma_ea[317]   2049
## sigma_ea[318]   1071
## sigma_ea[319]    858
## sigma_ea[320]    609
## sigma_ea[321]   1948
## sigma_ea[322]    856
## sigma_ea[323]   1668
## sigma_ea[324]    925
## sigma_ea[325]   1142
## sigma_ea[326]  33181
## sigma_ea[327]    453
## sigma_ea[328]   2913
## sigma_ea[329]   2383
## sigma_ea[330]   1162
## sigma_ea[331]    695
## sigma_ea[332]    505
## sigma_ea[333]   1404
## sigma_ea[334]    954
## sigma_ea[335]   2065
## sigma_ea[336]    719
```

```
## alfa_sd      13181
## beta_sd      1461
## deviance     11210
##
## Successful convergence based on Rhat values (all < 1.1).
## Rhat is the potential scale reduction factor (at convergence, Rhat=1).
## For each parameter, n.eff is a crude measure of effective sample size.
##
## overlap0 checks if 0 falls in the parameter's 95% credible interval.
## f is the proportion of the posterior with the same sign as the mean;
## i.e., our confidence that the parameter is positive or negative.
##
## DIC info: (pD = var(deviance)/2)
## pD = 263.7 and DIC = 1225.531
## DIC is an estimate of expected predictive error (lower is better).
```

```
model_fit2$DIC
```

```
## [1] 1225.531
```

### Modelo: splines y varianza lineal con P.lineal

Abundance<sub>i</sub> ~ Poisson( $\mu_i$ )

$\log(\mu_i) = \eta_i + \varepsilon_i$

$$\eta_i = \beta_0 + \beta_1[\text{appearance}_i] + \beta_2 \cdot \text{length}_i + \sum_{j=1}^k \beta_j^{(PC1)} \cdot B_j^{(PC1)}(\text{PC1}_i) + \sum_{j=1}^k \beta_j^{(PC2)} \cdot B_j^{(PC2)}(\text{PC2}_i) + u_{\text{Site}[i]}$$

```
# Bases para los splines
k <- 6
base_PC1 <- bs(Spider$PC1, df = k)
base_PC2 <- bs(Spider$PC2, df = k)

#Modelo
cat(file = "Modelo", "model {

#Capa verosimilitud
  for (i in 1:N) {
    Abundance[i] ~ dpois(mu[i])
    log(mu[i]) <- eta[i] + ea[i]
    eta[i] <- beta0 +
      beta1[appearance[i]] +
      beta2 * length[i] +
      inprod(beta_PC1[], base_PC1[i,]) +
      inprod(beta_PC2[], base_PC2[i,]) +
      site_effect[Site[i]]
  }

#Distribuciones previas
  beta0 ~ dnorm(0, 0.001)
  beta2 ~ dnorm(0, 0.001)
```

```

# Restricción de efecto fijo appearance
for (i in 1:3) {
  beta1[i] ~ dnorm(0, 0.001)
}
beta1[4] <- -sum(beta1[1:3])

# Splines
for (j in 1:6) {
  beta_PC1[j] ~ dnorm(0, tau_spline1)
  beta_PC2[j] ~ dnorm(0, tau_spline2)
}
tau_spline1 <- pow(sigma_spline1, -2)
sigma_spline1 ~ dunif(0, 100)
tau_spline2 <- pow(sigma_spline2, -2)
sigma_spline2 ~ dunif(0, 100)

#Efecto aleatorio de sitio
for (i in 1:n_site) {
  site_effect[i] ~ dnorm(0, tau_site)
}
tau_site <- pow(sigma_site, -2)
sigma_site ~ dunif(0, 100)

#Parámetro de dispersión: lineal con predictor lineal
for (i in 1:N){
  ea[i] ~ dnorm(0, tau_ea[i])
  tau_ea[i] <- pow(sigma_ea[i], -2)
  sigma_ea[i] <- max(alfa_sd + beta_sd * eta[i], 0.001)
}
alfa_sd ~ dnorm(0, 0.001)
beta_sd ~ dnorm(0, 0.001)
})")

# Datos
#Cambiamos factores por numeric
Spider$appearance_num <- as.numeric(Spider$appearance)

#Creamos vector de datos
datos <- list(
  Abundance = Spider$Abundance,
  appearance = Spider$appearance_num,
  length = Spider$length,
  base_PC1 = base_PC1,
  base_PC2 = base_PC2,
  Site = as.numeric(as.factor(Spider$Site)),
  N = nrow(Spider),
  n_site = length(unique(Spider$Site)),
  n_specie = length(unique(Spider$Specie))
)

```

```

#Iniciales
inits <- function() {
  list(
    beta0 = rnorm(1),
    beta1 = c(rnorm(1), rnorm(1), rnorm(1), NA),
    beta2 = rnorm(1),
    beta_PC1 = rnorm(6),
    beta_PC2 = rnorm(6),
    sigma_site = runif(1, 0, 10),
    alfa_sd= rnorm(1),
    beta_sd = rnorm(1),
    site_effect = rnorm(datos$n_site, 0, 1),
    ea = rnorm(datos$N, 0, 1),
    sigma_spline1 = runif(1, 0, 1),
    sigma_spline2 = runif(1, 0, 1)
  )
}

#Parámetros
params <- c("beta0", "beta1", "beta2", "beta_PC1", "beta_PC2", "sigma_site", "sigma_ea", "alfa_sd", "be

#Corremos modelo
model_splines2 <- jags(
  data = datos,
  inits = inits,
  parameters.to.save = params,
  model.file = "Modelo",
  n.chains = 3,
  n.iter = 100000,
  n.burnin = 20000,
  n.thin = 5,
  parallel = TRUE
)

traceplot(model_splines2)
model_splines2
model_splines2$DIC

#save(model_splines2, file = "modelo_splines2.RData")

load("modelo_splines2.RData")
model_splines2

```

```

## JAGS output for model 'Modelo', generated by jagsUI.
## Estimates based on 3 chains of 1e+05 iterations,
## adaptation = 100 iterations (sufficient),
## burn-in = 20000 iterations and thin rate = 5,
## yielding 48000 total samples from the joint posterior.
## MCMC ran in parallel for 11.517 minutes at time 2025-05-27 17:32:19.685952.
##
##          mean      sd    2.5%    50%    97.5% overlap0      f  Rhat
## beta0      1.790  1.085  -0.094   1.668   3.898      TRUE 0.968 1.081
## beta1[1]    0.314  0.404  -0.535   0.333   1.056      TRUE 0.788 1.004

```

## beta1[2]	-0.029	0.280	-0.579	-0.025	0.516	TRUE	0.534	1.004
## beta1[3]	-1.352	0.572	-2.585	-1.326	-0.348	FALSE	0.998	1.001
## beta1[4]	1.067	0.252	0.583	1.062	1.577	FALSE	1.000	1.006
## beta2	-1.644	0.475	-2.585	-1.630	-0.771	FALSE	1.000	1.038
## beta_PC1[1]	-0.932	1.327	-3.927	-0.754	1.353	TRUE	0.760	1.025
## beta_PC1[2]	0.127	1.069	-1.985	0.081	2.412	TRUE	0.544	1.004
## beta_PC1[3]	1.318	1.706	-1.232	0.967	5.444	TRUE	0.787	1.029
## beta_PC1[4]	1.667	1.310	-0.416	1.561	4.537	TRUE	0.921	1.012
## beta_PC1[5]	0.190	1.147	-2.260	0.158	2.500	TRUE	0.575	1.007
## beta_PC1[6]	-0.931	1.068	-3.284	-0.803	0.874	TRUE	0.820	1.005
## beta_PC2[1]	-0.116	1.692	-3.269	-0.203	3.827	TRUE	0.566	1.035
## beta_PC2[2]	-1.329	1.355	-4.272	-1.221	1.079	TRUE	0.849	1.017
## beta_PC2[3]	-0.298	1.106	-2.412	-0.338	2.271	TRUE	0.641	1.052
## beta_PC2[4]	1.691	1.446	-0.551	1.507	5.064	TRUE	0.906	1.033
## beta_PC2[5]	1.505	1.331	-0.591	1.328	4.662	TRUE	0.893	1.033
## beta_PC2[6]	1.447	1.238	-0.488	1.277	4.419	TRUE	0.903	1.048
## sigma_site	0.387	0.255	0.025	0.353	0.969	FALSE	1.000	1.002
## sigma_ea[1]	3.098	0.501	2.283	3.040	4.220	FALSE	1.000	1.007
## sigma_ea[2]	2.378	0.310	1.853	2.349	3.070	FALSE	1.000	1.004
## sigma_ea[3]	2.256	0.319	1.700	2.232	2.955	FALSE	1.000	1.010
## sigma_ea[4]	2.582	0.337	2.013	2.551	3.335	FALSE	1.000	1.006
## sigma_ea[5]	2.982	0.488	2.190	2.925	4.074	FALSE	1.000	1.006
## sigma_ea[6]	1.872	0.321	1.294	1.855	2.555	FALSE	1.000	1.002
## sigma_ea[7]	2.136	0.298	1.619	2.112	2.792	FALSE	1.000	1.003
## sigma_ea[8]	2.091	0.299	1.570	2.068	2.744	FALSE	1.000	1.003
## sigma_ea[9]	1.689	0.277	1.194	1.676	2.275	FALSE	1.000	1.004
## sigma_ea[10]	1.938	0.320	1.364	1.918	2.627	FALSE	1.000	1.002
## sigma_ea[11]	2.030	0.287	1.527	2.010	2.654	FALSE	1.000	1.006
## sigma_ea[12]	1.622	0.281	1.114	1.610	2.210	FALSE	1.000	1.004
## sigma_ea[13]	2.698	0.403	2.042	2.653	3.617	FALSE	1.000	1.006
## sigma_ea[14]	1.978	0.225	1.577	1.964	2.461	FALSE	1.000	1.001
## sigma_ea[15]	1.856	0.255	1.392	1.845	2.396	FALSE	1.000	1.008
## sigma_ea[16]	2.182	0.248	1.741	2.167	2.713	FALSE	1.000	1.004
## sigma_ea[17]	2.581	0.392	1.936	2.540	3.471	FALSE	1.000	1.003
## sigma_ea[18]	1.472	0.291	0.930	1.461	2.066	FALSE	1.000	1.002
## sigma_ea[19]	1.736	0.226	1.329	1.724	2.216	FALSE	1.000	1.003
## sigma_ea[20]	1.690	0.229	1.275	1.679	2.175	FALSE	1.000	1.004
## sigma_ea[21]	1.289	0.238	0.864	1.276	1.793	FALSE	1.000	1.003
## sigma_ea[22]	1.538	0.287	1.002	1.527	2.126	FALSE	1.000	1.001
## sigma_ea[23]	1.630	0.228	1.216	1.619	2.112	FALSE	1.000	1.002
## sigma_ea[24]	1.222	0.247	0.778	1.209	1.743	FALSE	1.000	1.004
## sigma_ea[25]	2.825	0.421	2.140	2.779	3.780	FALSE	1.000	1.009
## sigma_ea[26]	2.105	0.229	1.687	2.094	2.582	FALSE	1.000	1.004
## sigma_ea[27]	1.982	0.248	1.534	1.970	2.511	FALSE	1.000	1.017
## sigma_ea[28]	2.309	0.256	1.848	2.293	2.851	FALSE	1.000	1.010
## sigma_ea[29]	2.708	0.408	2.040	2.664	3.634	FALSE	1.000	1.006
## sigma_ea[30]	1.599	0.277	1.078	1.591	2.165	FALSE	1.000	1.000
## sigma_ea[31]	1.863	0.223	1.445	1.856	2.316	FALSE	1.000	1.001
## sigma_ea[32]	1.817	0.226	1.392	1.811	2.276	FALSE	1.000	1.001
## sigma_ea[33]	1.416	0.216	1.014	1.409	1.863	FALSE	1.000	1.000
## sigma_ea[34]	1.665	0.275	1.150	1.657	2.230	FALSE	1.000	1.001
## sigma_ea[35]	1.757	0.214	1.360	1.748	2.206	FALSE	1.000	1.007
## sigma_ea[36]	1.349	0.224	0.931	1.341	1.810	FALSE	1.000	1.000
## sigma_ea[37]	2.732	0.410	2.054	2.686	3.664	FALSE	1.000	1.010

## sigma_ea[38]	2.012	0.233	1.575	2.004	2.493	FALSE	1.000	1.007
## sigma_ea[39]	1.889	0.258	1.413	1.879	2.432	FALSE	1.000	1.015
## sigma_ea[40]	2.216	0.252	1.761	2.202	2.748	FALSE	1.000	1.013
## sigma_ea[41]	2.615	0.400	1.952	2.572	3.519	FALSE	1.000	1.007
## sigma_ea[42]	1.506	0.310	0.908	1.502	2.120	FALSE	1.000	1.001
## sigma_ea[43]	1.770	0.239	1.307	1.768	2.246	FALSE	1.000	1.005
## sigma_ea[44]	1.724	0.243	1.251	1.723	2.206	FALSE	1.000	1.005
## sigma_ea[45]	1.323	0.253	0.837	1.319	1.829	FALSE	1.000	1.002
## sigma_ea[46]	1.572	0.306	0.987	1.566	2.184	FALSE	1.000	1.001
## sigma_ea[47]	1.663	0.237	1.212	1.658	2.145	FALSE	1.000	1.007
## sigma_ea[48]	1.255	0.263	0.748	1.252	1.778	FALSE	1.000	1.003
## sigma_ea[49]	2.621	0.405	1.967	2.572	3.563	FALSE	1.000	1.005
## sigma_ea[50]	1.901	0.223	1.508	1.886	2.388	FALSE	1.000	1.001
## sigma_ea[51]	1.779	0.254	1.332	1.761	2.331	FALSE	1.000	1.007
## sigma_ea[52]	2.105	0.247	1.676	2.087	2.647	FALSE	1.000	1.003
## sigma_ea[53]	2.505	0.394	1.864	2.458	3.416	FALSE	1.000	1.003
## sigma_ea[54]	1.396	0.282	0.894	1.379	1.993	FALSE	1.000	1.002
## sigma_ea[55]	1.660	0.224	1.259	1.646	2.140	FALSE	1.000	1.003
## sigma_ea[56]	1.614	0.228	1.204	1.601	2.099	FALSE	1.000	1.005
## sigma_ea[57]	1.213	0.238	0.797	1.196	1.718	FALSE	1.000	1.003
## sigma_ea[58]	1.462	0.278	0.968	1.445	2.051	FALSE	1.000	1.002
## sigma_ea[59]	1.553	0.228	1.153	1.537	2.043	FALSE	1.000	1.002
## sigma_ea[60]	1.145	0.247	0.710	1.129	1.669	FALSE	1.000	1.005
## sigma_ea[61]	3.106	0.507	2.258	3.050	4.254	FALSE	1.000	1.008
## sigma_ea[62]	2.385	0.369	1.744	2.356	3.187	FALSE	1.000	1.002
## sigma_ea[63]	2.263	0.395	1.581	2.230	3.146	FALSE	1.000	1.009
## sigma_ea[64]	2.589	0.389	1.929	2.551	3.460	FALSE	1.000	1.005
## sigma_ea[65]	2.989	0.496	2.156	2.936	4.108	FALSE	1.000	1.006
## sigma_ea[66]	1.880	0.390	1.149	1.876	2.652	FALSE	1.000	1.003
## sigma_ea[67]	2.144	0.363	1.486	2.126	2.905	FALSE	1.000	1.001
## sigma_ea[68]	2.098	0.364	1.432	2.083	2.856	FALSE	1.000	1.001
## sigma_ea[69]	1.697	0.370	1.001	1.687	2.442	FALSE	1.000	1.003
## sigma_ea[70]	1.946	0.389	1.224	1.939	2.727	FALSE	1.000	1.004
## sigma_ea[71]	2.037	0.372	1.374	2.014	2.842	FALSE	1.000	1.005
## sigma_ea[72]	1.629	0.374	0.918	1.623	2.375	FALSE	1.000	1.003
## sigma_ea[73]	2.561	0.400	1.920	2.513	3.485	FALSE	1.000	1.006
## sigma_ea[74]	1.841	0.219	1.443	1.828	2.305	FALSE	1.000	1.001
## sigma_ea[75]	1.718	0.248	1.280	1.701	2.260	FALSE	1.000	1.012
## sigma_ea[76]	2.045	0.239	1.618	2.029	2.562	FALSE	1.000	1.006
## sigma_ea[77]	2.444	0.390	1.814	2.400	3.338	FALSE	1.000	1.004
## sigma_ea[78]	1.335	0.290	0.815	1.319	1.938	FALSE	1.000	1.002
## sigma_ea[79]	1.599	0.225	1.184	1.589	2.072	FALSE	1.000	1.001
## sigma_ea[80]	1.553	0.230	1.128	1.544	2.034	FALSE	1.000	1.002
## sigma_ea[81]	1.152	0.242	0.729	1.134	1.673	FALSE	1.000	1.001
## sigma_ea[82]	1.401	0.285	0.892	1.386	1.995	FALSE	1.000	1.001
## sigma_ea[83]	1.493	0.225	1.093	1.478	1.974	FALSE	1.000	1.004
## sigma_ea[84]	1.085	0.252	0.643	1.066	1.624	FALSE	1.000	1.002
## sigma_ea[85]	3.451	0.523	2.581	3.394	4.647	FALSE	1.000	1.006
## sigma_ea[86]	2.731	0.361	2.132	2.694	3.547	FALSE	1.000	1.001
## sigma_ea[87]	2.609	0.382	1.984	2.564	3.500	FALSE	1.000	1.007
## sigma_ea[88]	2.935	0.388	2.298	2.891	3.831	FALSE	1.000	1.003
## sigma_ea[89]	3.334	0.509	2.490	3.279	4.499	FALSE	1.000	1.004
## sigma_ea[90]	2.225	0.355	1.573	2.209	2.961	FALSE	1.000	1.004
## sigma_ea[91]	2.489	0.346	1.897	2.461	3.253	FALSE	1.000	1.001

## sigma_ea[92]	2.443	0.345	1.848	2.416	3.201	FALSE	1.000	1.001
## sigma_ea[93]	2.042	0.335	1.448	2.020	2.764	FALSE	1.000	1.003
## sigma_ea[94]	2.291	0.356	1.644	2.272	3.039	FALSE	1.000	1.004
## sigma_ea[95]	2.383	0.351	1.799	2.347	3.185	FALSE	1.000	1.004
## sigma_ea[96]	1.975	0.337	1.365	1.956	2.690	FALSE	1.000	1.004
## sigma_ea[97]	3.978	0.591	2.969	3.924	5.291	FALSE	1.000	1.006
## sigma_ea[98]	3.258	0.390	2.588	3.224	4.125	FALSE	1.000	1.003
## sigma_ea[99]	3.135	0.402	2.460	3.092	4.043	FALSE	1.000	1.009
## sigma_ea[100]	3.462	0.426	2.726	3.424	4.395	FALSE	1.000	1.006
## sigma_ea[101]	3.861	0.574	2.890	3.809	5.145	FALSE	1.000	1.005
## sigma_ea[102]	2.752	0.334	2.168	2.727	3.483	FALSE	1.000	1.001
## sigma_ea[103]	3.016	0.362	2.400	2.983	3.819	FALSE	1.000	1.001
## sigma_ea[104]	2.970	0.358	2.359	2.938	3.765	FALSE	1.000	1.001
## sigma_ea[105]	2.569	0.320	2.028	2.538	3.284	FALSE	1.000	1.001
## sigma_ea[106]	2.818	0.339	2.228	2.790	3.562	FALSE	1.000	1.001
## sigma_ea[107]	2.910	0.358	2.312	2.872	3.714	FALSE	1.000	1.005
## sigma_ea[108]	2.502	0.317	1.962	2.472	3.207	FALSE	1.000	1.001
## sigma_ea[109]	4.018	0.616	2.995	3.957	5.394	FALSE	1.000	1.003
## sigma_ea[110]	3.298	0.417	2.596	3.259	4.221	FALSE	1.000	1.000
## sigma_ea[111]	3.176	0.432	2.466	3.128	4.153	FALSE	1.000	1.004
## sigma_ea[112]	3.502	0.452	2.737	3.460	4.498	FALSE	1.000	1.001
## sigma_ea[113]	3.902	0.599	2.908	3.841	5.242	FALSE	1.000	1.002
## sigma_ea[114]	2.792	0.360	2.170	2.766	3.576	FALSE	1.000	1.001
## sigma_ea[115]	3.056	0.390	2.400	3.020	3.919	FALSE	1.000	1.001
## sigma_ea[116]	3.011	0.386	2.359	2.974	3.865	FALSE	1.000	1.001
## sigma_ea[117]	2.610	0.354	2.017	2.576	3.398	FALSE	1.000	1.001
## sigma_ea[118]	2.858	0.366	2.229	2.830	3.656	FALSE	1.000	1.001
## sigma_ea[119]	2.950	0.391	2.308	2.908	3.827	FALSE	1.000	1.001
## sigma_ea[120]	2.542	0.351	1.947	2.509	3.318	FALSE	1.000	1.001
## sigma_ea[121]	3.899	0.591	2.890	3.844	5.202	FALSE	1.000	1.007
## sigma_ea[122]	3.179	0.390	2.511	3.144	4.040	FALSE	1.000	1.005
## sigma_ea[123]	3.056	0.399	2.388	3.015	3.953	FALSE	1.000	1.010
## sigma_ea[124]	3.383	0.426	2.653	3.345	4.323	FALSE	1.000	1.007
## sigma_ea[125]	3.782	0.574	2.808	3.727	5.053	FALSE	1.000	1.005
## sigma_ea[126]	2.673	0.337	2.086	2.648	3.413	FALSE	1.000	1.003
## sigma_ea[127]	2.937	0.362	2.318	2.905	3.739	FALSE	1.000	1.004
## sigma_ea[128]	2.891	0.358	2.275	2.861	3.687	FALSE	1.000	1.004
## sigma_ea[129]	2.490	0.317	1.946	2.462	3.190	FALSE	1.000	1.003
## sigma_ea[130]	2.739	0.342	2.146	2.712	3.493	FALSE	1.000	1.003
## sigma_ea[131]	2.830	0.356	2.234	2.793	3.626	FALSE	1.000	1.007
## sigma_ea[132]	2.422	0.315	1.875	2.397	3.115	FALSE	1.000	1.003
## sigma_ea[133]	3.637	0.563	2.702	3.578	4.888	FALSE	1.000	1.007
## sigma_ea[134]	2.917	0.368	2.314	2.877	3.750	FALSE	1.000	1.005
## sigma_ea[135]	2.795	0.377	2.176	2.753	3.640	FALSE	1.000	1.011
## sigma_ea[136]	3.121	0.402	2.458	3.079	4.020	FALSE	1.000	1.007
## sigma_ea[137]	3.521	0.547	2.616	3.463	4.743	FALSE	1.000	1.006
## sigma_ea[138]	2.412	0.333	1.844	2.381	3.159	FALSE	1.000	1.005
## sigma_ea[139]	2.676	0.343	2.109	2.640	3.453	FALSE	1.000	1.004
## sigma_ea[140]	2.630	0.341	2.066	2.595	3.398	FALSE	1.000	1.004
## sigma_ea[141]	2.229	0.303	1.722	2.200	2.911	FALSE	1.000	1.006
## sigma_ea[142]	2.478	0.337	1.907	2.445	3.237	FALSE	1.000	1.005
## sigma_ea[143]	2.569	0.336	2.019	2.532	3.327	FALSE	1.000	1.008
## sigma_ea[144]	2.161	0.302	1.650	2.134	2.838	FALSE	1.000	1.006
## sigma_ea[145]	2.571	0.404	1.909	2.523	3.483	FALSE	1.000	1.008

## sigma_ea[146]	1.850	0.248	1.407	1.837	2.375	FALSE	1.000	1.002
## sigma_ea[147]	1.728	0.269	1.241	1.716	2.286	FALSE	1.000	1.011
## sigma_ea[148]	2.054	0.264	1.583	2.039	2.612	FALSE	1.000	1.006
## sigma_ea[149]	2.454	0.395	1.798	2.411	3.344	FALSE	1.000	1.005
## sigma_ea[150]	1.345	0.324	0.759	1.331	2.010	FALSE	1.000	1.001
## sigma_ea[151]	1.609	0.255	1.145	1.598	2.140	FALSE	1.000	1.000
## sigma_ea[152]	1.563	0.260	1.088	1.554	2.101	FALSE	1.000	1.001
## sigma_ea[153]	1.162	0.268	0.683	1.149	1.715	FALSE	1.000	1.001
## sigma_ea[154]	1.411	0.319	0.839	1.395	2.069	FALSE	1.000	1.001
## sigma_ea[155]	1.502	0.250	1.052	1.489	2.025	FALSE	1.000	1.004
## sigma_ea[156]	1.094	0.278	0.591	1.082	1.666	FALSE	1.000	1.001
## sigma_ea[157]	2.681	0.399	2.035	2.634	3.610	FALSE	1.000	1.008
## sigma_ea[158]	1.961	0.222	1.555	1.951	2.425	FALSE	1.000	1.005
## sigma_ea[159]	1.838	0.249	1.393	1.825	2.370	FALSE	1.000	1.012
## sigma_ea[160]	2.165	0.241	1.733	2.150	2.675	FALSE	1.000	1.009
## sigma_ea[161]	2.564	0.389	1.926	2.520	3.464	FALSE	1.000	1.005
## sigma_ea[162]	1.455	0.283	0.935	1.445	2.033	FALSE	1.000	1.001
## sigma_ea[163]	1.719	0.228	1.294	1.711	2.186	FALSE	1.000	1.005
## sigma_ea[164]	1.673	0.233	1.239	1.665	2.149	FALSE	1.000	1.006
## sigma_ea[165]	1.272	0.244	0.822	1.263	1.772	FALSE	1.000	1.002
## sigma_ea[166]	1.521	0.278	1.010	1.511	2.089	FALSE	1.000	1.001
## sigma_ea[167]	1.613	0.227	1.196	1.603	2.086	FALSE	1.000	1.005
## sigma_ea[168]	1.205	0.254	0.735	1.196	1.725	FALSE	1.000	1.003
## sigma_ea[169]	4.014	0.589	3.022	3.960	5.322	FALSE	1.000	1.003
## sigma_ea[170]	3.293	0.410	2.609	3.252	4.207	FALSE	1.000	1.001
## sigma_ea[171]	3.171	0.423	2.472	3.126	4.125	FALSE	1.000	1.006
## sigma_ea[172]	3.497	0.443	2.750	3.457	4.468	FALSE	1.000	1.003
## sigma_ea[173]	3.897	0.573	2.937	3.843	5.177	FALSE	1.000	1.002
## sigma_ea[174]	2.788	0.366	2.171	2.752	3.613	FALSE	1.000	1.001
## sigma_ea[175]	3.052	0.385	2.412	3.011	3.917	FALSE	1.000	1.000
## sigma_ea[176]	3.006	0.383	2.372	2.965	3.866	FALSE	1.000	1.000
## sigma_ea[177]	2.605	0.352	2.020	2.567	3.406	FALSE	1.000	1.000
## sigma_ea[178]	2.854	0.371	2.231	2.816	3.687	FALSE	1.000	1.001
## sigma_ea[179]	2.945	0.384	2.316	2.903	3.815	FALSE	1.000	1.003
## sigma_ea[180]	2.537	0.350	1.951	2.500	3.335	FALSE	1.000	1.000
## sigma_ea[181]	4.234	0.712	3.048	4.165	5.827	FALSE	1.000	1.001
## sigma_ea[182]	3.514	0.534	2.641	3.454	4.726	FALSE	1.000	1.000
## sigma_ea[183]	3.392	0.542	2.504	3.332	4.635	FALSE	1.000	1.002
## sigma_ea[184]	3.718	0.566	2.789	3.659	4.993	FALSE	1.000	1.001
## sigma_ea[185]	4.118	0.696	2.962	4.050	5.675	FALSE	1.000	1.001
## sigma_ea[186]	3.008	0.478	2.221	2.956	4.097	FALSE	1.000	1.003
## sigma_ea[187]	3.272	0.507	2.446	3.214	4.429	FALSE	1.000	1.002
## sigma_ea[188]	3.227	0.504	2.406	3.167	4.372	FALSE	1.000	1.002
## sigma_ea[189]	2.826	0.468	2.057	2.773	3.901	FALSE	1.000	1.003
## sigma_ea[190]	3.074	0.484	2.281	3.020	4.181	FALSE	1.000	1.002
## sigma_ea[191]	3.166	0.505	2.344	3.107	4.333	FALSE	1.000	1.001
## sigma_ea[192]	2.758	0.464	1.991	2.706	3.818	FALSE	1.000	1.004
## sigma_ea[193]	4.080	0.605	3.059	4.027	5.409	FALSE	1.000	1.003
## sigma_ea[194]	3.360	0.424	2.657	3.315	4.305	FALSE	1.000	1.001
## sigma_ea[195]	3.238	0.433	2.527	3.193	4.214	FALSE	1.000	1.005
## sigma_ea[196]	3.564	0.457	2.797	3.518	4.571	FALSE	1.000	1.003
## sigma_ea[197]	3.964	0.589	2.973	3.911	5.263	FALSE	1.000	1.002
## sigma_ea[198]	2.854	0.374	2.229	2.817	3.702	FALSE	1.000	1.000
## sigma_ea[199]	3.118	0.398	2.463	3.072	4.012	FALSE	1.000	1.000



## sigma_ea[200]	3.073	0.395	2.423	3.028	3.962	FALSE	1.000	1.001
## sigma_ea[201]	2.672	0.359	2.082	2.630	3.492	FALSE	1.000	1.001
## sigma_ea[202]	2.920	0.379	2.287	2.882	3.778	FALSE	1.000	1.001
## sigma_ea[203]	3.012	0.394	2.371	2.967	3.909	FALSE	1.000	1.002
## sigma_ea[204]	2.604	0.357	2.012	2.564	3.414	FALSE	1.000	1.001
## sigma_ea[205]	4.222	0.659	3.113	4.161	5.688	FALSE	1.000	1.002
## sigma_ea[206]	3.502	0.480	2.714	3.452	4.577	FALSE	1.000	1.000
## sigma_ea[207]	3.379	0.489	2.574	3.328	4.478	FALSE	1.000	1.003
## sigma_ea[208]	3.706	0.513	2.854	3.654	4.851	FALSE	1.000	1.002
## sigma_ea[209]	4.105	0.643	3.029	4.042	5.540	FALSE	1.000	1.001
## sigma_ea[210]	2.996	0.425	2.296	2.951	3.959	FALSE	1.000	1.000
## sigma_ea[211]	3.260	0.453	2.525	3.210	4.281	FALSE	1.000	1.000
## sigma_ea[212]	3.214	0.449	2.487	3.164	4.226	FALSE	1.000	1.001
## sigma_ea[213]	2.813	0.414	2.138	2.766	3.749	FALSE	1.000	1.001
## sigma_ea[214]	3.062	0.430	2.353	3.016	4.038	FALSE	1.000	1.000
## sigma_ea[215]	3.154	0.450	2.420	3.104	4.174	FALSE	1.000	1.001
## sigma_ea[216]	2.746	0.410	2.071	2.700	3.674	FALSE	1.000	1.001
## sigma_ea[217]	3.820	0.600	2.825	3.754	5.182	FALSE	1.000	1.002
## sigma_ea[218]	3.099	0.422	2.395	3.056	4.049	FALSE	1.000	1.000
## sigma_ea[219]	2.977	0.437	2.257	2.931	3.965	FALSE	1.000	1.003
## sigma_ea[220]	3.304	0.452	2.544	3.259	4.316	FALSE	1.000	1.001
## sigma_ea[221]	3.703	0.585	2.736	3.637	5.035	FALSE	1.000	1.001
## sigma_ea[222]	2.594	0.385	1.916	2.570	3.420	FALSE	1.000	1.003
## sigma_ea[223]	2.858	0.401	2.180	2.819	3.756	FALSE	1.000	1.002
## sigma_ea[224]	2.812	0.399	2.134	2.775	3.705	FALSE	1.000	1.002
## sigma_ea[225]	2.411	0.376	1.763	2.379	3.244	FALSE	1.000	1.003
## sigma_ea[226]	2.660	0.388	1.981	2.635	3.496	FALSE	1.000	1.002
## sigma_ea[227]	2.751	0.403	2.087	2.710	3.659	FALSE	1.000	1.001
## sigma_ea[228]	2.343	0.376	1.689	2.314	3.171	FALSE	1.000	1.004
## sigma_ea[229]	4.370	0.771	3.106	4.286	6.114	FALSE	1.000	1.000
## sigma_ea[230]	3.649	0.599	2.690	3.577	5.032	FALSE	1.000	1.000
## sigma_ea[231]	3.527	0.606	2.555	3.453	4.928	FALSE	1.000	1.001
## sigma_ea[232]	3.853	0.630	2.835	3.781	5.298	FALSE	1.000	1.000
## sigma_ea[233]	4.253	0.755	3.021	4.171	5.961	FALSE	1.000	1.000
## sigma_ea[234]	3.144	0.540	2.288	3.072	4.396	FALSE	1.000	1.002
## sigma_ea[235]	3.408	0.573	2.500	3.334	4.733	FALSE	1.000	1.001
## sigma_ea[236]	3.362	0.569	2.462	3.289	4.677	FALSE	1.000	1.002
## sigma_ea[237]	2.961	0.533	2.107	2.894	4.192	FALSE	1.000	1.002
## sigma_ea[238]	3.210	0.546	2.348	3.137	4.477	FALSE	1.000	1.001
## sigma_ea[239]	3.301	0.570	2.395	3.230	4.620	FALSE	1.000	1.000
## sigma_ea[240]	2.893	0.529	2.044	2.828	4.113	FALSE	1.000	1.003
## sigma_ea[241]	4.160	0.650	3.060	4.103	5.595	FALSE	1.000	1.002
## sigma_ea[242]	3.440	0.454	2.661	3.402	4.436	FALSE	1.000	1.001
## sigma_ea[243]	3.317	0.464	2.530	3.273	4.333	FALSE	1.000	1.004
## sigma_ea[244]	3.644	0.487	2.803	3.605	4.704	FALSE	1.000	1.002
## sigma_ea[245]	4.043	0.634	2.979	3.986	5.448	FALSE	1.000	1.002
## sigma_ea[246]	2.934	0.395	2.244	2.903	3.787	FALSE	1.000	1.002
## sigma_ea[247]	3.198	0.427	2.469	3.161	4.141	FALSE	1.000	1.001
## sigma_ea[248]	3.152	0.424	2.429	3.115	4.088	FALSE	1.000	1.001
## sigma_ea[249]	2.751	0.388	2.086	2.715	3.604	FALSE	1.000	1.001
## sigma_ea[250]	3.000	0.400	2.306	2.968	3.868	FALSE	1.000	1.002
## sigma_ea[251]	3.092	0.424	2.377	3.051	4.022	FALSE	1.000	1.002
## sigma_ea[252]	2.684	0.385	2.020	2.649	3.528	FALSE	1.000	1.002
## sigma_ea[253]	4.075	0.706	2.886	4.013	5.655	FALSE	1.000	1.011

## sigma_ea[254]	3.355	0.519	2.501	3.299	4.529	FALSE	1.000	1.014
## sigma_ea[255]	3.232	0.532	2.360	3.175	4.435	FALSE	1.000	1.022
## sigma_ea[256]	3.559	0.555	2.640	3.501	4.806	FALSE	1.000	1.015
## sigma_ea[257]	3.958	0.688	2.802	3.897	5.498	FALSE	1.000	1.010
## sigma_ea[258]	2.849	0.461	2.078	2.802	3.885	FALSE	1.000	1.021
## sigma_ea[259]	3.113	0.487	2.314	3.061	4.220	FALSE	1.000	1.013
## sigma_ea[260]	3.067	0.483	2.275	3.016	4.165	FALSE	1.000	1.013
## sigma_ea[261]	2.666	0.446	1.929	2.618	3.677	FALSE	1.000	1.019
## sigma_ea[262]	2.915	0.468	2.133	2.866	3.968	FALSE	1.000	1.022
## sigma_ea[263]	3.007	0.490	2.204	2.953	4.122	FALSE	1.000	1.021
## sigma_ea[264]	2.599	0.441	1.865	2.552	3.593	FALSE	1.000	1.019
## sigma_ea[265]	4.268	0.693	3.083	4.203	5.809	FALSE	1.000	1.003
## sigma_ea[266]	3.548	0.485	2.709	3.508	4.613	FALSE	1.000	1.001
## sigma_ea[267]	3.425	0.496	2.585	3.379	4.516	FALSE	1.000	1.004
## sigma_ea[268]	3.752	0.522	2.845	3.709	4.892	FALSE	1.000	1.003
## sigma_ea[269]	4.151	0.675	3.002	4.088	5.658	FALSE	1.000	1.002
## sigma_ea[270]	3.042	0.408	2.336	3.008	3.943	FALSE	1.000	1.000
## sigma_ea[271]	3.306	0.451	2.528	3.268	4.297	FALSE	1.000	1.001
## sigma_ea[272]	3.260	0.446	2.492	3.223	4.240	FALSE	1.000	1.001
## sigma_ea[273]	2.859	0.404	2.175	2.825	3.759	FALSE	1.000	1.001
## sigma_ea[274]	3.108	0.416	2.390	3.072	4.029	FALSE	1.000	1.000
## sigma_ea[275]	3.199	0.451	2.438	3.159	4.193	FALSE	1.000	1.002
## sigma_ea[276]	2.791	0.398	2.116	2.757	3.677	FALSE	1.000	1.001
## sigma_ea[277]	4.403	0.730	3.155	4.334	6.016	FALSE	1.000	1.008
## sigma_ea[278]	3.683	0.524	2.787	3.635	4.842	FALSE	1.000	1.006
## sigma_ea[279]	3.560	0.529	2.667	3.511	4.733	FALSE	1.000	1.011
## sigma_ea[280]	3.887	0.559	2.922	3.838	5.117	FALSE	1.000	1.008
## sigma_ea[281]	4.286	0.713	3.072	4.219	5.869	FALSE	1.000	1.006
## sigma_ea[282]	3.177	0.443	2.436	3.130	4.169	FALSE	1.000	1.003
## sigma_ea[283]	3.441	0.492	2.607	3.393	4.537	FALSE	1.000	1.005
## sigma_ea[284]	3.395	0.488	2.574	3.347	4.483	FALSE	1.000	1.005
## sigma_ea[285]	2.994	0.442	2.263	2.949	3.983	FALSE	1.000	1.004
## sigma_ea[286]	3.243	0.451	2.488	3.197	4.253	FALSE	1.000	1.003
## sigma_ea[287]	3.334	0.487	2.519	3.287	4.412	FALSE	1.000	1.008
## sigma_ea[288]	2.926	0.437	2.203	2.881	3.904	FALSE	1.000	1.004
## sigma_ea[289]	3.073	0.455	2.324	3.021	4.107	FALSE	1.000	1.005
## sigma_ea[290]	2.353	0.261	1.891	2.336	2.913	FALSE	1.000	1.002
## sigma_ea[291]	2.231	0.286	1.730	2.208	2.861	FALSE	1.000	1.008
## sigma_ea[292]	2.557	0.290	2.057	2.532	3.189	FALSE	1.000	1.005
## sigma_ea[293]	2.957	0.442	2.232	2.905	3.954	FALSE	1.000	1.003
## sigma_ea[294]	1.848	0.273	1.339	1.840	2.403	FALSE	1.000	1.001
## sigma_ea[295]	2.112	0.249	1.652	2.101	2.631	FALSE	1.000	1.005
## sigma_ea[296]	2.066	0.250	1.602	2.056	2.584	FALSE	1.000	1.006
## sigma_ea[297]	1.665	0.243	1.214	1.658	2.167	FALSE	1.000	1.002
## sigma_ea[298]	1.914	0.272	1.410	1.904	2.473	FALSE	1.000	1.000
## sigma_ea[299]	2.005	0.252	1.554	1.988	2.543	FALSE	1.000	1.002
## sigma_ea[300]	1.597	0.248	1.134	1.592	2.107	FALSE	1.000	1.004
## sigma_ea[301]	4.049	0.655	2.950	3.983	5.522	FALSE	1.000	1.001
## sigma_ea[302]	3.329	0.459	2.562	3.280	4.368	FALSE	1.000	1.000
## sigma_ea[303]	3.206	0.473	2.427	3.151	4.275	FALSE	1.000	1.002
## sigma_ea[304]	3.533	0.493	2.703	3.482	4.636	FALSE	1.000	1.001
## sigma_ea[305]	3.932	0.638	2.867	3.866	5.371	FALSE	1.000	1.001
## sigma_ea[306]	2.823	0.400	2.141	2.790	3.710	FALSE	1.000	1.001
## sigma_ea[307]	3.087	0.431	2.368	3.044	4.063	FALSE	1.000	1.002

## sigma_ea[308]	3.041	0.427	2.326	2.998	4.007	FALSE	1.000	1.002
## sigma_ea[309]	2.640	0.395	1.982	2.602	3.538	FALSE	1.000	1.002
## sigma_ea[310]	2.889	0.406	2.200	2.855	3.790	FALSE	1.000	1.001
## sigma_ea[311]	2.980	0.433	2.272	2.932	3.963	FALSE	1.000	1.000
## sigma_ea[312]	2.572	0.392	1.915	2.536	3.459	FALSE	1.000	1.002
## sigma_ea[313]	4.206	0.671	3.081	4.144	5.689	FALSE	1.000	1.001
## sigma_ea[314]	3.486	0.467	2.696	3.440	4.525	FALSE	1.000	1.002
## sigma_ea[315]	3.364	0.481	2.564	3.311	4.442	FALSE	1.000	1.001
## sigma_ea[316]	3.690	0.505	2.831	3.643	4.810	FALSE	1.000	1.001
## sigma_ea[317]	4.089	0.653	2.994	4.028	5.535	FALSE	1.000	1.001
## sigma_ea[318]	2.980	0.393	2.311	2.942	3.856	FALSE	1.000	1.005
## sigma_ea[319]	3.244	0.434	2.515	3.201	4.213	FALSE	1.000	1.005
## sigma_ea[320]	3.198	0.429	2.476	3.156	4.157	FALSE	1.000	1.006
## sigma_ea[321]	2.797	0.390	2.154	2.755	3.670	FALSE	1.000	1.007
## sigma_ea[322]	3.046	0.401	2.365	3.006	3.941	FALSE	1.000	1.004
## sigma_ea[323]	3.138	0.437	2.416	3.090	4.121	FALSE	1.000	1.002
## sigma_ea[324]	2.730	0.385	2.093	2.689	3.591	FALSE	1.000	1.009
## sigma_ea[325]	4.222	0.675	3.076	4.161	5.710	FALSE	1.000	1.001
## sigma_ea[326]	3.502	0.464	2.703	3.463	4.520	FALSE	1.000	1.000
## sigma_ea[327]	3.380	0.477	2.576	3.335	4.432	FALSE	1.000	1.001
## sigma_ea[328]	3.706	0.501	2.839	3.665	4.804	FALSE	1.000	1.000
## sigma_ea[329]	4.106	0.657	2.994	4.046	5.558	FALSE	1.000	1.001
## sigma_ea[330]	2.996	0.386	2.325	2.965	3.840	FALSE	1.000	1.002
## sigma_ea[331]	3.260	0.430	2.522	3.223	4.209	FALSE	1.000	1.002
## sigma_ea[332]	3.215	0.425	2.483	3.178	4.153	FALSE	1.000	1.003
## sigma_ea[333]	2.813	0.385	2.166	2.777	3.665	FALSE	1.000	1.003
## sigma_ea[334]	3.062	0.394	2.380	3.029	3.925	FALSE	1.000	1.001
## sigma_ea[335]	3.154	0.431	2.429	3.113	4.104	FALSE	1.000	1.000
## sigma_ea[336]	2.746	0.379	2.106	2.711	3.582	FALSE	1.000	1.004
## alfa_sd	2.490	0.146	2.224	2.484	2.794	FALSE	1.000	1.001
## beta_sd	-0.429	0.070	-0.566	-0.429	-0.287	FALSE	1.000	1.001
## sigma_spline1	1.908	1.287	0.184	1.676	5.091	FALSE	1.000	1.005
## sigma_spline2	2.158	1.406	0.346	1.857	5.740	FALSE	1.000	1.021
## deviance	961.077	23.177	917.303	960.500	1008.161	FALSE	1.000	1.000
##	n.eff							
## beta0	32							
## beta1[1]	968							
## beta1[2]	571							
## beta1[3]	19432							
## beta1[4]	1575							
## beta2	68							
## beta_PC1[1]	97							
## beta_PC1[2]	546							
## beta_PC1[3]	251							
## beta_PC1[4]	312							
## beta_PC1[5]	306							
## beta_PC1[6]	2807							
## beta_PC2[1]	75							
## beta_PC2[2]	128							
## beta_PC2[3]	49							
## beta_PC2[4]	136							
## beta_PC2[5]	85							
## beta_PC2[6]	84							
## sigma_site	1168							

```

## sigma_ea[1]      568
## sigma_ea[2]     1487
## sigma_ea[3]      236
## sigma_ea[4]      441
## sigma_ea[5]      879
## sigma_ea[6]     2639
## sigma_ea[7]    28185
## sigma_ea[8]     7548
## sigma_ea[9]     5788
## sigma_ea[10]    2081
## sigma_ea[11]     559
## sigma_ea[12]    2703
## sigma_ea[13]     668
## sigma_ea[14]    8310
## sigma_ea[15]     269
## sigma_ea[16]     563
## sigma_ea[17]    1241
## sigma_ea[18]    1214
## sigma_ea[19]    1025
## sigma_ea[20]     673
## sigma_ea[21]     848
## sigma_ea[22]    1605
## sigma_ea[23]     984
## sigma_ea[24]     543
## sigma_ea[25]     369
## sigma_ea[26]     523
## sigma_ea[27]     133
## sigma_ea[28]     214
## sigma_ea[29]     554
## sigma_ea[30]    8016
## sigma_ea[31]    2402
## sigma_ea[32]    1956
## sigma_ea[33]   48000
## sigma_ea[34]    3036
## sigma_ea[35]     288
## sigma_ea[36]    4317
## sigma_ea[37]     343
## sigma_ea[38]     285
## sigma_ea[39]     146
## sigma_ea[40]     170
## sigma_ea[41]     493
## sigma_ea[42]    4615
## sigma_ea[43]     406
## sigma_ea[44]     391
## sigma_ea[45]    1037
## sigma_ea[46]    3304
## sigma_ea[47]     311
## sigma_ea[48]     855
## sigma_ea[49]     829
## sigma_ea[50]   37439
## sigma_ea[51]     332
## sigma_ea[52]     753
## sigma_ea[53]    1688
## sigma_ea[54]     971

```

```

## sigma_ea[55]      683
## sigma_ea[56]      483
## sigma_ea[57]      643
## sigma_ea[58]     1386
## sigma_ea[59]     1527
## sigma_ea[60]      432
## sigma_ea[61]      736
## sigma_ea[62]     4374
## sigma_ea[63]      443
## sigma_ea[64]      874
## sigma_ea[65]     1186
## sigma_ea[66]     1464
## sigma_ea[67]     4502
## sigma_ea[68]     2694
## sigma_ea[69]     1923
## sigma_ea[70]     1544
## sigma_ea[71]     1143
## sigma_ea[72]     1348
## sigma_ea[73]      477
## sigma_ea[74]     1871
## sigma_ea[75]      186
## sigma_ea[76]      336
## sigma_ea[77]      792
## sigma_ea[78]     1346
## sigma_ea[79]     2534
## sigma_ea[80]     1345
## sigma_ea[81]     1376
## sigma_ea[82]     1412
## sigma_ea[83]      518
## sigma_ea[84]      856
## sigma_ea[85]      957
## sigma_ea[86]     8222
## sigma_ea[87]      505
## sigma_ea[88]     1171
## sigma_ea[89]     1614
## sigma_ea[90]     1116
## sigma_ea[91]     2459
## sigma_ea[92]     1587
## sigma_ea[93]     1254
## sigma_ea[94]     1301
## sigma_ea[95]     1353
## sigma_ea[96]      862
## sigma_ea[97]      491
## sigma_ea[98]      598
## sigma_ea[99]      238
## sigma_ea[100]     345
## sigma_ea[101]     665
## sigma_ea[102]     2985
## sigma_ea[103]     1333
## sigma_ea[104]     1445
## sigma_ea[105]     2749
## sigma_ea[106]     1563
## sigma_ea[107]      421
## sigma_ea[108]     3790

```

```
## sigma_ea[109] 1283
## sigma_ea[110] 8651
## sigma_ea[111] 648
## sigma_ea[112] 1348
## sigma_ea[113] 2250
## sigma_ea[114] 3220
## sigma_ea[115] 4946
## sigma_ea[116] 2814
## sigma_ea[117] 3441
## sigma_ea[118] 4318
## sigma_ea[119] 2206
## sigma_ea[120] 1701
## sigma_ea[121] 485
## sigma_ea[122] 461
## sigma_ea[123] 236
## sigma_ea[124] 314
## sigma_ea[125] 637
## sigma_ea[126] 1720
## sigma_ea[127] 648
## sigma_ea[128] 648
## sigma_ea[129] 991
## sigma_ea[130] 1241
## sigma_ea[131] 385
## sigma_ea[132] 1000
## sigma_ea[133] 481
## sigma_ea[134] 710
## sigma_ea[135] 224
## sigma_ea[136] 354
## sigma_ea[137] 670
## sigma_ea[138] 3629
## sigma_ea[139] 2821
## sigma_ea[140] 3431
## sigma_ea[141] 8382
## sigma_ea[142] 1751
## sigma_ea[143] 421
## sigma_ea[144] 38729
## sigma_ea[145] 427
## sigma_ea[146] 1498
## sigma_ea[147] 192
## sigma_ea[148] 335
## sigma_ea[149] 688
## sigma_ea[150] 2015
## sigma_ea[151] 6795
## sigma_ea[152] 2815
## sigma_ea[153] 2555
## sigma_ea[154] 1878
## sigma_ea[155] 523
## sigma_ea[156] 1472
## sigma_ea[157] 446
## sigma_ea[158] 400
## sigma_ea[159] 189
## sigma_ea[160] 224
## sigma_ea[161] 694
## sigma_ea[162] 4861
```

```
## sigma_ea[163]    410
## sigma_ea[164]    366
## sigma_ea[165]    966
## sigma_ea[166]   8611
## sigma_ea[167]    498
## sigma_ea[168]    674
## sigma_ea[169]    699
## sigma_ea[170]   1806
## sigma_ea[171]    370
## sigma_ea[172]    639
## sigma_ea[173]   1048
## sigma_ea[174]   5165
## sigma_ea[175]  24302
## sigma_ea[176]  14702
## sigma_ea[177] 41500
## sigma_ea[178]   3173
## sigma_ea[179]    851
## sigma_ea[180] 10413
## sigma_ea[181]   2256
## sigma_ea[182]   6847
## sigma_ea[183]   1222
## sigma_ea[184]   3682
## sigma_ea[185]   3507
## sigma_ea[186]    904
## sigma_ea[187]   1667
## sigma_ea[188]   1294
## sigma_ea[189]    963
## sigma_ea[190]   1086
## sigma_ea[191]   2179
## sigma_ea[192]    738
## sigma_ea[193]    840
## sigma_ea[194]   1926
## sigma_ea[195]    452
## sigma_ea[196]    741
## sigma_ea[197]   1296
## sigma_ea[198] 48000
## sigma_ea[199]   4384
## sigma_ea[200]   3416
## sigma_ea[201] 21086
## sigma_ea[202] 12698
## sigma_ea[203]   1156
## sigma_ea[204]   5474
## sigma_ea[205]   1329
## sigma_ea[206]   4946
## sigma_ea[207]    767
## sigma_ea[208]   1369
## sigma_ea[209]   2259
## sigma_ea[210] 15730
## sigma_ea[211]   5036
## sigma_ea[212]   3369
## sigma_ea[213]   8020
## sigma_ea[214] 27802
## sigma_ea[215]   2619
## sigma_ea[216]   3185
```

```
## sigma_ea[217] 1836
## sigma_ea[218] 9442
## sigma_ea[219] 928
## sigma_ea[220] 3003
## sigma_ea[221] 3199
## sigma_ea[222] 752
## sigma_ea[223] 1267
## sigma_ea[224] 950
## sigma_ea[225] 775
## sigma_ea[226] 937
## sigma_ea[227] 2069
## sigma_ea[228] 574
## sigma_ea[229] 7368
## sigma_ea[230] 19359
## sigma_ea[231] 4516
## sigma_ea[232] 26507
## sigma_ea[233] 26186
## sigma_ea[234] 1692
## sigma_ea[235] 1734
## sigma_ea[236] 1339
## sigma_ea[237] 1394
## sigma_ea[238] 2497
## sigma_ea[239] 28151
## sigma_ea[240] 983
## sigma_ea[241] 1096
## sigma_ea[242] 5101
## sigma_ea[243] 561
## sigma_ea[244] 1160
## sigma_ea[245] 1741
## sigma_ea[246] 2206
## sigma_ea[247] 15116
## sigma_ea[248] 6644
## sigma_ea[249] 3725
## sigma_ea[250] 2227
## sigma_ea[251] 1405
## sigma_ea[252] 2259
## sigma_ea[253] 187
## sigma_ea[254] 157
## sigma_ea[255] 104
## sigma_ea[256] 144
## sigma_ea[257] 200
## sigma_ea[258] 107
## sigma_ea[259] 171
## sigma_ea[260] 173
## sigma_ea[261] 118
## sigma_ea[262] 106
## sigma_ea[263] 109
## sigma_ea[264] 119
## sigma_ea[265] 1119
## sigma_ea[266] 2073
## sigma_ea[267] 607
## sigma_ea[268] 931
## sigma_ea[269] 1715
## sigma_ea[270] 48000
```



```

## sigma_ea[271] 3043
## sigma_ea[272] 2541
## sigma_ea[273] 8327
## sigma_ea[274] 25427
## sigma_ea[275] 1534
## sigma_ea[276] 3996
## sigma_ea[277] 447
## sigma_ea[278] 399
## sigma_ea[279] 248
## sigma_ea[280] 305
## sigma_ea[281] 543
## sigma_ea[282] 757
## sigma_ea[283] 536
## sigma_ea[284] 556
## sigma_ea[285] 647
## sigma_ea[286] 640
## sigma_ea[287] 347
## sigma_ea[288] 708
## sigma_ea[289] 757
## sigma_ea[290] 933
## sigma_ea[291] 326
## sigma_ea[292] 464
## sigma_ea[293] 1294
## sigma_ea[294] 3536
## sigma_ea[295] 563
## sigma_ea[296] 455
## sigma_ea[297] 944
## sigma_ea[298] 16532
## sigma_ea[299] 1097
## sigma_ea[300] 580
## sigma_ea[301] 2241
## sigma_ea[302] 48000
## sigma_ea[303] 1183
## sigma_ea[304] 3229
## sigma_ea[305] 4640
## sigma_ea[306] 1796
## sigma_ea[307] 2370
## sigma_ea[308] 1610
## sigma_ea[309] 1646
## sigma_ea[310] 2684
## sigma_ea[311] 5659
## sigma_ea[312] 1025
## sigma_ea[313] 7735
## sigma_ea[314] 3084
## sigma_ea[315] 3306
## sigma_ea[316] 32581
## sigma_ea[317] 12805
## sigma_ea[318] 470
## sigma_ea[319] 604
## sigma_ea[320] 488
## sigma_ea[321] 426
## sigma_ea[322] 625
## sigma_ea[323] 2881
## sigma_ea[324] 324

```

```

## sigma_ea[325] 3814
## sigma_ea[326] 22306
## sigma_ea[327] 1978
## sigma_ea[328] 6087
## sigma_ea[329] 10668
## sigma_ea[330] 1360
## sigma_ea[331] 1336
## sigma_ea[332] 988
## sigma_ea[333] 1059
## sigma_ea[334] 2282
## sigma_ea[335] 30246
## sigma_ea[336] 689
## alfa_sd 2007
## beta_sd 1831
## sigma_spline1 1160
## sigma_spline2 435
## deviance 13563
##
## Successful convergence based on Rhat values (all < 1.1).
## Rhat is the potential scale reduction factor (at convergence, Rhat=1).
## For each parameter, n.eff is a crude measure of effective sample size.
##
## overlap0 checks if 0 falls in the parameter's 95% credible interval.
## f is the proportion of the posterior with the same sign as the mean;
## i.e., our confidence that the parameter is positive or negative.
##
## DIC info: (pD = var(deviance)/2)
## pD = 268.5 and DIC = 1229.626
## DIC is an estimate of expected predictive error (lower is better).

```

```
model_splines2$DIC
```

```
## [1] 1229.626
```

```
#traceplot(model_splines2)
```