

Final

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2025-03-20

R Markdown

```
ufo_raw <- read.csv("ufo_sightings_scrubbed.csv")
#convert date time to ymd_hms format
ufo_raw$datetime <- ymd_hms(ufo_raw$datetime)

#cleaning data
ufo<- ufo_raw|>
  mutate(seconds = duration..seconds.,
         year = year(datetime), #create year column
         month = month.name[month(datetime)])|> #create month column and convert to name
  select(datetime, city, state, country, seconds, latitude, longitude, year, month)

ufo$latitude <- as.numeric(ufo$latitude) #chaning lat to numeric

## Warning: NAs introduced by coercion
```

Including Plots

Longitude and latitude histogram

```
long_hist <- ggplot(
  data = ufo,
  mapping = aes( x= longitude
  )
)+>
  geom_histogram(fill = "olivedrab",
                 color = "black",
                 bins = 40)+>
  labs(
    title = "Number of sightings per longitude",
    x = "Longitude",
    y = "Number of Sightings"
  )+>
  scale_x_continuous(breaks = seq(-200, 200, 20))+>
  scale_y_continuous(expand = c(0, 0, 0.05, 0))

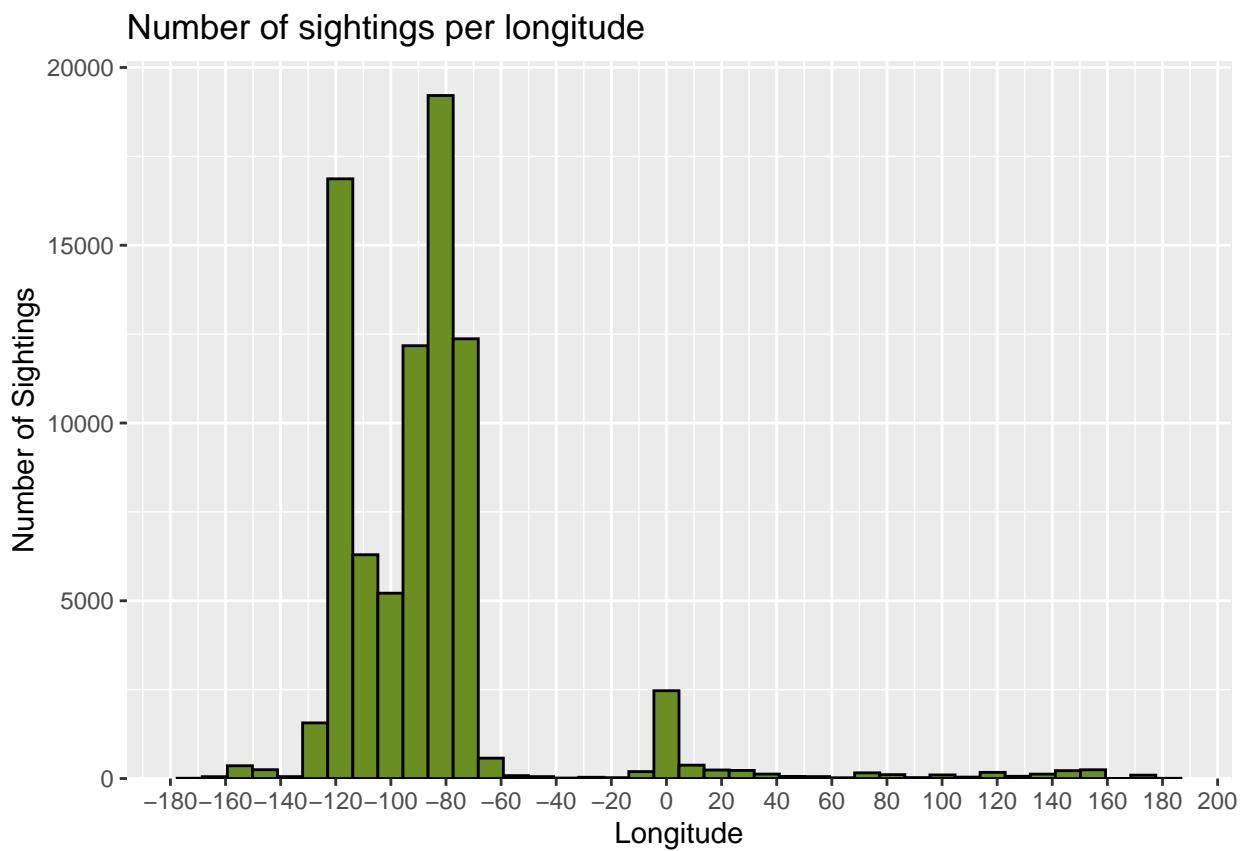
lat_hist <- ggplot(
  data = ufo,
  mapping = aes( x= latitude
```

```

)
)+>
  geom_histogram(fill = "olivedrab",
                 color = "black",
                 bins = 40)+>
  labs(
    title = "Number of sightings per lattitude",
    x = "Latitude",
    y = "Number of Sightings"
)+>
  scale_x_continuous(breaks = seq(-100, 100, 20))+>
  scale_y_continuous(expand = c(0, 0, 0.05, 0))

long_hist

```



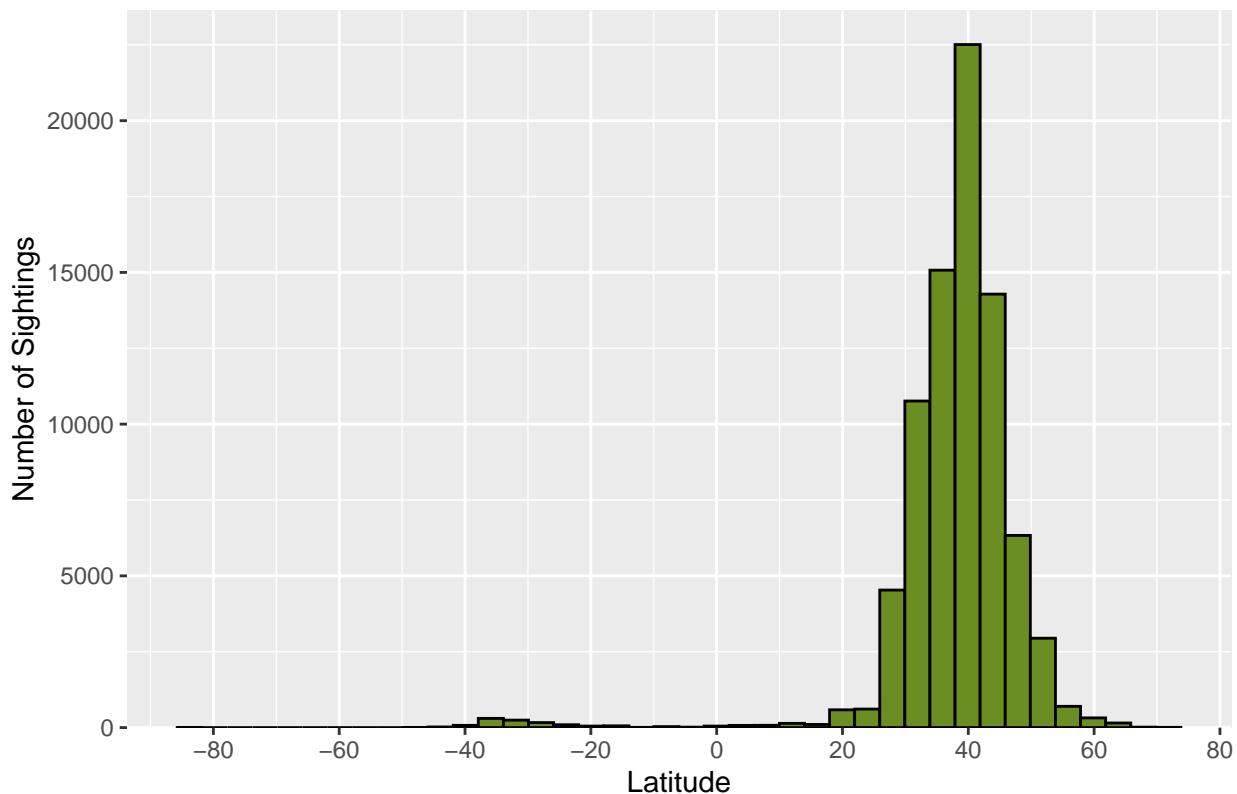
```
lat_hist
```

```

## Warning: Removed 1 row containing non-finite outside the scale range
## (`stat_bin()`).

```

Number of sightings per latitude



Observations * Longitudes of sightings appear to be concentrated around -120 through -70 (Number of sightings per longitude) * Latitude of sightings appear to be concentrated around 30 through 50 (Number of sightings per latitude)

Scatter plot of sighting locations

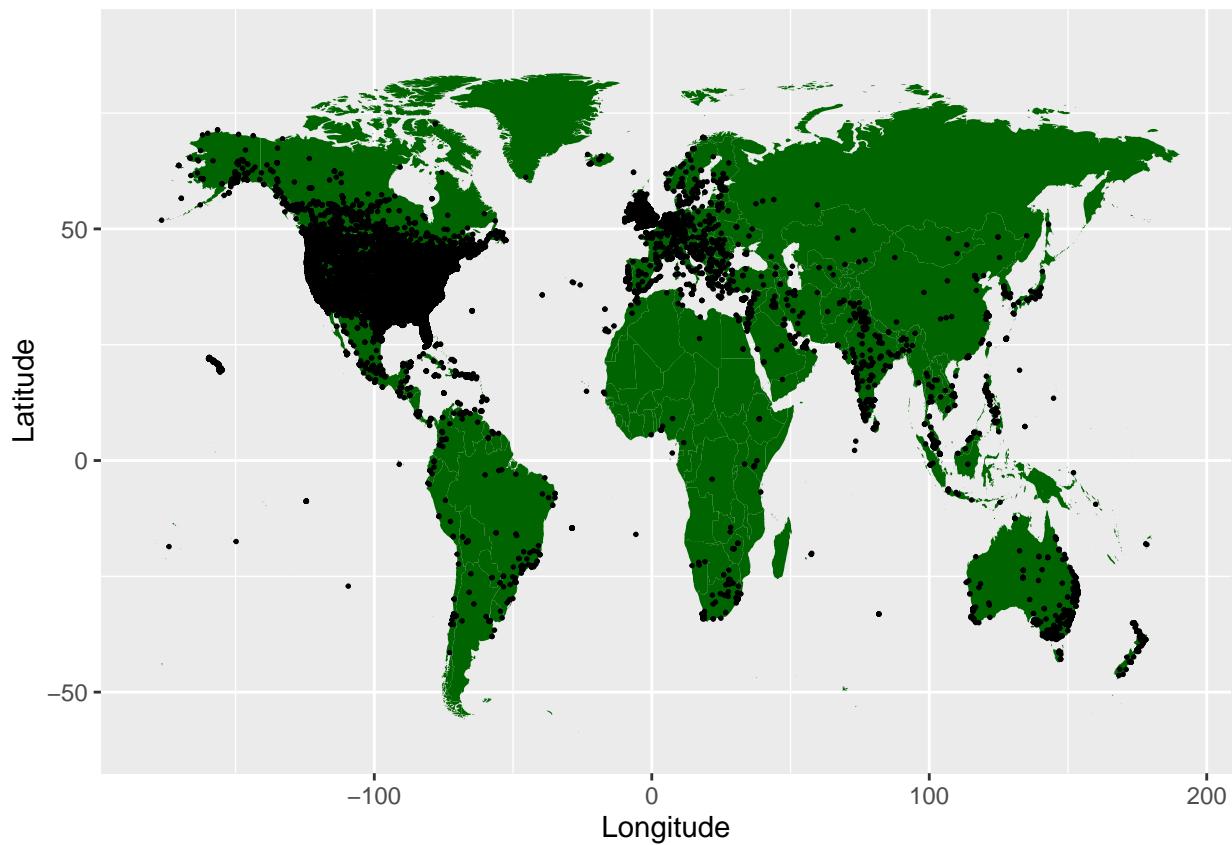
```
map <- map_data("world")

map_plot <- ggplot()+
  geom_polygon(data = map,
               mapping = aes(x= long,
                             y = lat,
                             group = group),
               fill = "darkgreen")+
  geom_point(data = ufo,
             mapping = aes(x = longitude,
                           y = latitude),
             size = 0.3)+

  labs(
    x = "Longitude",
    y = "Latitude"
  )+
  scale_y_continuous(expand = c(0, 0, 0.05, 0))+

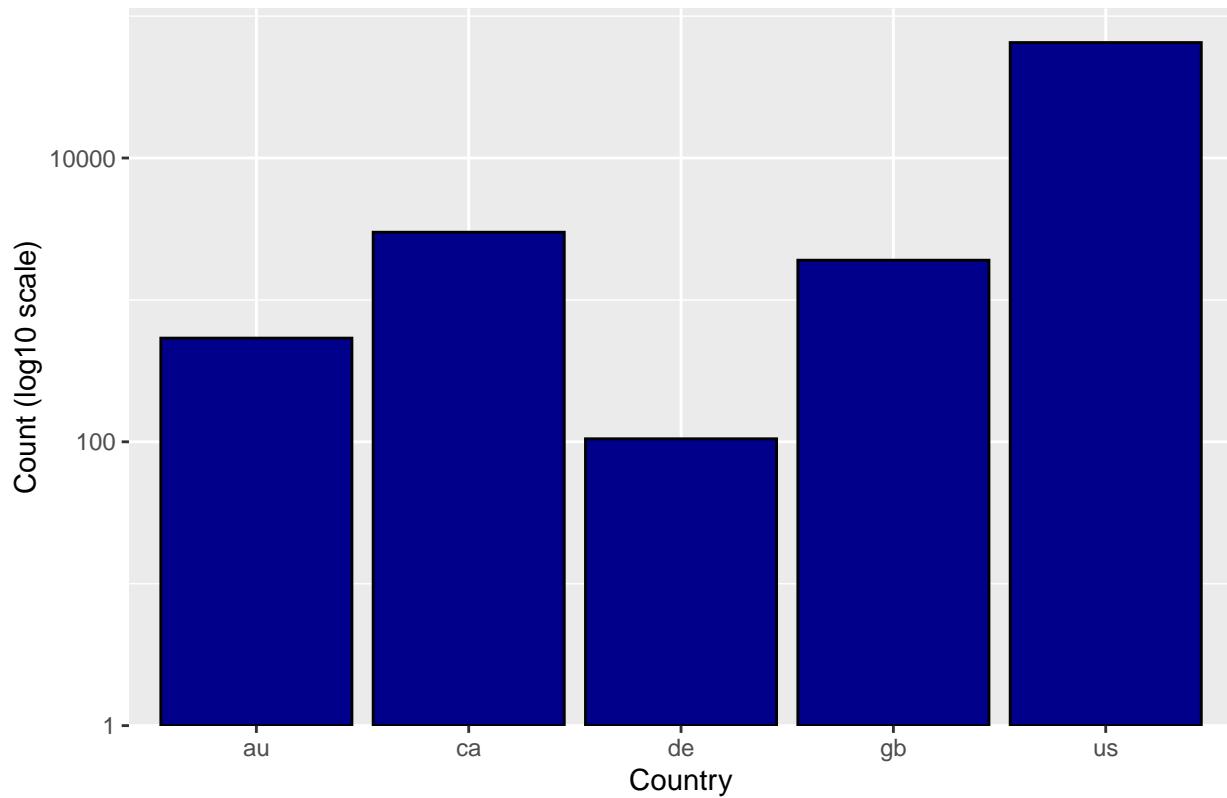
## Scale for y is already present.
## Adding another scale for y, which will replace the existing scale.
```

```
map_plot  
## Warning: Removed 2 rows containing missing values or values outside the scale range  
## (`geom_point()`).
```



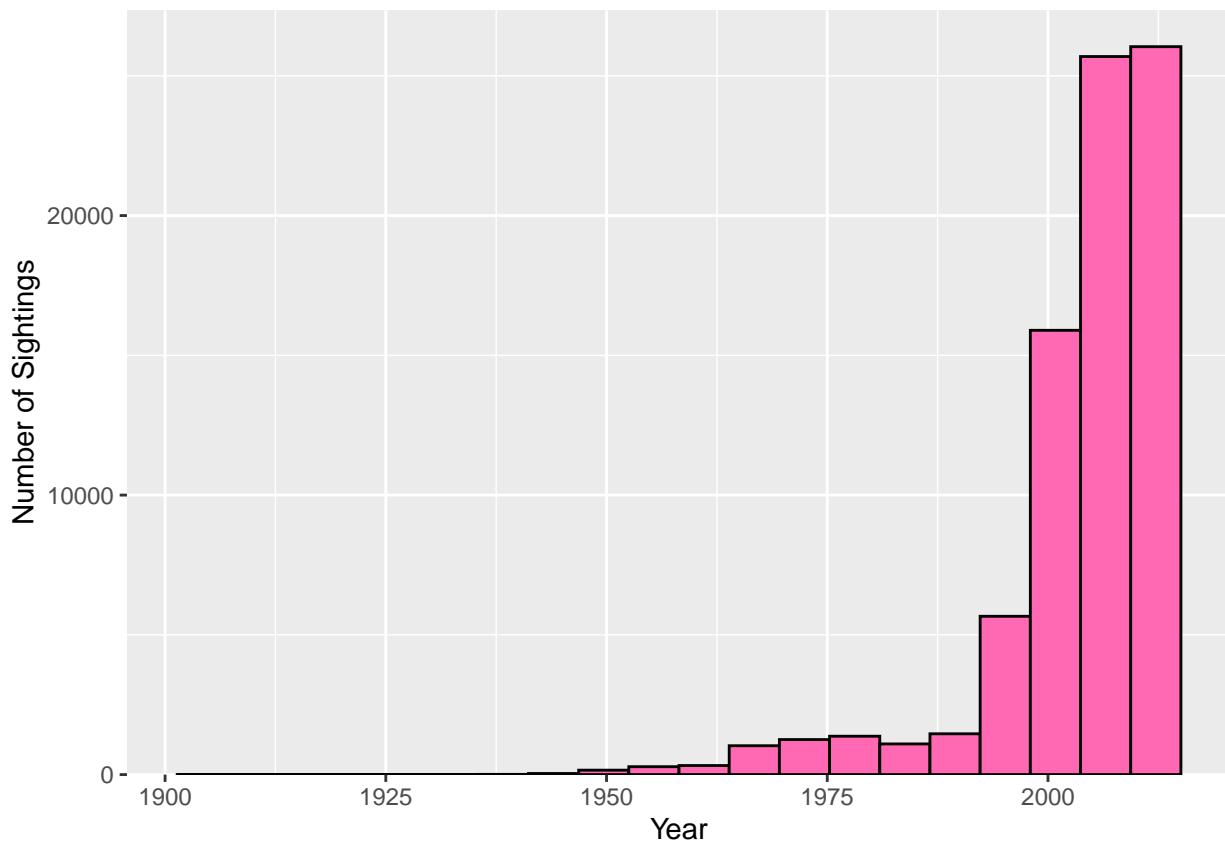
```
modified_data = ufo |> filter(country != "")  
  
ggplot(data = modified_data,  
       mapping = aes(x = country))+  
  geom_bar(fill = "blue4",  
           color = "black",  
           na.rm = T)+  
  scale_y_log10(expand = c(0, 0, 0.05, 0))+  
  labs(title = "Total number of sightings per country",  
       x = "Country",  
       y = "Count (log10 scale)")
```

Total number of sightings per country



Bar graph of sightings per year

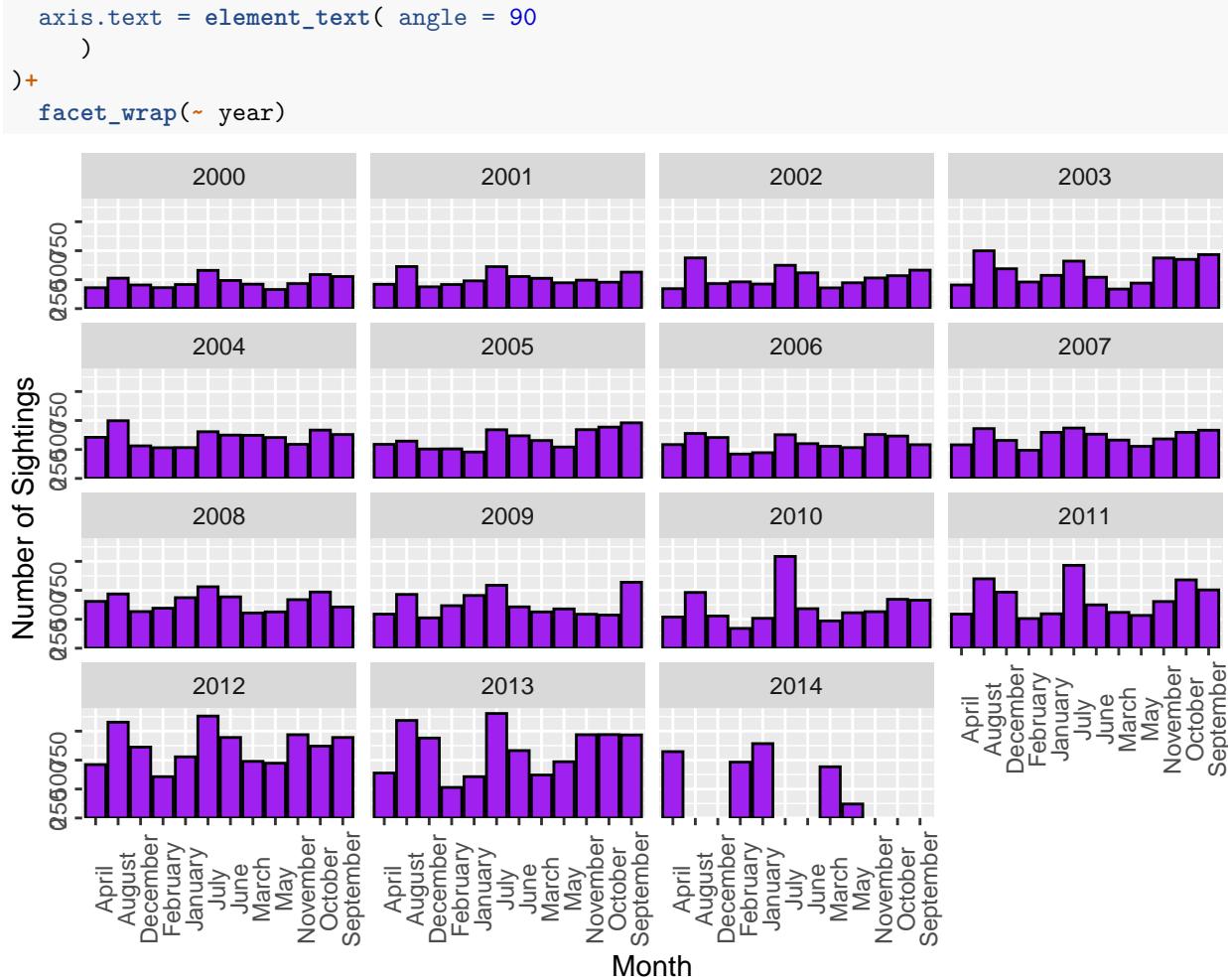
```
ggplot( data = ufo,
        mapping = aes(x = year))+
  geom_histogram(fill = "hotpink",
                 color = "black",
                 bins = 20) +
  labs(
    x = "Year",
    y = "Number of Sightings"
  ) +
  scale_y_continuous(expand = c(0, 0, 0.05, 0))
```



```
by_month <- ggplot( data = ufo,
                     mapping = aes(x = month))+
  geom_bar(fill = "purple",
           color = "black")+
  labs(
    x = "Month",
    y = "Number of Sightings"
  )+
  scale_y_continuous(expand = c(0, 0, 0.05, 0))+
  theme(
    axis.text = element_text( angle = 90
      )
)
)
```

```
ufo_2000<- ufo|>
  filter(year >= 2000)

ggplot( data = ufo_2000,
        mapping = aes(x = month))+
  geom_bar(fill = "purple",
           color = "black")+
  labs(
    x = "Month",
    y = "Number of Sightings"
  )+
  scale_y_continuous(expand = c(0, 0, 0.05, 0))+
  theme(
```



linear regression

```

ufo|>
# filter(seconds > 0)|>
ggplot(
  mapping = aes(x = longitude,
                 y = seconds))+

  geom_point()+
  geom_smooth()

## `geom_smooth()` using method = 'gam' and formula = 'y ~ s(x, bs = "cs")'

## Warning: Failed to fit group 2.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 3.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 4.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 5.

```

```

## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 6.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 7.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 9.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 12.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 13.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 14.
## Caused by error in `gam.reparam()`:
## ! NA/Nan/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 20.
## Caused by error in `gam.reparam()`:
## ! NA/Nan/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 21.
## Caused by error in `gam.reparam()`:
## ! NA/Nan/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 22.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 23.
## Caused by error in `gam.reparam()`:
## ! NA/Nan/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 26.
## Caused by error in `gam.reparam()`:
## ! NA/Nan/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 27.
## Caused by error in `gam.reparam()`:
## ! NA/Nan/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 28.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 32.
## Caused by error in `gam.reparam()`:
## ! NA/Nan/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 37.
## Caused by error in `gam.reparam()`:

```

```
## ! NA/Nan/Inf in foreign function call (arg 3)
## Warning: Failed to fit group 38.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 40.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 47.
## Caused by error in `gam.reparam()`:
## ! NA/Nan/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 48.
## Caused by error in `gam.reparam()`:
## ! NA/Nan/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 54.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 55.
## Caused by error in `gam.reparam()`:
## ! NA/Nan/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 56.
## Caused by error in `gam.reparam()`:
## ! NA/Nan/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 57.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 64.
## Caused by error in `gam.reparam()`:
## ! NA/Nan/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 66.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 67.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
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## Warning: Failed to fit group 68.
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## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 69.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 73.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 74.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
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```

```
## Warning: Failed to fit group 78.  
## Caused by error in `gam.reparam()`:  
## ! NA/Nan/Inf in foreign function call (arg 3)  
  
## Warning: Failed to fit group 79.  
## Caused by error in `gam.reparam()`:  
## ! NA/Nan/Inf in foreign function call (arg 3)  
  
## Warning: Failed to fit group 82.  
## Caused by error in `smooth.construct.cr.smooth.spec()`:  
## ! x has insufficient unique values to support 10 knots: reduce k.  
  
## Warning: Failed to fit group 83.  
## Caused by error in `gam.reparam()`:  
## ! NA/Nan/Inf in foreign function call (arg 3)  
  
## Warning: Failed to fit group 85.  
## Caused by error in `smooth.construct.cr.smooth.spec()`:  
## ! x has insufficient unique values to support 10 knots: reduce k.  
  
## Warning: Failed to fit group 87.  
## Caused by error in `smooth.construct.cr.smooth.spec()`:  
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## Warning: Failed to fit group 89.  
## Caused by error in `smooth.construct.cr.smooth.spec()`:  
## ! x has insufficient unique values to support 10 knots: reduce k.  
  
## Warning: Failed to fit group 100.  
## Caused by error in `smooth.construct.cr.smooth.spec()`:  
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## Warning: Failed to fit group 104.  
## Caused by error in `gam.reparam()`:  
## ! NA/Nan/Inf in foreign function call (arg 3)  
  
## Warning: Failed to fit group 105.  
## Caused by error in `gam.reparam()`:  
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## Warning: Failed to fit group 110.  
## Caused by error in `smooth.construct.cr.smooth.spec()`:  
## ! x has insufficient unique values to support 10 knots: reduce k.  
  
## Warning: Failed to fit group 115.  
## Caused by error in `smooth.construct.cr.smooth.spec()`:  
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## Warning: Failed to fit group 118.  
## Caused by error in `gam.reparam()`:  
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## Warning: Failed to fit group 119.  
## Caused by error in `smooth.construct.cr.smooth.spec()`:  
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## Warning: Failed to fit group 120.  
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## ! x has insufficient unique values to support 10 knots: reduce k.  
  
## Warning: Failed to fit group 121.
```

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## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 124.
## Caused by error in `gam.reparam()`:
## ! NA/Nan/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 125.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 126.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
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## Warning: Failed to fit group 127.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
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## Warning: Failed to fit group 129.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
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## Warning: Failed to fit group 133.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
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## Warning: Failed to fit group 134.
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## Warning: Failed to fit group 135.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
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## Warning: Failed to fit group 139.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 140.
## Caused by error in `gam.reparam()`:
## ! NA/Nan/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 145.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 148.
## Caused by error in `gam.reparam()`:
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## Warning: Failed to fit group 149.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 153.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
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## Warning: Failed to fit group 156.
## Caused by error in `smooth.construct.cr.smooth.spec()`:

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## ! x has insufficient unique values to support 10 knots: reduce k.
## Warning: Failed to fit group 158.
## Caused by error in `gam.reparam()`:
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## Warning: Failed to fit group 165.
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## Warning: Failed to fit group 166.
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## Warning: Failed to fit group 172.
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## Warning: Failed to fit group 178.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
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## Warning: Failed to fit group 180.
## Caused by error in `gam.reparam()`:
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## Warning: Failed to fit group 181.
## Caused by error in `gam.reparam()`:
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```

```

## Warning: Failed to fit group 184.
## Caused by error in `gam.reparam()`:
## ! NA/NaN/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 187.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
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## Warning: Failed to fit group 188.
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## Warning: Failed to fit group 189.
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## Warning: Failed to fit group 191.
## Caused by error in `gam.reparam()`:
## ! NA/NaN/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 192.
## Caused by error in `gam.reparam()`:
## ! NA/NaN/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 195.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 201.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
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## Warning: Failed to fit group 202.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 204.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
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## Warning: Failed to fit group 206.
## Caused by error in `gam.reparam()`:
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## Warning: Failed to fit group 208.
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## Warning: Failed to fit group 210.
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## Warning: Failed to fit group 212.
## Caused by error in `gam.reparam()`:
## ! NA/NaN/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 213.

```

```

## Caused by error in `gam.reparam()`:
## ! NA/NaN/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 216.
## Caused by error in `gam.reparam()`:
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## Warning: Failed to fit group 217.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
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## Warning: Failed to fit group 218.
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## Warning: Failed to fit group 221.
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## Warning: Failed to fit group 224.
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## Warning: Failed to fit group 225.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 228.
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## Warning: Failed to fit group 231.
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## Warning: Failed to fit group 233.
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## Warning: Failed to fit group 235.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
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## Warning: Failed to fit group 236.
## Caused by error in `gam.reparam()`:
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## Warning: Failed to fit group 237.
## Caused by error in `smooth.construct.cr.smooth.spec()`:

```

```

## ! x has insufficient unique values to support 10 knots: reduce k.
## Warning: Failed to fit group 240.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 241.
## Caused by error in `gam.reparam()`:
## ! NA/Nan/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 242.
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## Warning: Failed to fit group 243.
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## Warning: Failed to fit group 245.
## Caused by error in `gam.reparam()`:
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## Warning: Failed to fit group 247.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 248.
## Caused by error in `gam.reparam()`:
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## Warning: Failed to fit group 253.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
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## Warning: Failed to fit group 254.
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## Warning: Failed to fit group 257.
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## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 260.
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## Warning: Failed to fit group 261.
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## Warning: Failed to fit group 263.
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## Warning: Failed to fit group 264.
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```

```

## Warning: Failed to fit group 265.
## Caused by error in `gam.reparam()`:
## ! NA/NaN/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 269.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
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## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 273.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 274.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 275.
## Caused by error in `gam.reparam()`:
## ! NA/NaN/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 276.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
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## Warning: Failed to fit group 277.
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## Warning: Failed to fit group 279.
## Caused by error in `gam.reparam()`:
## ! NA/NaN/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 281.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 283.
## Caused by error in `gam.reparam()`:
## ! NA/NaN/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 284.
## Caused by error in `gam.reparam()`:
## ! NA/NaN/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 286.
## Caused by error in `gam.reparam()`:
## ! NA/NaN/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 291.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
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## Warning: Failed to fit group 293.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 294.

```

```

## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 295.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 296.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 298.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 301.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 302.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
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## Warning: Failed to fit group 303.
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## Warning: Failed to fit group 304.
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## ! NA/Nan/Inf in foreign function call (arg 3)

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## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 311.
## Caused by error in `gam.reparam()`:
## ! NA/Nan/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 313.
## Caused by error in `gam.reparam()`:
## ! NA/Nan/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 314.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 317.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 318.
## Caused by error in `gam.reparam()`:
## ! NA/Nan/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 319.
## Caused by error in `gam.reparam()`:

```

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## ! NA/Nan/Inf in foreign function call (arg 3)
## Warning: Failed to fit group 320.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 326.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 330.
## Caused by error in `gam.reparam()`:
## ! NA/Nan/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 331.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 335.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 337.
## Caused by error in `gam.reparam()`:
## ! NA/Nan/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 341.
## Caused by error in `gam.reparam()`:
## ! NA/Nan/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 343.
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## ! NA/Nan/Inf in foreign function call (arg 3)

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## Caused by error in `gam.reparam()`:
## ! NA/Nan/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 349.
## Caused by error in `gam.reparam()`:
## ! NA/Nan/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 354.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

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## Warning: Failed to fit group 355.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 356.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 359.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 360.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 362.
## Caused by error in `gam.reparam()`:
## ! NA/Nan/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 363.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 364.
## Caused by error in `gam.reparam()`:
## ! NA/Nan/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 373.
## Caused by error in `gam.reparam()`:
## ! NA/Nan/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 374.
## Caused by error in `gam.reparam()`:
## ! NA/Nan/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 378.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 380.
## Caused by error in `gam.reparam()`:
## ! NA/Nan/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 381.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 382.
## Caused by error in `gam.reparam()`:
## ! NA/Nan/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 385.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 386.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 387.

```

```

## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 388.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 389.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 390.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 391.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

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## Warning: Failed to fit group 393.
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## ! NA/Nan/Inf in foreign function call (arg 3)

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## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 396.
## Caused by error in `gam.reparam()`:
## ! NA/Nan/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 400.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 407.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 410.
## Caused by error in `gam.reparam()`:
## ! NA/Nan/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 412.
## Caused by error in `gam.reparam()`:
## ! NA/Nan/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 418.
## Caused by error in `gam.reparam()`:
## ! NA/Nan/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 423.
## Caused by error in `gam.reparam()`:

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## ! NA/Nan/Inf in foreign function call (arg 3)
## Warning: Failed to fit group 424.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 426.
## Caused by error in `gam.reparam()`:
## ! NA/Nan/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 427.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 430.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 433.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 435.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 436.
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## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 437.
## Caused by error in `gam.reparam()`:
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## Warning: Failed to fit group 438.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 442.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
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## Warning: Failed to fit group 443.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 446.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 447.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 449.
## Caused by error in `gam.reparam()`:
## ! NA/Nan/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 452.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

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## Warning: Failed to fit group 459.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 462.
## Caused by error in `gam.reparam()`:
## ! NA/Nan/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 463.
## Caused by error in `gam.reparam()`:
## ! NA/Nan/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 464.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 468.
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## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 469.
## Caused by error in `gam.reparam()`:
## ! NA/Nan/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 470.
## Caused by error in `gam.reparam()`:
## ! NA/Nan/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 479.
## Caused by error in `gam.reparam()`:
## ! NA/Nan/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 480.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
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## ! NA/Nan/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 485.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
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## Warning: Failed to fit group 486.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 490.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 491.
## Caused by error in `gam.reparam()`:
## ! NA/Nan/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 492.
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## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 494.

```

```

## Caused by error in `gam.reparam()`:
## ! NA/NaN/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 496.
## Caused by error in `gam.reparam()`:
## ! NA/NaN/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 499.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 505.
## Caused by error in `gam.reparam()`:
## ! NA/NaN/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 508.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 510.
## Caused by error in `gam.reparam()`:
## ! NA/NaN/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 511.
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## ! NA/NaN/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 516.
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## ! NA/NaN/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 517.
## Caused by error in `gam.reparam()`:
## ! NA/NaN/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 518.
## Caused by error in `gam.reparam()`:
## ! NA/NaN/Inf in foreign function call (arg 3)

## Warning: Failed to fit group 519.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 521.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

## Warning: Failed to fit group 522.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

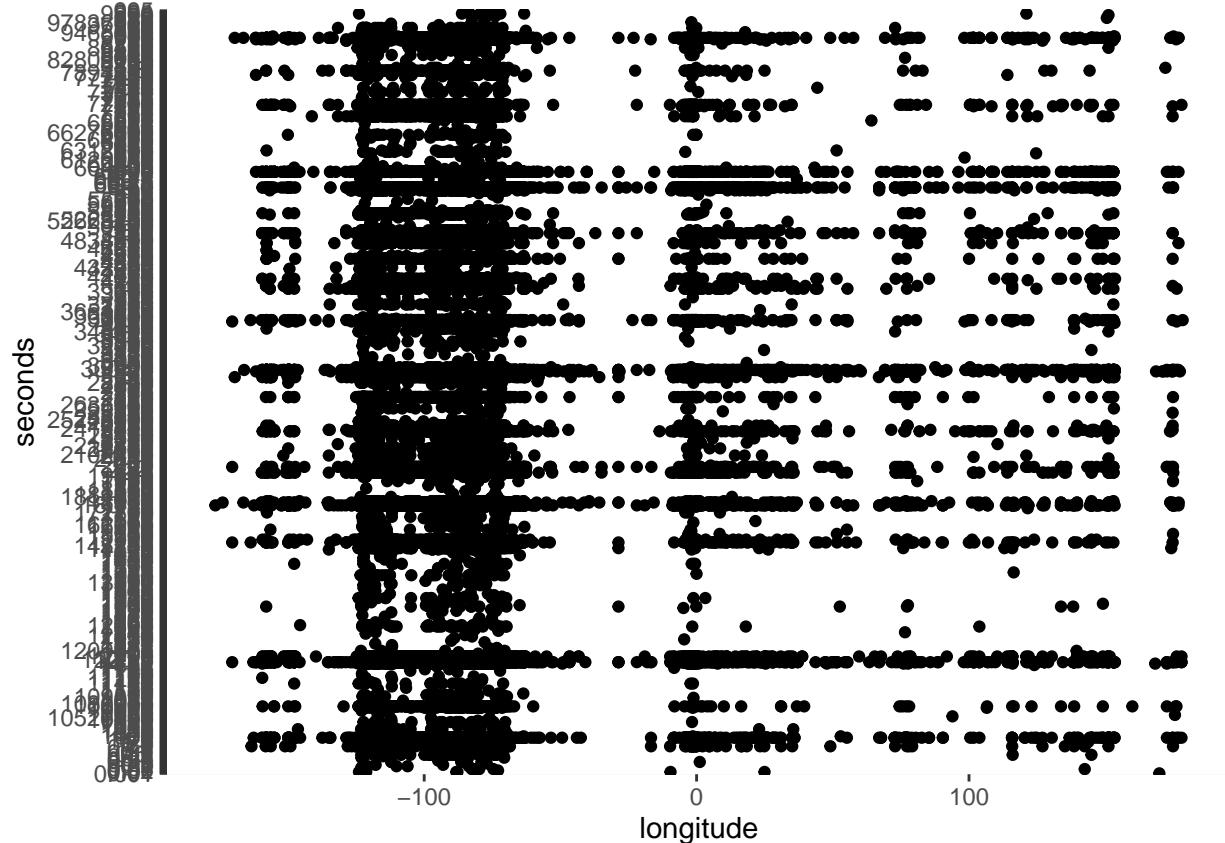
## Warning: Failed to fit group 524.
## Caused by error in `gam.reparam()`:

```

```

## ! NA/NaN/Inf in foreign function call (arg 3)
## Warning: Failed to fit group 534.
## Caused by error in `smooth.construct.cr.smooth.spec()`:
## ! x has insufficient unique values to support 10 knots: reduce k.

```



```

ufo$seconds <- as.numeric(ufo$seconds)

## Warning: NAs introduced by coercion

lm(
  formula = seconds ~ longitude + latitude,
  data = ufo
)

##
## Call:
## lm(formula = seconds ~ longitude + latitude, data = ufo)
##
## Coefficients:
## (Intercept)    longitude      latitude
##       7230.4        137.9        360.8

```

Note that the `echo = FALSE` parameter was added to the code chunk to prevent printing of the R code that generated the plot.