Package: growthbreaks (via r-universe)

May 16, 2026

Type Package

Title Spatio-temporal Growth Anomaly Detection

Version 0.1.0

Author Maia S. Kapur

Maintainer Maia S. Kapur <maia.kapur@noaa.gov>

Description Implements the GAM-based breakpoint detection method for length-at-age observations as described Kapur et. al. 2019.

License GPL-3

Encoding UTF-8

LazyData true

Depends R, TMB, tidyr, dplyr, ggplot2, zoo, sessioninfo, abind, rmarkdown, knitr, magrittr, mgcv, purrr, sf, MASS, rnaturalearth, rnaturalearthdata, gridExtra, here

LinkingTo TMB, RcppEigen

Suggests knitr, rmarkdown

VignetteBuilder knitr

URL https://afsc-assessments.github.io/growthbreaks/

RoxygenNote 7.2.3

Config/pak/sysreqs libabsl-dev cmake libgdal-dev gdal-bin libgeos-dev make libicu-dev libuv1-dev libssl-dev libproj-dev libsqlite3-dev libudunits2-dev

Repository https://jimianelli.r-universe.dev

Date/Publication 2025-02-12 19:46:30 UTC

RemoteUrl https://github.com/afsc-assessments/growthbreaks

RemoteRef HEAD

RemoteSha 1a68005152cab81ba4ea7e56b981d159a49f5116

Contents

`check_data` *Load, check and plot input data for use in breakpoint detection*

Description

Load, check and plot input data for use in breakpoint detection

Usage

```
check_data(dat, sex = FALSE, showPlot = TRUE)
```

Arguments

`dat`	data.frame with columns year, age, length, sex (optional)
`sex`	logical. does your data frame include a sex column?
`showPlot`	logical. do you want to visualize your input data?

Value

plots

`check_Deriv` *Check whether the CI of the derivative includes zero or not*

Description

Check whether the CI of the derivative includes zero or not

Usage

```
check_Deriv(x, d, upper, lower, eval = 0, crit.eval)
```

Arguments

x	vector of values over which derivatives were evaluated
d	vector output of Deriv()
upper	upper confidence interval; output of confint_Deriv()
lower	lower confidence interval; output of confint_Deriv()
eval	the value that you would like to examine. default 0

Value

vector of confidence intervals of same length as object.

---

confint_Deriv *Calculate confidence interval of derivative.*

Usage

```
confint_Deriv(object, term, alpha = 0.05, ...)
```

Arguments

object	vector output of Deriv()
term	string smooth name, i.e. "year". must match values in mod and newdata
alpha	confidence threshold. default 0.05 (for 95

vector of confidence intervals of same length as object.

Calculate confidence interval of derivative.

Deriv *Evaluate first derivative of GAM smooth(s), adapted from* R*hrefhttps://gist.githubusercontent.com/gavinsimpson/e73f011fdaaab4bb5a30/raw/82118ee30c9* *Simpson.*

Description

Evaluate first derivative of GAM smooth(s), adapted from Gavin Simpson.

Usage

```
Deriv(mod, n = 200, eps = 1e-04, newdata, term)
```

Arguments

mod	the output of mgcv::gam()
n	number of intervals over which to evaluate each smooth. default 200.
eps	tolerance threshold. default 1e-4.
newdata	optional; data.frame of new smooth parameters to evaluate
term	string smooth name, i.e. "year". must match values in mod and newdata

Value

a vector of derivative values of length n

---

get_Breaks *Wrapper function to to fit gams & evaluate first derivatives*

Description

Wrapper function to to fit gams & evaluate first derivatives

Usage

```
get_Breaks(dat, ages_to_use = c(5, 10), sex = FALSE, axes = 0, showPlot = TRUE)
```

Arguments

dat	data.frame with columns year, age, length, lat, long, sex (optional)
ages_to_use	optional. vector of age(s) to evaluate for breakpoints.
sex	logical.
axes	do you want to evaluate axes for space only (0, default), time only (1), or both simultaneously (2)?
showPlot	logical. do you want to see the detected break(s) on a map? Applicable only for axes options 0 or 2.

Value

matrix of detected breakpoints and plots

hello *Hello, World!*

Description

Prints 'Hello, world!'.

Usage

```
hello()
```

Examples

```
hello()
```

plot_Breaks *Show breakpoints (and optionally data) on a map*

Description

Show breakpoints (and optionally data) on a map

Usage

```
plot_Breaks(dat, breakpoints, showData = TRUE)
```

Arguments

dat	data.frame with columns year, age, length, lat, long, sex (optional)
breakpoints	data.frame with columns year (optional) lat and long. can be output of get_Breaks(). Use -Inf to turn off a break.
showData	logical. do you want to see your datapoints?

Value

Map

p1 plot of Alaska with dashed breakpoints and (optionally) raw length observations

`refit_Growth` *Re-fit growth data at putative breaks and return estimates for validation*

Description

Re-fit growth data at putative breaks and return estimates for validation

Usage

```
refit_Growth(dat = simulated_data, breakpoints, selex = FALSE, showPlot = TRUE)
```

Arguments

`dat`	data.frame with columns year, age, length, lat, long, sex (optional)
`breakpoints`	data.frame with columns year and/or lat and long. can be output of get_Breaks().
`showPlot`	logical. do you want to see plots of the fitted curves?

Value

Von B growth parameters at input breakpoints; plots with uncertainty of growth curves:

`$split_tables` list of tables of input data split by strata specified in breakpoints

`$fits_df` input data, estimates and associated standard errors as single dataframe

`$pars_df` Parameter estimates and associated standard errors

`$fits_plot` input observations and fitted growth curves, by strata

`$pars_plot` Parameter estimates and associated standard errors; red lines indicate statistically significant differences

Index