Package 'rct3'

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Title Predict Fish Year-Class Strength from Survey Data

LazyData yes

Description Predict fish year-class strength by calibration regression analysis of multiple recruitment index series.

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R topics documented:

rct3-package *Predict Fish Year-Class Strength from Survey Data*

Description

Predict fish year-class strength by calibration regression analysis of multiple recruitment index series.

Details

Functions:

rct3	run a calibrated regression to predict rectruitment
print.rct3	print a rct3 object
summary.rct3	summarise a rct3 object

#' Data sets:

recdata	example dataset of recruitment and survey indices

References

J. G. Shepherd, Prediction of year-class strength by calibration regression analysis of multiple recruit index series, ICES Journal of Marine Science, Volume 54, Issue 5, October 1997, Pages 741–752, https://doi.org/10.1006/jmsc.1997.0222

print.rct3 *Print an rct3 fit*

Description

Print an rct3 fit showing the model settings and predicted recruitments

Usage

```
## S3 method for class 'rct3'
print(x, digits = max(3, getOption("digits") - 3), ...)
```

Arguments

x	an object of class rct3 - an output from the rct3 function.
digits	optional integer for how much to round the values in the output tables.
...	additional arguments to print.data.frame

Value

invisibly returns a summary data frame.

See Also

rct3 run a calibrated regression to predict rectruitment.

summary.rct3 summarise a rct3 object

rct3-package gives an overview of the package.

Examples

```
# load recruitment data
data(recdata)

formula <-
 recruitment ~ NT1 + NT2 + NT3 + NAK1 + NAK2 + NAK3 +
               RT1 + RT2 + RT3 + EC01 + ECO2 + ECO3

my_rct3 <- rct3(formula, recdata, predictions = 2012:2017, shrink = TRUE)

# see a short summary
my_rct3

# for a full summary do:
summary(my_rct3)

# the components are here:
my_rct3$rct3
my_rct3$rct3.summary

# predicted recruitment
t(my_rct3$rct3.summary["WAP"])
```

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rct3 *Run a calibrated regression to predict recruitment*

Description

Function to run a calibrated regression to predict recruitment using the method decribed by Shepherd (1997)

Usage

```
rct3(
  formula,
  data,
  predictions = NULL,
```

```
  shrink = FALSE,
  power = 3,
  range = 20,
  min.se = 0.2,
  old = TRUE
)
```

Arguments

formula	a formula to define which surveys to use in the recruitment estimation.
data	a dataframe with one column named 'yearclass' and other columns with the recruitment and the survey index relavent for that recruitment value
predictions	which yearclasses to make recruitment predictions for
shrink	shrink predictions to the VPA mean?
power	the power to use 0 - no weighting, 2 - bisquare, 3 - tricubic
range	the year range to use in the time tapered weighting
min.se	the minimum standard error used in the weighting of predictions
old	default TRUE, defines how to treat zero values. In the origional implmentation al values were transformed using log(x + 1), old=TRUE maintains this.

Value

Object of class `rct3`.

Note

This function was written based on the publication by Shepherd (1997) with additional reverse engeneering by comparing results to previous examples run using the RCT3 ver3.1 dos program

References

J. G. Shepherd, Prediction of year-class strength by calibration regression analysis of multiple recruit index series, ICES Journal of Marine Science, Volume 54, Issue 5, October 1997, Pages 741–752, https://doi.org/10.1006/jmsc.1997.0222

See Also

rct3-package gives an overview of the package.

Examples

```
# load recruitment data
data(recdata)

formula <- recruitment ~ NT1 + NT2 + NT3 +
                         NAK1 + NAK2 + NAK3 +
                         RT1 + RT2 + RT3 +
                         EC01 + ECO2 + ECO3
```

```
my_rct3 <- rct3(formula, recdata, predictions = 2012:2017, shrink = TRUE)

# see a short summary
my_rct3

# for a full summary do:
summary(my_rct3)

# the components are here:
my_rct3$rct3
my_rct3$rct3.summary

# predicted recruitment
t(my_rct3$rct3.summary["WAP"])
```

---

recdata *Recruitment and survey index data*

Description

data.frame containing recruitment (age 3) and survey indices from several surveys over ages 1 to 3

Usage

```
recdata
```

Format

Data frame containing 14 columns:

`yearclass`	the yearclass
`recruitment`	the recruiment (age 3) for that yearclass
`NT1`	The age 1 survey index from 'NT' survey
`NT2`	The age 2 survey index from 'NT' survey
`...`	and so on

See Also

`rct3` run a calibrated regression to predict rectruitment.

`rct3-package` gives an overview of the package.

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summary.rct3 *Summarise an rct3 fit*

Description

Print an rct3 fit showing the model settings, a summary of the prediction for each yearclass and the overall predicted recruitments

Usage

```
## S3 method for class 'rct3'
summary(object, digits = max(3, getOption("digits") - 3), ...)
```

Arguments

object	an object of class rct3 - an output from the rct3 function.
digits	optional integer for how much to round the values in the output tables.
...	additional arguments to print.data.frame

Value

invisibly returns a summary data frame.

See Also

rct3 run a calibrated regression to predict rectruitment.

rct3-package gives an overview of the package.

Examples

```
# load recruitment data
data(recdata)

formula <- recruitment ~ NT1 + NT2 + NT3 +
                         NAK1 + NAK2 + NAK3 +
                         RT1 + RT2 + RT3 +
                         EC01 + ECO2 + ECO3

my_rct3 <- rct3(formula, recdata, predictions = 2012:2017, shrink = TRUE)

# see a short summary
my_rct3

# for a full summary do:
summary(my_rct3)

# the components are here:
my_rct3$rct3
my_rct3$rct3.summary

# predicted recruitment
t(my_rct3$rct3.summary["WAP"])
```

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